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Workshop Manual

Audi A4 2015 ➤

Audi A5 2016 ➤

6-cylinder direct injection engine (2.9 ltr., 3.0 ltr. 4-valve TFSI EA 839)

Engine ID	CWG D	DEC A							
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Edition 02.2019



List of Workshop Manual Repair Groups

Repair Group

- 00 - Technical data
- 10 - Removing and installing engine
- 13 - Crankshaft group
- 15 - Cylinder head, valve gear
- 17 - Lubrication
- 19 - Cooling
- 21 - Turbocharging/supercharging
- 24 - Mixture preparation - injection
- 26 - Exhaust system
- 28 - Ignition system



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



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00 – Technical data

1 Identification

(ARL006255; Edition 02.2019)

All information can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Identification .



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2 Safety precautions

All information can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Safety precautions .



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3 Repair instructions

All information can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair instructions .



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10 – Removing and installing engine

1 Removing and installing engine

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1.1 Removing engine

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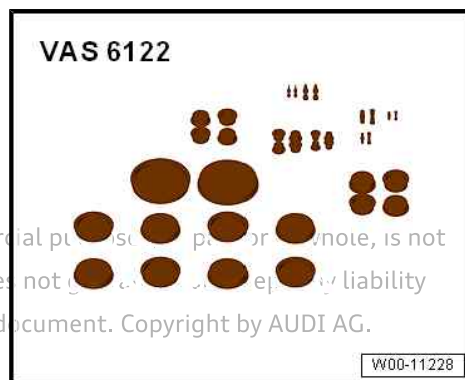
1.1.1 Removing engine - 2.9 ltr. engine without particulate filter

Special tools and workshop equipment required

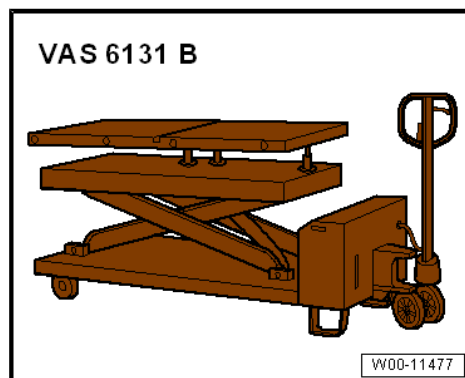
- ◆ Engine bung set - VAS 6122-



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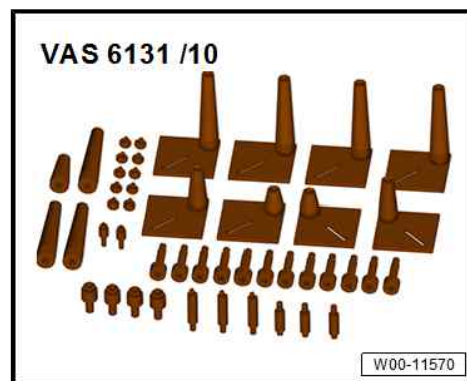


- ◆ Scissor-type assembly platform - VAS 6131 B-





- ◆ Support set for Audi - VAS 6131/10-



- ◆ Supplementary kit - VAS 6131/11- (not illustrated)
- ◆ Supplementary set, Audi Q7 >2005 - VAS 6131/13-

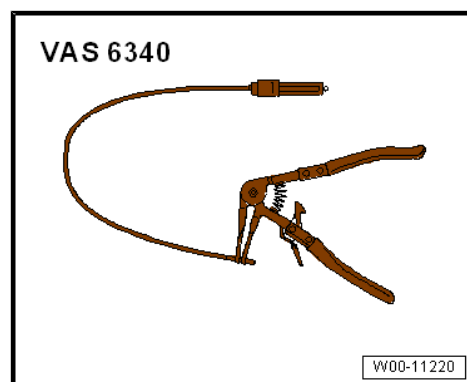


- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-

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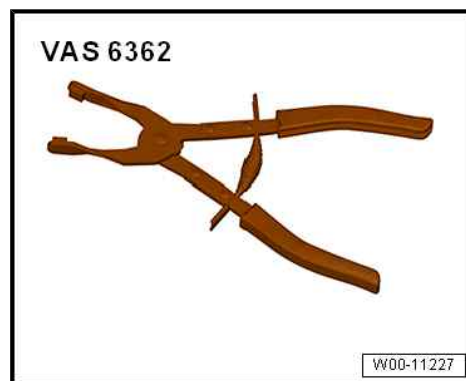


- ◆ Hose clip pliers - VAS 6340-

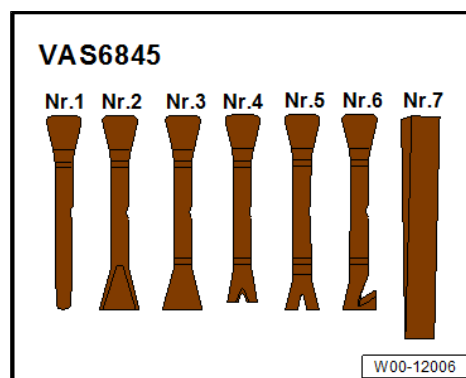




- ◆ Hose clip pliers - VAS 6362-



- ◆ Universal wedge no. 7 from scraper set - VAS 6845-



- ◆ Engine and gearbox jack - VAS 6931-



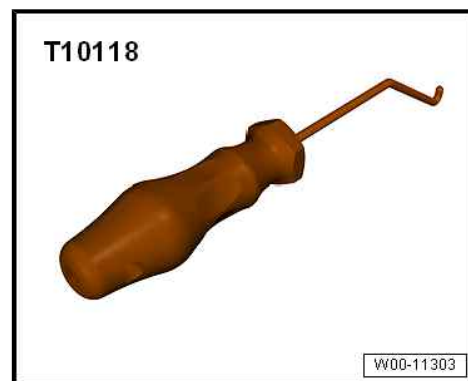
- ◆ Ball joint ejector - VAS 251 805-



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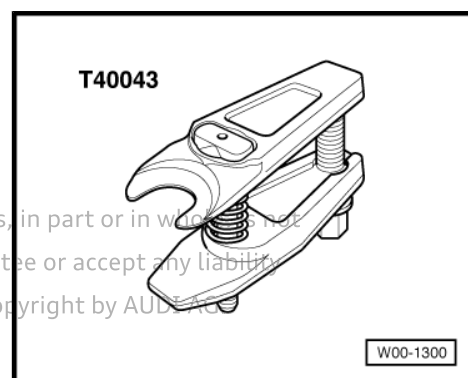
- ◆ Assembly tool - T10118-



- ◆ Ball joint puller - T40043-



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- ◆ Stepladder (commercially available)

Procedure

- ◆ The engine is removed from underneath together with the gearbox and subframe (with lock carrier installed).
- ◆ Fit cable ties in the same locations when installing.
- ◆ Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- ◆ All bolts on running gear components with bonded rubber bushes must be tightened with suspension in unladen position (vehicle unladen) on vehicles with coil springs or in reference position on vehicles with air suspension.
- ◆ Bonded rubber bushes can only be turned to a limited extent. Therefore, before tightening the bolts, suspension components with bonded rubber bushes must be brought into a position corresponding to the normal position while driving (unladen position/reference position). Otherwise, the bush would be subject to torsion loading and its service life shortened.
- Before starting work, determine unladen position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with coil springs) or determine reference position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with air suspension) .
- The electromechanical parking brake must be released before disconnecting the battery, so that the propshaft can be turned during removal.
- Bring front wheels into straight-ahead position.
- Switch off ignition.



- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Release catches -arrows B- and open cover -1- -arrow A-.

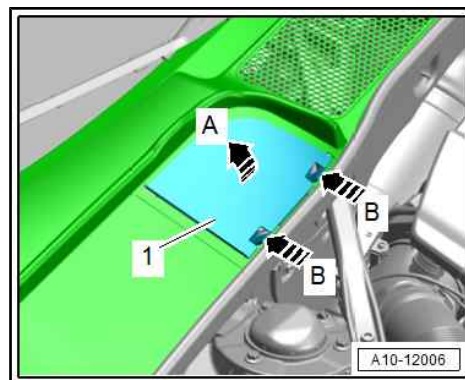


WARNING

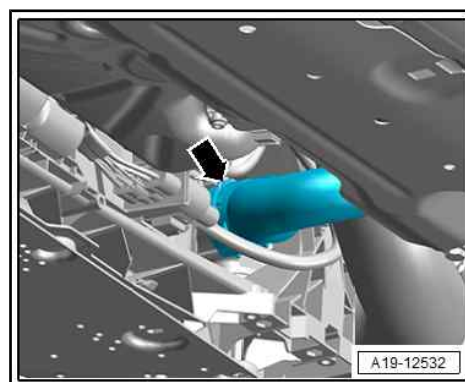
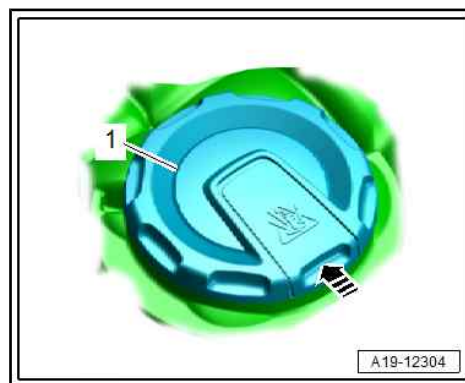
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

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.



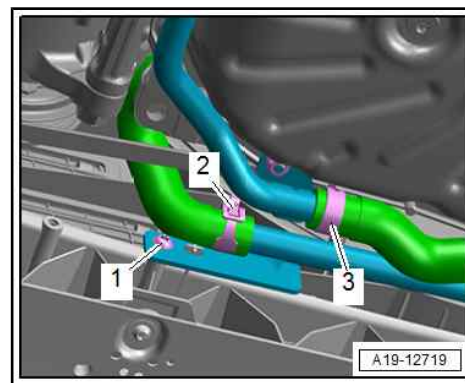
- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel spoiler on both sides and unfasten front section of front right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -arrow-, disconnect coolant hose (bottom right) from radiator and drain off coolant.



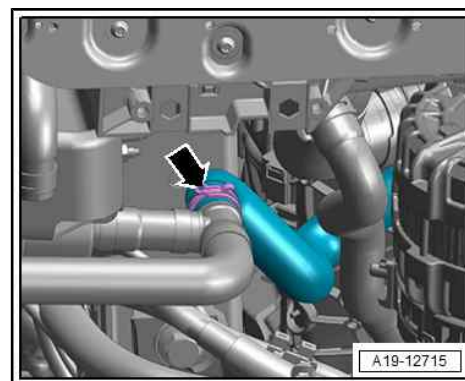
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- Release hose clips -2, 3-, disconnect coolant hoses and drain off coolant.
- Unscrew bolts -1- on both sides and tie up coolant pipes to right side.



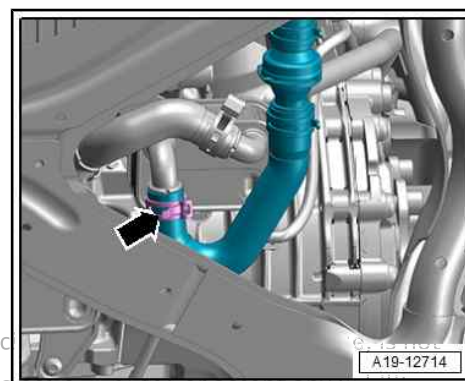
- Release hose clip -arrow-.
- Disconnect coolant hose at T-piece and drain off coolant.



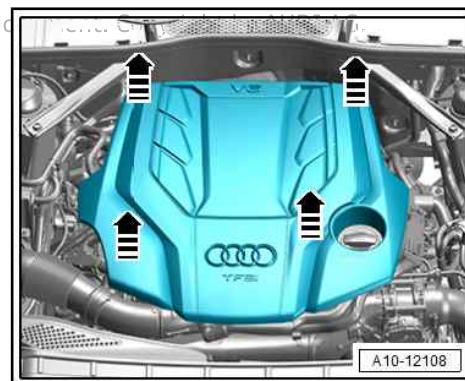
- Release hose clip -arrow-.
- Disconnect coolant hose from gear oil cooler, hold end of hose downwards and drain off coolant.



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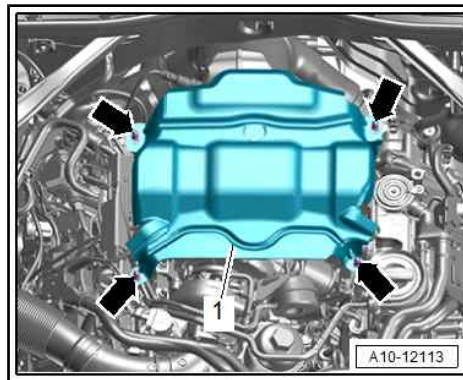


- Carefully pull engine cover panel off retaining pins one after another -arrows-. Do not jerk engine cover panel away, and do not try to pull on one side only.

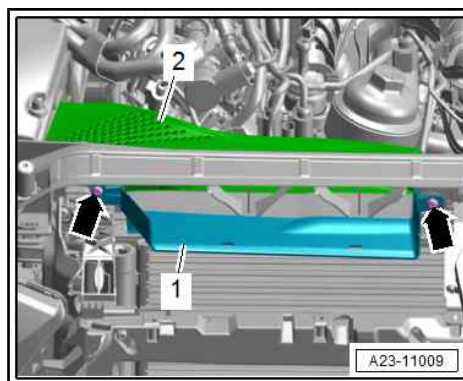




- Remove ball stud -arrows- and detach heat shield -1-.



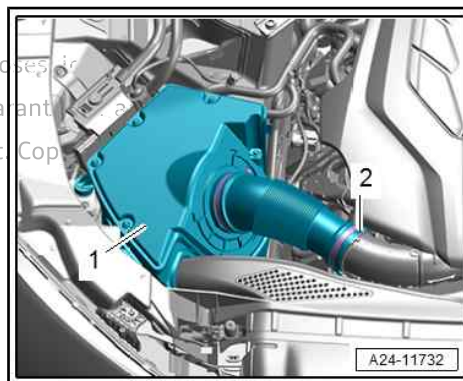
- Remove bolts -arrows- and detach air duct -2-.



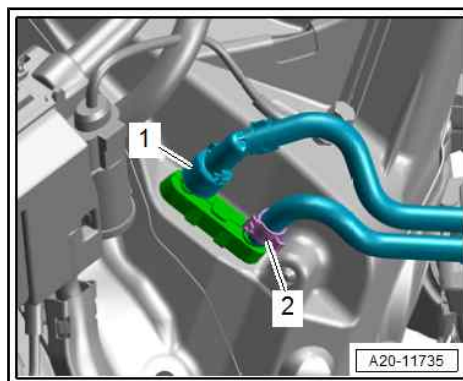
- Release hose clip -2- and detach air pipe.

- Lift off air cleaner housing -1- and detach.

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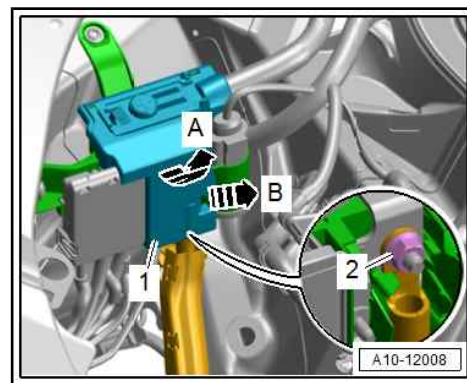


- Disconnect fuel hose -1- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Release hose clip -2- and disconnect hose for activated charcoal filter system.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .

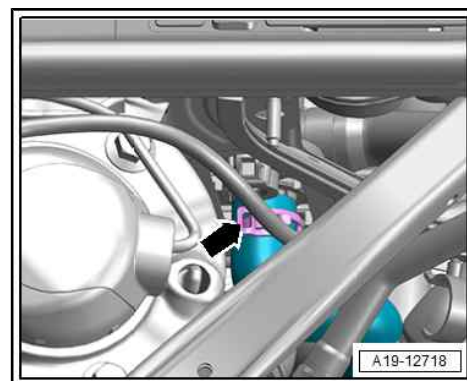




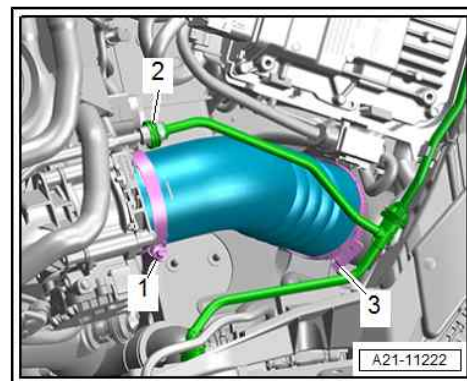
- Release catch -arrow B- and open electronics box -1- -arrow A-.
- Remove nut -2- and move B+ wire clear.
- Move wiring duct clear at top.



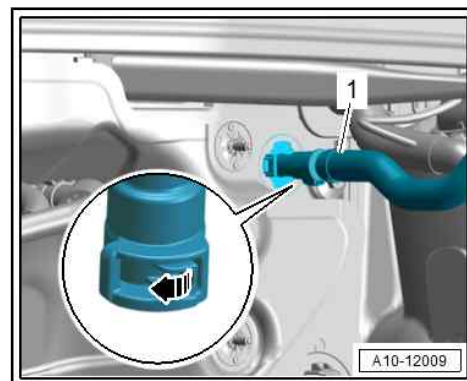
- Release hose clip -arrow- and detach coolant hose.



- Lift retaining clip -2- and disconnect coolant bleeder line.
- Release hose clip -1-, detach air hose and tie up to left side.



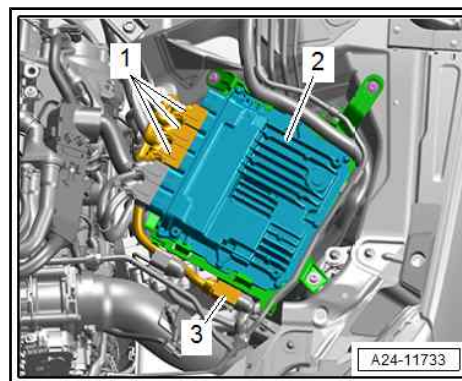
- Release fastener -arrow- and disconnect vacuum hose -1-, taking care not to damage it.



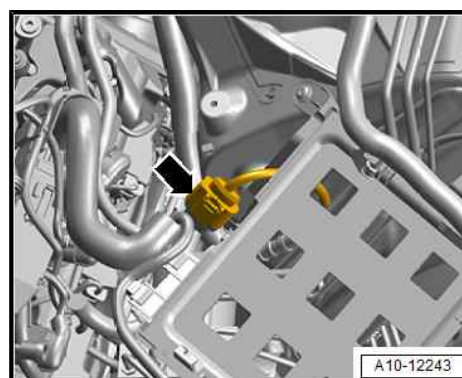
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- Unplug electrical connectors -1- on engine control unit - J623-
-item 2- and move connectors clear.
- Detach electrical connector -3- from bracket, unplug and move
electrical wiring clear.

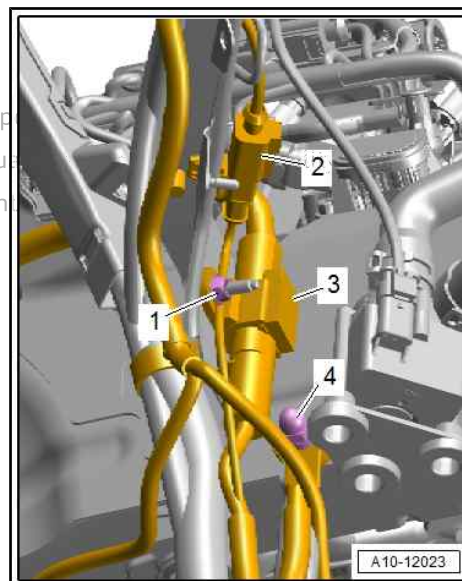


- Detach electrical connector -arrow- from bracket and unplug.

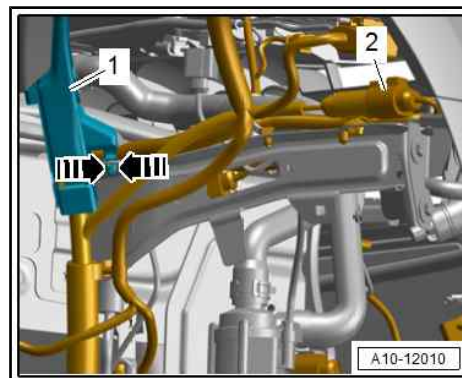


- Unplug electrical connector -2- and move electrical wire clear.
- Loosen nut -1- a few turns, move electrical connector -3- clear
and unplug.
- Remove nut -4- and move earth wires clear.

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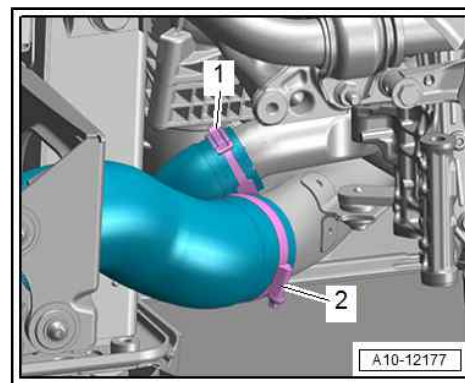


- Detach electrical connector -2- from bracket, unplug and move
electrical wire clear.
- Release fasteners -arrows- and move wiring duct -1- clear.
- Remove refrigerant lines from air conditioner compressor ⇒
Heating, air conditioning; Rep. gr. 87 ; Air conditioner com-
pressor; Detaching and attaching refrigerant lines at air con-
ditioner compressor .

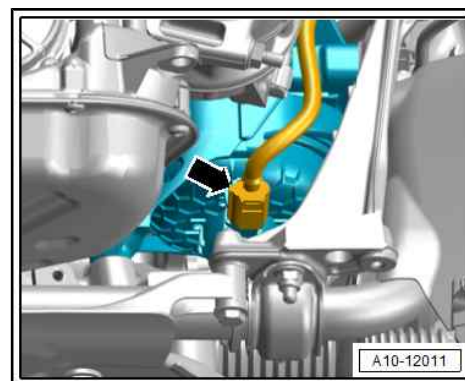




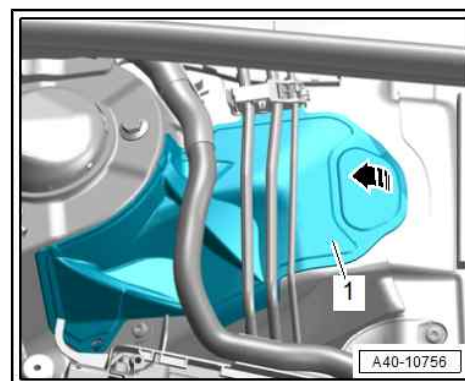
- Release hose clip -2- and detach air hose from air pipe.
- Release hose clip -1- and detach coolant hose from connection.



- Using assembly tool - T10118- , unplug electrical connector -arrow- for electrohydraulic engine mounting solenoid valve on both sides and move wiring clear.



- Open cover -1- -arrow- on suspension turret (both sides).

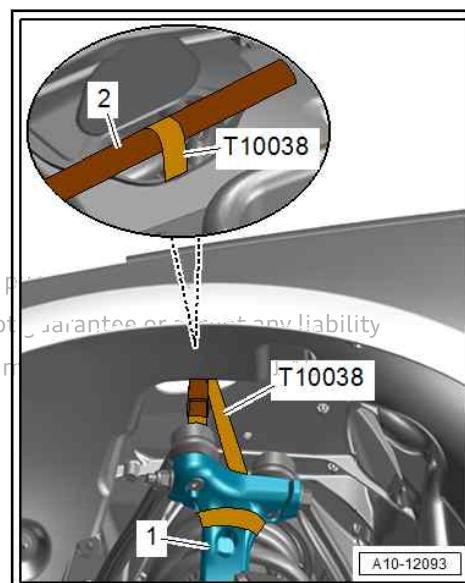


Caution

Danger of damage to the joints of the upper links.

- ♦ ***The weight of the wheel bearing housings must be supported.***

- Tie up wheel bearing housing -1- on both sides with tensioning strap - T10038- (use the handle of a hammer -2- to do so).





- Unplug electrical connector -3- for front vehicle level sender on both sides and move electrical wire clear.



Note

For the following work on the running gear, check the latest versions ⇒ Running gear, axles, steering; Rep. gr. 48; Steering rack; Removing and installing track rod ball joint, and ⇒ Running gear, axles, steering; Rep. gr. 40; Lower suspension links, swivel joint; Removing and installing guide link.



- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out.

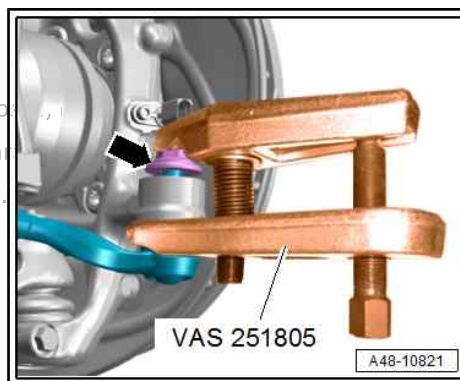
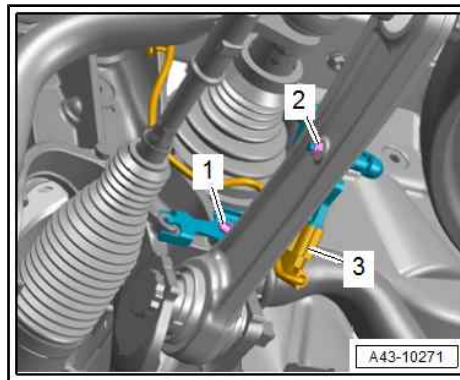
- ◆ The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.



Caution

Risk of damage to ball joint puller.

- ◆ Make sure the two lever arms of the puller are parallel when maximum force is exerted.



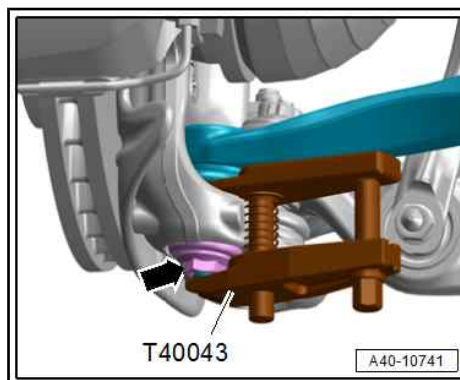
- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805-; counterhold with a 6 mm hexagon socket.
- To protect thread, unscrew nut -arrow- on joint pin of guide link until nut is flush with thread of joint pin. Counterhold joint pin if necessary.



WARNING

Risk of injury if parts are allowed to drop out.

- ◆ The swivel joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.



- Press joint pin of guide link out of tapered seat using ball joint puller - T40043-; taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.



- On appropriate versions: Remove nut -2- and move coupling rod for vehicle level sender clear.
- Detach bolted connections -1, 3- for track control link.
- Swivel track control link towards front.



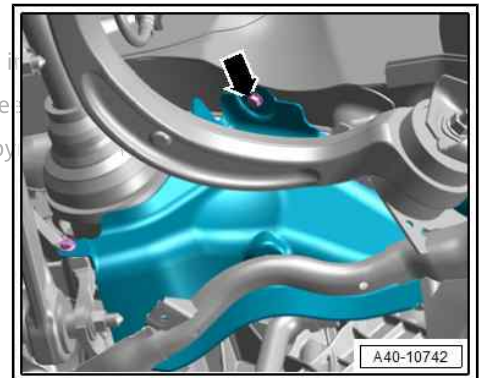
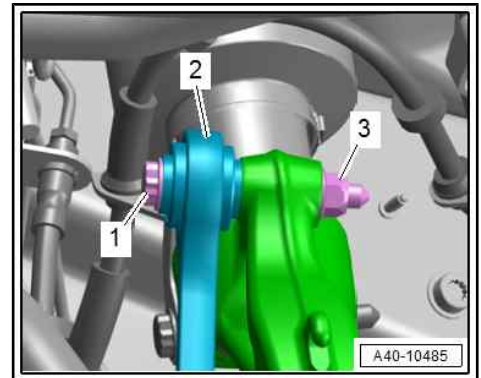
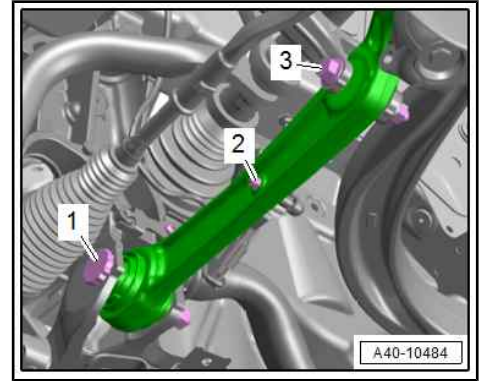
Note

To remove bolt -1-, turn steering to full left/right lock.

- Repeat procedure on opposite side of vehicle.
- On both sides, unscrew nut -3- and pull out bolt -1- for coupling rod -2-.
- Unbolt drive shaft (left and right) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



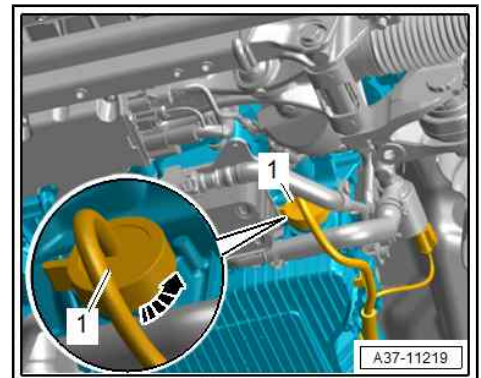
- Remove bolt -arrow- for subframe shield on both sides.
- Detach intermediate steering shaft from steering rack and move clear by telescoping together ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft.



Caution

Risk of irreparable damage to gearbox control unit (mechanic unit) because of electrostatic discharge.

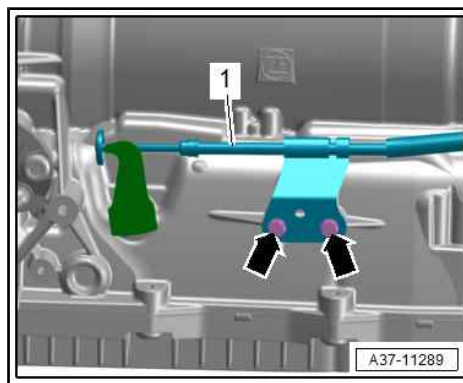
- ◆ ***Before unplugging or plugging in electrical connector, mechanic must discharge static electricity. To do so, touch vehicle earth, heater radiator, or lifting platform, with your hand.***
- ◆ ***Do NOT touch connector contacts in gearbox connector with your hands.***



- Turn retainer catch anti-clockwise -arrow- and unplug electrical connector -1- at gearbox.



- Remove bolts -arrows- and move manual release cable -1- for parking lock clear.

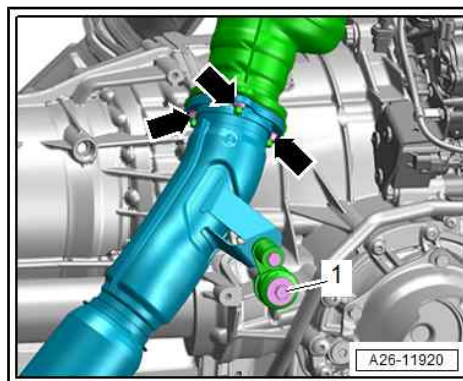
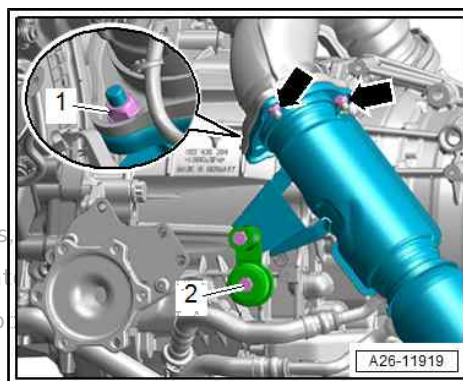


Caution

Risk of damage to flexible joints in front silencer.

- ◆ **Do NOT bend the flexible joint in the front silencer more than 10°.**

- Remove bolt -2- and nuts -1- and -arrows- for front silencer (left-side).
- Detach front silencer (left-side).
- Remove bolt -1- and nuts -arrows- for front silencer (right-side).
- Detach front silencer (right-side).



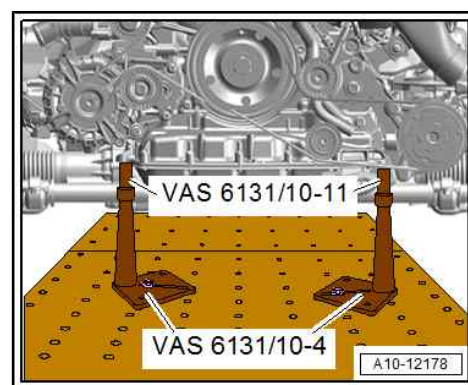
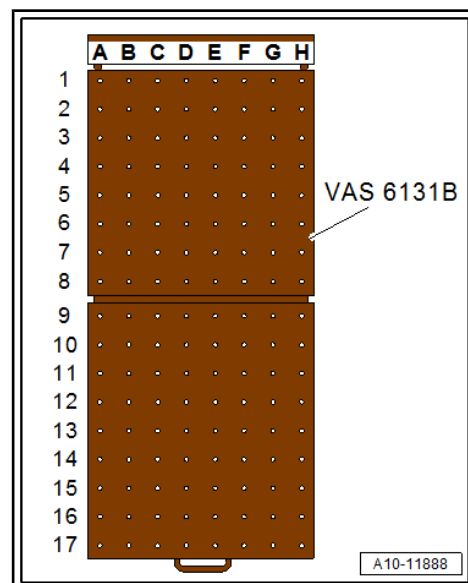


Set up the scissor-type assembly platform as follows:

- Set up scissor-type assembly platform - VAS 6131 B- with support set for Audi - VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2- as follows:

Platform coordinates	Parts from -VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2-			
C4	/10-1	/10-4	/10-5	/10-11
E4	/10-1	/10-4	/10-5	/10-11
E10	/10-1	/10-2	/10-5	/13-2
B15	/10-1	/10-2	/10-5	/11-1
F15	/10-1	/10-3	/10-5	/11-1

- Initially hand-tighten the support elements on the scissor-type assembly platform.
- Position scissor-type assembly platform - VAS 6131 B- horizontally.
- Take note of spirit level (bubble gauge).
- Position scissor-type assembly platform - VAS 6131 B- below engine/gearbox assembly.
- Position support elements from -VAS 6131/10- at both sides of engine.
- Make sure that threaded spindles are screwed in completely.

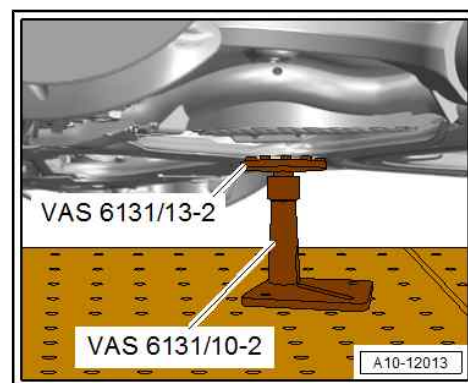


- Support subframe using support elements from - VAS 6131/10- and adapter -VAS 6131/13-2- .



Note

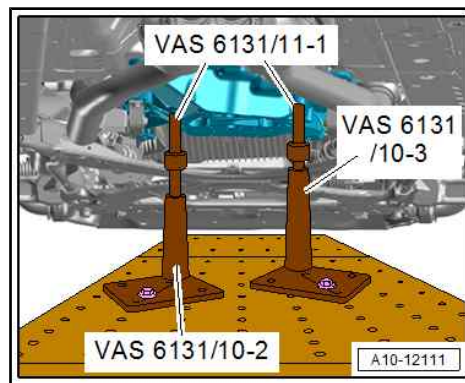
The support elements only support the subframe; the base plate is not secured to the scissor-type assembly platform.



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- Position support elements from -VAS 6131/10- and adapters -VAS 6131/11-1- at tunnel cross member.
- Turn remaining spindles for support elements upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .
- Fix position of subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Fixing position of subframe .



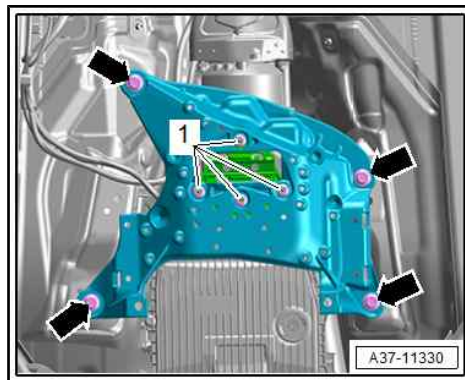
- Remove bolts -arrows- on tunnel cross member.



Caution

Danger of damage to hoses, pipes and wiring connections and to engine compartment.

- ◆ ***Check that all hoses and wiring connections between engine, gearbox, subframe and body have been detached.***
- ◆ ***Carefully guide out engine/gearbox assembly with subframe from engine compartment when lowering.***
- ◆ ***Guide drive shafts carefully past gearbox.***

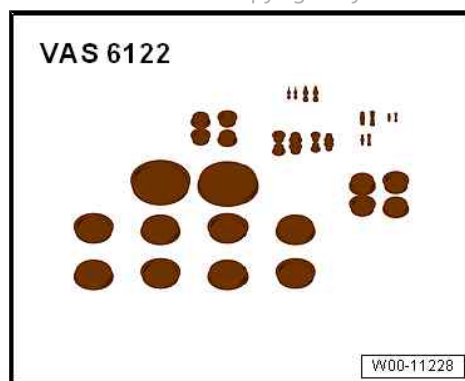


- Lower scissor-type assembly platform - VAS 6131 B- with engine/gearbox assembly and pull out from underneath vehicle.
- Tie up drive shafts.

1.1.2 Removing engine - 2.9 ltr. engine with particulate filter

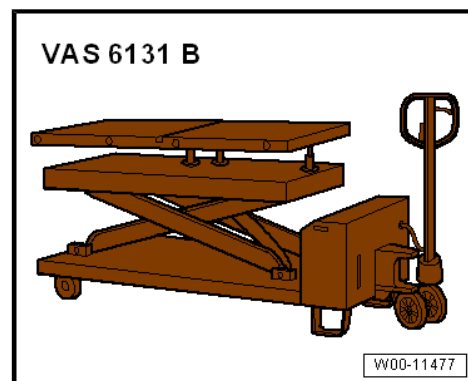
Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-

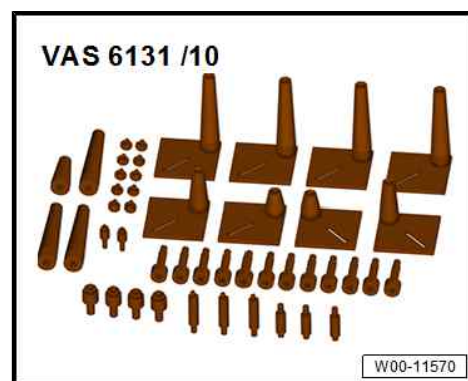




- ◆ Scissor-type assembly platform - VAS 6131 B-



- ◆ Support set for Audi - VAS 6131/10-



- ◆ Supplementary kit - VAS 6131/11- (not illustrated)
- ◆ Supplementary set, Audi Q7 >2005 - VAS 6131/13-



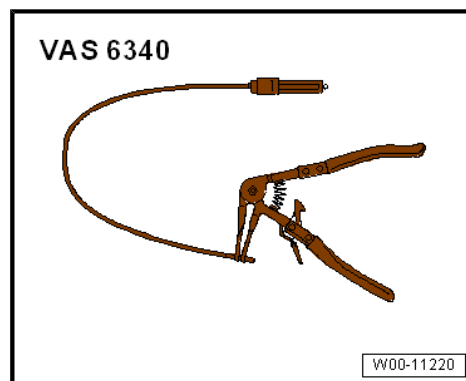
- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



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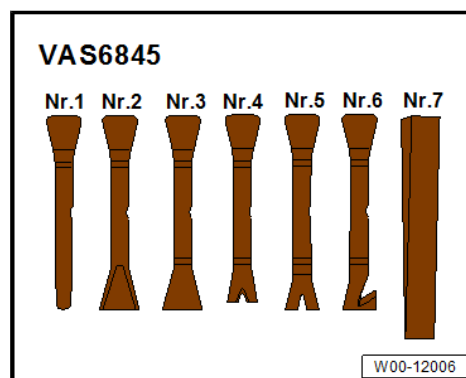
- ◆ Hose clip pliers - VAS 6340-



- ◆ Hose clip pliers - VAS 6362-



- ◆ Universal wedge no. 7 from scraper set - VAS 6845-



- ◆ Engine and gearbox jack - VAS 6931-



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- ◆ Ball joint ejector - VAS 251 805-

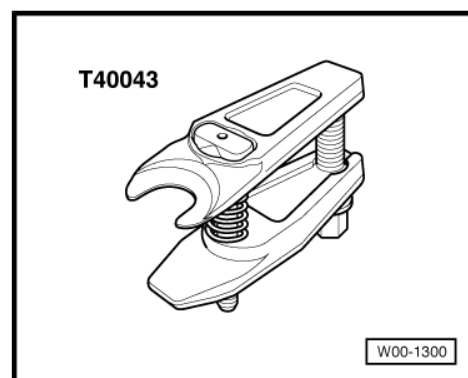


- ◆ Assembly tool - T10118-

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- ◆ Ball joint puller - T40043-



- ◆ Stepladder (commercially available)

Procedure

- ◆ The engine is removed from underneath together with the gearbox and subframe (with lock carrier installed).
- ◆ Fit cable ties in the same locations when installing.
- ◆ Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- ◆ All bolts on running gear components with bonded rubber bushes must be tightened with suspension in unladen position (vehicle unladen) on vehicles with coil springs or in reference position on vehicles with air suspension.
- ◆ Bonded rubber bushes can only be turned to a limited extent. Therefore, before tightening the bolts, suspension components with bonded rubber bushes must be brought into a position corresponding to the normal position while driving (unladen position/reference position). Otherwise, the bush would be subject to torsion loading and its service life shortened.



- Before starting work, determine unladen position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with coil springs) or determine reference position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with air suspension) .
- The electromechanical parking brake must be released before disconnecting the battery, so that the propshaft can be turned during removal.
- Bring front wheels into straight-ahead position.
- Switch off ignition.
- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Release catches -arrows B- and open cover -1- -arrow A-.

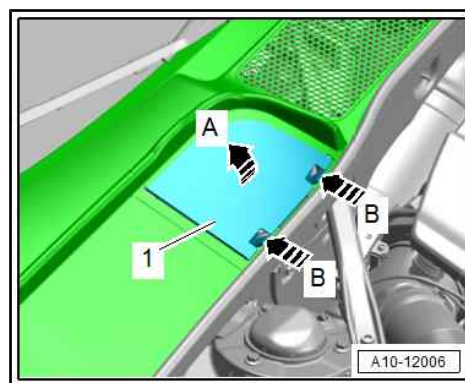


WARNING

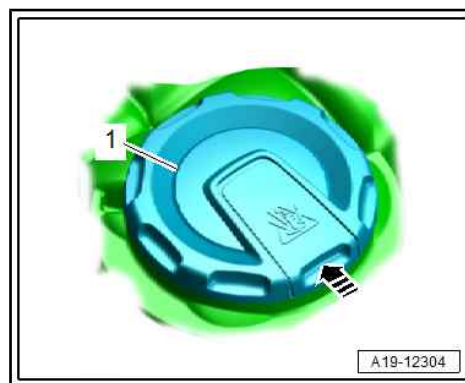
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

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.*



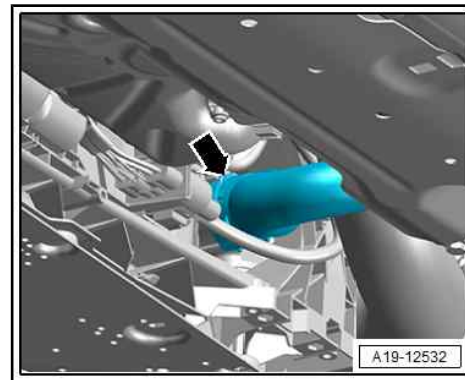
- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
- Remove body brace (right-side) ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel spoiler on both sides and unfasten front section of front right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .



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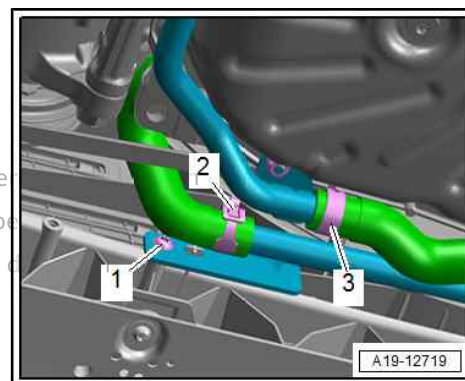


- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -arrow-, disconnect coolant hose (bottom right) from radiator and drain off coolant.

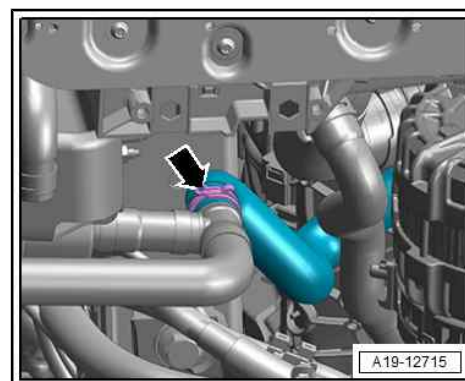


- Release hose clips -2, 3-, disconnect coolant hoses and drain off coolant.
- Unscrew bolts -1- on both sides and tie up coolant pipes to right side.

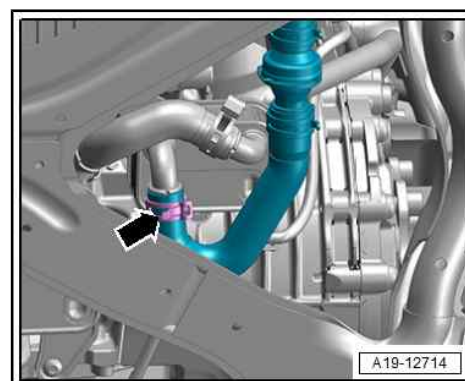
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- Release hose clip -arrow-.
- Disconnect coolant hose at T-piece and drain off coolant.

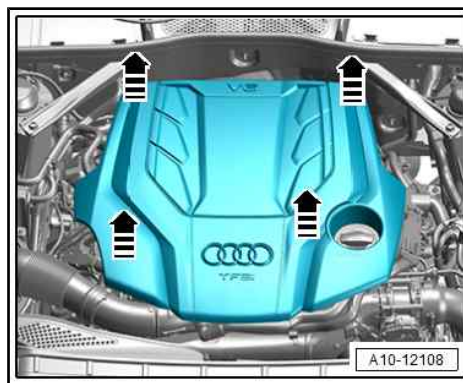


- Release hose clip -arrow-.
- Disconnect coolant hose from gear oil cooler, hold end of hose downwards and drain off coolant.

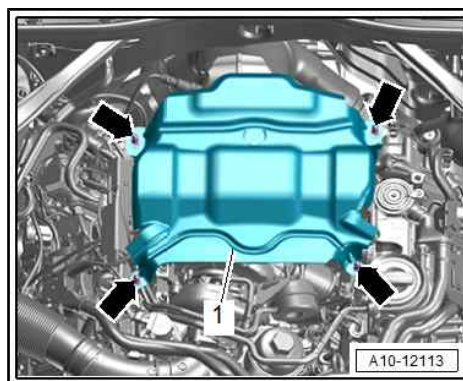




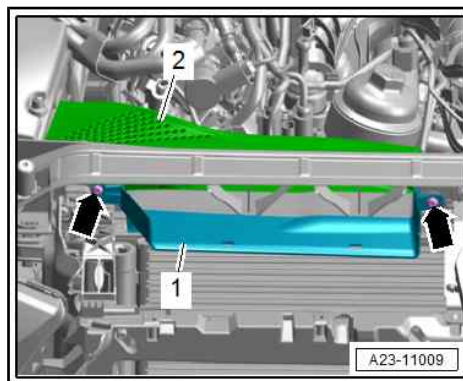
- Carefully pull engine cover panel off retaining pins one after another -arrows-. Do not jerk engine cover panel away, and do not try to pull on one side only.



- Remove ball stud -arrows- and detach heat shield -1-.

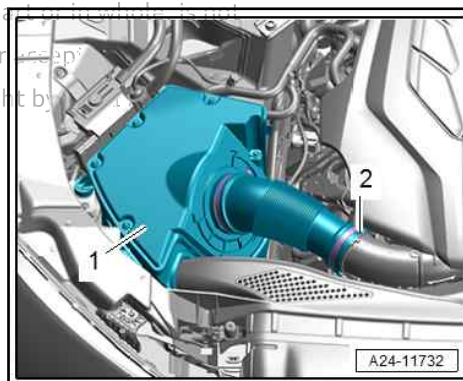


- Remove bolts -arrows- and detach air duct -2-.



- Release hose clip -2- and detach air pipe.

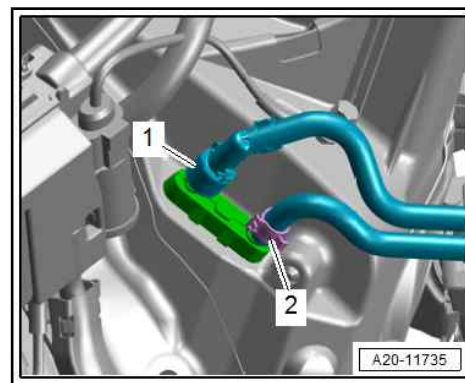
- Lift off air cleaner housing -1- and detach.



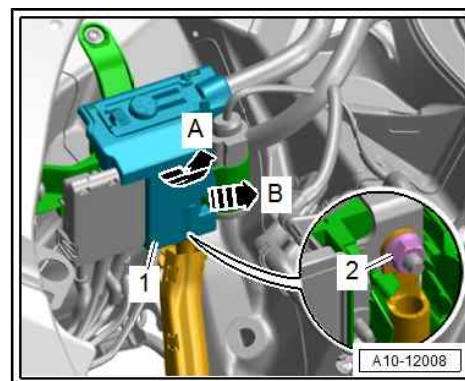
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- Disconnect fuel hose -1- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Release hose clip -2- and disconnect hose for activated charcoal filter system.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .



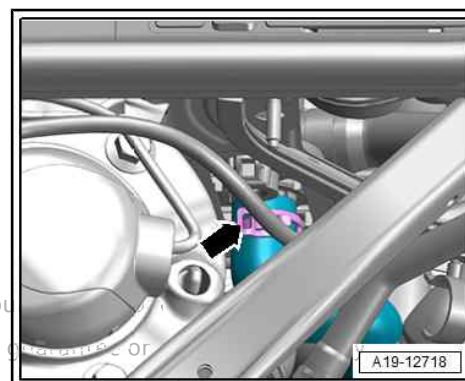
- Release catch -arrow B- and open electronics box -1- -arrow A-.
- Remove nut -2- and move B+ wire clear.
- Move wiring duct clear at top.



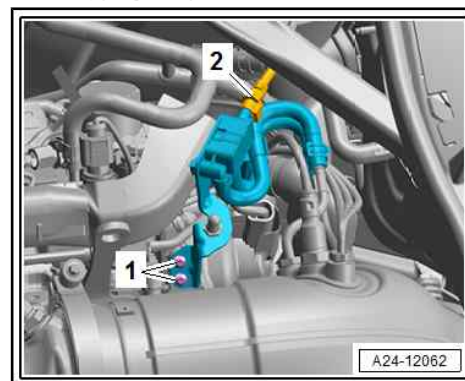
- Release hose clip -arrow- and detach coolant hose.



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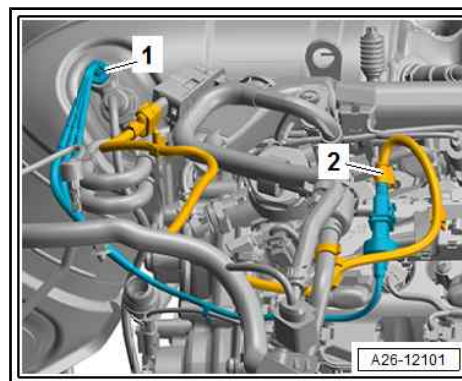


- Unplug electrical connector -2- for pressure differential sender for particulate filter - G1037- .
- If engine is to be separated from gearbox: Remove bolts -1- and move bracket clear together with pressure differential sender for particulate filter - G1037- .

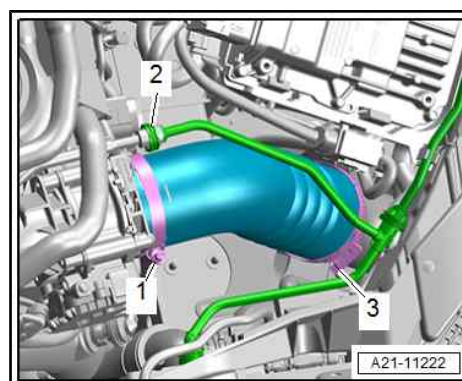




- Unplug electrical connector -2- for exhaust gas temperature sender 3 - G495- .
- If engine is to be separated from gearbox: Detach electrical connector from bracket and move clear.



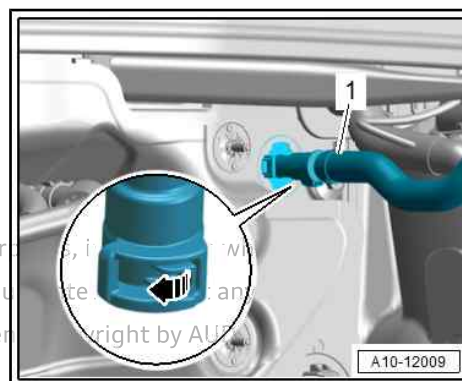
- Lift retaining clip -2- and disconnect coolant bleeder line.
- Release hose clip -1-, detach air hose and tie up to left side.



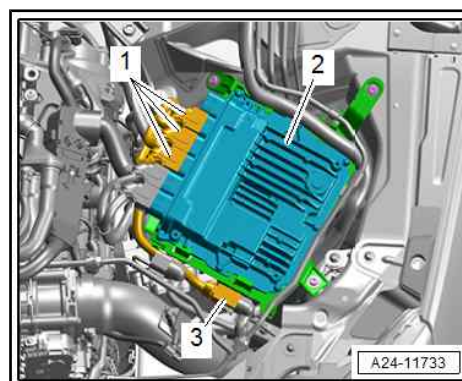
- Release fastener -arrow- and disconnect vacuum hose -1-, taking care not to damage it.



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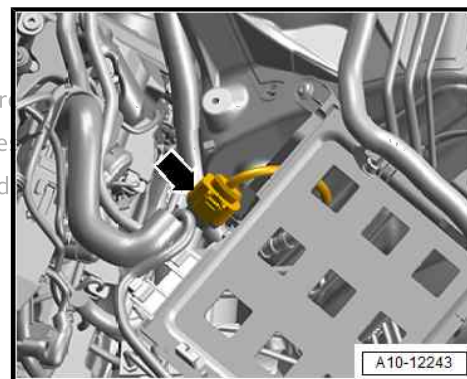
- Unplug electrical connectors -1- on engine control unit - J623- item 2- and move connectors clear.
- Detach electrical connector -3- from bracket, unplug and move electrical wiring clear.



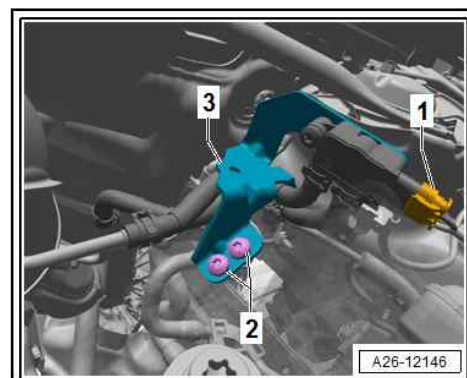


- Detach electrical connector -arrow- from bracket and unplug.

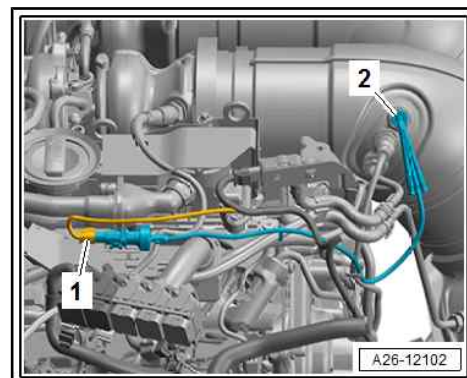
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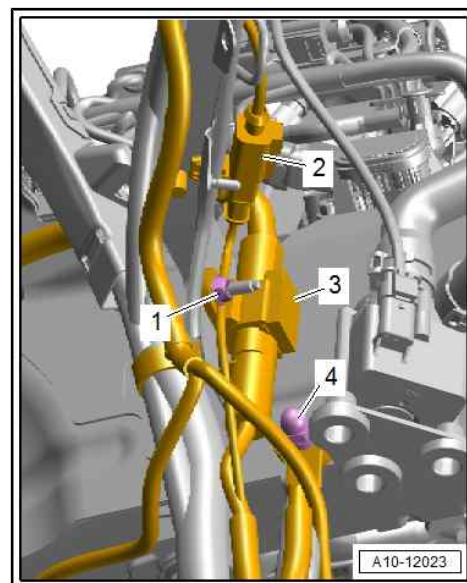
- Unplug electrical connector -1- for pressure differential sender 2 for particulate filter - G1038- .
- If engine is to be separated from gearbox: Remove bolts -2- and move bracket -3- clear together with pressure differential sender 2 for particulate filter - G1038- .



- Unplug electrical connector -1- for exhaust gas temperature sender 3 for bank 2 - G497- .
- If engine is to be separated from gearbox: Detach electrical connector from bracket and move clear.



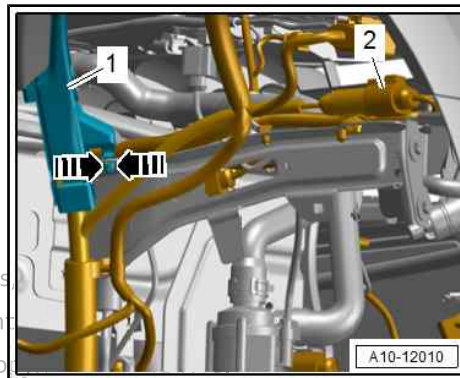
- Unplug electrical connector -2- and move electrical wire clear.
- Loosen nut -1- a few turns, move electrical connector -3- clear and unplug.
- Remove nut -4- and move earth wires clear.



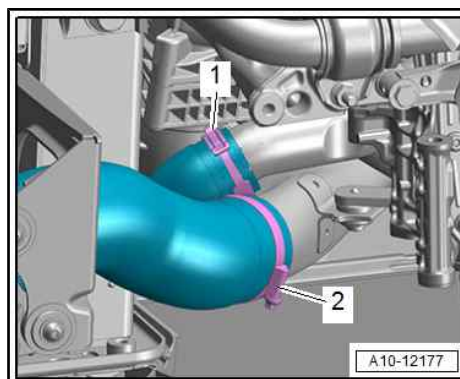


- Detach electrical connector -2- from bracket, unplug and move electrical wire clear.
- Release fasteners -arrows- and move wiring duct -1- clear.
- Remove refrigerant lines from air conditioner compressor ➔ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching refrigerant lines at air conditioner compressor .

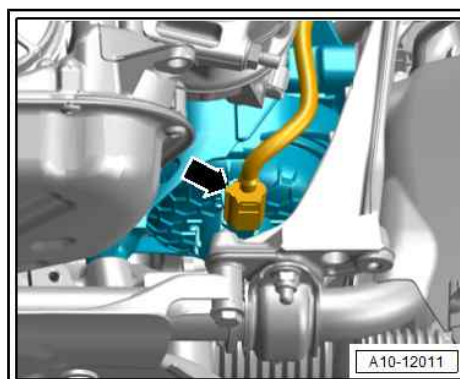
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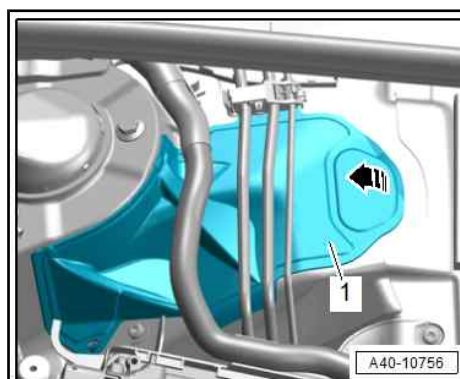
- Release hose clip -2- and detach air hose from air pipe.
- Release hose clip -1- and detach coolant hose from connection.



- Using assembly tool - T10118- , unplug electrical connector -arrow- for electrohydraulic engine mounting solenoid valve on both sides and move wiring clear.



- Open cover -1- -arrow- on suspension turret (both sides).



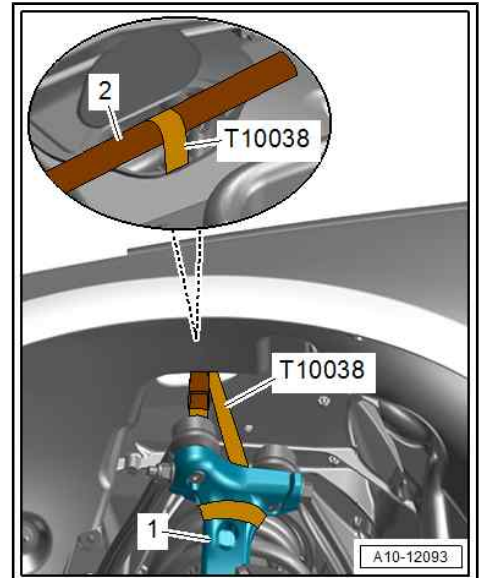


Caution

Danger of damage to the joints of the upper links.

- ◆ **The weight of the wheel bearing housings must be supported.**

- Tie up wheel bearing housing -1- on both sides with tensioning strap - T10038- (use the handle of a hammer -2- to do so).

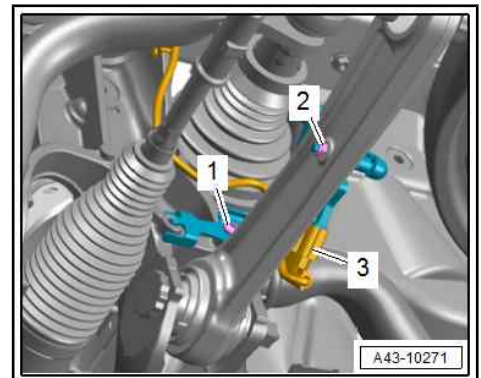


- Unplug electrical connector -3- for front vehicle level sender on both sides and move electrical wire clear.



Note

For the following work on the running gear, check the latest versions ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering rack; Removing and installing track rod ball joint , and ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower suspension links, swivel joint; Removing and installing guide link .



- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out.

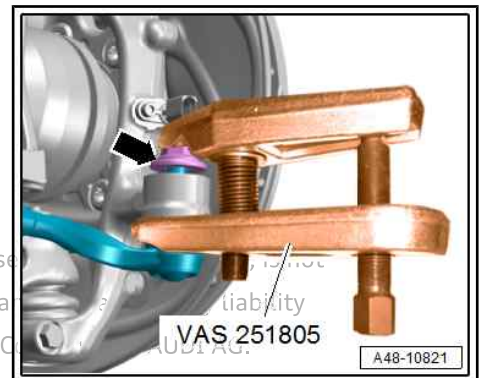
- ◆ **The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.**



Caution

Risk of damage to ball joint puller.

- ◆ **Make sure the two lever arms of the puller are parallel when maximum force is exerted.**



- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805- ; counterhold with a 6 mm hexagon socket.



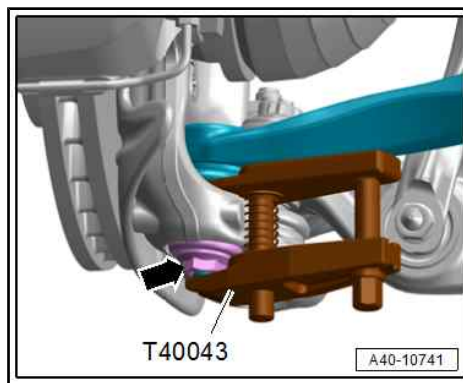
- To protect thread, unscrew nut -arrow- on joint pin of guide link until nut is flush with thread of joint pin. Counterhold joint pin if necessary.



WARNING

Risk of injury if parts are allowed to drop out.

- ◆ *The swivel joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.

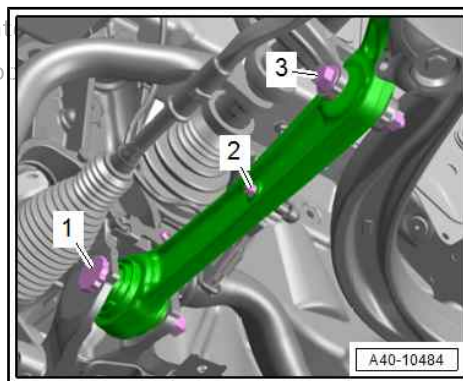
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- On appropriate versions: Remove nut -2- and move coupling rod for vehicle level sender clear.
- Detach bolted connections -1, 3- for track control link.
- Swivel track control link towards front.

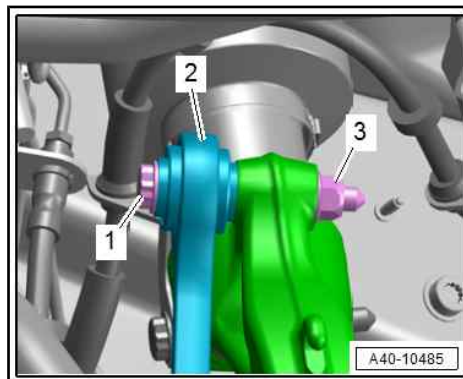


Note

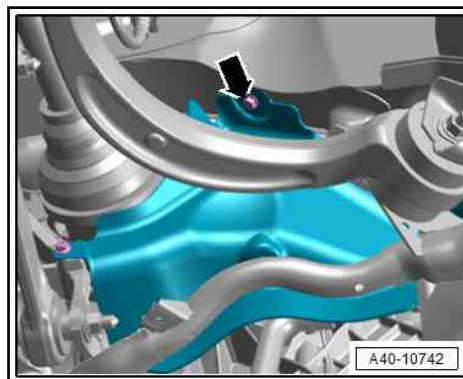
To remove bolt -1-, turn steering to full left/right lock.



- Repeat procedure on opposite side of vehicle.
- On both sides, unscrew nut -3- and pull out bolt -1- for coupling rod -2-.
- Unbolt drive shaft (left and right) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



- Remove bolt -arrow- for subframe shield on both sides.
- Detach intermediate steering shaft from steering rack and move clear by telescoping together ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .

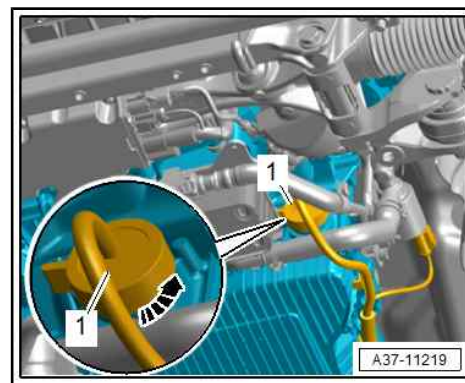




Caution

Risk of irreparable damage to gearbox control unit (mechanic unit) because of electrostatic discharge.

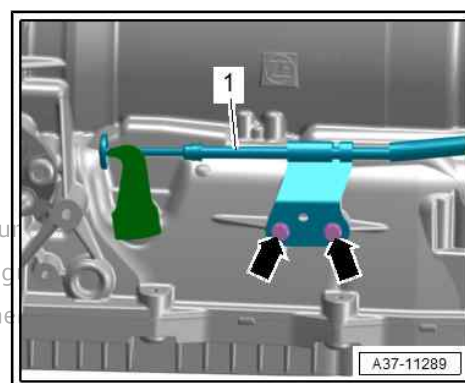
- ◆ **Before unplugging or plugging in electrical connector, mechanic must discharge static electricity. To do so, touch vehicle earth, heater radiator, or lifting platform, with your hand.**
- ◆ **Do NOT touch connector contacts in gearbox connector with your hands.**



- Turn retainer catch anti-clockwise -arrow- and unplug electrical connector -1- at gearbox.
- Remove bolts -arrows- and move manual release cable -1- for parking lock clear.



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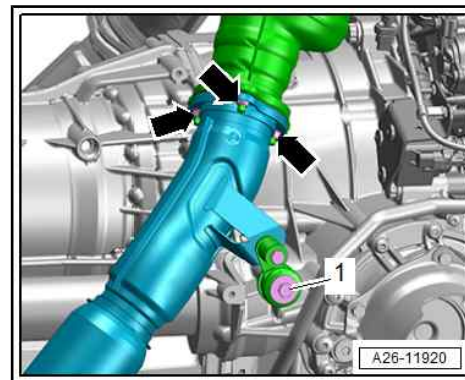


Caution

Risk of damage to flexible joints in front silencer.

- ◆ **Do NOT bend the flexible joint in the front silencer more than 10°.**

- Remove bolt -1- and nuts -arrows- for front silencer (left and right).
- Detach front silencer.



**Setting up scissor-type assembly platform:**

- Set up scissor-type assembly platform - VAS 6131 B- with support set for Audi - VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2- as follows:

Platform coordinates	Parts from -VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2-			
C4	/10-1	/10-4	/10-5	/10-11
E4	/10-1	/10-4	/10-5	/10-11
E10	/10-1	/10-2	/10-5	/13-2
B15	/10-1	/10-2	/10-5	/11-1
F15	/10-1	/10-3	/10-5	/11-1

- Initially hand-tighten the support elements on the scissor-type assembly platform.
- Position scissor-type assembly platform - VAS 6131 B- horizontally.
- Take note of spirit level (bubble gauge).
- Position scissor-type assembly platform - VAS 6131 B- below engine/gearbox assembly.
- Position support elements from -VAS 6131/10- at both sides of engine.
- Make sure that threaded spindles are screwed in completely.

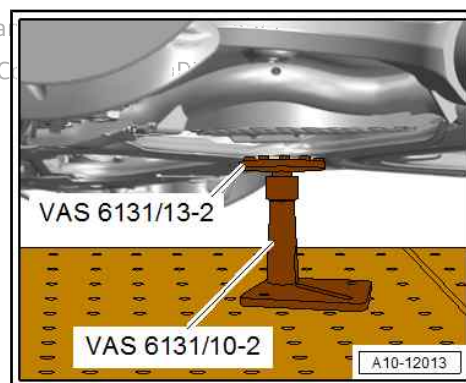
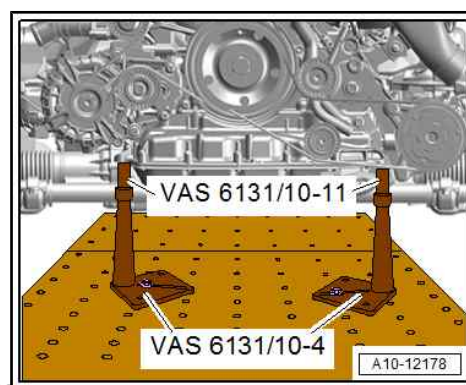
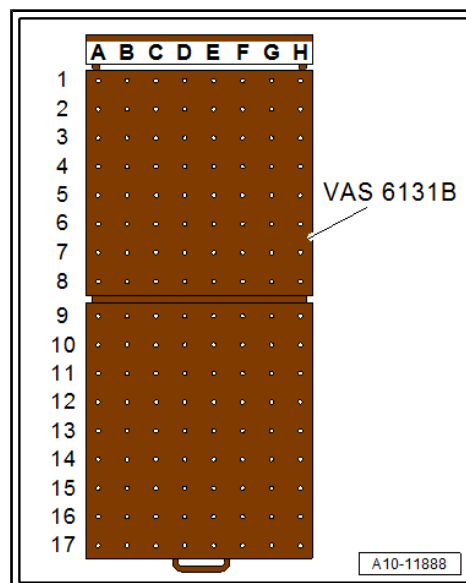


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- Support subframe using support elements from VAS 6131/10- and adapter -VAS 6131/13-2- .

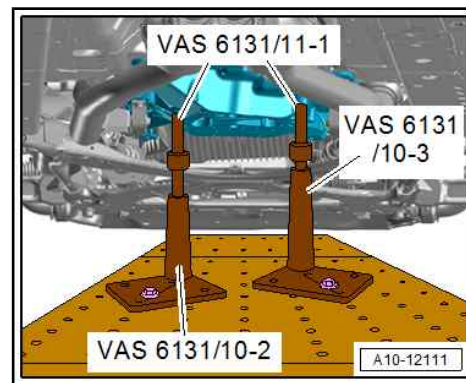
**Note**

The support elements only support the subframe; the base plate is not secured to the scissor-type assembly platform.





- Position support elements from -VAS 6131/10- and adapters -VAS 6131/11-1- at tunnel cross member.
- Turn remaining spindles for support elements upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .
- Fix position of subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Fixing position of subframe .

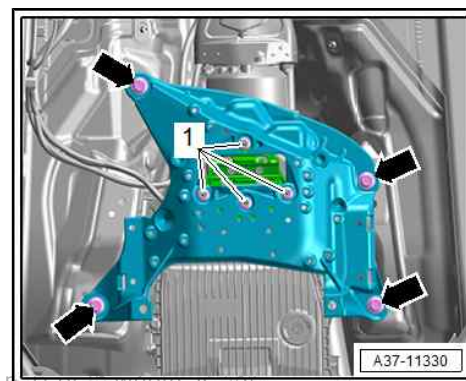


- Remove bolts -arrows- on tunnel cross member.

Caution

Danger of damage to hoses, pipes and wiring connections and to engine compartment.

- ◆ ***Check that all hoses and wiring connections between engine, gearbox, subframe and body have been detached.***
- ◆ ***Carefully guide out engine/gearbox assembly with subframe from engine compartment when lowering.***
- ◆ ***Guide drive shafts carefully past gearbox.***

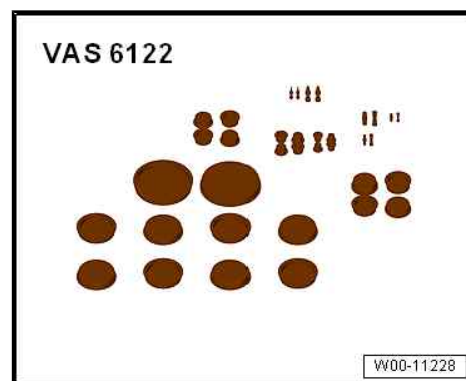


- Lower scissor-type assembly platform - VAS 6131 B- with engine/gearbox assembly and pull out from underneath vehicle.
- Tie up drive shafts.

1.1.3 Removing engine - 3.0 ltr. engine without particulate filter

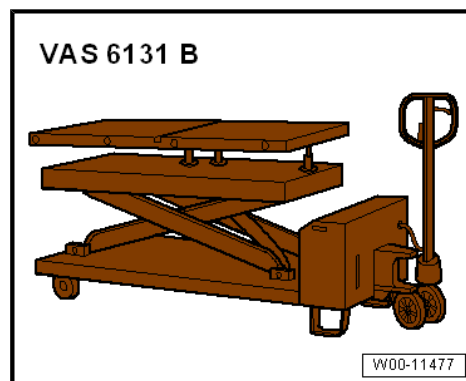
Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-

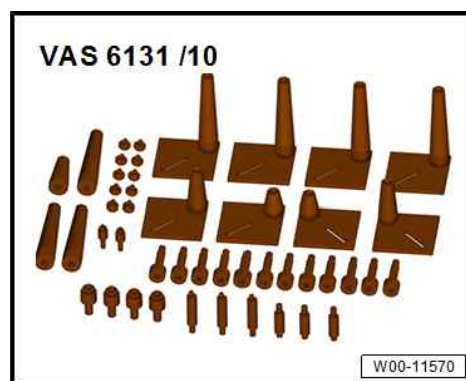




- ◆ Scissor-type assembly platform - VAS 6131 B-



- ◆ Support set for Audi - VAS 6131/10-



- ◆ Supplementary kit - VAS 6131/11- (not illustrated)
- ◆ Supplementary set, Audi Q7 >2005 - VAS 6131/13-



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

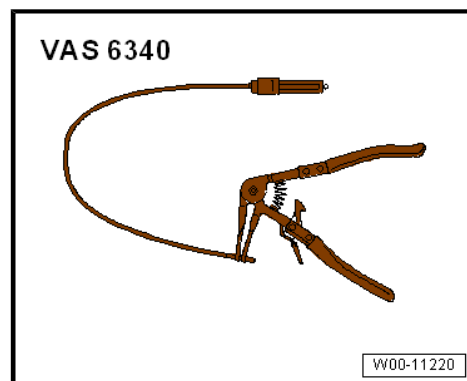


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- ◆ Hose clip pliers - VAS 6340-



- ◆ Hose clip pliers - VAS 6362-



- ◆ Engine and gearbox jack - VAS 6931-



- ◆ Ball joint ejector - VAS 251 805-

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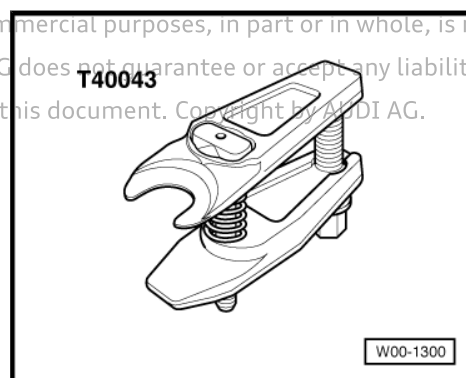


- ◆ Tensioning strap - T10038-



- ◆ Ball joint puller - T40043-

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- ◆ Stepladder (commercially available)

Procedure

- ◆ The engine is removed from underneath together with the gearbox and subframe (with lock carrier installed).
- ◆ Fit cable ties in the same locations when installing.
- ◆ Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- ◆ All bolts on running gear components with bonded rubber bushes must be tightened with suspension in unladen position (vehicle unladen) on vehicles with coil springs or in reference position on vehicles with air suspension.
- ◆ Bonded rubber bushes can only be turned to a limited extent. Therefore, before tightening the bolts, suspension components with bonded rubber bushes must be brought into a position corresponding to the normal position while driving (unladen position/reference position). Otherwise, the bush would be subject to torsion loading and its service life shortened.
- Before starting work, determine unladen position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with coil springs) or determine reference position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with air suspension) .
- The electromechanical parking brake must be released before disconnecting the battery, so that the propshaft can be turned during removal.
- Bring front wheels into straight-ahead position.
- Switch off ignition.



- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Release catches -arrows B- and open cover -1- -arrow A-.

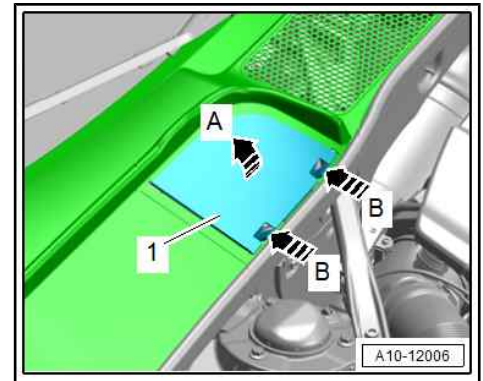


WARNING

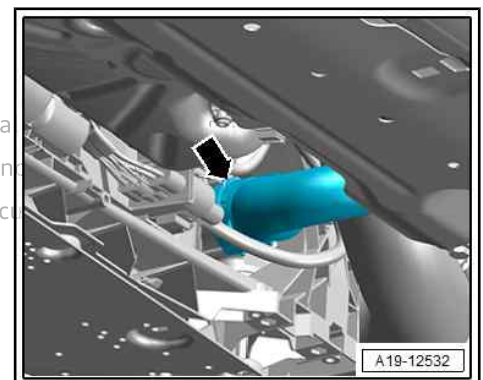
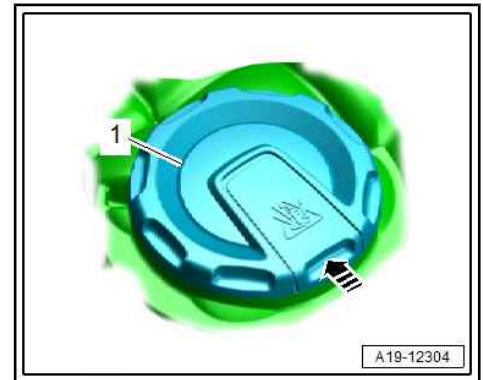
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

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.



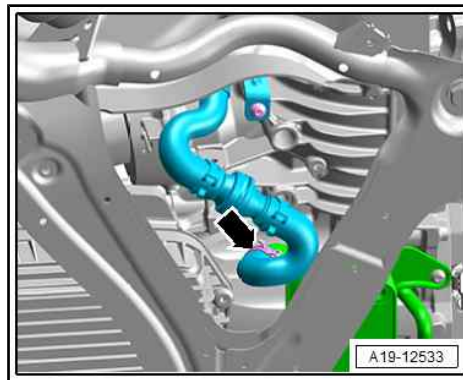
- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel spoiler on both sides and unfasten front section of front right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -arrow-, disconnect coolant hose from radiator and drain off coolant.



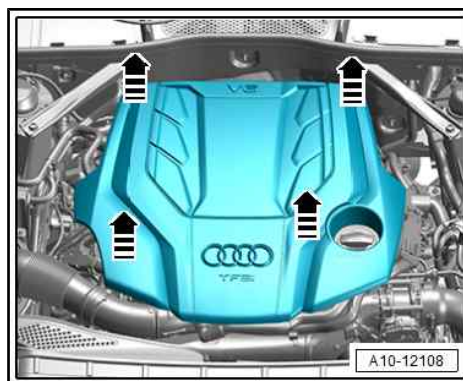
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- Release hose clip -arrow-.
- Disconnect coolant hose from ATF cooler, hold end of hose downwards and drain off coolant.

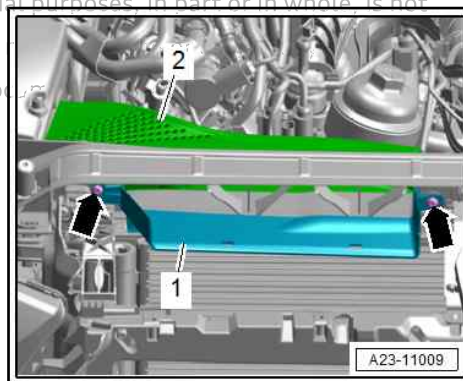


- Carefully pull engine cover panel off retaining pins one after another -arrows-. Do not jerk engine cover panel away, and do not try to pull on one side only.

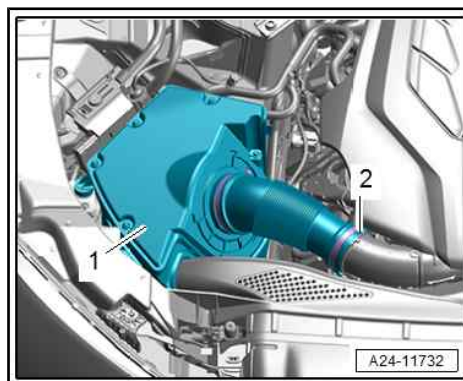


- Remove bolts -arrows- and detach air duct -2-.

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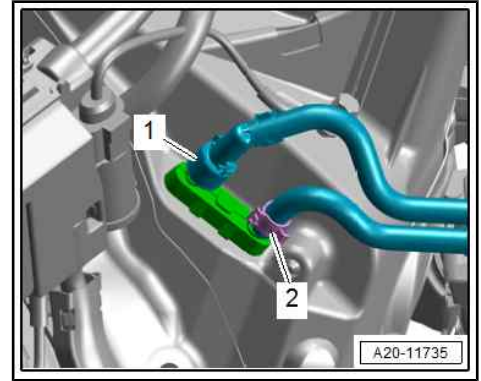


- Release hose clip -2- and detach air pipe.
- Lift off air cleaner housing -1- and detach.

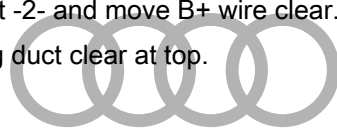




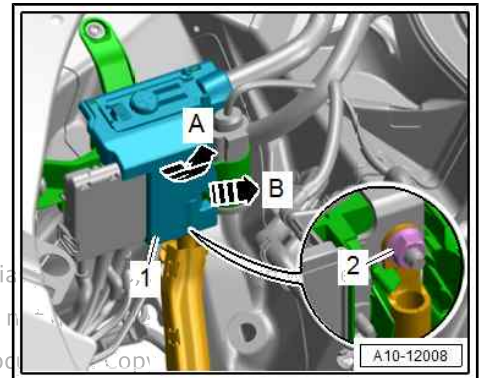
- Disconnect fuel hose -1- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Release hose clip -2- and disconnect hose for activated charcoal filter system.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .



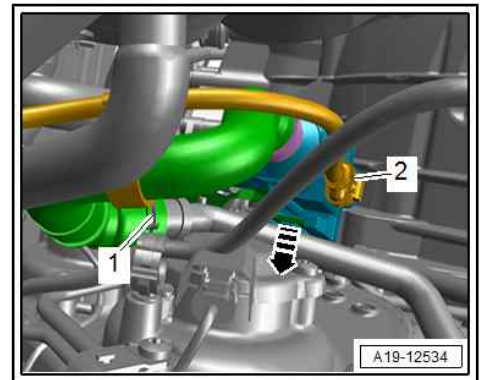
- Release catch -arrow B- and open electronics box -1- -arrow A-.
- Remove nut -2- and move B+ wire clear.
- Move wiring duct clear at top.



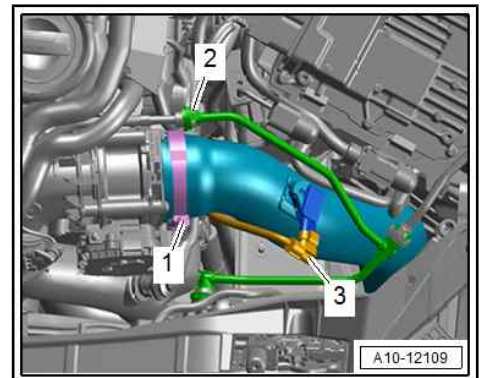
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- Lift retaining clip -1- and disconnect coolant hose.
- Release fastener -arrow- and press coolant circulation pump - V50- to one side.

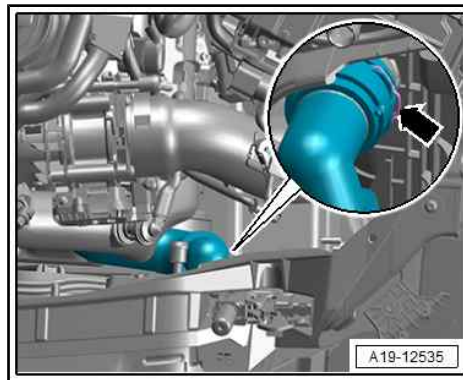


- Unplug electrical connector -3- for charge pressure sender - G31- .
- Lift retaining clip -2- and disconnect coolant bleeder line.
- Release hose clip -1-, detach air pipe and tie up to left side.

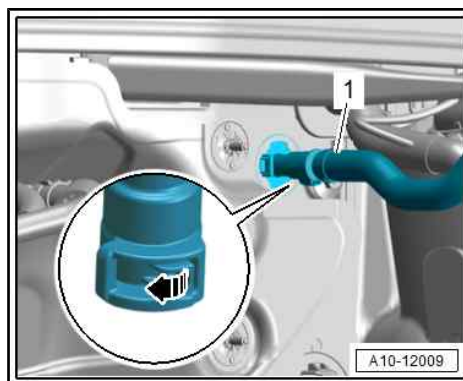




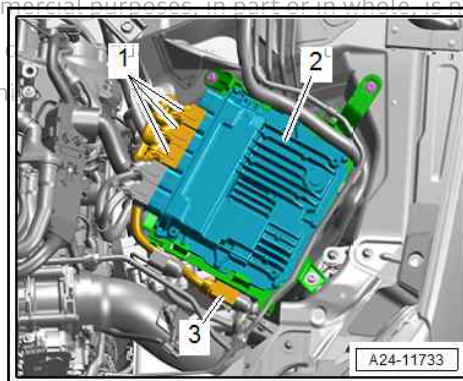
- Lift retaining clip -arrow- and disconnect coolant hose (top left) from radiator.



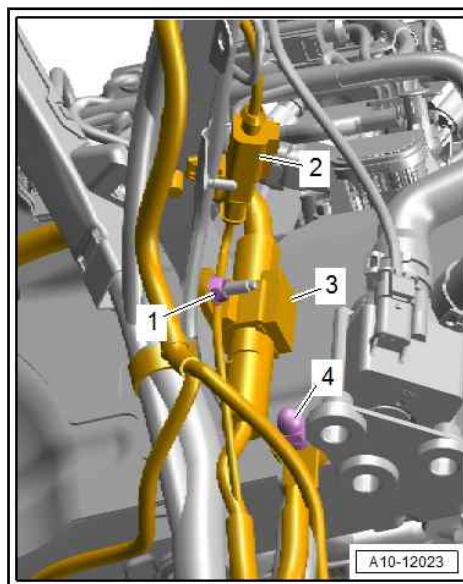
- Release fastener -arrow- and disconnect vacuum hose -1-, taking care not to damage it.



- Unplug electrical connectors -1- on engine control unit - J623- -item 2- and move connectors clear.
- Detach electrical connector -3- from bracket, unplug and move electrical wiring clear.

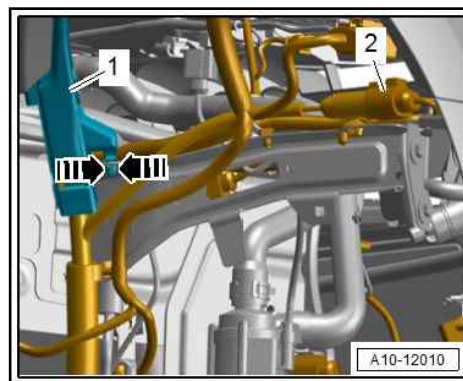


- Unplug electrical connector -2- and move electrical wire clear.
- Loosen nut -1- a few turns, move electrical connector -3- clear and unplug.
- Remove nut -4- and move earth wires clear.





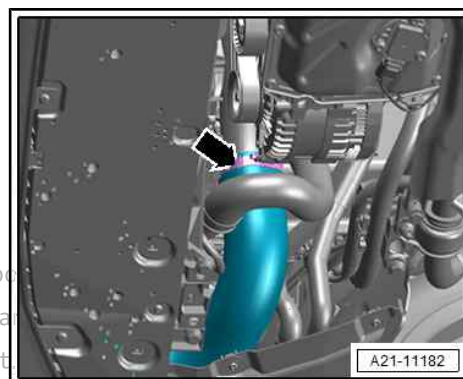
- Detach electrical connector -2- from bracket, unplug and move electrical wire clear.
- Release fasteners -arrows- and move wiring duct -1- clear.



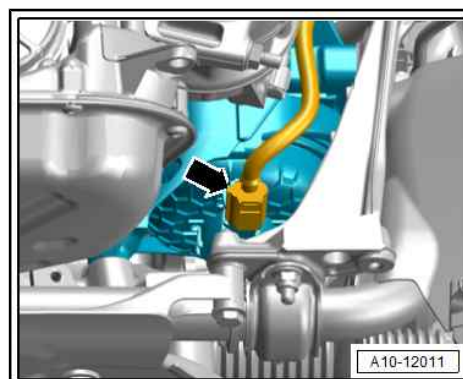
- Release hose clip -arrow- and detach air hose from air pipe.



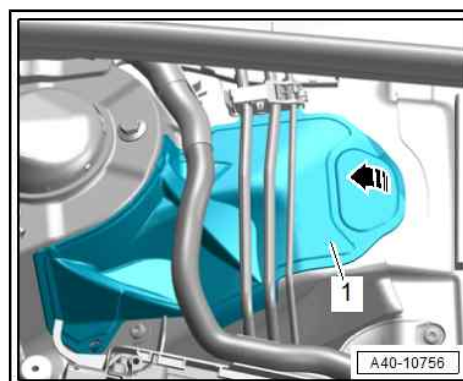
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- Unplug electrical connector -arrow- for electrohydraulic engine mounting solenoid valve on both sides and move wiring clear.



- Open cover -1- -arrow- on suspension turret (both sides).



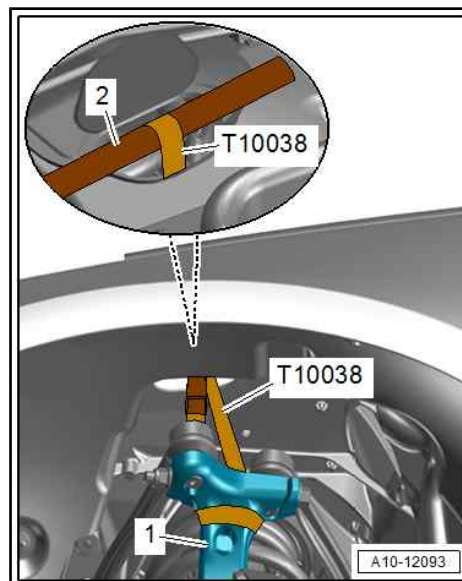


Caution

Danger of damage to the joints of the upper links.

- ◆ **The weight of the wheel bearing housings must be supported.**

- Tie up wheel bearing housing -1- on both sides with tensioning strap - T10038- (use the handle of a hammer -2- to do so).

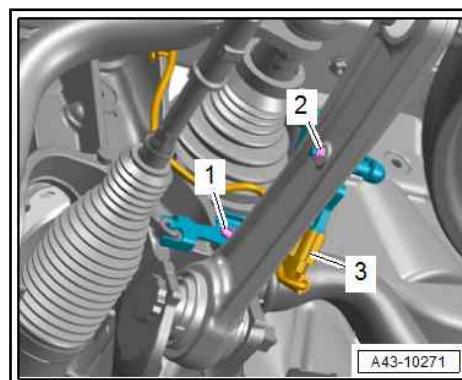


- Unplug electrical connector -3- for front vehicle level sender on both sides and move electrical wire clear.



Note

For the following work on the running gear, check the latest versions ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering rack; Removing and installing track rod ball joint , and ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower suspension links, swivel joint; Removing and installing guide link .



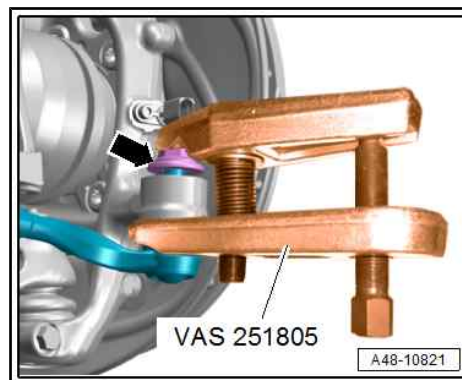
- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out.

- ◆ **The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.**



Caution

Risk of damage to ball joint puller.

- ◆ **Make sure the two lever arms of the puller are parallel when maximum force is exerted.**

- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805- ; counterhold with a 6 mm hexagon socket.

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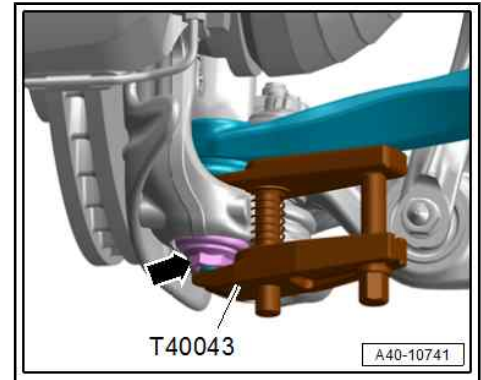
- To protect thread, unscrew nut -arrow- on joint pin of guide link until nut is flush with thread of joint pin. Counterhold joint pin if necessary.



WARNING

Risk of injury if parts are allowed to drop out.

- ◆ *The swivel joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*

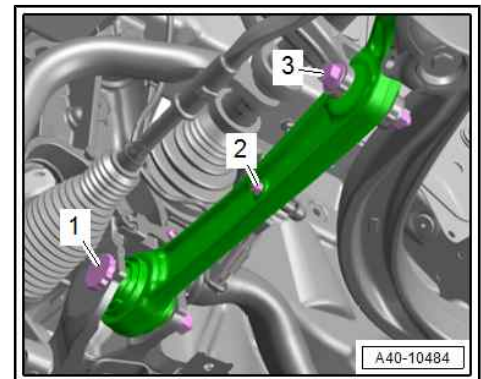


- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.
- On appropriate versions: Remove nut -2- and move coupling rod for vehicle level sender clear.
- Detach bolted connections -1, 3- for track control link.
- Swivel track control link towards front.

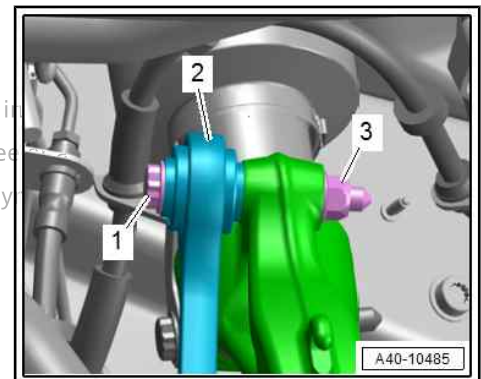


Note

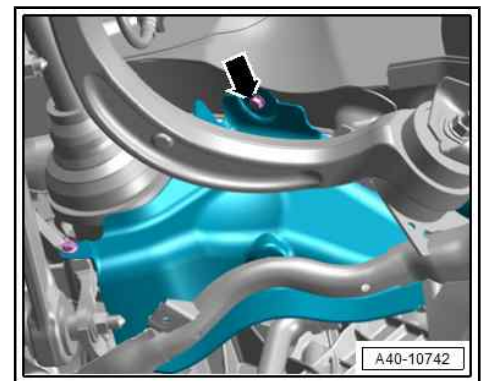
To remove bolt -1-, turn steering to full left/right lock.



- Repeat procedure on opposite side of vehicle.
- On both sides, unscrew nut -3- and pull out bolt -1- for coupling rod -2-.
- Unbolt drive shaft (left and right) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft.



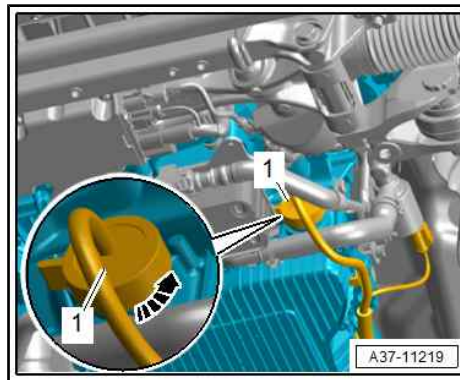
- Remove bolt -arrow- for subframe shield on both sides.
- Detach intermediate steering shaft from steering rack and move clear by telescoping together ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Remove poly V-belt from air conditioner compressor pulley ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Remove air conditioner compressor from bracket ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .



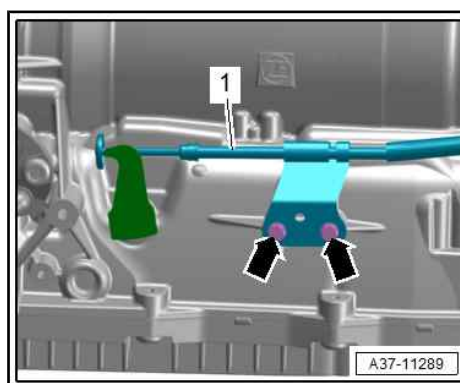
**Caution**

Risk of irreparable damage to gearbox control unit (mechanic unit) because of electrostatic discharge.

- ◆ **Before unplugging or plugging in electrical connector, mechanic must discharge static electricity. To do so, touch vehicle earth, heater radiator, or lifting platform, with your hand.**
- ◆ **Do NOT touch connector contacts in gearbox connector with your hands.**



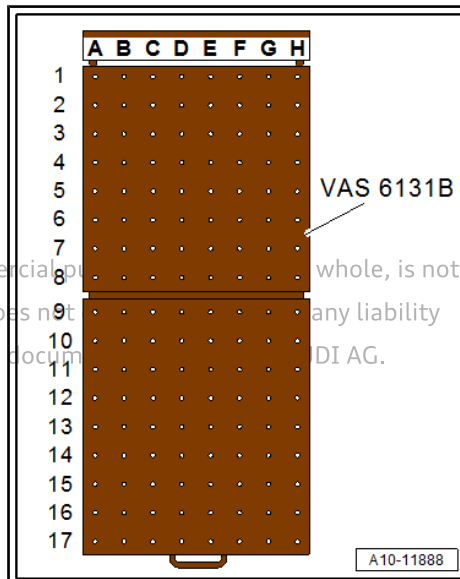
- Turn retainer catch anti-clockwise -arrow- and unplug electrical connector -1- at gearbox.
- Remove bolts -arrows- and move manual release cable -1- for parking lock clear.

**Set up the scissor-type assembly platform as follows:**

- Set up scissor-type assembly platform - VAS 6131 B- with support set for Audi - VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2- as follows:

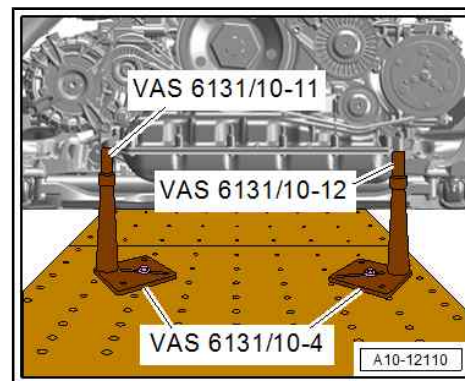
Platform coordinates	Parts from -VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2-			
C4	/10-1	/10-4	/10-5	/10-12
E4	/10-1	/10-4	/10-5	/10-11
E10	/10-1	/10-2	/10-5	/13-2
B15	/10-1	/10-2	/10-5	/11-1
F15	/10-1	/10-3	/10-5	/11-1

- Initially hand-tighten the support elements on the scissor-type assembly platform.
- Position scissor-type assembly platform - VAS 6131 B- horizontally.
- Take note of spirit level (bubble gauge).
- Position scissor-type assembly platform - VAS 6131 B- below engine/gearbox assembly.





- Position support elements from -VAS 6131/10- at both sides of engine.
- Make sure that threaded spindles are screwed in completely.



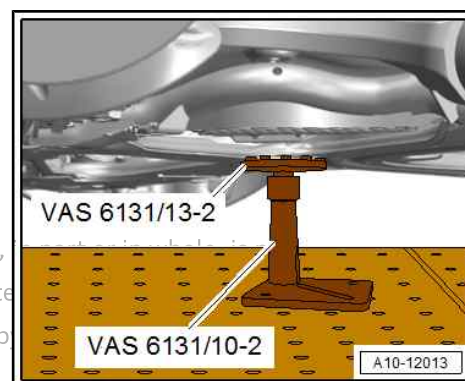
- Support subframe using support elements from -VAS 6131/10- and adapter -VAS 6131/13-2- .



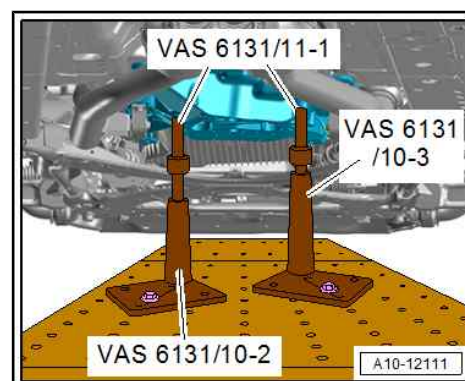
Note

The support elements only support the subframe; the base plate is not secured to the scissor-type assembly platform.

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- Position support elements from -VAS 6131/10- and adapters -VAS 6131/11-1- at tunnel cross member.
- Turn remaining spindles for support elements upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .
- Fix position of subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Fixing position of subframe .



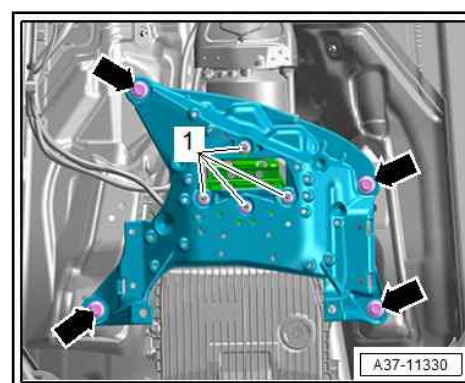
- Remove bolts -arrows- on tunnel cross member.



Caution

Danger of damage to hoses, pipes and wiring connections and to engine compartment.

- ◆ ***Check that all hoses and wiring connections between engine, gearbox, subframe and body have been detached.***
- ◆ ***Carefully guide out engine/gearbox assembly with subframe from engine compartment when lowering.***
- ◆ ***Guide drive shafts carefully past gearbox.***



- Lower scissor-type assembly platform - VAS 6131 B- with engine/gearbox assembly and pull out from underneath vehicle.
- Tie up drive shafts.



1.1.4 Removing engine - 3.0 ltr. engine with particulate filter

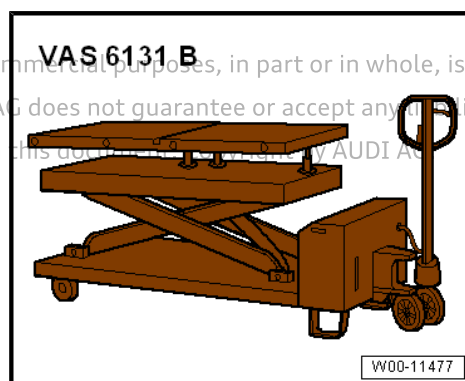
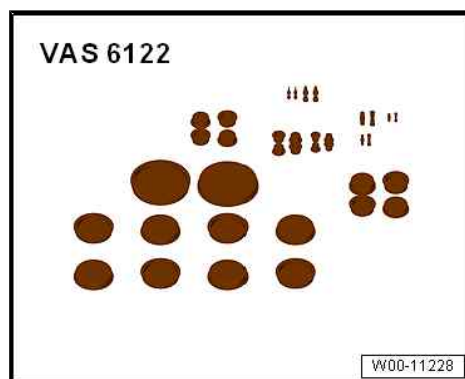
Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-

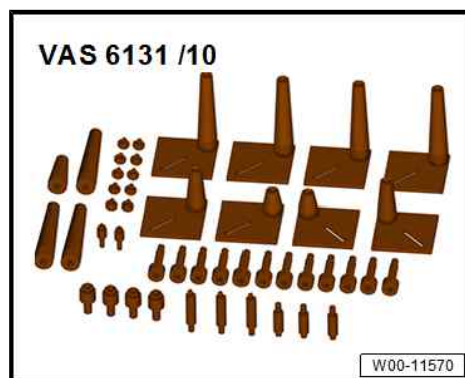


- ♦ Scissor-type assembly platform - VAS 6131 B-

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- ♦ Support set for Audi - VAS 6131/10-



- ♦ Supplementary kit - VAS 6131/11- (not illustrated)
- ♦ Supplementary set, Audi Q7 >2005 - VAS 6131/13-

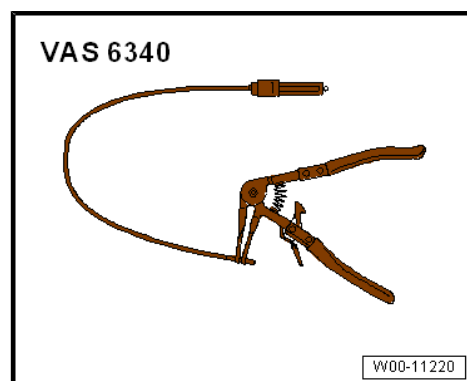




- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6340-



- ◆ Hose clip pliers - VAS 6362-



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- ◆ Engine and gearbox jack - VAS 6931-





- ◆ Ball joint ejector - VAS 251 805-



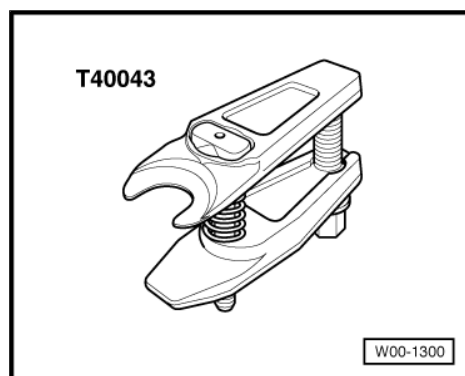
- ◆ Tensioning strap - T10038-



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- ◆ Ball joint puller - T40043-



- ◆ Stepladder (commercially available)

Procedure

- ◆ The engine is removed from underneath together with the gearbox and subframe (with lock carrier installed).
- ◆ Fit cable ties in the same locations when installing.
- ◆ Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- ◆ All bolts on running gear components with bonded rubber bushes must be tightened with suspension in unladen position (vehicle unladen) on vehicles with coil springs or in reference position on vehicles with air suspension.
- ◆ Bonded rubber bushes can only be turned to a limited extent. Therefore, before tightening the bolts, suspension components with bonded rubber bushes must be brought into a position corresponding to the normal position while driving (unladen position/reference position). Otherwise, the bush would be subject to torsion loading and its service life shortened.



- Before starting work, determine unladen position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with coil springs) or determine reference position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with air suspension) .
- The electromechanical parking brake must be released before disconnecting the battery, so that the propshaft can be turned during removal.
- Bring front wheels into straight-ahead position.
- Switch off ignition.
- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Release catches -arrows B- and open cover -1- -arrow A-.

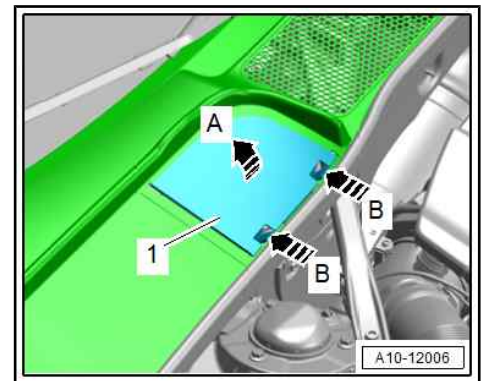


WARNING

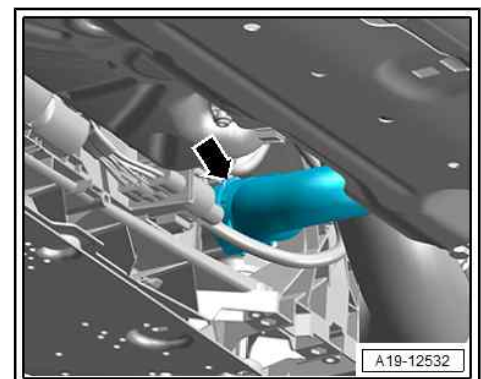
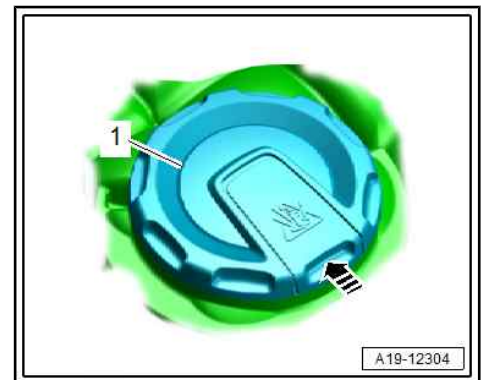
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

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.

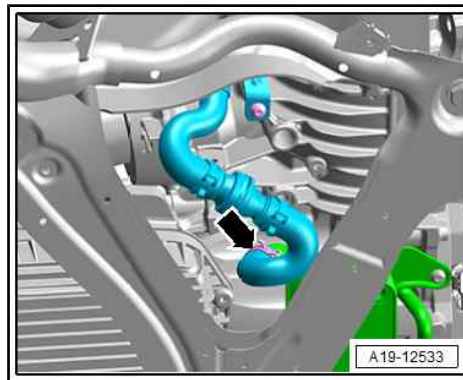


- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel spoiler on both sides and unfasten front section of front right wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -arrow-, disconnect coolant hose from radiator and drain off coolant.

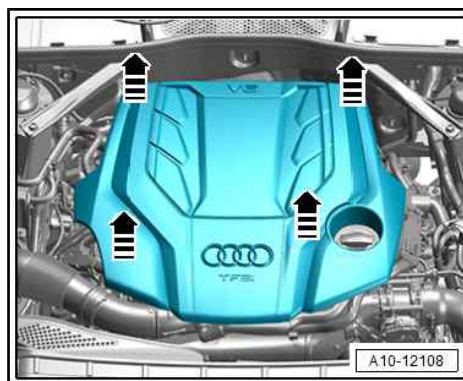




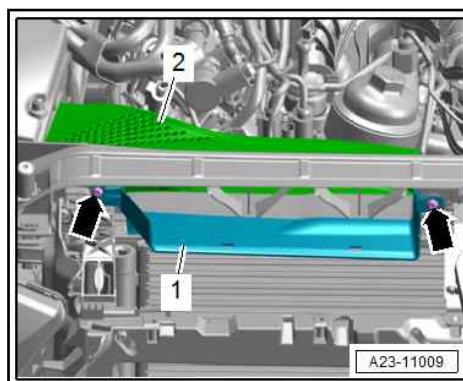
- Release hose clip -arrow-.
- Disconnect coolant hose from ATF cooler, hold end of hose downwards and drain off coolant.



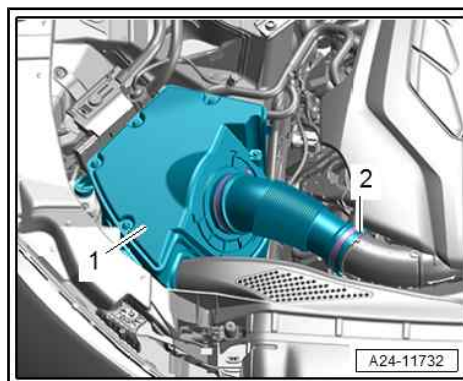
- Carefully pull engine cover panel off retaining pins one after another -arrows-. Do not jerk engine cover panel away, and do not try to pull on one side only.



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



- Release hose clip -2- and detach air pipe.
- Lift off air cleaner housing -1- and detach.

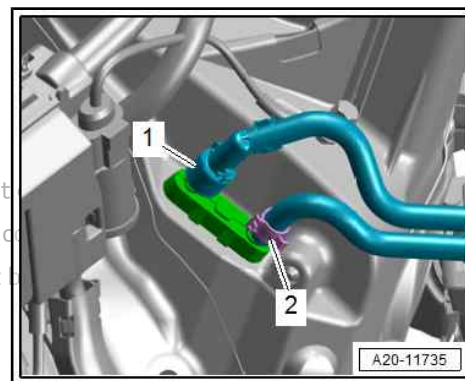


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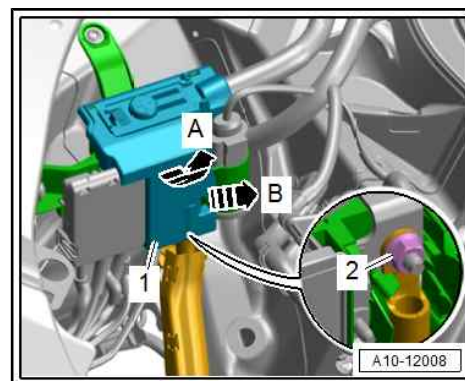


- Disconnect fuel hose -1- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Release hose clip -2- and disconnect hose for activated charcoal filter system.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122-

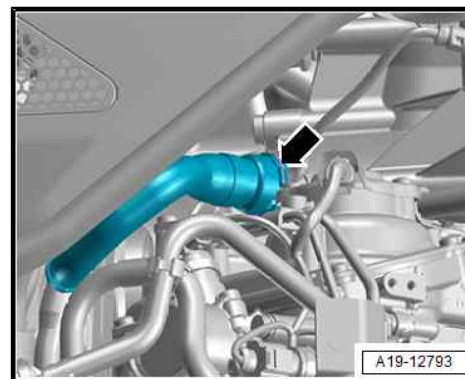
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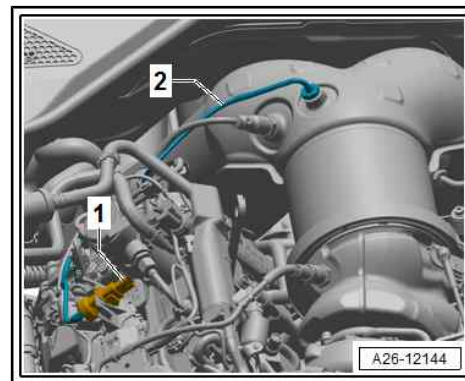
- Release catch -arrow B- and open electronics box -1- -arrow A-.
- Remove nut -2- and move B+ wire clear.
- Move wiring duct clear at top.



- Lift retaining clip -1- and disconnect coolant hose.

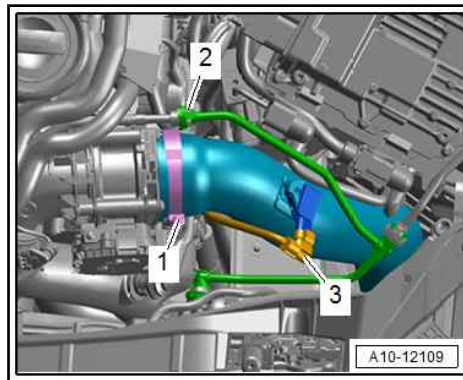


- Unplug electrical connector -1- for exhaust gas temperature sender 3 - G495- .
- If engine is to be separated from gearbox: Remove electrical connector from bracket and move electrical wiring clear.

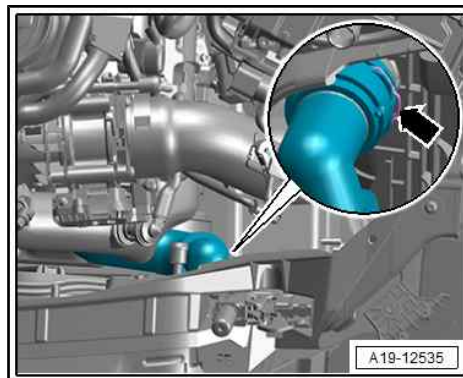




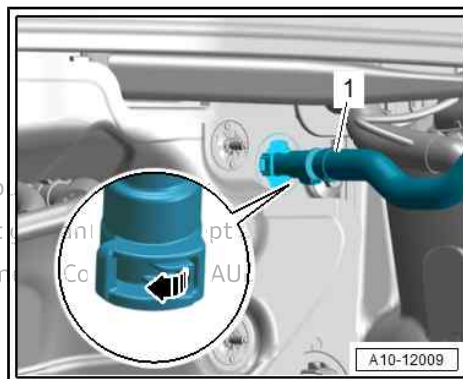
- Unplug electrical connector -3- for charge pressure sender - G31- .
- Lift retaining clip -2- and disconnect coolant bleeder line.
- Release hose clip -1-, detach air pipe and tie up to left side.



- Lift retaining clip -arrow- and disconnect coolant hose (top left) from radiator.

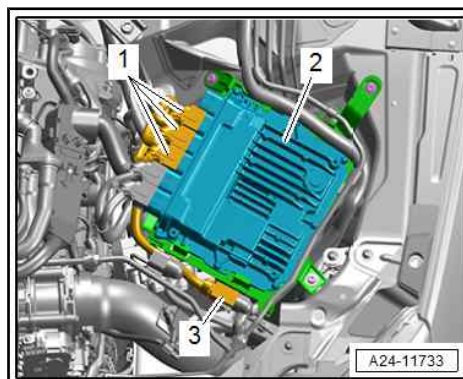


- Release fastener -arrow- and disconnect vacuum hose -1-, taking care not to damage it.



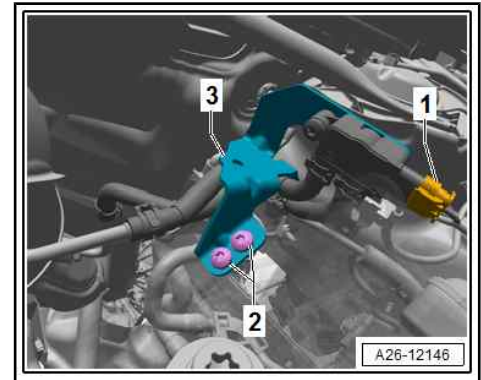
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- Unplug electrical connectors -1- on engine control unit - J623- -item 2- and move connectors clear.
- Detach electrical connector -3- from bracket, unplug and move electrical wiring clear.



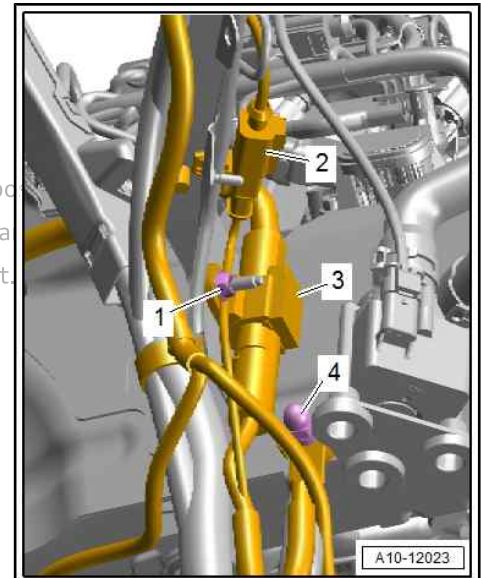


- Unplug electrical connector -1- for pressure differential sender for particulate filter - G1037- .
- If engine is to be separated from gearbox at a later stage: Remove bolts -2- and move bracket -3- clear together with pressure differential sender 2 for particulate filter - G1038- .

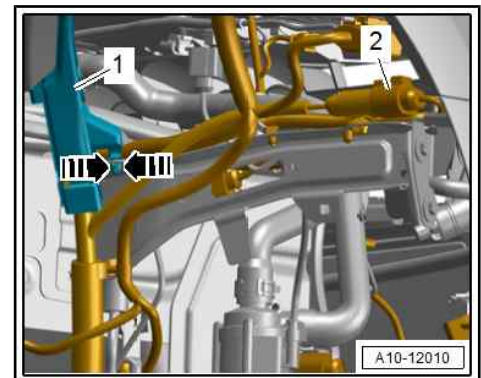


- Unplug electrical connector -2- and move electrical wire clear.
- Loosen nut -1- a few turns, move electrical connector -3- clear and unplug.
- Remove nut -4- and move earth wires clear.

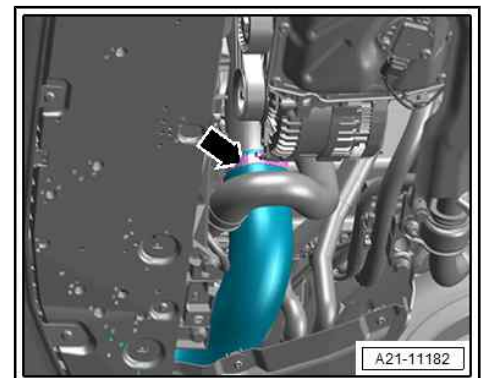
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- Detach electrical connector -2- from bracket, unplug and move electrical wire clear.
- Release fasteners -arrows- and move wiring duct -1- clear.

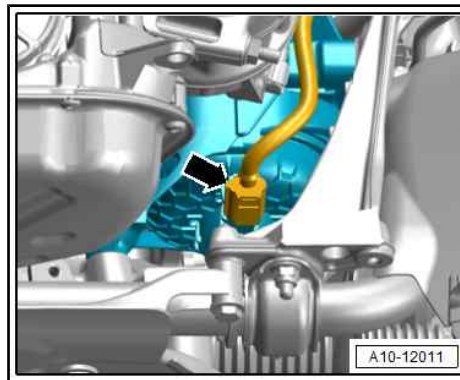


- Release hose clip -arrow- and detach air hose from air pipe.

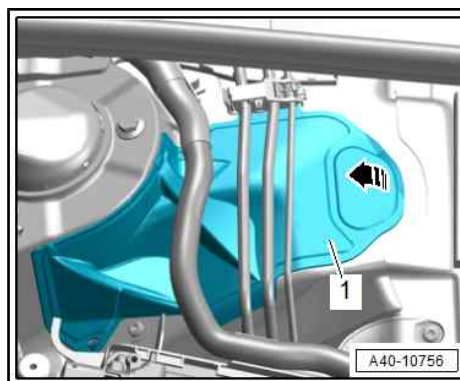




- Unplug electrical connector -arrow- for electrohydraulic engine mounting solenoid valve on both sides and move wiring clear.



- Open cover -1- -arrow- on suspension turret (both sides).



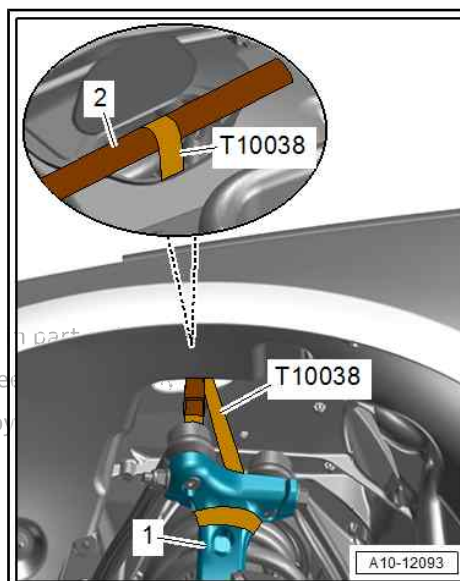
Caution

Danger of damage to the joints of the upper links.

- ◆ ***The weight of the wheel bearing housings must be supported.***

- Tie up wheel bearing housing -1- on both sides with tensioning strap - T10038- (use the handle of a hammer -2- to do so).

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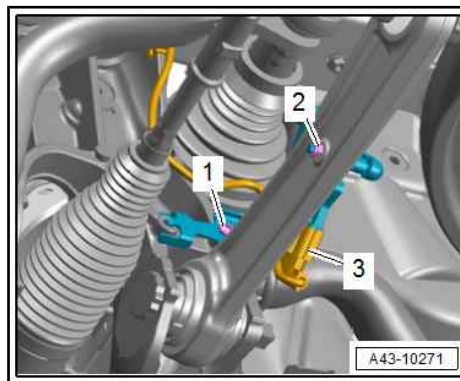


- Unplug electrical connector -3- for front vehicle level sender on both sides and move electrical wire clear.



Note

For the following work on the running gear, check the latest versions ➤ Running gear, axles, steering; Rep. gr. 48 ; Steering rack; Removing and installing track rod ball joint , and ➤ Running gear, axles, steering; Rep. gr. 40 ; Lower suspension links, swivel joint; Removing and installing guide link .





- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.



WARNING

Risk of injury if parts are allowed to drop out.

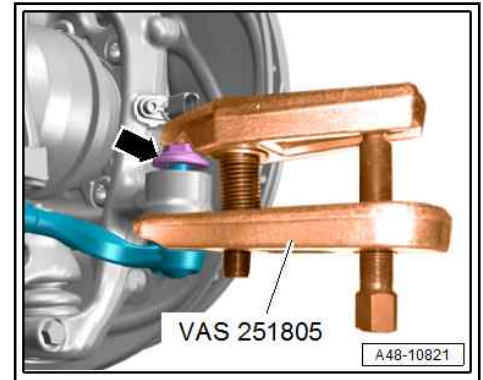
- ◆ *The track rod ball joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



Caution

Risk of damage to ball joint puller.

- ◆ *Make sure the two lever arms of the puller are parallel when maximum force is exerted.*



- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805- ; counterhold with a 6 mm hexagon socket.

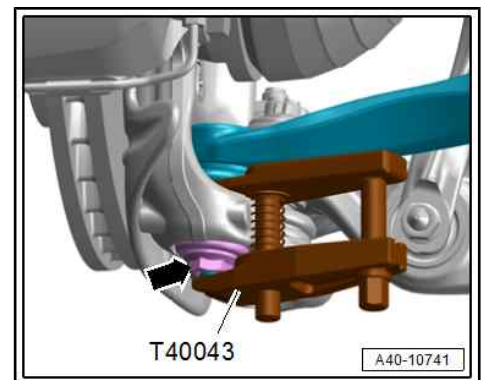
- To protect thread, unscrew nut -arrow- on joint pin of guide link until nut is flush with thread of joint pin. Counterhold joint pin if necessary.



WARNING

Risk of injury if parts are allowed to drop out.

- ◆ *The swivel joint will release suddenly from the wheel bearing housing when pressed out. Use engine and gearbox jack - VAS 6931- or similar to provide support.*



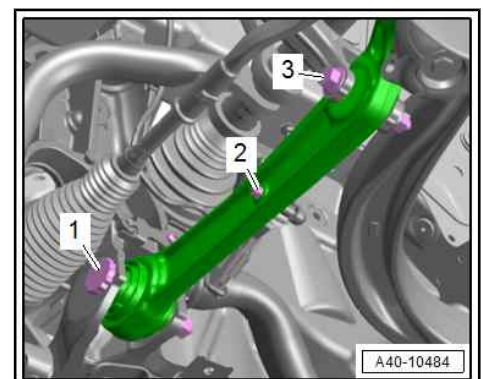
- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.
- On appropriate versions: Remove nut -2- and move coupling rod for vehicle level sender clear.
- Detach bolted connections -1, 3- for track control link.
- Swivel track control link towards front.



Note

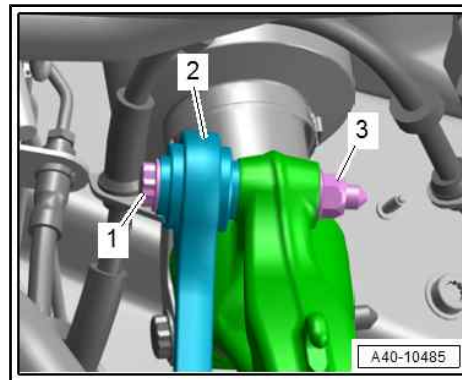
To remove bolt -1-, turn steering to full left/right lock.

- Repeat procedure on opposite side of vehicle.

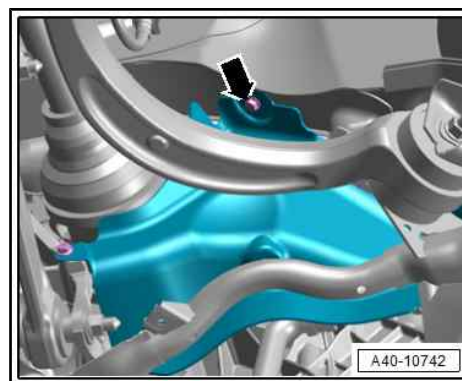




- On both sides, unscrew nut -3- and pull out bolt -1- for coupling rod -2-.
- Unbolt drive shaft (left and right) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



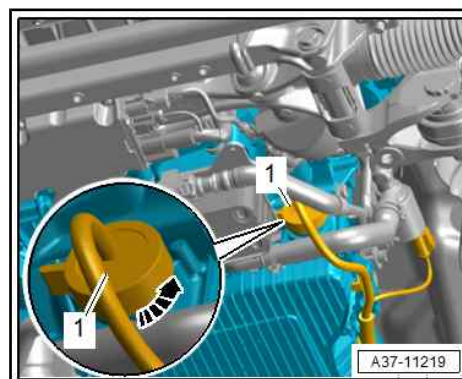
- Remove bolt -arrow- for subframe shield on both sides.
- Detach intermediate steering shaft from steering rack and move clear by telescoping together ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Remove poly V-belt from air conditioner compressor pulley ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Remove air conditioner compressor from bracket ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .



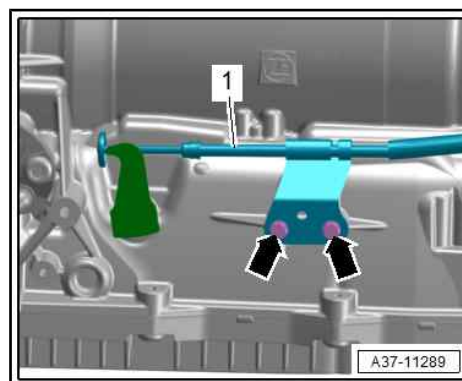
Caution

Risk of irreparable damage to gearbox control unit (mechanic unit) because of electrostatic discharge.

- ◆ **Before unplugging or plugging in electrical connector, mechanic must discharge static electricity. To do so, touch vehicle earth, heater radiator, or lifting platform, with your hand.**
- ◆ **Do NOT touch connector contacts in gearbox connector with your hands.**

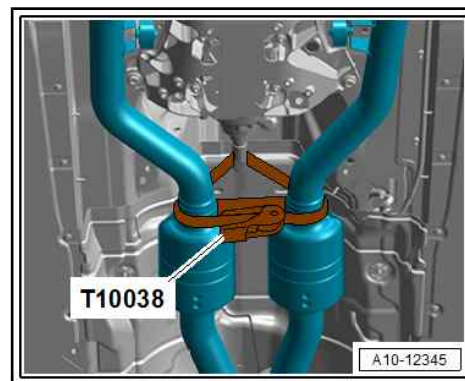


- Turn retainer catch anti-clockwise -arrow- and unplug electrical connector -1- at gearbox.
- Remove bolts -arrows- and move manual release cable -1- for parking lock clear.





- Use tensioning strap - T10038- to secure front silencers as shown.

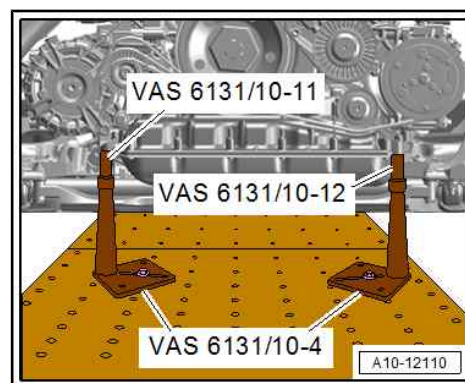
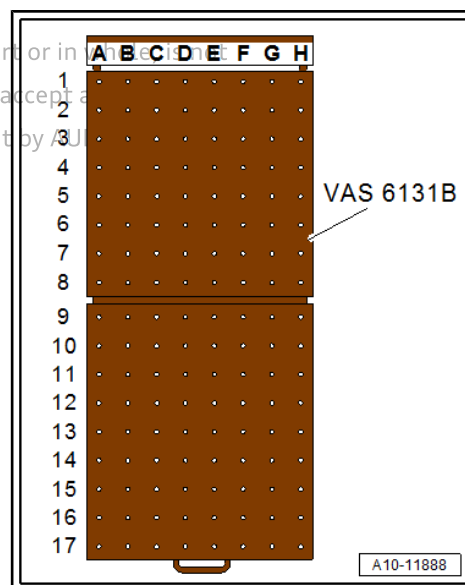


Set up the scissor-type assembly platform as follows:

- Set up scissor-type assembly platform - VAS 6131 B- with support set for Audi -VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2- as follows:

Platform coordinates	Parts from -VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2-			
C4	/10-1	/10-4	/10-5	/10-12
E4	/10-1	/10-4	/10-5	/10-11
E10	/10-1	/10-2	/10-5	/13-2
B15	/10-1	/10-2	/10-5	/11-1
F15	/10-1	/10-3	/10-5	/11-1

- Initially hand-tighten the support elements on the scissor-type assembly platform.
- Position scissor-type assembly platform - VAS 6131 B- horizontally.
- Take note of spirit level (bubble gauge).
- Position scissor-type assembly platform - VAS 6131 B- below engine/gearbox assembly.
- Position support elements from -VAS 6131/10- at both sides of engine.
- Make sure that threaded spindles are screwed in completely.





- Support subframe using support elements from -VAS 6131/10- and adapter -VAS 6131/13-2- .



Note

The support elements only support the subframe; the base plate is not secured to the scissor-type assembly platform.

- Position support elements from -VAS 6131/10- and adapters -VAS 6131/11-1- at tunnel cross member.
- Turn remaining spindles for support elements upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .
- Fix position of subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Fixing position of subframe .

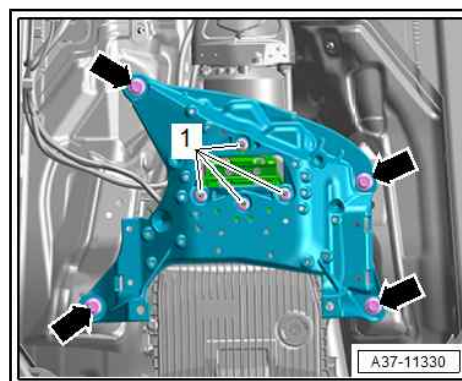
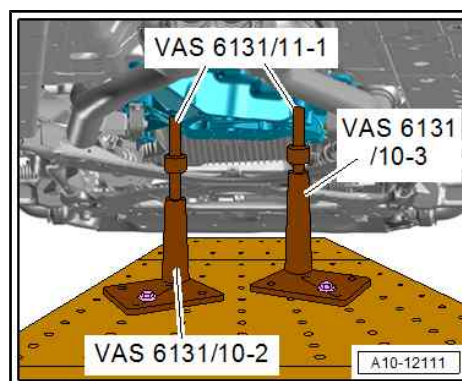
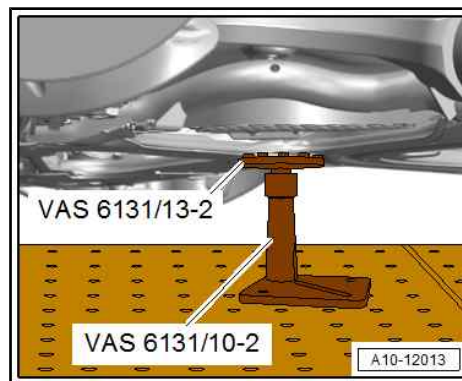
- Remove bolts -arrows- on tunnel cross member.



Caution

Danger of damage to hoses, pipes and wiring connections and to engine compartment.

- ◆ ***Check that all hoses and wiring connections between engine, gearbox, subframe and body have been detached.***
- ◆ ***Carefully guide out engine/gearbox assembly with subframe from engine compartment when lowering.***
- ◆ ***Guide drive shafts carefully past gearbox.***



- Lower scissor-type assembly platform - VAS 6131 B- with engine/gearbox assembly and pull out from underneath vehicle.
- Tie up drive shafts.

1.2 Separating engine and gearbox

⇒ **"1.2.1 Separating engine and gearbox - vehicles with 2.9 ltr. engine", page 58**

⇒ **"1.2.2 Separating engine and gearbox - vehicles with 3.0 ltr. engine", page 63**

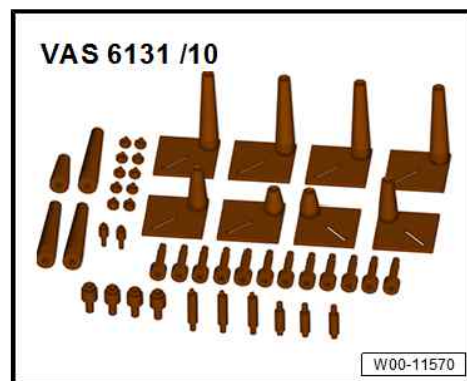
1.2.1 Separating engine and gearbox - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

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- ◆ Support set for Audi - VAS 6131/10-



- ◆ Adapter -VAS 6131/11-1- from support set, Audi A8 >2002 - VAS 6131/11- (not illustrated)
- ◆ Adapter -VAS 6131/12-2- from support set, Audi A6 >2005 - VAS 6131/12- (not illustrated)
- ◆ Hose clip pliers - VAS 6362-



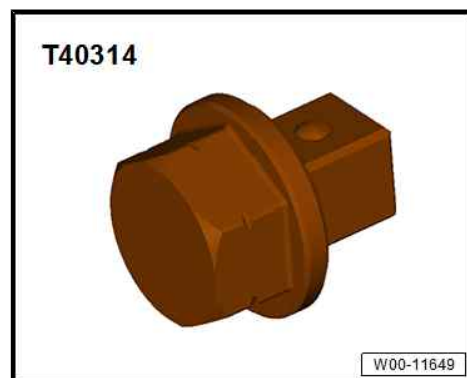
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- ◆ Wrench, 21 mm - T40263-



- ◆ Adapter - T40314-

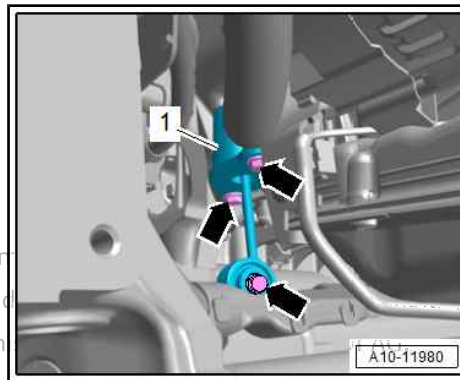




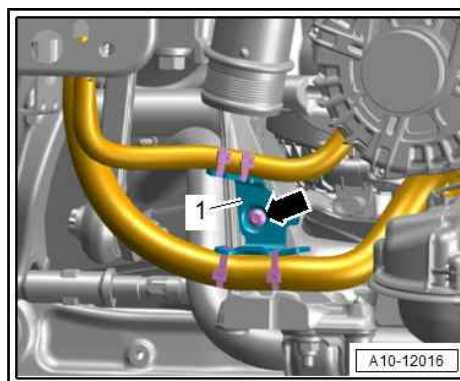
Procedure

- Engine/gearbox assembly removed and secured to scissor-type assembly platform - VAS 6131 B-
- Remove bolt -bottom arrow- for support mounting (right-side) -1-.

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

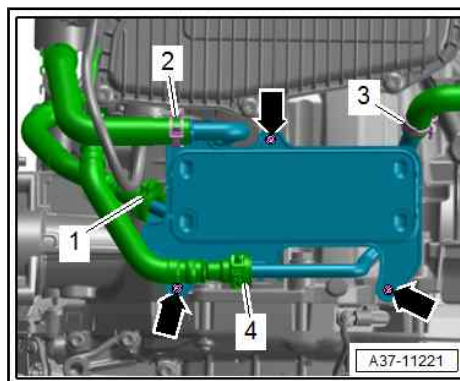
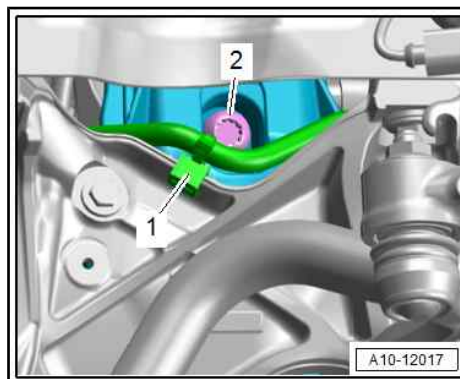


WARNING

Risk of accident caused by high weight of subframe.

- *Perform the following work with the assistance of a second mechanic.*

- On both sides, remove bolt -2- and detach subframe to one side (remove support elements). Shown with engine installed.
- Place a cloth underneath to catch escaping coolant.
- Release hose clips -2, 3- and disconnect coolant hoses.
- Remove bolts -arrows- and push ATF cooler slightly to one side with hoses -1, 4- attached.





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



Caution

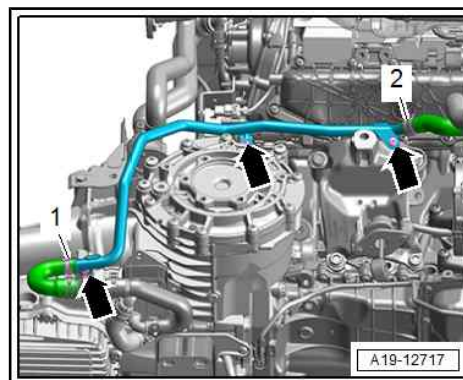
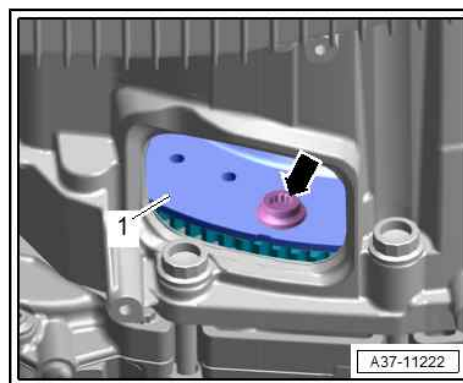
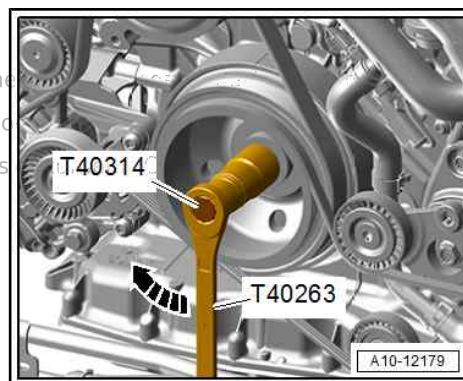
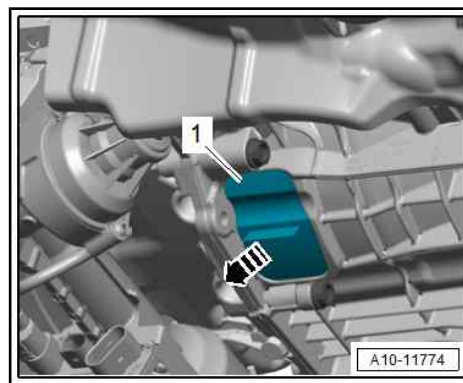
Irreparable damage can be caused if the camshaft timing chain slips.

- ◆ **Turn crankshaft only in direction of engine rotation -arrow-.**

- To slacken bolts for torque converter, counterhold crankshaft at vibration damper using wrench, 21 mm - T40263- and adapter -T40314- .

- Remove 6 bolts -arrow- for torque converter from drive plate -1-. Turn crankshaft 60° in direction of engine rotation each time.

- Remove bolts -arrows- and move coolant pipe (right-side) to one side.



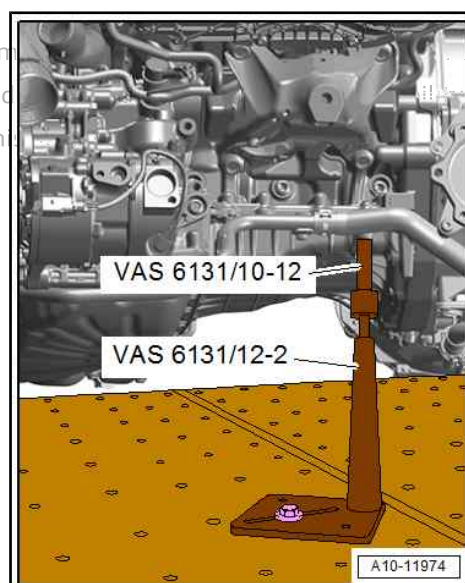
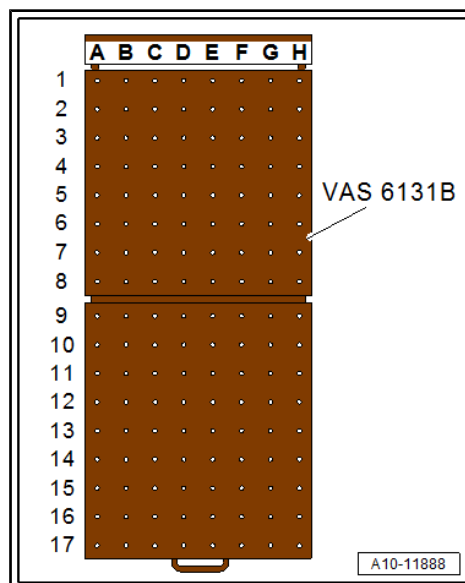


- Set up scissor-type assembly platform - VAS 6131 B- with support set for Audi - VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/12-2- as follows:
- The other support elements remain unchanged.

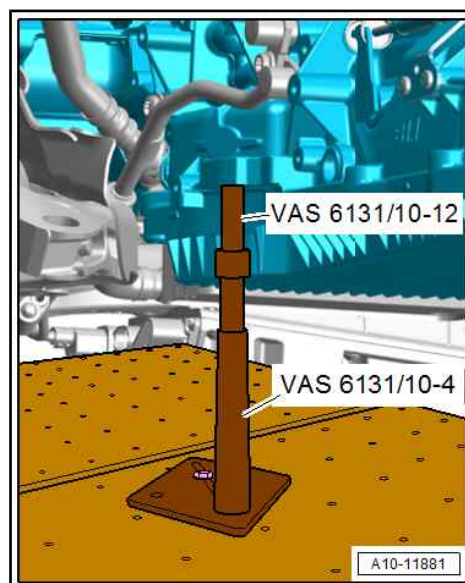
Platform coordinates	Parts of support set for Audi - VAS 6131/10- , adapter -VAS 6131/11-1- and adapter - VAS 6131/12-2-			
C7	/10-1	/12-2	/10-5	/10-12
E7	/10-1	/12-2	/10-5	/10-12
C10	/10-1	/10-4	/10-5	/10-12
F10	/10-1	/10-4	/10-5	/11-3



- Position support elements from -VAS 6131/10- and adapter - VAS 6131/12-2- at both sides of engine.

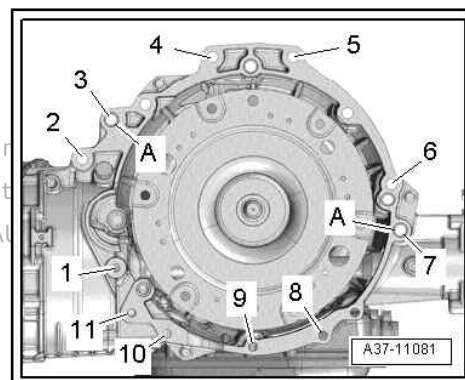
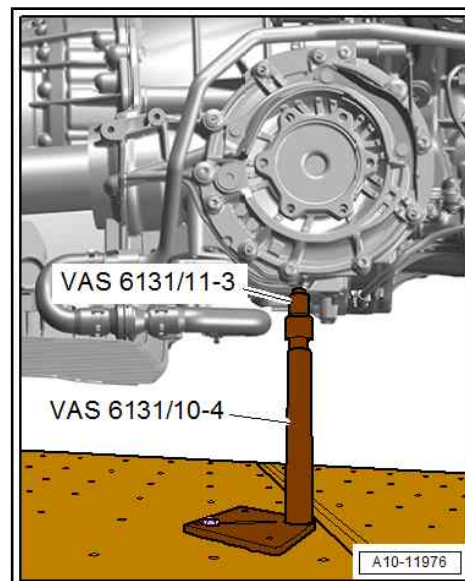


- Position support elements from -VAS 6131/10- at left of gear-box.

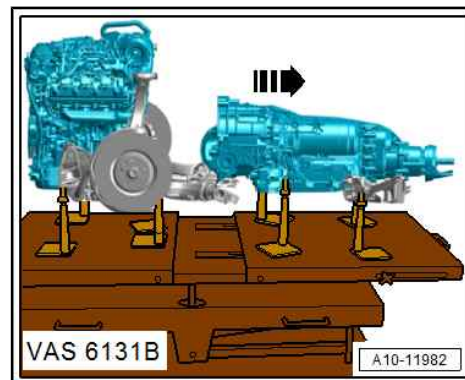




- Position support elements from -VAS 6131/10- and adapter - VAS 6131/11-3- at right of gearbox.
- Turn spindles (left and right) upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .



- Remove bolts -2 ... 11- securing gearbox to engine.
- Loosen bolt -1- for starter.
- Loosen clamping bolts on sides of scissor-type assembly platform - VAS 6131 B- , pull rear section of platform (together with gearbox) slightly towards rear -arrow-, and at the same time remove bolt for starter completely.
- Pull gearbox towards rear as far as it will go; lower it slightly with front spindles if necessary.

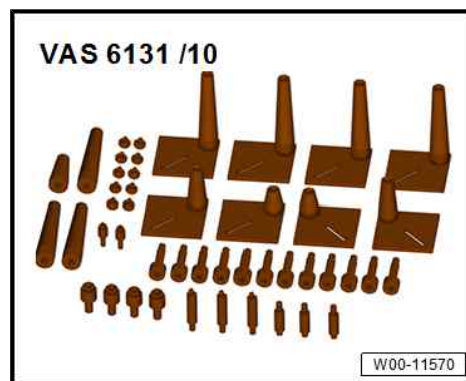


1.2.2 Separating engine and gearbox - vehicles with 3.0 ltr. engine

Special tools and workshop equipment required



- ◆ Support set for Audi - VAS 6131/10-



- ◆ Adapter -VAS 6131/11-1- from support set, Audi A8 >2002 - VAS 6131/11- (not illustrated)
- ◆ Adapter -VAS 6131/12-2- from support set, Audi A6 >2005 - VAS 6131/12- (not illustrated)
- ◆ Hose clip pliers - VAS 6362-

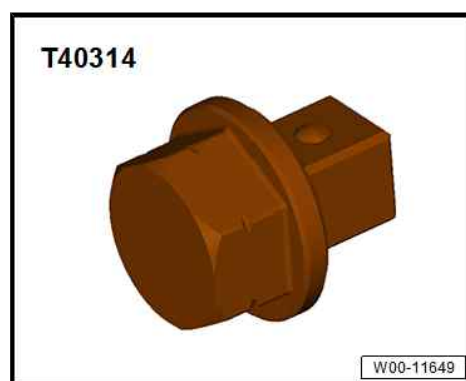


- ◆ Wrench, 21 mm - T40263-

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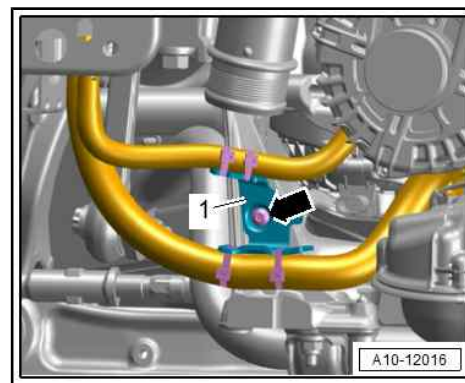
- ◆ Adapter - T40314-





Procedure

- Engine/gearbox assembly removed and secured to scissor-type assembly platform - VAS 6131 B-
- Remove bolt -arrow- and move bracket -1- clear with electrical wiring harness.

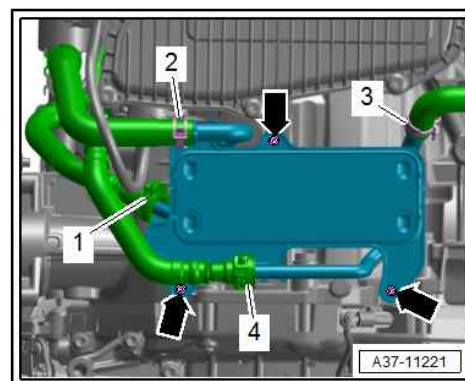
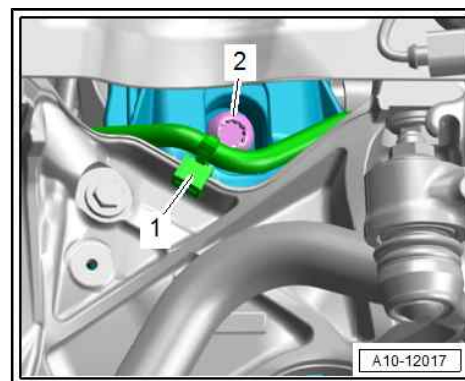


WARNING

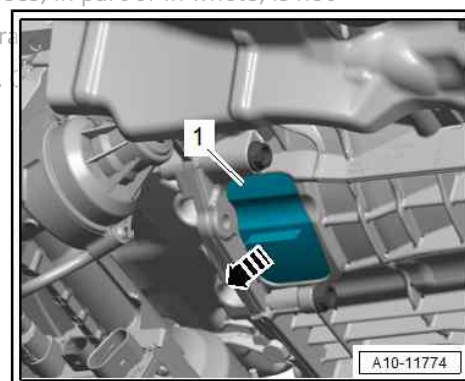
Risk of accident caused by high weight of subframe.

- *Perform the following work with the assistance of a second mechanic.*

- On both sides, remove bolt -2- and detach subframe to one side (remove support elements). Shown with engine installed.
- Place a cloth underneath to catch escaping coolant.
- Release hose clips -2, 3- and disconnect coolant hoses.
- Remove bolts -arrows- and push ATF cooler slightly to one side with hoses -1, 4- attached.



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



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Caution

Irreparable damage can be caused if the camshaft timing chain slips.

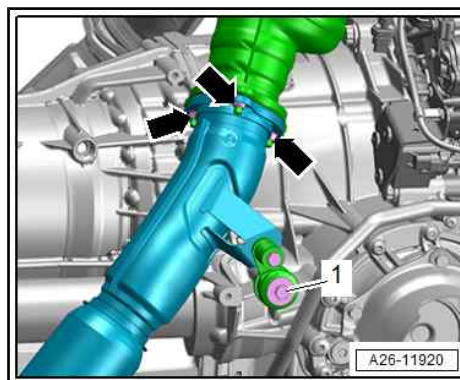
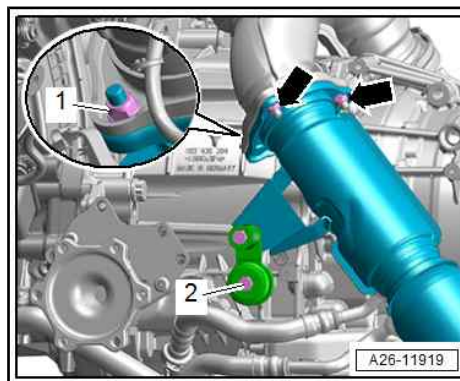
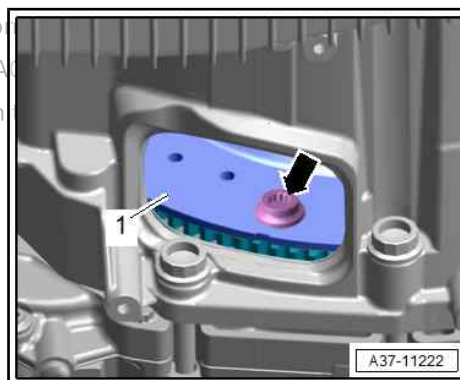
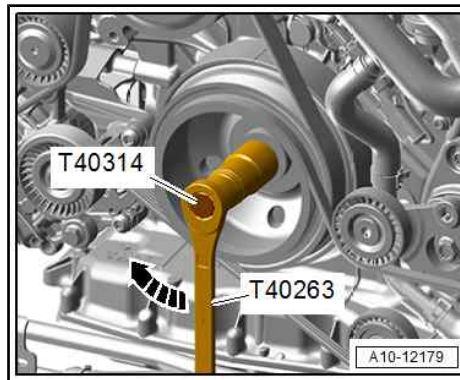
- ◆ *Turn crankshaft only in direction of engine rotation -arrow-.*

- To slacken bolts for torque converter, counterhold crankshaft at vibration damper using wrench, 21 mm - T40263- and adapter -T40314- .

- Remove 6 bolts -arrow- for torque converter from drive plate -1-. Turn crankshaft 60° in direction of engine rotation each time.

- Remove bolt -2- and nuts -1- and -arrows- for front silencer (left-side).

- Remove bolt -1- and nuts -arrows- for front silencer (right-side).





Caution

Risk of damage to flexible joints in front silencer.

- ◆ **Do NOT bend the flexible joint in the front silencer more than 10°.**

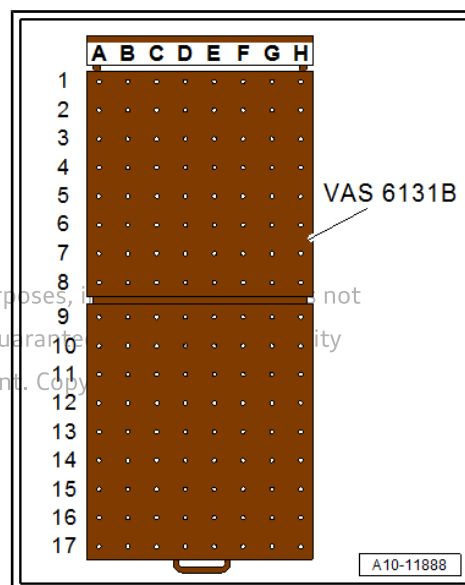
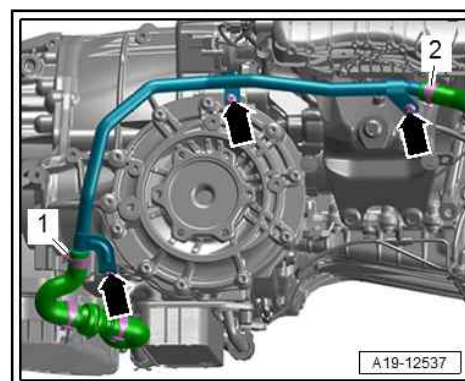
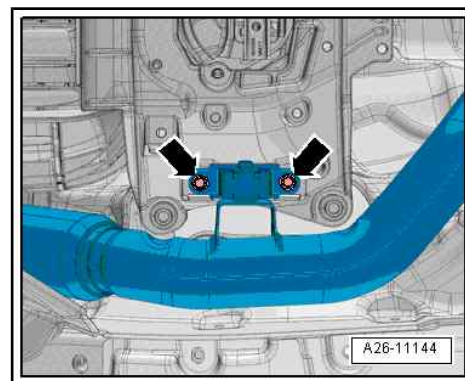
– Remove bolts -arrows- on both sides and detach corresponding front silencer.

– Remove bolts -arrows- and move coolant pipe (right-side) to one side.

– Set up scissor-type assembly platform - VAS 6131 B- with support set for Audi - VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/12-2- as follows:

- The other support elements remain unchanged.

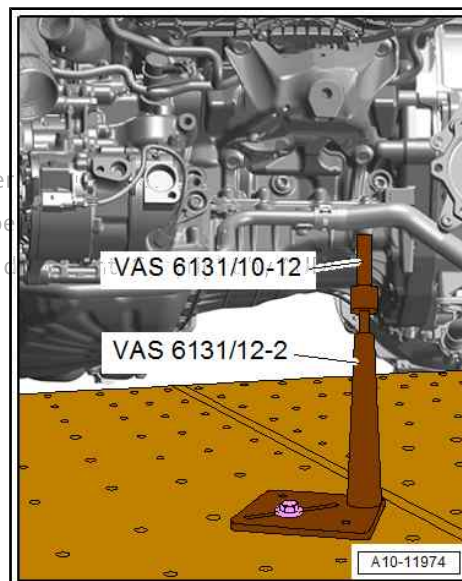
Platform coordinates	Parts of support set for Audi - VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/12-2-			
C7	/10-1	/12-2	/10-5	/10-12
E7	/10-1	/12-2	/10-5	/10-12
C10	/10-1	/10-4	/10-5	/10-12
F10	/10-1	/10-4	/10-5	/11-3



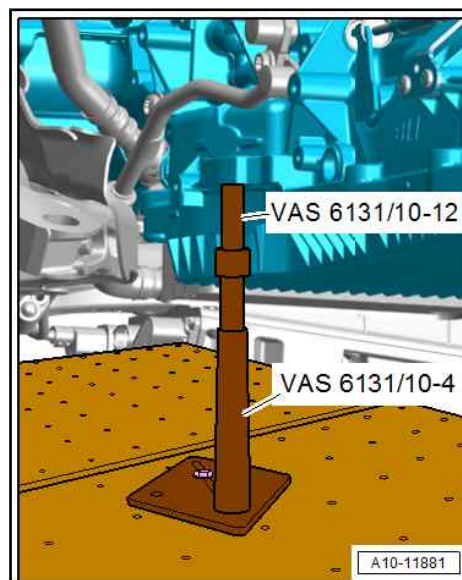


- Position support elements from -VAS 6131/10- and adapter - VAS 6131/12-2- at both sides of engine.

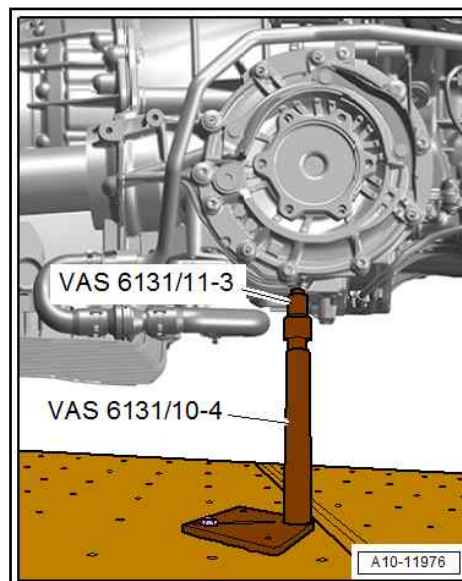
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- Position support elements from -VAS 6131/10- at left of gearbox.



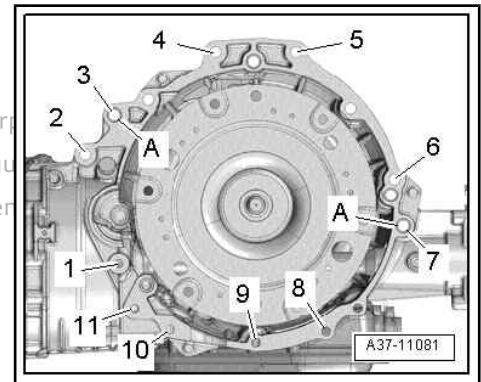
- Position support elements from -VAS 6131/10- and adapter - VAS 6131/11-3- at right of gearbox.
- Turn spindles (left and right) upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .



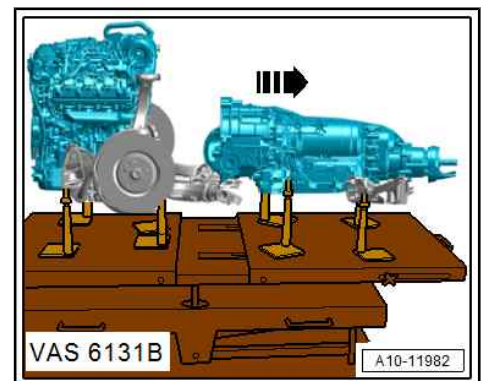


- Remove bolts -2 ... 11- securing gearbox to engine.
- Loosen bolt -1- for starter.

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- Loosen clamping bolts on sides of scissor-type assembly platform - VAS 6131 B- , pull rear section of platform (together with gearbox) slightly towards rear -arrow-, and at the same time remove bolt for starter completely.
- Pull gearbox towards rear as far as it will go; lower it slightly with front spindles if necessary.



1.3 Removing engine from scissor-type assembly platform

⇒ [“1.3.1 Removing engine from scissor-type assembly platform - vehicles with 2.9 ltr. engine”, page 69](#)

⇒ [“1.3.2 Removing engine from scissor-type assembly platform - vehicles with 3.0 ltr. engine”, page 70](#)

1.3.1 Removing engine from scissor-type assembly platform - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ◆ Lifting tackle - 3033-

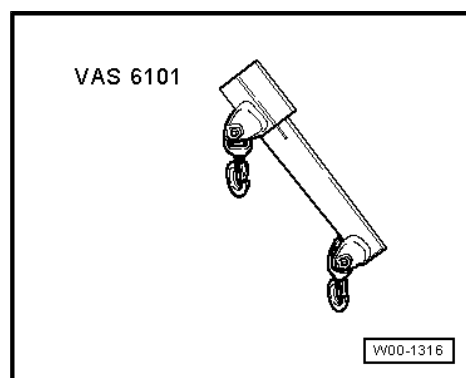




◆ Workshop hoist - VAS 6100-



◆ Lift arm extension/workshop hoist - VAS 6101-



Procedure

- Engine/gearbox assembly removed and secured to scissor-type assembly platform - VAS 6131 B- (with engine detached from gearbox)
⇒ [“1.2.1 Separating engine and gearbox - vehicles with 2.9 ltr. engine”, page 58](#) .

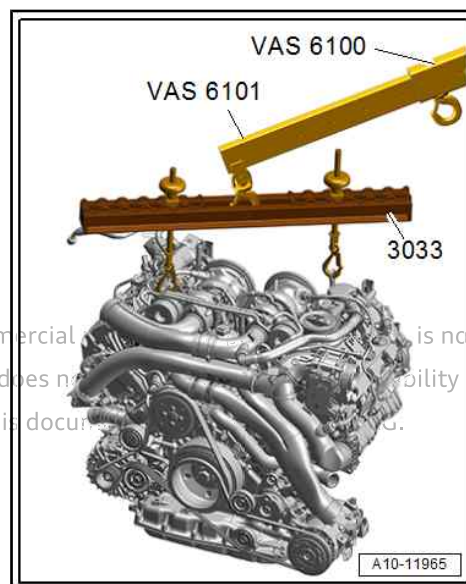


WARNING

Risk of accident!

- ◆ *The engine can only be transported with the gearbox removed using the method described.*

- Attach lift arm extension - VAS 6101- to workshop hoist - VAS 6100- .
- Attach lifting tackle - 3033- to engine lifting eyes and workshop hoist as shown in illustration.
- Raise engine using workshop hoist.



1.3.2 Removing engine from scissor-type assembly platform - vehicles with 3.0 ltr. engine

Special tools and workshop equipment required



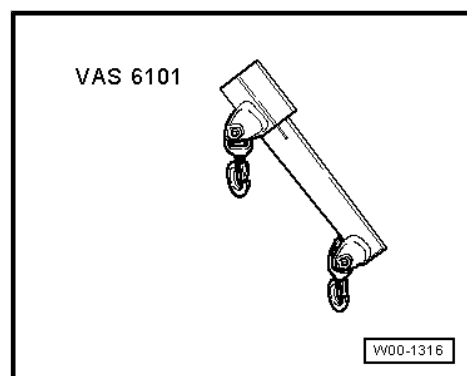
◆ Lifting tackle - 3033-



◆ Workshop hoist - VAS 6100-



◆ Lift arm extension/workshop hoist - VAS 6101-



Procedure

- Engine/gearbox assembly removed and secured to scissor-type assembly platform - VAS 6131 B- (with engine detached from gearbox)
⇒ ["1.2.2 Separating engine and gearbox - vehicles with 3.0 ltr. engine", page 63](#).

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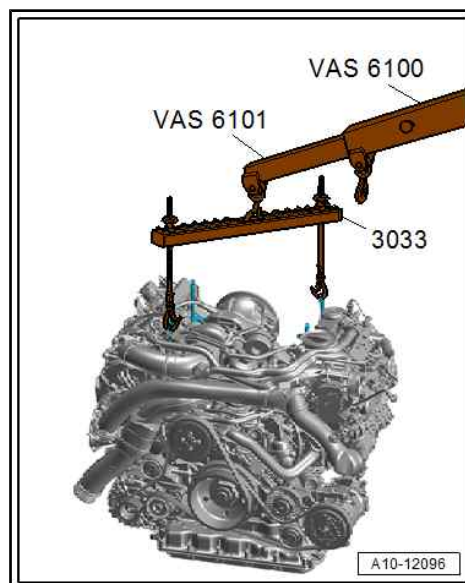


WARNING

Risk of accident!

- ◆ *The engine can only be transported with the gearbox removed using the method described.*

- Attach lift arm extension - VAS 6101- to workshop hoist - VAS 6100- .
- Attach lifting tackle - 3033- to engine lifting eyes and workshop hoist as shown in illustration.
- Raise engine using workshop hoist.



1.4 Securing engine to engine and gearbox support

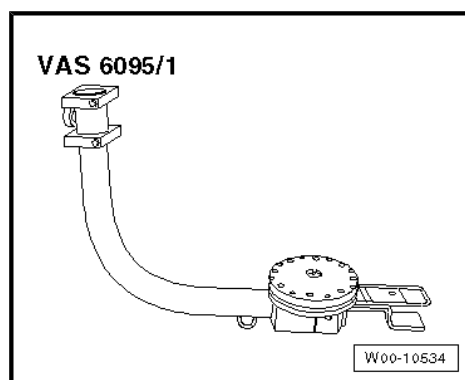
Special tools and workshop equipment required

- ◆ Engine and gearbox support - VAS 6095A-

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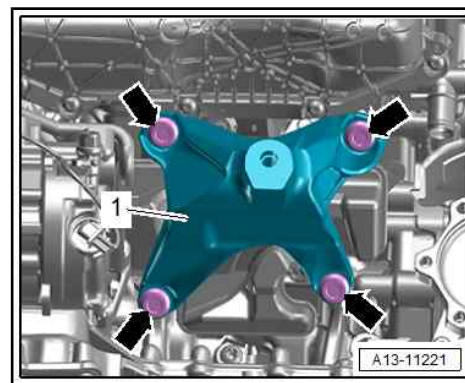
- ◆ Universal mounting - VAS 6095/1- and bracket for V6 TFSI engine - VAS 6095/1-15-





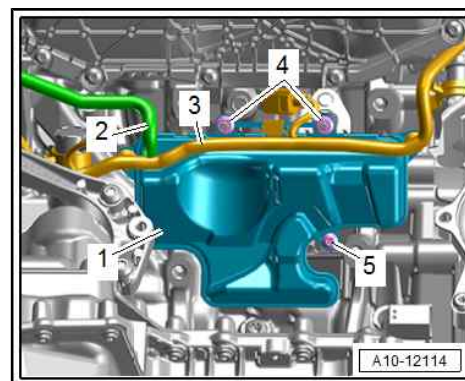
Procedure

- Unscrew bolts -arrows- and remove engine support (left-side).

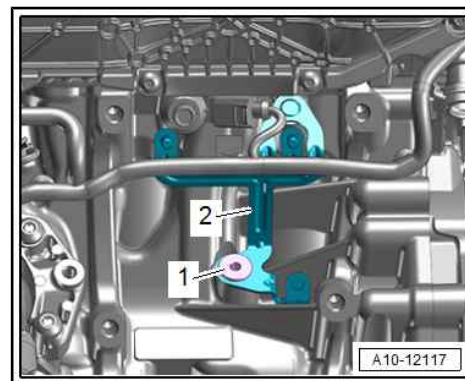


If work is subsequently required on chain drive:

- Being careful not to damage it, detach vacuum hose -2-.
- Move electrical wiring harness -3- clear.
- Remove nuts -4- and bolt -5-.
- Detach vacuum reservoir -1-.



- Unscrew plug -1- for "TDC" hole and detach bracket -2-.

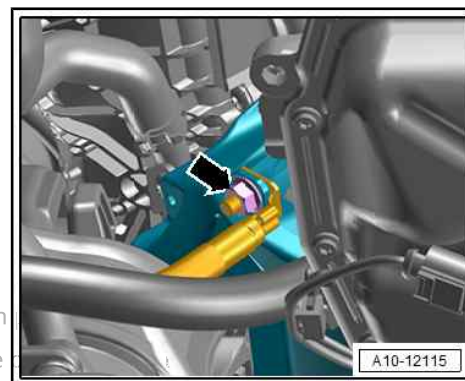


Continued:

- Remove nut -arrow- for earth wire.

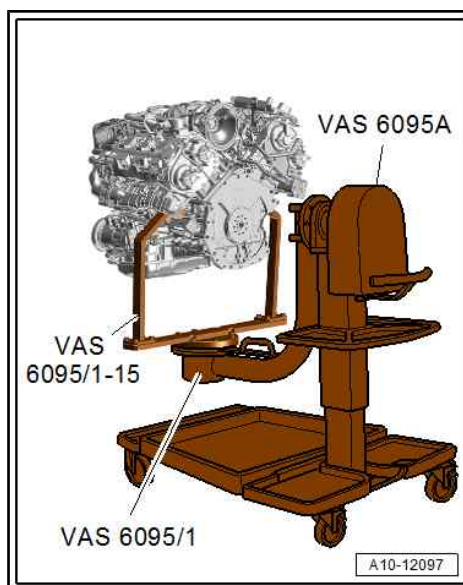
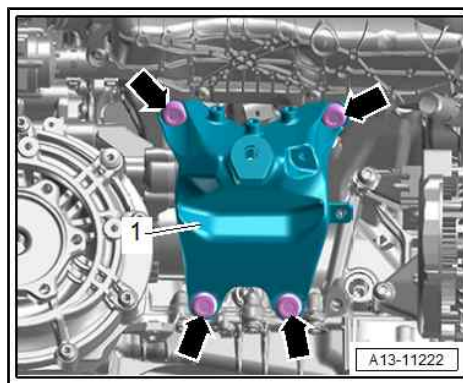


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- Remove bolts -arrows- and detach engine support -1-.
- Remove starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Removing and installing starter .
- Using universal mounting - VAS 6095/1- and bracket for V6 TFSI engine - VAS 6095/1-15- , secure engine to engine and gearbox support - VAS 6095A- (40 Nm).



1.5 Installing 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.
- ◆ 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 .
- ◆ Before fitting, check vacuum hoses for damage and renew if necessary.
- ◆ Re-install all cable ties in the same locations when installing.
- ◆ Bonded rubber bushes can only be turned to a limited extent. Therefore, only tighten the bolted connections for the suspension once the vehicle is in the unladen position or the reference position.
- Move starter into installation position.
- Install engine supports, engine mountings and, if applicable, support mountings
⇒ ["2.1 Exploded view - assembly mountings", page 78](#) .



- Engine with subframe positioned on scissor-type assembly platform - VAS 6131 B-
- Fit gearbox to engine ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Removing and installing gearbox; Installing gearbox .
- Fit plug for "OT" hole ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Crankshaft; Exploded view - crankshaft .
- Install coolant pipes
⇒ ["3.1 Exploded view - coolant pipes", page 152](#) .
- Install exhaust system
⇒ ["1.1 Exploded view - silencers", page 259](#) .
- Install ATF cooler ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; ATF circuit; Removing and installing ATF cooler .
- Carefully guide engine/gearbox assembly into body using scissor-type assembly platform - VAS 6131 B- .
- Remove locating pins and install subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Fixing position of subframe .
- Tighten bolts for tunnel cross member ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings .

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

- Install manual release cable for parking lock ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Selector mechanism .
- If removed previously, install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit .
- If removed previously, install poly V-belt
⇒ ["1.3 Removing and installing poly V-belts", page 85](#) and
⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- If removed previously, fit refrigerant lines at air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching refrigerant lines at air conditioner compressor .
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Install anti-roll bar and coupling rod ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .
- Secure drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install lower suspension links ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower suspension links, swivel joint; Exploded view - lower suspension links, swivel joint .
- Install subframe shield ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .
- Install track rod ball joint ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering rack; Exploded view - steering rack .
- If previously removed, install body brace (right-side) ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 ;



- Suspension strut, upper links; Removing and installing body brace .
- Install pressure differential sender together with bracket ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI EA 839; Rep. gr. 24 ; Senders and sensors; Exploded view - pressure differential sender .
 - Install engine control unit - J623-
⇒ ["9.2 Removing and installing engine/motor control unit J623", page 257](#) .
 - Electrical wiring and connections ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes and ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
 - Connect fuel hoses ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
 - Install air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#) .
 - Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
 - Install propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
 - Install bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
 - Install wheel spoiler and wheel housing liner ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
 - Fit front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
 - Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
 - Fill up with engine oil (⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: filling up), and check oil level (⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: checking oil level and correcting if necessary) .
 - Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



Caution

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

◆ ***Never use battery charging equipment for boost starting.***

- If engine and gearbox have been separated or engine has been renewed, perform corresponding adaptations listed in Guided Function "0001 - Functions, engine mechanics" ⇒ Vehicle diagnostic tester.



Caution

Risk of damage to components.

- ◆ *Only perform additional adaptations for those components which were renewed after removal.*

- Connect coolant hoses with plug-in connector
⇒ [Fig. ""Connecting coolant hose with plug-in connector""](#), [page 176](#) .
- Fill up with coolant
⇒ ["1.3 Draining and filling cooling system"](#), [page 122](#) .
- Check ATF level ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; ATF; Checking ATF level .
- Install noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .

Tightening torques

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

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

- ◆ ⇒ ["2.1 Exploded view - assembly mountings"](#), [page 78](#)
- ◆ Bolts securing engine to gearbox ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Removing and installing gearbox; Tightening torques for gearbox





2 Assembly mountings

⇒ [“2.1 Exploded view - assembly mountings”, page 78](#)

⇒ [“2.2 Supporting engine in installation position”, page 80](#)

⇒ [“2.3 Removing and installing engine mountings”, page 81](#)

⇒ [“2.4 Removing and installing gearbox mounting”, page 83](#)

2.1 Exploded view - assembly mountings

Engine mounting

1 - Subframe

2 - Bolt

- ☐ For 2.9 ltr. engine
- ☐ 20 Nm

3 - Bolt

- ☐ For 2.9 ltr. engine
- ☐ 10 Nm

4 - Support mounting

- ☐ For 2.9 ltr. engine, right side only
- ☐ Removing and installing
⇒ [“2.3.2 Removing and installing support mounting”, page 82](#)
- ☐ Installation position
⇒ [Fig. “Support mounting - installation position”, page 79](#)

5 - Bolt

- ☐ 55 Nm

6 - Engine support

- ☐ Removing and installing
⇒ [“1.7 Removing and installing engine support”, page 91](#)

7 - Not fitted

8 - Not fitted

9 - Bolt

- ☐ 55 Nm

10 - Engine mounting

- ☐ With:

◆ Left electrohydraulic engine mounting solenoid valve - N144-

◆ Right electrohydraulic engine mounting solenoid valve - N145-

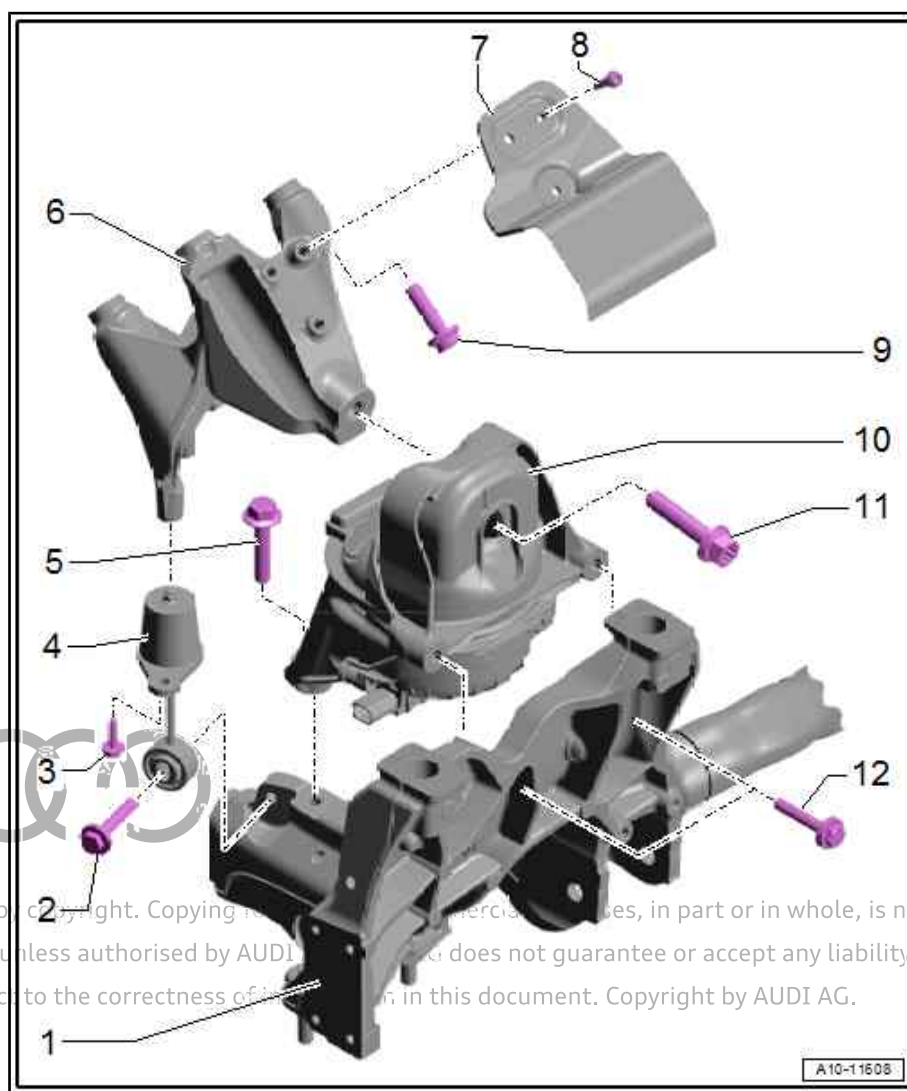
- ☐ Removing and installing ⇒ [“2.3.1 Removing and installing engine mountings”, page 81](#)

11 - Bolt

- ☐ Renew after removing
- ☐ 90 Nm +90°

12 - Bolt

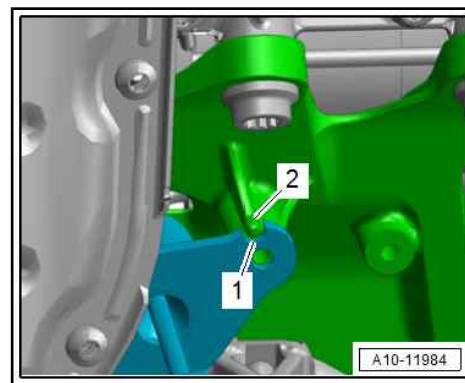
- ☐ 30 Nm





Support mounting - installation position

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



Gearbox mounting

1 - Bolt

- ❑ Tightening torques ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

2 - Tunnel cross member

- ❑ Removing and installing ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

3 - Nut

- ❑ Only remove if detaching gearbox mounting from gearbox support
- ❑ Tightening torques ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

4 - Gearbox support

- ❑ Removing and installing ⇒ ["2.4 Removing and installing gearbox mounting", page 83](#)

5 - Bolt

- ❑ Tightening torques ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

6 - Gearbox mounting

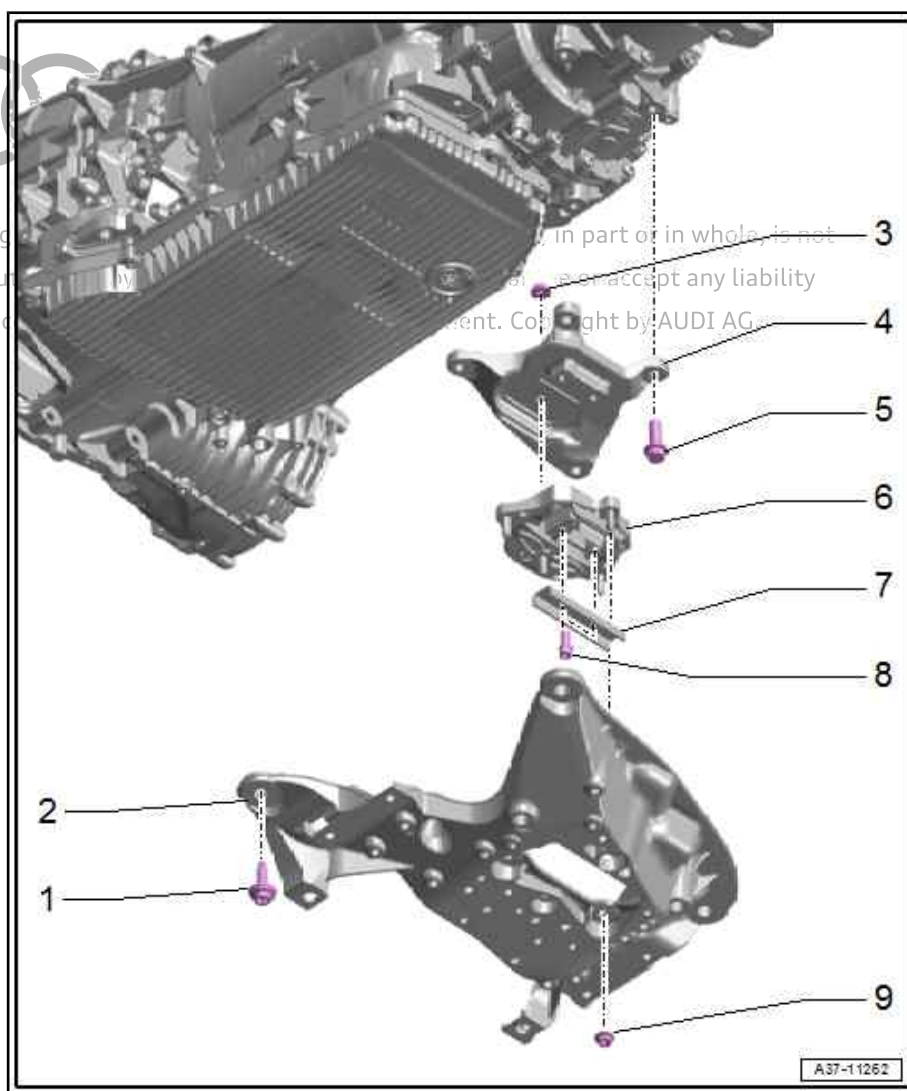
- ❑ Removing and installing ⇒ ["2.4 Removing and installing gearbox mounting", page 83](#)

7 - Stop plate

- ❑ For gearbox mounting

8 - Bolt

- ❑ Only remove if detaching gearbox mounting from gearbox support





- ❑ Tightening torques ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

9 - Nut

- ❑ Only remove if detaching gearbox mounting from gearbox support
- ❑ Tightening torques ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

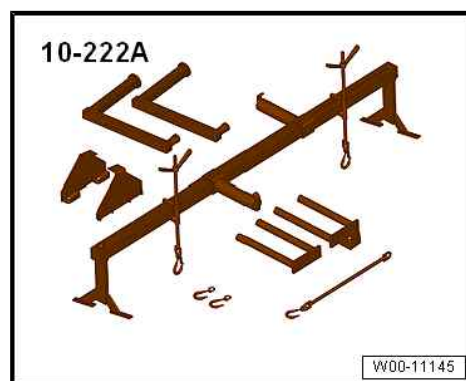
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2.2 Supporting engine in installation position

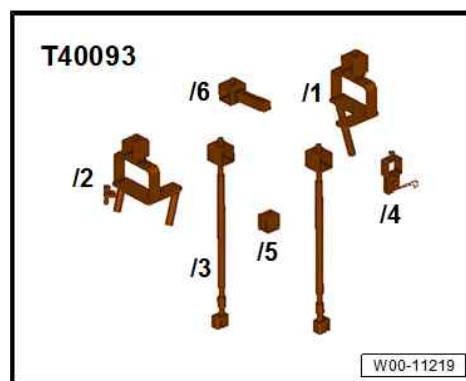
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Special tools and workshop equipment required

- ◆ Support bracket - 10-222A-



- ◆ Engine support bracket (supplementary set) - T40093-



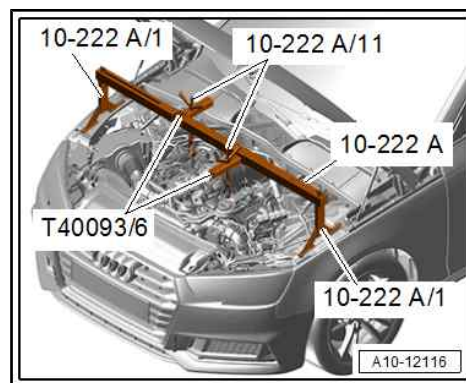
Procedure

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Set up support bracket - 10-222A- on longitudinal members (left and right).
- Engage spindles -10-222A/11- at engine lifting eyes (left and right).
- Tighten spindles slightly to take up weight of engine until engine mountings are no longer supporting engine.

Attaching

Assembly is performed in reverse sequence; note the following:

- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .





2.3 Removing and installing engine mountings

⇒ [“2.3.1 Removing and installing engine mountings”, page 81](#)

⇒ [“2.3.2 Removing and installing support mounting”, page 82](#)

2.3.1 Removing and installing engine mountings

Removing

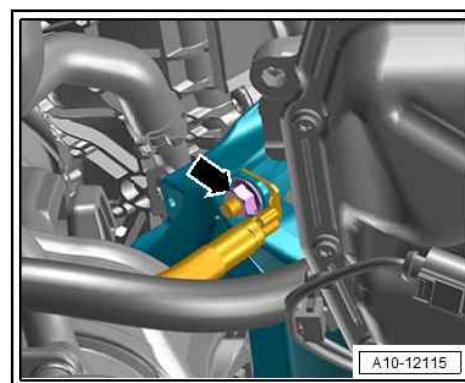
- Support engine in installation position
⇒ [“2.2 Supporting engine in installation position”, page 80](#) and take up weight with spindle - 10-222A/11- until load on engine mounting is relieved.
- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Unfasten front section of wheel housing liner and press to one side ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove wheel spoiler (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

Engine mounting (left-side):

- Remove poly V-belt from air conditioner compressor pulley ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Remove air conditioner compressor from bracket and tie up to left side ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .

Engine mounting (right-side):

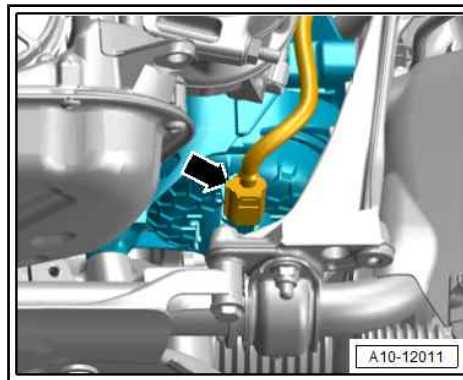
- Remove poly V-belt from alternator pulley ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Remove alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- Vehicles with 2.9 ltr. engine: Remove support mounting (right-side)
⇒ [“2.3.2 Removing and installing support mounting”, page 82](#) .
- Remove nut -arrow- and move earth wire clear.





Both sides (continued):

- Unplug electrical connector affected -arrow- for electrohydraulic engine mounting solenoid valve.

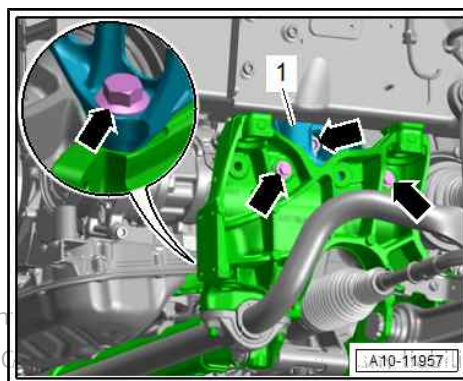


- Remove bolts -arrows- and detach engine mounting -1- (shown on left).

Installing

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

- After removing, renew bolts tightened with specified tightening angle.
- Vehicles with 2.9 ltr. engine: Install support mounting (right-side)
⇒ [“2.3.2 Removing and installing support mounting”, page 82](#).
- Install poly V-belt
⇒ [“1.3 Removing and installing poly V-belts”, page 85](#) and
⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Detach support bracket
⇒ [“2.2 Supporting engine in installation position”, page 80](#).



Tightening torques

- ♦ ⇒ [“2.1 Exploded view - assembly mountings”, page 78](#)
- ♦ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit
- ♦ ⇒ Electrical system; Rep. gr. 27 ; Alternator; Exploded view - alternator
- ♦ Earth wire ⇒ Current flow diagrams, Electrical fault finding and Fitting locations
- ♦ ⇒ 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

2.3.2 Removing and installing support mounting

Removing

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



- Remove bolts -arrows- for support mounting -1-.

Installing

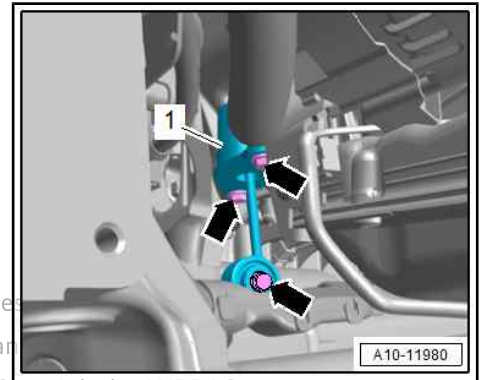
Installation is carried out in reverse order; note the following:

- Installation position
⇒ Fig. ““Support mounting - installation position””, page 79 .

Tightening torques

- ◆ ⇒ “2.1 Exploded view - assembly mountings”, page 78
- ◆ ⇒ General body repairs, exterior, Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

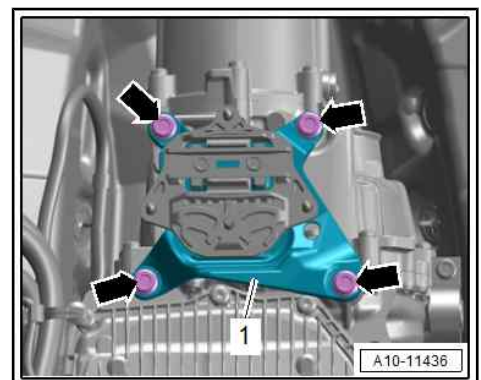
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2.4 Removing and installing gearbox mounting

Removing gearbox support with gearbox mounting

- Remove tunnel cross member ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings .
- Remove bolts -arrows- and detach gearbox support -1- and gearbox mounting from gearbox.



Removing and installing gearbox mounting

- Unscrew bolts -1- and detach stop -2- for gearbox mounting.
- Remove nut -5- and detach gearbox mounting -3- from gearbox support -4- (gearbox support in vehicle does not correspond to illustration).

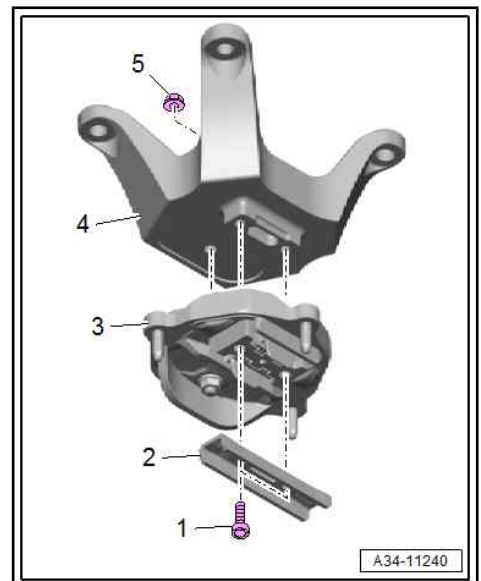
Installing

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

- Tighten nut -5- hand-tight initially.
- Tighten bolts -1- and then nut -5-.
- Install gearbox support with gearbox mounting.

Tightening torques

- ◆ ⇒ 8-speed automatic gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings





3 Engine cover panel

All procedures can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; 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 85](#)

⇒ [“1.2 Exploded view - sealing flange \(pulley end\)”, page 85](#)

⇒ [“1.3 Removing and installing poly V-belts”, page 85](#)

⇒ [“1.4 Removing and installing tensioner for poly V-belt”, page 89](#)

⇒ [“1.5 Removing and installing vibration damper”, page 90](#)

⇒ [“1.6 Removing and installing bracket for ancillaries”, page 91](#)

⇒ [“1.7 Removing and installing engine support”, page 91](#)

⇒ [“1.8 Renewing crankshaft oil seal \(pulley end\)”, page 92](#)

⇒ [“1.9 Removing and installing sealing flange \(pulley end\)”, page 92](#)

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1.1 Exploded view - cylinder block (pulley end)

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; 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 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - sealing flange (pulley end) .

1.3 Removing and installing poly V-belts

⇒ [“1.3.1 Removing and installing poly V-belt for alternator/coolant pump - vehicles with 2.9 ltr. engine”, page 85](#)

⇒ [“1.3.2 Removing and installing poly V-belt for air conditioner compressor \(with radiator fitted\) - vehicles with 2.9 ltr. engine”, page 86](#)

⇒ [“1.3.3 Removing and installing poly V-belt for air conditioner compressor \(with radiator removed\) - vehicles with 2.9 ltr. engine”, page 88](#)

⇒ [“1.3.4 Removing and installing poly V-belts for alternator/coolant pump and air conditioner compressor - vehicles with 3.0 ltr. engine”, page 89](#)

1.3.1 Removing and installing poly V-belt for alternator/coolant pump - vehicles with 2.9 ltr. engine

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .

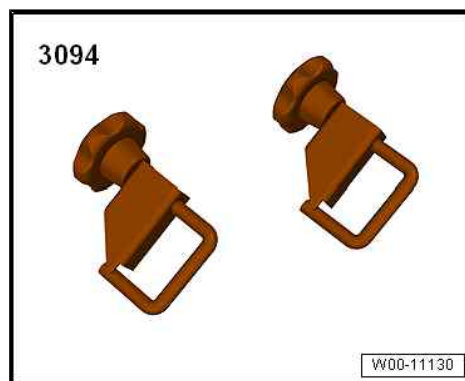


1.3.2 Removing and installing poly V-belt for air conditioner compressor (with radiator fitted) - vehicles with 2.9 ltr. engine

Complete procedure if radiator has NOT been removed during preparatory work

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



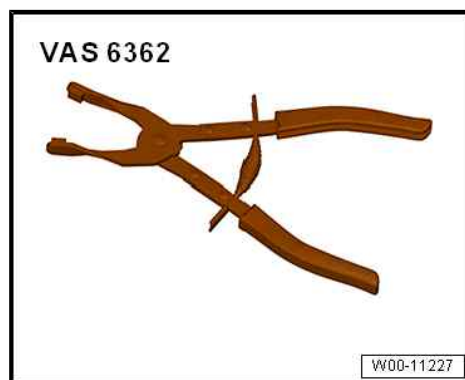
- ◆ Counterhold tool - 3145-



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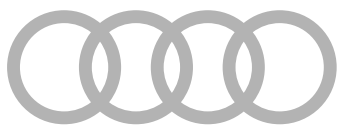


- ◆ Hose clip pliers - VAS 6362-

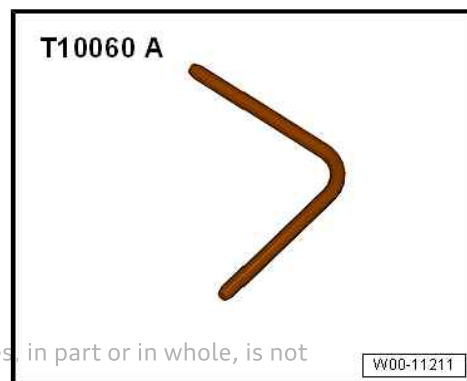




- ◆ Locking pin - T10060A-



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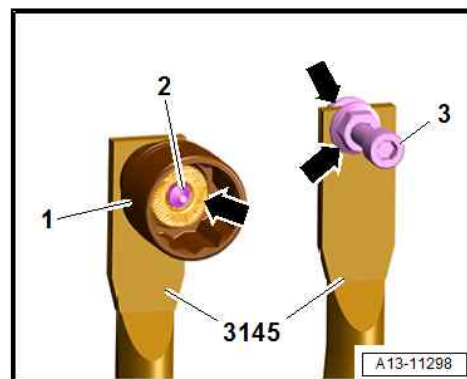
- ◆ Flat-nose pliers, straight and long version (commercially available)
- ◆ Socket (30 mm)
- ◆ M10x40 bolt
- ◆ M10x60 bolt
- ◆ Nuts M10 (3x)

Preparing counterhold tool - 3145-

- Secure socket (30 mm) -item 1- to counterhold tool - 3145- with M10x40 bolt -item 2- and M10x60 bolt -item 3-, as shown in illustration.
- Tighten nuts -arrows-.

Removing

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

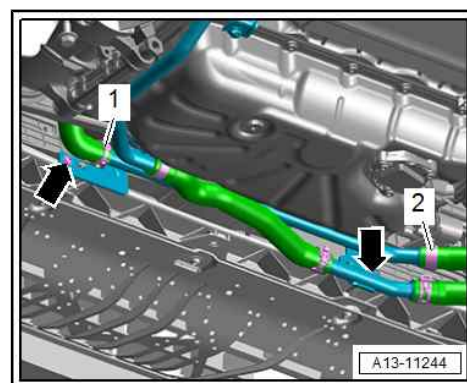


If poly V-belt for air conditioner compressor is being removed completely:

- Place a cloth underneath to catch escaping coolant.
- Clamp off coolant hose -2- with hose clamp, up to 25 mm - 3094- .
- Clamp off coolant hose using hose clamp up to 25 mm - 3094- , release hose clip -1- and disconnect hose.

Continued:

- Remove bolts -arrows- and push coolant pipes at lock carrier slightly upwards.





- Apply counterhold tool - 3145- at poly V-belt and sump flange, as shown.
- Turn counterhold tool anti-clockwise only until tensioner -1- can be locked with locking pin - T10060A- .

Note:

Fit locking pin - T10060A- with flat-nose pliers (long version).

- Take off poly V-belt.

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 .
- Fit poly V-belt ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end) .
- Apply counterhold tool - 3145- on poly V-belt, swivel slightly anti-clockwise and pull out locking pin - T10060A- .
- Detach counterhold tool.
- Check that poly V-belts are properly seated.
- Start engine and check that poly V-belt(s) run properly.
- Check coolant level
⇒ ["1.3 Draining and filling cooling system", page 122](#) .

Tightening torques

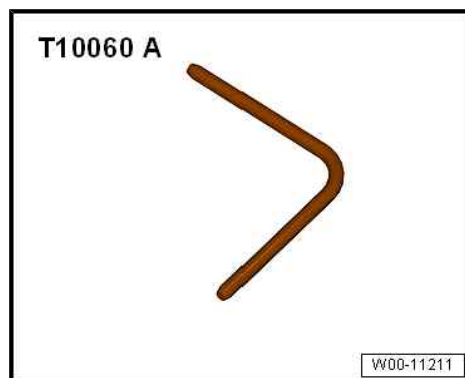
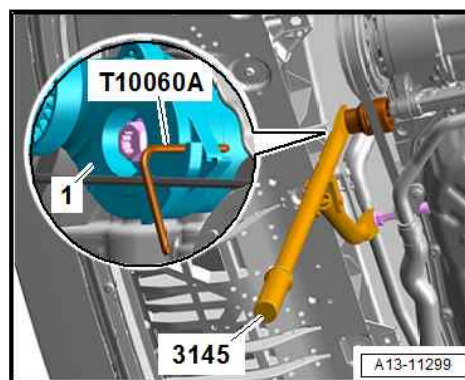
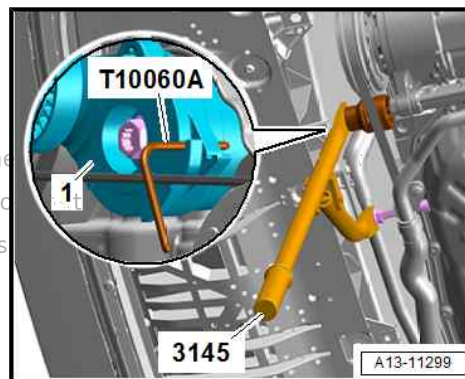
- ◆ ⇒ ["3.1 Exploded view - coolant pipes", page 152](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

1.3.3 Removing and installing poly V-belt for air conditioner compressor (with radiator removed) - vehicles with 2.9 ltr. engine

Simplified procedure if radiator has been removed during preparatory work

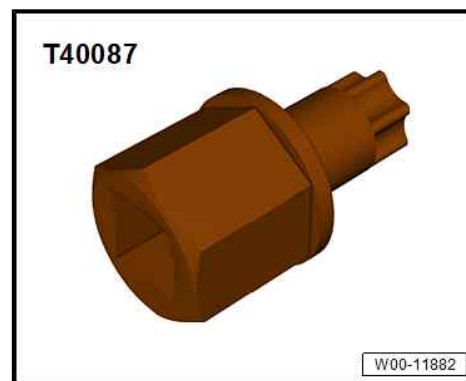
Special tools and workshop equipment required

- ◆ Locking pin - T10060A-





◆ Socket Torx T60 - 40087-



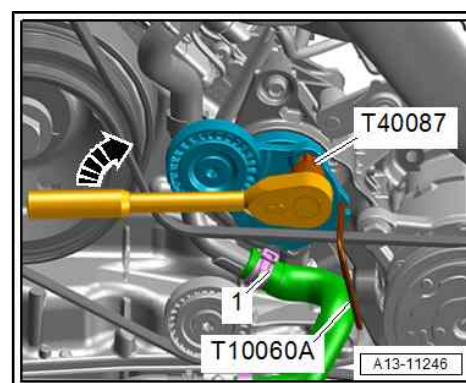
Removing

- Slacken poly V-belt by turning tensioner clockwise -arrow- using socket Torx T 60 - 40087- .
- Lock tensioner with locking pin - T10060A- and take off poly V-belt.
- If removing poly V-belt for air conditioner compressor completely: Release hose clip -1- and detach coolant hose.

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 .
- Fit poly V-belt ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end) .
- Turn poly V-belt tensioner slightly clockwise using socket Torx T 60 - 40087- and pull out locking pin - T10060A- .
- Release tensioner to slacken poly V-belt.
- Check that poly V-belt is properly seated.
- Start engine and check that poly V-belt(s) run properly.



1.3.4 Removing and installing poly V-belts for alternator/coolant pump and air conditioner compressor - vehicles with 3.0 ltr. engine

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .

1.4 Removing and installing tensioner for poly V-belt

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .

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1.5 Removing and installing vibration damper

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⇒ **"1.5.1 Removing and installing vibration damper - vehicles with 2.9 ltr. engine", page 90**

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⇒ **"1.5.2 Removing and installing vibration damper - vehicles with 3.0 ltr. engine", page 90**

1.5.1 Removing and installing vibration damper - vehicles with 2.9 ltr. engine

Removing

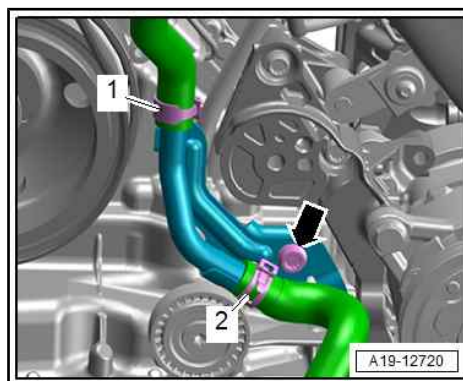
- Remove radiator with radiator cowl
⇒ **"4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine", page 181** .
- Remove bolt -arrow-.
- Release hose clip -1-, disconnect coolant hose and push front coolant pipe (bottom left) slightly to one side.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing vibration damper .

Installing

Additional work:

- Install radiator with radiator cowl
⇒ **"4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine", page 181** .



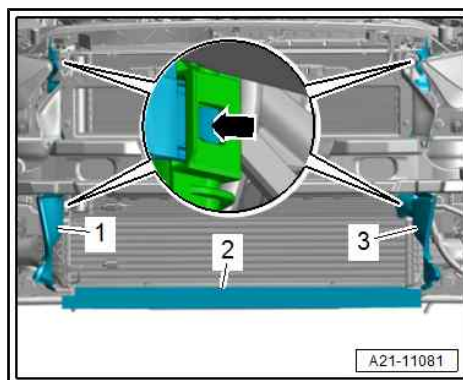
Tightening torques

- ♦ ⇒ **"3.1.1 Exploded view - coolant pipes (engine end), vehicles with 2.9 ltr. engine", page 152**

1.5.2 Removing and installing vibration damper - vehicles with 3.0 ltr. engine

Removing

- Remove lock carrier cover, air intake grille (left and right) and closure plate at bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Release catches -arrow- and detach air ducts -1, 3-.
- Unclip air duct (bottom) -2-.





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

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing vibration damper .

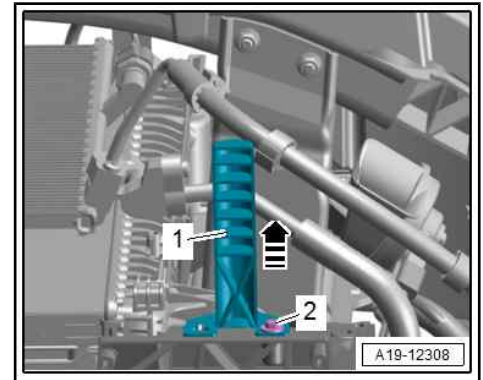
Installing

Additional work:

- 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 - radiator/radiator fans”, page 175](#)



1.6 Removing and installing bracket for ancillaries

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries .

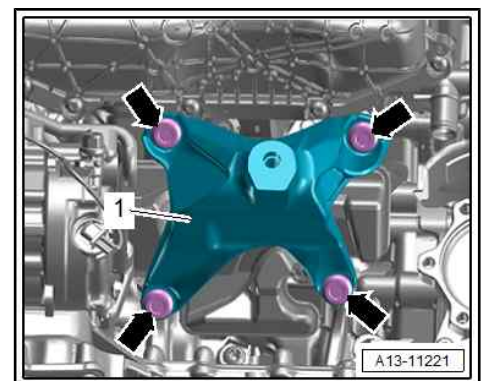
1.7 Removing and installing engine support

Removing

- Remove engine mounting
⇒ [“2.3.1 Removing and installing engine mountings”, page 81](#) .

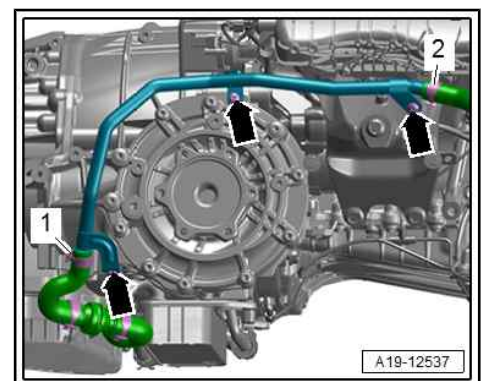
Engine support (left-side):

- Remove bolts -arrows- and detach engine support -1-.



Engine support (right-side):

- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove cover for drive shaft (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove bolts -arrows- and press coolant pipe (right-side) slightly to one side (shown on vehicle with 3.0 ltr. engine).





- Remove bolts -arrows- and detach engine support -1-.

Installing

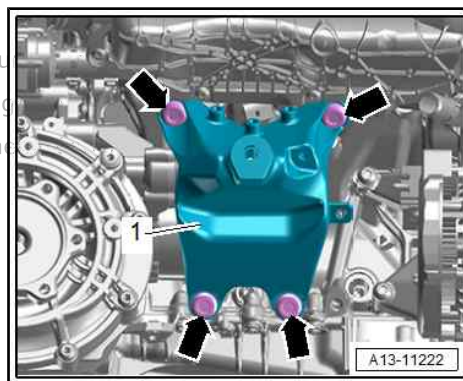
Installation is carried out in reverse order; note the following:

- Install engine mountings

⇒ [“2.3.1 Removing and installing engine mountings”, page 81](#) .

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - assembly mountings”, page 78](#)
- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 152](#)
- ◆ ⇒ 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



1.8 Renewing crankshaft oil seal (pulley end)

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Renewing crankshaft oil seal (pulley end) .

1.9 Removing and installing sealing flange (pulley end)

⇒ [“1.9.1 Removing and installing sealing flange \(pulley end\) - vehicles with 2.9 ltr. engine”, page 92](#)

⇒ [“1.9.2 Removing and installing sealing flange \(pulley end\) - vehicles with 3.0 ltr. engine”, page 93](#)

1.9.1 Removing and installing sealing flange (pulley end) - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-

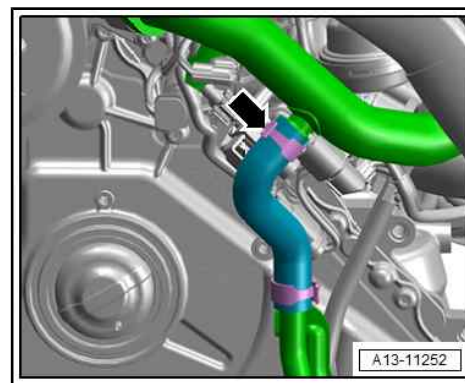


Removing

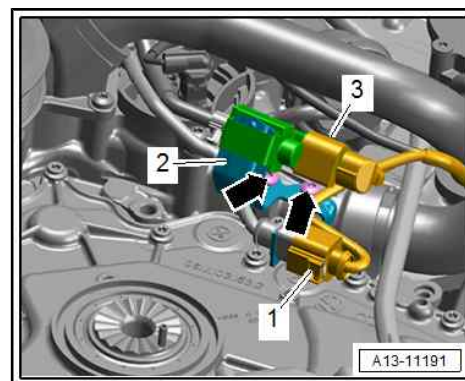
- Remove vibration damper
⇒ [“1.5.1 Removing and installing vibration damper - vehicles with 2.9 ltr. engine”, page 90](#) .
- Remove air pipe (top)
⇒ [“2.3.1 Removing and installing air pipe \(top\) with radiator fitted - vehicles with 2.9 ltr. engine”, page 211](#) .
- Remove coolant pipe (front left)
⇒ [“3.2.3 Removing and installing coolant pipe \(front left\) - vehicles with 2.9 ltr. engine”, page 160](#) .



- Release hose clip -arrow- and detach coolant hose.



- Unplug electrical connector -3- and pull coolant valve for cylinder head - N489- slightly off from bracket -2-.
- Unplug electrical connector -1-.
- Remove bolts -arrows-, pull bracket off coolant valve and tie to one side.



All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing sealing flange (pulley end) .

Installing

Additional work:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install coolant pipe (front left)
⇒ [“3.2.3 Removing and installing coolant pipe \(front left\) - vehicles with 2.9 ltr. engine”, page 160](#) .
- Install air pipe (top)
⇒ [“2.3.1 Removing and installing air pipe \(top\) with radiator fitted - vehicles with 2.9 ltr. engine”, page 211](#) .
- Install vibration damper ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing vibration damper .

1.9.2 Removing and installing sealing flange (pulley end) - vehicles with 3.0 ltr. engine

Removing

- Remove vibration damper
⇒ [“1.5.2 Removing and installing vibration damper - vehicles with 3.0 ltr. engine”, page 90](#) .
- Remove air pipe
⇒ [“2.3.4 Removing and installing air pipe \(top\) - vehicles with 3.0 ltr. engine”, page 219](#) .

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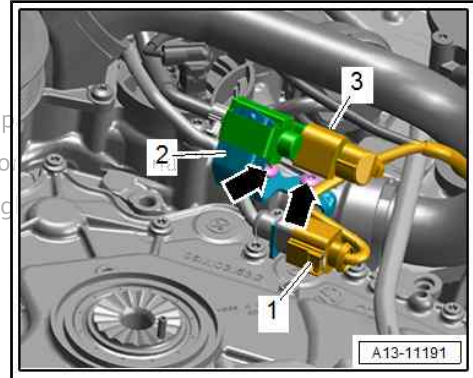
- Unplug electrical connector -3- and detach coolant valve for cylinder head - N489- from bracket -2-.
- Unplug electrical connector -1-.
- Remove bolts -arrows- and tie up bracket to one side.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13; Cylinder block (pulley end); Removing and installing sealing flange (pulley end) .

Installing

Additional work:

- Install air pipe
⇒ ["2.3.4 Removing and installing air pipe \(top\) - vehicles with 3.0 ltr. engine", page 219](#) .
- Install vibration damper ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing vibration damper .





2 Cylinder block (gearbox end)

All procedures and components can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (gearbox end) .



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3 Crankshaft

All procedures and components can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Crankshaft .



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4 Balance shaft

All procedures and components can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Balance shaft .



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5 Pistons and conrods

All procedures and components can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Pistons and conrods .



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15 – Cylinder head, valve gear

1 Timing chain cover

All procedures and components can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Timing chain cover .



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2 Chain drive

⇒ [“2.1 Exploded view - camshaft timing chains”, page 100](#)

⇒ [“2.2 Exploded view - drive chain for oil pump”, page 100](#)

⇒ [“2.3 Removing camshaft timing chain from camshafts”, page 100](#)

⇒ [“2.4 Removing and installing camshaft timing chain”, page 101](#)

2.1 Exploded view - camshaft timing chains

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15; Chain drive; Exploded view - camshaft timing chains.

2.2 Exploded view - drive chain for oil pump

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15; Chain drive; Exploded view - drive chain for oil pump .

2.3 Removing camshaft timing chain from camshafts

⇒ [“2.3.1 Removing camshaft timing chain from camshafts - vehicles with 2.9 ltr. engine”, page 100](#)

⇒ [“2.3.2 Removing camshaft timing chain from camshafts - vehicles with 3.0 ltr. engine”, page 100](#)

2.3.1 Removing camshaft timing chain from camshafts - vehicles with 2.9 ltr. engine

Removing

If performing this work with the engine installed:

- Remove radiator with radiator cowl
⇒ [“4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine”, page 181](#) .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15; Chain drive; Removing camshaft timing chain from camshafts .

Installing

Additional work:

- Install radiator with radiator cowl
⇒ [“4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine”, page 181](#) .

2.3.2 Removing camshaft timing chain from camshafts - vehicles with 3.0 ltr. engine

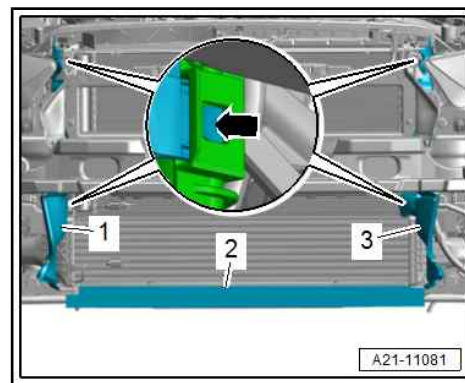
Removing

If performing this work with the engine installed:

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



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



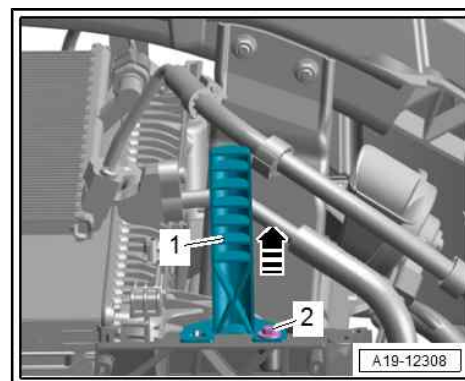
- Remove bolt -2- on both sides and press radiator bracket -1- with radiator towards front -arrow-.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Chain drive; Removing camshaft timing chain from camshafts .

Installing

Additional work:

- 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 - radiator/radiator fans”, page 175](#)

2.4 Removing and installing camshaft timing chain

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Chain drive; Removing and installing camshaft timing chain .



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3 Cylinder head

⇒ [“3.1 Exploded view - cylinder head”, page 102](#)

⇒ [“3.2 Exploded view - camshaft housing”, page 102](#)

⇒ [“3.3 Removing and installing cylinder head”, page 102](#)

⇒ [“3.4 Removing and installing camshaft housing”, page 102](#)

⇒ [“3.5 Checking compression”, page 103](#)

3.1 Exploded view - cylinder head

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head .

3.2 Exploded view - camshaft housing

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Exploded view - camshaft housing .

3.3 Removing and installing cylinder head

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Removing and installing cylinder head .

3.4 Removing and installing camshaft housing

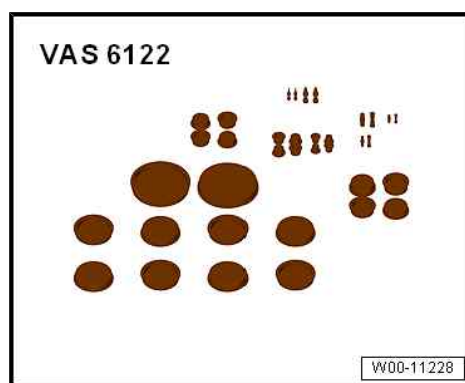
⇒ [“3.4.1 Removing and installing camshaft housing - cylinder bank 1 \(right-side\)”, page 102](#)

⇒ [“3.4.2 Removing and installing camshaft housing - cylinder bank 2 \(left-side\)”, page 103](#)

3.4.1 Removing and installing camshaft housing - cylinder bank 1 (right-side)

Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-





Removing

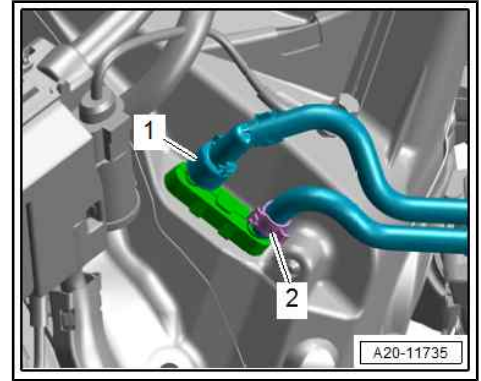
- Release hose clip -2- and disconnect hose for activated charcoal filter system.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Removing and installing camshaft housing .

Installing

Additional work:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .



3.4.2 Removing and installing camshaft housing - cylinder bank 2 (left-side)

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3.5 Checking compression

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Checking compression .



4 Valve gear

⇒ [“4.1 Exploded view - valve gear”, page 104](#)

⇒ [“4.2 Measuring axial clearance of camshaft”, page 104](#)

⇒ [“4.3 Measuring radial clearance of camshaft”, page 104](#)

⇒ [“4.4 Removing and installing camshaft”, page 104](#)

⇒ [“4.5 Removing and installing cam actuators”, page 104](#)

⇒ [“4.6 Removing and installing camshaft control valve 1 N205 ”, page 105](#)

⇒ [“4.7 Removing and installing valve stem oil seals”, page 106](#)

4.1 Exploded view - valve gear

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Exploded view - valve gear .

4.2 Measuring axial clearance of camshaft

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Measuring axial clearance of camshaft .

4.3 Measuring radial clearance of camshaft

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Measuring radial clearance of camshaft .

4.4 Removing and installing camshaft

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Removing and installing camshaft .

4.5 Removing and installing cam actuators

Removing cam actuators for cylinder bank 1 (right-side)

- Remove air cleaner housing

⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Removing and installing cam actuators .



Removing cam actuators for cylinder bank 2 (left-side)

- Detach engine control unit - J623- from bracket and move to one side
⇒ [“9.2 Removing and installing engine/motor control unit J623”, page 257](#)
- Move coolant line -3- and electrical wiring harness -2- clear.
- Remove bolts -arrows- and detach bracket -1- for engine control unit.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Removing and installing cam actuators .

Installing

Additional work:

- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .

Tightening torques

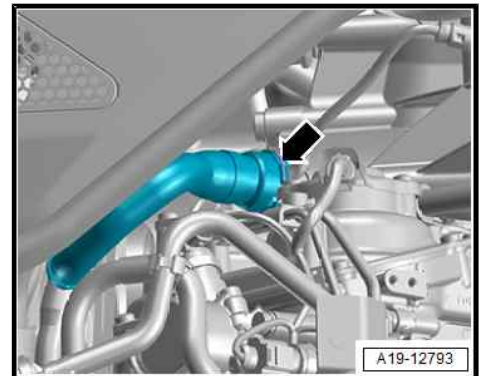
- ◆ ⇒ [“9.1 Exploded view - engine control unit”, page 257](#)

4.6 Removing and installing camshaft control valve 1 - N205-

This procedure applies to camshaft control valves -N205- , -N208- , -N318- and -N319- .

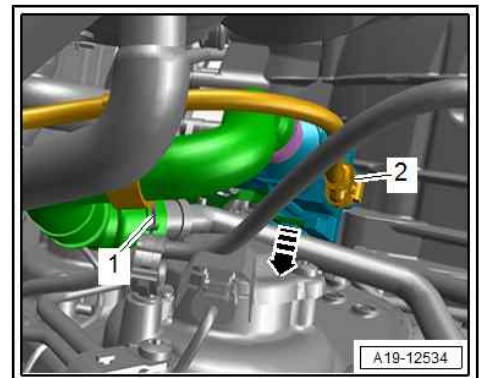
Removing camshaft control valve 1 - N205- on vehicles with 2.9 ltr. engine with particulate filter:

- Remove body brace (right-side) ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Drain coolant
⇒ [“1.3 Draining and filling cooling system”, page 122](#) .
- Lift retaining clip -arrow- and disconnect coolant hose.



Removing camshaft control valve 1 - N205- on vehicles with 3.0 ltr. engine with coolant circulation pump - V50- :

- Unplug electrical connector -2-.
- Release fastener -arrow- and move coolant circulation pump - V50- to one side.





Removing camshaft control valve 2 - N208- on vehicles with 2.9 ltr. engine with particulate filter:

- Remove body brace (left-side) ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Release fastener -arrow- and disconnect vacuum hose -1-, taking care not to damage it.

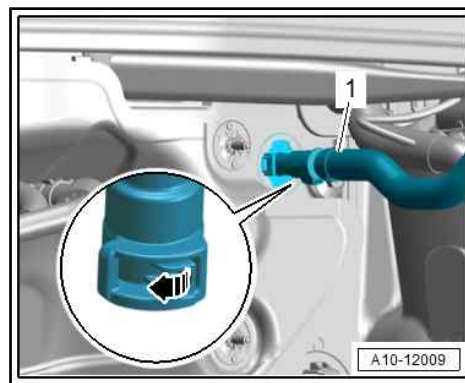
All vehicles (continued):

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Removing and installing camshaft control valve 1 - N205- .

Installing

Additional work:

- Install body brace (right-side) ⇒ Running gear, front-wheel drive and four-wheel drive; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Connect coolant hose with plug-in connector ⇒ [page 176](#) .
- Fill up with coolant
⇒ [“1.3 Draining and filling cooling system”, page 122](#) .



4.7 Removing and installing valve stem oil seals

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Valve gear; Removing and installing valve stem oil seals .



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5 Inlet and exhaust valves

All procedures can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; 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 108](#)

⇒ [“1.2 Engine oil”, page 108](#)

⇒ [“1.3 Removing and installing sump \(bottom section\)”, page 108](#)

⇒ [“1.4 Removing and installing sump \(top section\)”, page 108](#)

⇒ [“1.5 Removing and installing oil pump”, page 108](#)

⇒ [“1.6 Removing and installing oil level and oil temperature sender G266”, page 109](#)

1.1 Exploded view - sump/oil pump

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump .

1.2 Engine oil

- ◆ Draining engine oil ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: draining
- ◆ Extracting engine oil ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: extracting
- ◆ Filling up with engine oil ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: filling up
- ◆ Removing and installing oil filter element ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter
- ◆ Check oil level ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: checking oil level and correcting if necessary .
- ◆ Oil capacities, oil specifications and viscosity grades ⇒ Maintenance tables .

1.3 Removing and installing sump (bottom section)

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Sump/oil pump; Removing and installing sump (bottom section) .

1.4 Removing and installing sump (top section)

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Sump/oil pump; Removing and installing sump (top section) .

1.5 Removing and installing oil pump

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil pump .

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

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil level and oil temperature sender - G266- .



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2 Engine oil cooler

⇒ [“2.1 Exploded view - engine oil cooler”, page 110](#)

⇒ [“2.2 Removing and installing engine oil cooler”, page 110](#)

⇒ [“2.3 Removing and installing spray nozzle valve”, page 111](#)

2.1 Exploded view - engine oil cooler

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Engine oil cooler; Exploded view - engine oil cooler .

2.2 Removing and installing engine oil cooler

⇒ [“2.2.1 Removing and installing engine oil cooler - vehicles with 2.9 ltr. engine”, page 110](#)

⇒ [“2.2.2 Removing and installing engine oil cooler - vehicles with 3.0 ltr. engine”, page 110](#)

2.2.1 Removing and installing engine oil cooler - vehicles with 2.9 ltr. engine

Removing

- Remove turbocharger, cylinder bank 1 (right-side)
⇒ [“1.2.1 Removing and installing turbocharger, cylinder bank 1 \(right-side\) - vehicles with 2.9 ltr. engine”, page 205](#) .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Engine oil cooler; Removing and installing engine oil cooler .

Installing

Additional work:

- Install turbocharger, cylinder bank 1 (right-side)
⇒ [“1.2.1 Removing and installing turbocharger, cylinder bank 1 \(right-side\) - vehicles with 2.9 ltr. engine”, page 205](#) .

2.2.2 Removing and installing engine oil cooler - vehicles with 3.0 ltr. engine

Removing

- Reinstall heat insulation sleeves in the same locations when installing.
- Remove turbocharger
⇒ [“1.2.3 Removing and installing turbocharger - vehicles with 3.0 ltr. engine”, page 206](#) .



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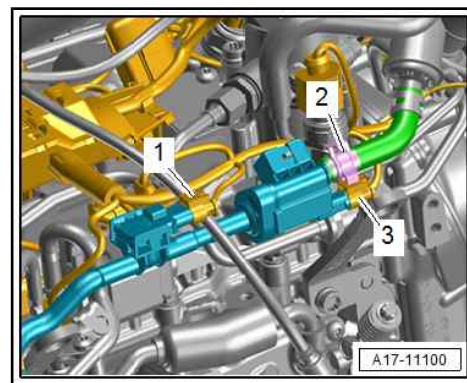
- Open heat insulation sleeve.
- Unplug electrical connectors:
 - 1 - For tank breather pressure sensor 1 - G950-
 - 3 - For activated charcoal filter solenoid valve 1 - N80-
- Release hose clip -2- and disconnect hose for activated charcoal filter system.
- Detach activated charcoal filter solenoid valve 1 - N80- from bracket.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Engine oil cooler; Removing and installing engine oil cooler .

Installing

Additional work:

- Install turbocharger
⇒ [“1.2.3 Removing and installing turbocharger - vehicles with 3.0 ltr. engine”, page 206](#) .



2.3 Removing and installing spray nozzle valve

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Engine oil cooler; Removing and installing spray nozzle valve .



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3 Crankcase breather

All procedures and components can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Crankcase breather .



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4 Oil filter/oil pressure switches

⇒ ["4.1 Exploded view - oil filter", page 113](#)

⇒ ["4.2 Exploded view - oil pressure switches/oil pressure control", page 113](#)

⇒ ["4.3 Removing and installing oil filter housing", page 113](#)

⇒ ["4.4 Removing and installing oil pressure switch F22 ", page 114](#)

⇒ ["4.5 Removing and installing oil temperature sender G8 ", page 114](#)

⇒ ["4.6 Removing and installing oil pressure sender G10 ", page 114](#)

⇒ ["4.7 Checking oil pressure", page 115](#)

⇒ ["4.8 Removing and installing valve for oil pressure control N428 ", page 115](#)

4.1 Exploded view - oil filter

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil filter .

4.2 Exploded view - oil pressure switches/oil pressure control

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil pressure switches/oil pressure control .

4.3 Removing and installing oil filter housing

⇒ ["4.3.1 Removing and installing oil filter housing - vehicles with 2.9 ltr. engine", page 113](#)

⇒ ["4.3.2 Removing and installing oil filter housing - vehicles with 3.0 ltr. engine", page 113](#)

4.3.1 Removing and installing oil filter housing - vehicles with 2.9 ltr. engine

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing oil filter housing .

4.3.2 Removing and installing oil filter housing - vehicles with 3.0 ltr. engine

Removing

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



- Press release tabs on both sides and detach hose -arrow- for activated charcoal filter system.



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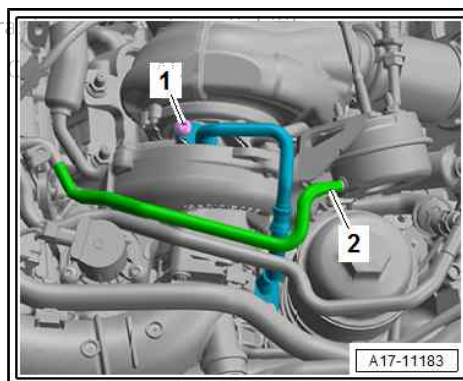
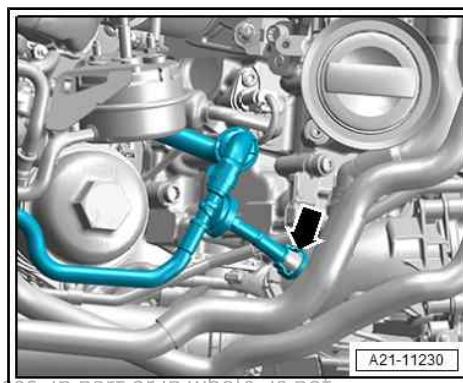
- Place a cloth underneath to catch escaping engine oil.
- Remove bolt -1- and detach oil supply line.
- Being careful not to damage it, detach vacuum hose -2-.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing oil filter housing .

Installing

Additional work:

- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



4.4 Removing and installing oil pressure switch - F22-

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing oil pressure switch - F22- .

4.5 Removing and installing oil temperature sender - G8-

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Oil filter/oil pressure switches ; Removing and installing oil temperature sender - G8- .

4.6 Removing and installing oil pressure sender - G10-

⇒ [“4.6.1 Removing and installing oil pressure sender G10 - vehicles with 2.9 ltr. engine”, page 114](#)

⇒ [“4.6.2 Removing and installing oil pressure sender G10 - vehicles with 3.0 ltr. engine”, page 115](#)

4.6.1 Removing and installing oil pressure sender - G10- - vehicles with 2.9 ltr. engine

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Oil filter/oil pressure switches ; Removing and installing oil pressure sender - G10- .



4.6.2 Removing and installing oil pressure sender - G10- - vehicles with 3.0 ltr. engine

Removing

- Remove poly V-belt for alternator
⇒ [“1.3 Removing and installing poly V-belts”, page 85](#) .
- Remove poly V-belt tensioner for air conditioner compressor
⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt , and detach poly V-belt.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Oil filter/oil pressure switches ; Removing and installing oil pressure sender - G10- .

Installing

Additional work:

- Install poly V-belt tensioner for air conditioner compressor ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .
- Install poly V-belt for alternator
⇒ [“1.3 Removing and installing poly V-belts”, page 85](#) .

4.7 Checking oil pressure

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Oil filter/oil pressure switches; Checking oil pressure .

4.8 Removing and installing valve for oil pressure control - N428-

⇒ [“4.8.1 Removing and installing valve for oil pressure control N428 - vehicles with 2.9 ltr. engine”, page 115](#)

⇒ [“4.8.2 Removing and installing valve for oil pressure control N428 - vehicles with 3.0 ltr. engine”, page 115](#)

4.8.1 Removing and installing valve for oil pressure control - N428- - vehicles with 2.9 ltr. engine

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing valve for oil pressure control - N428- .

4.8.2 Removing and installing valve for oil pressure control - N428- - vehicles with 3.0 ltr. engine

Removing

- Remove poly V-belt from air conditioner compressor ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Remove air conditioner compressor from bracket and tie up to left side ⇒ Heating, air conditioning; Rep. gr. 87 ; Air condi-



tioner compressor; Detaching and attaching air conditioner compressor at bracket .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. TFSI, 4-valve; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing valve for oil pressure control - N428- .

Installing

Additional work:

- Install poly V-belt for air conditioner compressor ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .

Tightening torques

- ♦ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit

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19 – Cooling

1 Cooling system/coolant

⇒ [“1.1 Connection diagram - coolant hoses”, page 117](#)

⇒ [“1.2 Checking cooling system for leaks”, page 122](#)

⇒ [“1.3 Draining and filling cooling system”, page 122](#)

1.1 Connection diagram - coolant hoses

⇒ [“1.1.1 Connection diagram - coolant hoses, vehicles with 2.9 ltr. engine”, page 117](#)

⇒ [“1.1.2 Connection diagram - coolant hoses, vehicles with 3.0 ltr. engine without auxiliary heater”, page 119](#)

⇒ [“1.1.3 Connection diagram - coolant hoses, vehicles with 3.0 ltr. engine with auxiliary heater”, page 121](#)

1.1.1 Connection diagram - coolant hoses, vehicles with 2.9 ltr. engine

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

**1 - Radiator**

- ☐ For coolant circuit for gearbox

2 - Auxiliary radiator (right-side)**3 - Radiator outlet coolant temperature sender - G83-****4 - Thermostat**

- ☐ For auxiliary radiator (right-side)

5 - Map-controlled engine cooling system thermostat - F265-**6 - Engine outlet coolant temperature sender - G82-****7 - Coolant shut-off valve**

- ☐ Vacuum-controlled

8 - Temperature sender for engine temperature regulation - G694-**9 - Cylinder head**

- ☐ Cylinder bank 1 (right-side)

10 - Cylinder block**11 - Turbocharger**

- ☐ Cylinder bank 1 (right-side)

12 - Non-return valve**13 - Restrictor****14 - Bleeder hole****15 - Heat exchanger for heater****16 - Coolant circulation pump - V50-****17 - Continued coolant circulation pump - V51-****18 - Filler cap**

- ☐ Checking pressure relief valve ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks

19 - Coolant expansion tank**20 - Non-return valve****21 - Thermostat**

- ☐ For coolant circuit for gearbox

22 - Radiator

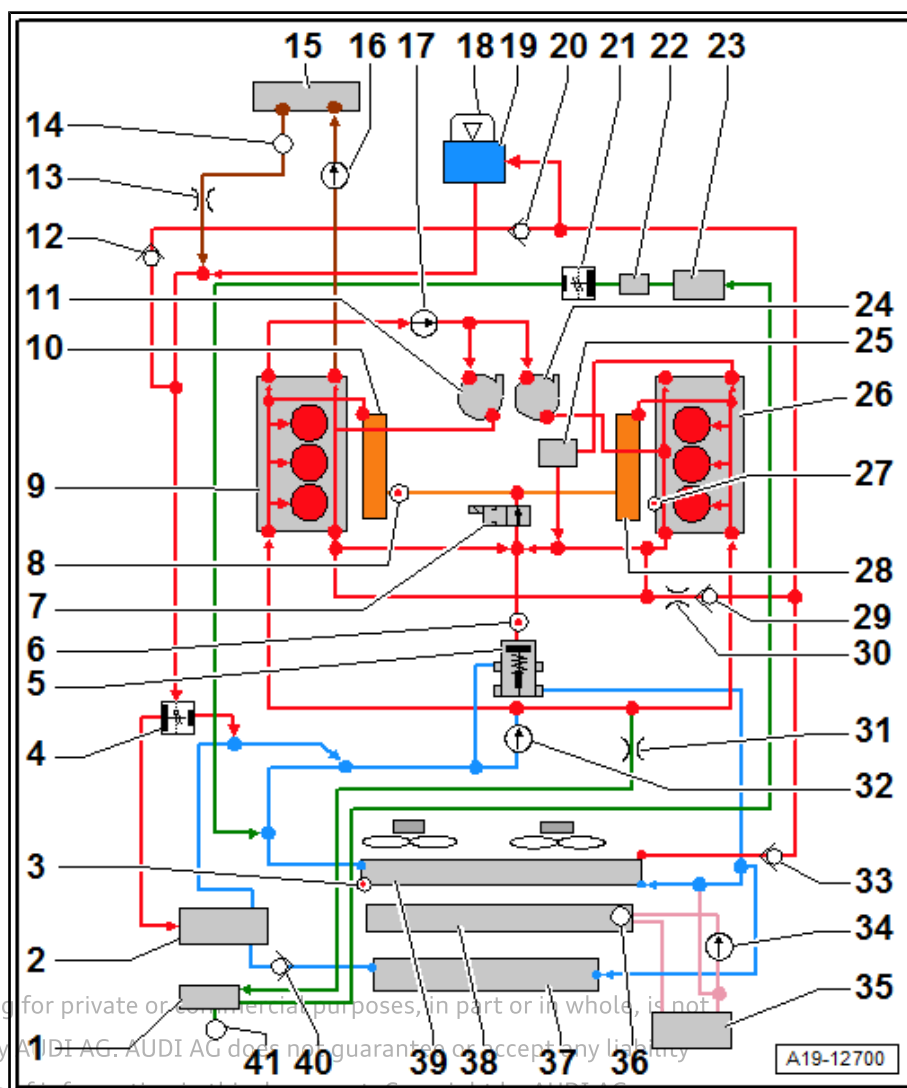
- ☐ For gear oil

23 - ATF cooler**24 - Turbocharger**

- ☐ Cylinder bank 2 (left-side)

25 - Engine oil cooler**26 - Cylinder head**

- ☐ Cylinder bank 2 (left-side)





27 - Coolant temperature sender - G62-

28 - Cylinder block

29 - Non-return valve

30 - Restrictor

31 - Restrictor

32 - Coolant pump

☐ Actuated by switch valve for mechanical coolant pump - N649-

33 - Non-return valve

34 - Charge air cooling pump - V188-

35 - Charge air cooler

36 - Bleeder screw

37 - Auxiliary radiator (bottom front)

38 - Auxiliary radiator (front)

39 - Radiator

40 - Non-return valve

41 - Bleeder screw

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1.1.2 Connection diagram - coolant hoses, vehicles with 3.0 ltr. engine without auxiliary heater

- ◆ Blue = Large coolant circuit
- ◆ Red = Small coolant circuit
- ◆ Orange = Coolant circuit for cylinder block.
- ◆ Brown = Heating circuit
- ◆ Green = Coolant circuit for gearbox



◆ Arrows = Direction of coolant flow

1 - Radiator

2 - Radiator outlet coolant temperature sender - G83-

3 - Engine outlet coolant temperature sender - G82-

4 - Coolant shut-off valve
☐ Vacuum-controlled

5 - Temperature sender for engine temperature regulation - G694-

6 - Cylinder head
☐ Cylinder bank 1 (right-side)

7 - Cylinder block

8 - Bleeder hole

9 - Heat exchanger for heater

10 - Coolant circulation pump - V50-

11 - Continued coolant circulation pump - V51-

12 - Filler cap
☐ Checking pressure relief valve ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks

13 - Coolant expansion tank

14 - Thermostat
☐ For ATF coolant circuit

15 - ATF cooler

16 - Non-return valve

17 - Turbocharger

18 - Restrictor

19 - Engine oil cooler

20 - Cylinder block

21 - Cylinder head
☐ Cylinder bank 2 (left-side)

22 - Coolant temperature sender - G62-

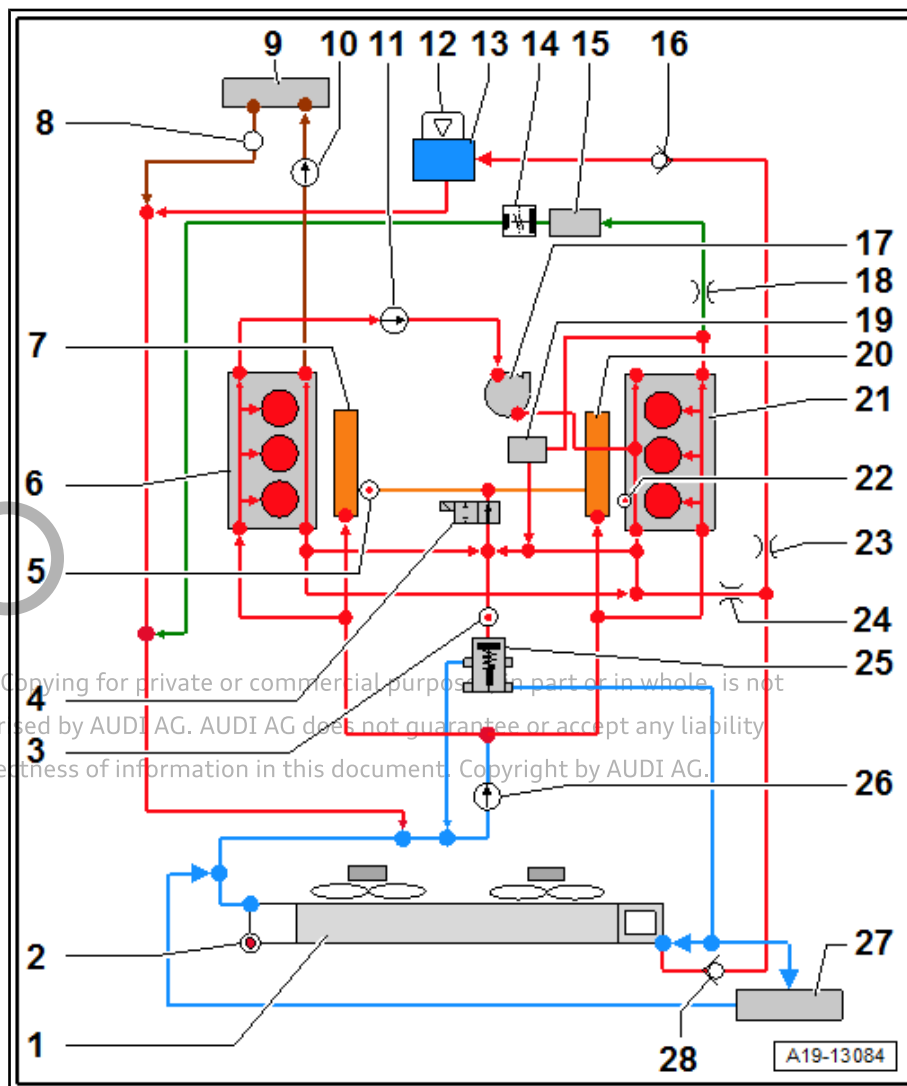
23 - Restrictor

24 - Restrictor

25 - Map-controlled engine cooling system thermostat - F265-

26 - Coolant pump

☐ Actuated by switch valve for mechanical coolant pump - N649-





27 - Auxiliary radiator

- ☐ Depending on vehicle equipment

28 - Non-return valve

1.1.3 Connection diagram - coolant hoses, vehicles with 3.0 ltr. engine with auxiliary heater

- ◆ Blue = Large coolant circuit
- ◆ Red = Small coolant circuit
- ◆ Orange = Coolant circuit for cylinder block.
- ◆ Brown = Heating circuit
- ◆ Green = Coolant circuit for gearbox
- ◆ Arrows = Direction of coolant flow

1 - Radiator

2 - Radiator outlet coolant temperature sender - G83-

3 - Engine outlet coolant temperature sender - G82-

4 - Coolant shut-off valve

- ☐ Vacuum-controlled

5 - Temperature sender for engine temperature regulation - G694-

6 - Auxiliary heater

- ☐ With circulation pump - V55-

7 - Cylinder head

- ☐ Cylinder bank 1 (right-side)

8 - Heater coolant shut-off valve - N279-

9 - Cylinder block

10 - Bleeder hole

11 - Heat exchanger for heater

12 - Continued coolant circulation pump - V51-

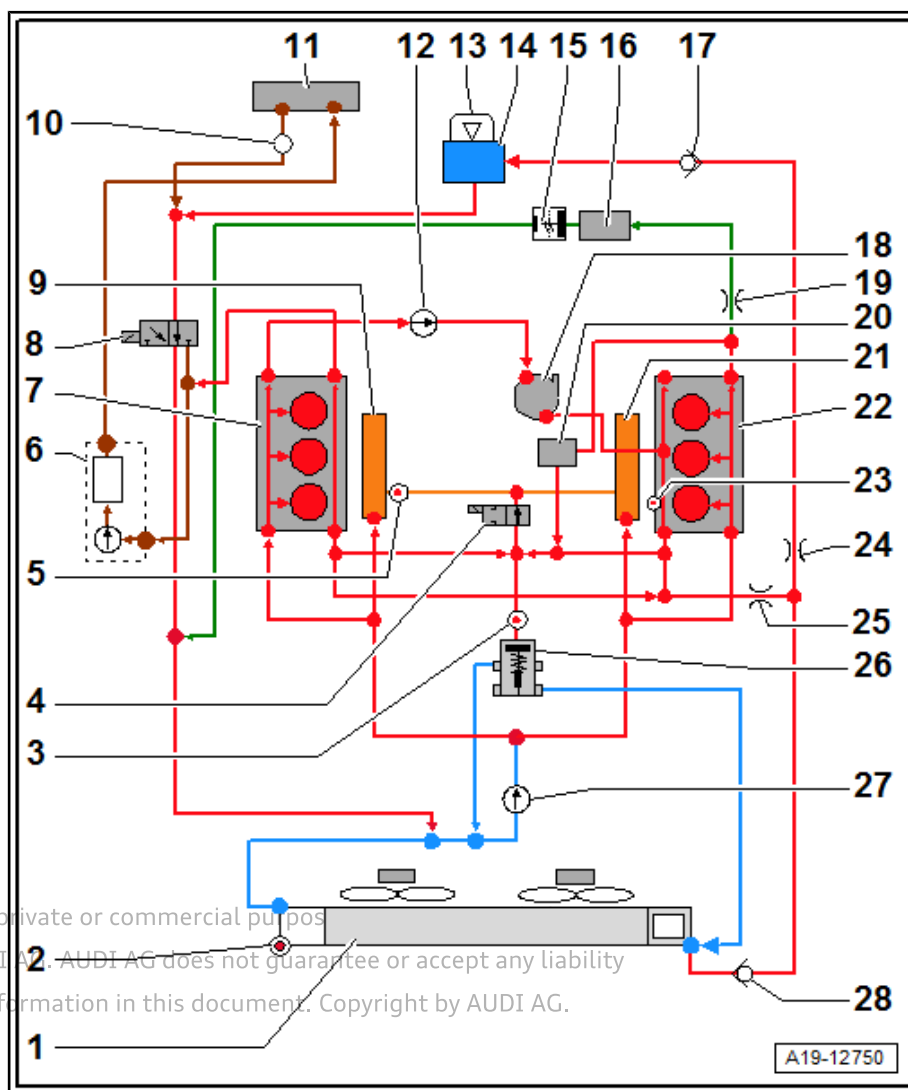
13 - Filler cap

- ☐ Checking pressure relief valve ➤ Servicing 6 cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI, Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks

14 - Coolant expansion tank

15 - Thermostat

- ☐ For ATF coolant circuit



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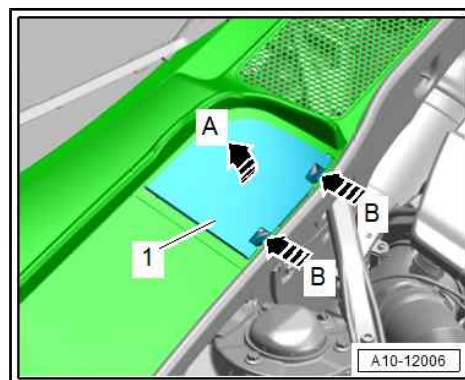
- 16 - ATF cooler
- 17 - Non-return valve
- 18 - Turbocharger
- 19 - Restrictor
- 20 - Engine oil cooler
- 21 - Cylinder block
- 22 - Cylinder head
 - ❑ Cylinder bank 2 (left-side)
- 23 - Coolant temperature sender - G62-
- 24 - Restrictor
- 25 - Restrictor
- 26 - Map-controlled engine cooling system thermostat - F265-
- 27 - Coolant pump
 - ❑ Actuated by switch valve for mechanical coolant pump - N649-
- 28 - Non-return valve

1.2 Checking cooling system for leaks

Procedure

- Release catches -arrows B- and open cover -1- -arrow A-.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19; Cooling system/coolant; Checking cooling system for leaks .



1.3 Draining and filling cooling system

⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#)

⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#)

1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

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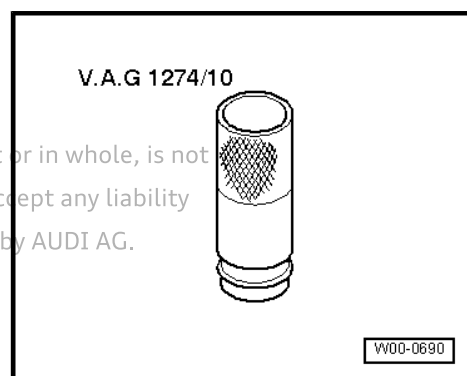
- ◆ Adapter for cooling system tester - V.A.G 1274/8-



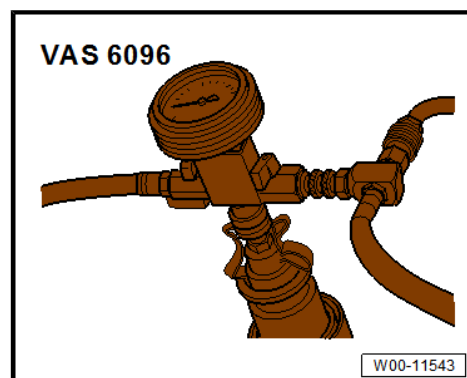
- ◆ Pipe for cooling system tester - V.A.G 1274/10-



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- ◆ Cooling system charge unit - VAS 6096-

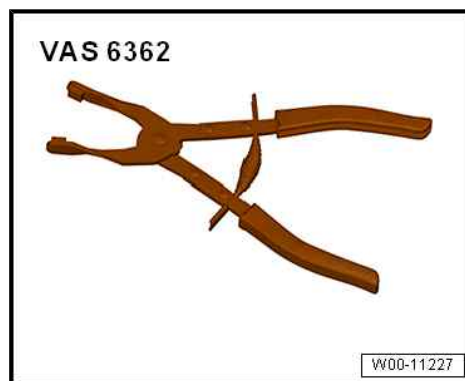


- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-





- ◆ Hose clip pliers - VAS 6362-



- ◆ Refractometer - T10007A-

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- ◆ Safety goggles
- ◆ Protective gloves

Draining coolant

- Release catches -arrows B- and open cover -1- -arrow A-.

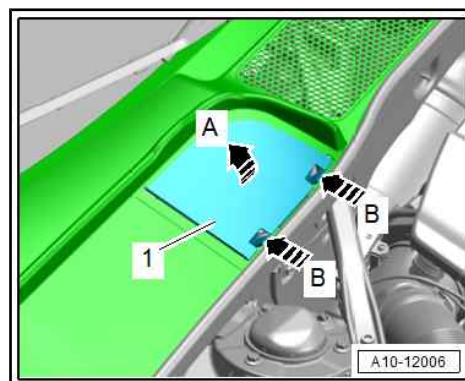


WARNING

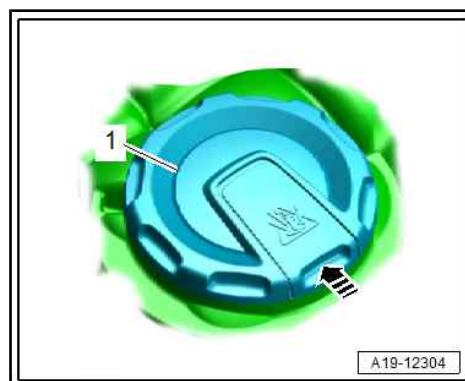
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

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 panels ⇒ 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.



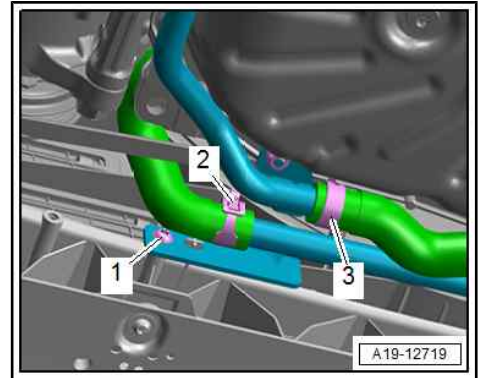
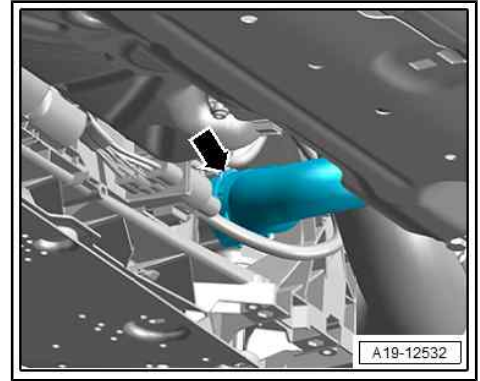


WARNING

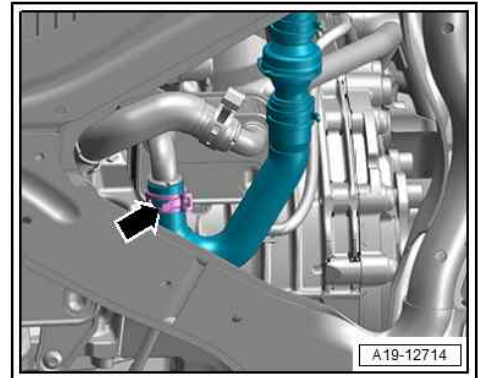
Risk of injury as the radiator fans may start up automatically.

- ◆ *Even when the ignition is switched off, the radiator fans can start up without warning due to accumulated heat in the engine compartment, etc.*

- Lift retaining clip -arrow-, disconnect coolant hose from radiator and drain off coolant.
- Release hose clips -2, 3-, disconnect coolant hoses and drain off coolant.



- Release hose clip -arrow-.
- Disconnect coolant hose from ATF cooler, hold end of hose downwards and drain off coolant.
- Reconnect coolant hoses (version with plug-in connector)
⇒ Fig. [“Connecting coolant hose with plug-in connector”](#), page 176 .



Coolant specifications

All information can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

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



Caution

Danger of corrosion damage if unsuitable mixtures of water and coolant additives are used.

- ◆ *Always use distilled water as this ensures optimum corrosion protection.*

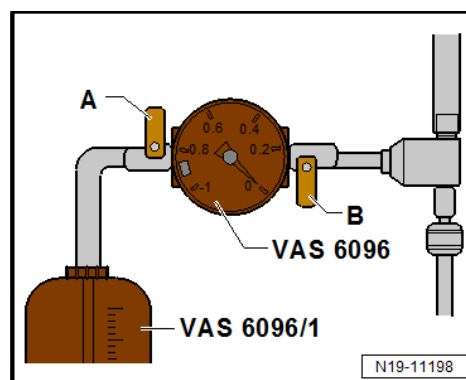
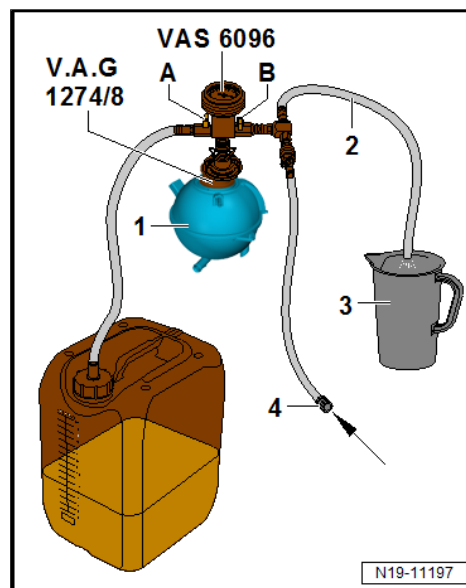
**Filling cooling system**

- Ignition switched off.
- Do not reuse coolant.
- Fill reservoir of -VAS 6096- with 10 litres of premixed coolant (according to recommended ratio; for recommended ratio see ⇒ [page 125](#)).
- To simplify filling procedure, place filled 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.

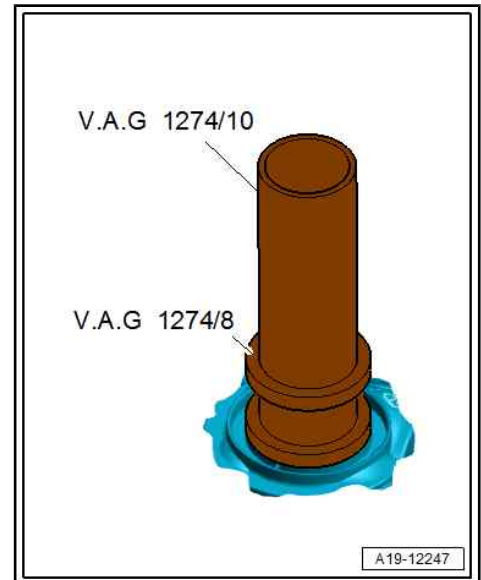




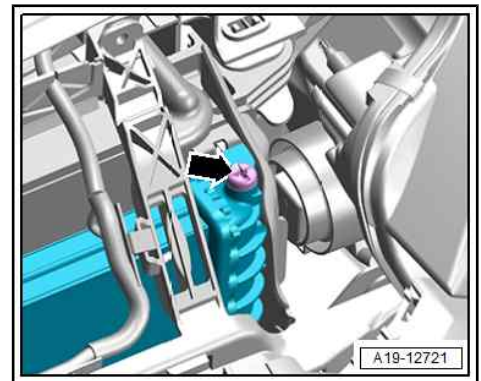
- Attach pipe -V.A.G 1274/10- onto adapter -V.A.G 1274/8- .
- Fill up with coolant until pipe for cooling system tester is filled. If required, add further coolant when performing bleeding procedure.

Bleeding cooling system

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



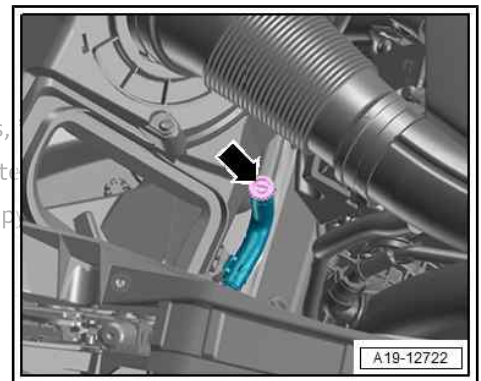
- Place a cloth underneath to catch escaping coolant.
- Open bleeder screw -arrow- until coolant flows out.
- Close bleeder screw.



- Place a cloth underneath to catch escaping coolant.
- Open bleeder screw -arrow- until coolant flows out.
- Close bleeder screw.

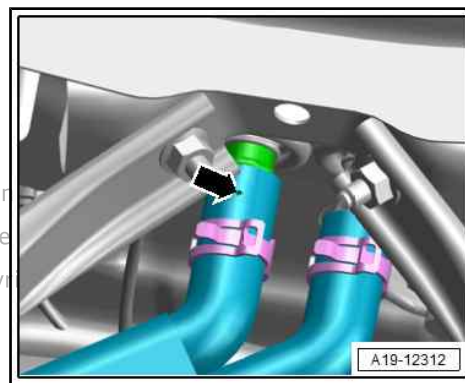


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- Place a cloth underneath to catch escaping coolant.
- Release hose clip -1- on coolant hose going to heat exchanger for heater and pull back hose until bleeder hole -arrow- is no longer blocked by connection.
- Fill up with coolant until it flows out at bleeder hole in coolant hose.
- Push coolant hose back onto connection and secure with hose clip.
- Close filler cap on coolant expansion tank (make sure it engages).
- Vehicles with auxiliary heater/supplementary heater: Set heating to “HI” and select lowest possible blower speed (= 0).
- Open valves in coolant circuit ⇒ Vehicle diagnostic tester [01 19 Coolant circuit vent routine].
- Follow instructions shown on vehicle diagnostic tester .
- Switch off engine.
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



Checking coolant level



WARNING

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

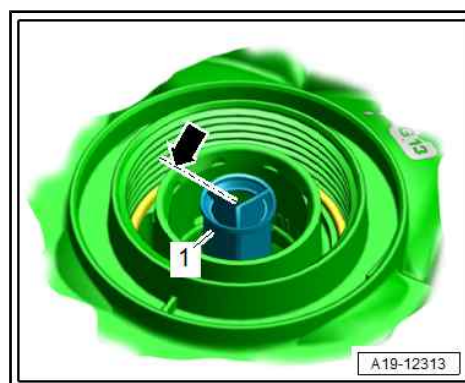
Danger of scalding skin and other parts of the body.

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

- The top edge (= MAX marking) of the float -1- must be flush with the opening -arrow- on the coolant expansion tank when the engine is cold.
- The top edge of the float may be above the opening on the coolant expansion tank when the engine is at operating temperature.
- Top up with coolant again if necessary.

Tightening torques

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



1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester



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



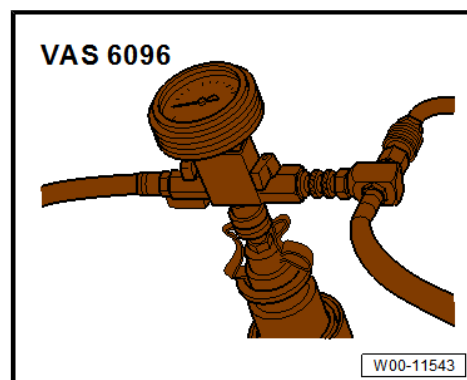
- ◆ Pipe for cooling system tester - V.A.G 1274/10-



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- ◆ Cooling system charge unit - VAS 6096-

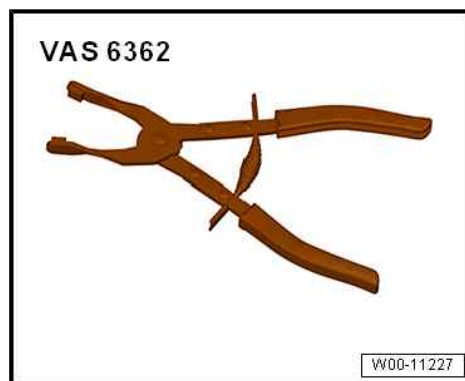


- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-





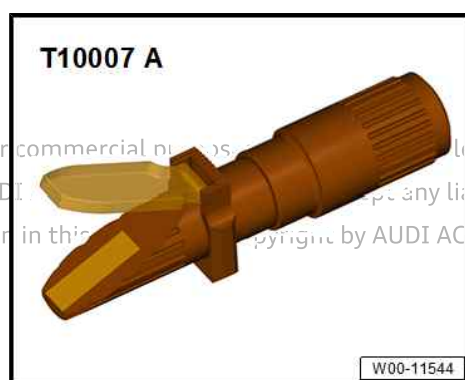
- ◆ Hose clip pliers - VAS 6362-



- ◆ Refractometer - T10007A-



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- ◆ Safety goggles
- ◆ Protective gloves

Draining coolant

- Release catches -arrows B- and open cover -1- -arrow A-.

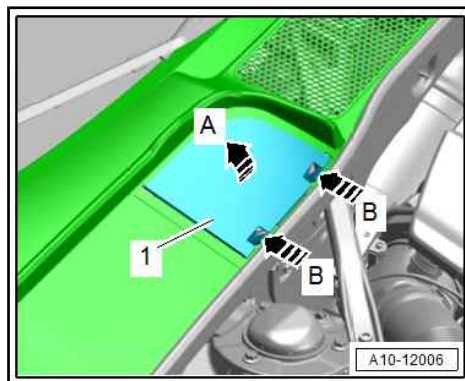


WARNING

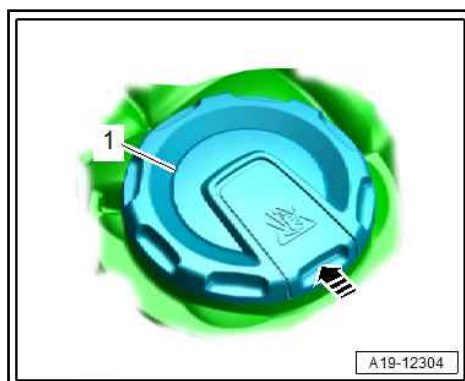
The cooling system is under pressure when the power unit is hot. Risk of scalding due to hot steam and hot coolant.

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 panels ⇒ 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.





WARNING

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

- ◆ *Even when the ignition is switched off, the radiator fans can start up without warning due to accumulated heat in the engine compartment, etc.*

- Lift retaining clip -arrow-, disconnect coolant hose from radiator and drain off coolant.
- Release hose clip -arrow-.
- Disconnect coolant hose from ATF cooler, hold end of hose downwards and drain off coolant.
- Reconnect coolant hoses (version with plug-in connector)
⇒ Fig. “Connecting coolant hose with plug-in connector”, page 176.

Coolant specifications

All information can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

Recommended mixture ratio for coolant

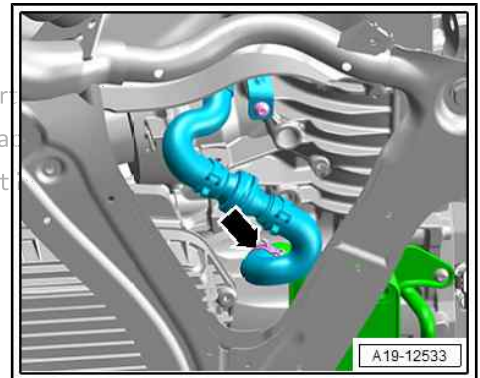
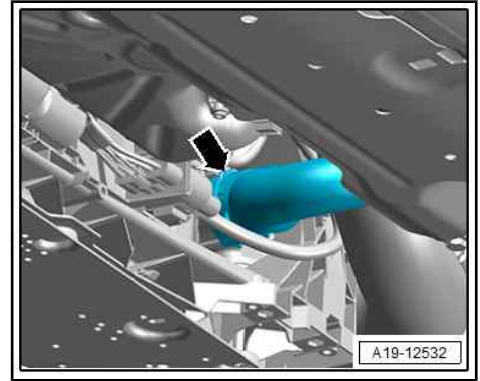
- Coolant (40 %) and distilled water (60 %) for frost protection to -25 °C
- Coolant (50 %) and distilled water (50 %) for frost protection to -36 °C
- Coolant ⇒ Electronic parts catalogue



Caution

Danger of corrosion damage if unsuitable mixtures of water and coolant additives are used.

- ◆ *Always use distilled water as this ensures optimum corrosion protection.*

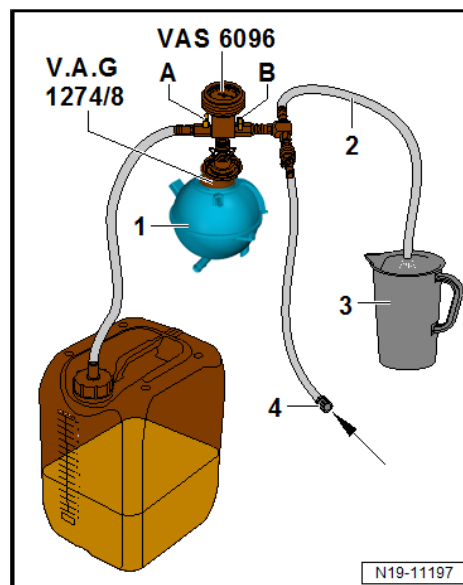


**Filling cooling system**

- Ignition switched off.
- Do not reuse coolant.
- Fill reservoir of -VAS 6096- with 10 litres of premixed coolant (according to recommended ratio; for recommended ratio see [⇒ page 131](#)).
- To simplify filling procedure, place filled 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-.

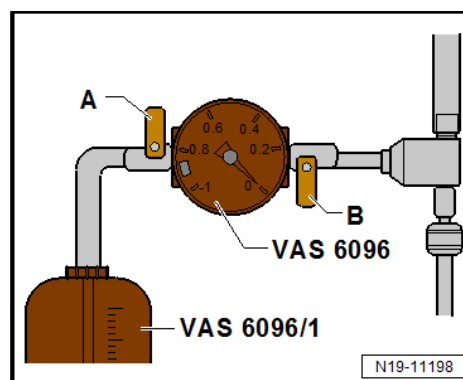
Note:

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.

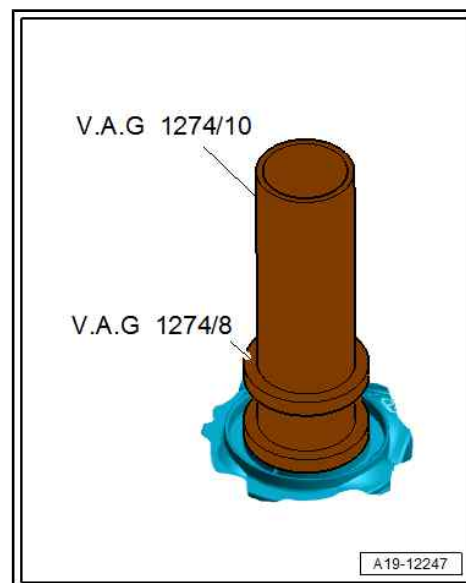




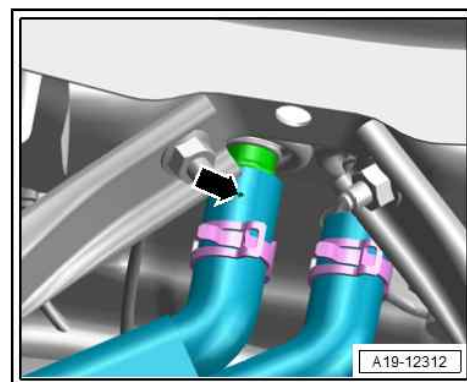
- Attach pipe -V.A.G 1274/10- onto adapter -V.A.G 1274/8- .
- Fill up with coolant until pipe for cooling system tester is filled. If required, add further coolant when performing bleeding procedure.

Bleeding cooling system

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



- Release hose clip -1- on coolant hose going to heat exchanger for heater and pull back hose until bleeder hole -arrow- 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 hose clip.
- Close filler cap on coolant expansion tank (make sure it engages).



If bleeding routine is NOT stored in engine control unit:

- On vehicles with auxiliary/supplementary heater, switch heater on for about 30 seconds.
- Start engine.

Time period	Engine speed	Air conditioner/heater setting
3 minutes	2500 rpm	• Air conditioning system "OFF", LED in [AC] button not lit • Heating at "HI", select lowest possible blower speed (= 0)
Until radiator fan starts running	Idling speed	• Air conditioning system "OFF" • Heating at "HI"
2 minutes	2500 rpm	• Air conditioning system "OFF" • Heating at "HI"

- Switch off engine.

If bleeding routine is stored in engine control unit:

- Vehicles with auxiliary heater/supplementary heater: Set heating to "HI" and select lowest possible blower speed (= 0).
- Open valves in coolant circuit ⇒ Vehicle diagnostic tester [01 19 Coolant circuit vent routine].
- Follow instructions shown on vehicle diagnostic tester .



- Switch off engine.
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Checking coolant level



WARNING

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

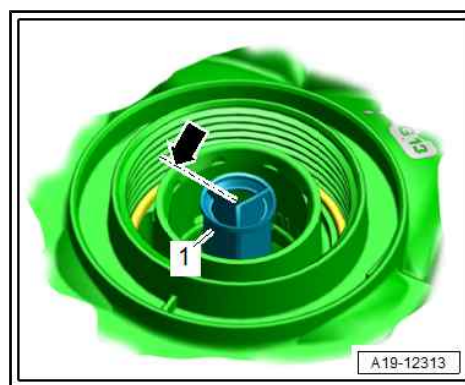
Danger of scalding skin and other parts of the body.

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

- The top edge (= MAX marking) of the float -1- must be flush with the opening -arrow- on the coolant expansion tank when the engine is cold.
- The top edge of the float may be above the opening on the coolant expansion tank when the engine is at operating temperature.
- Top up with coolant again if necessary.

Tightening torques

- ◆ ⇒ 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 135](#)

⇒ [“2.2 Exploded view - electric coolant pump”, page 135](#)

⇒ [“2.3 Exploded view - coolant temperature senders”, page 139](#)

⇒ [“2.4 Removing and installing electric coolant pump”, page 139](#)

⇒ [“2.5 Removing and installing coolant pump”, page 149](#)

⇒ [“2.6 Removing and installing map-controlled engine cooling system thermostat F265”, page 149](#)

⇒ [“2.7 Removing and installing coolant temperature sender G62”, page 150](#)

⇒ [“2.8 Removing and installing engine outlet coolant temperature sender G82”, page 150](#)

⇒ [“2.9 Removing and installing radiator outlet coolant temperature sender G83”, page 150](#)

⇒ [“2.10 Removing and installing temperature sender for engine temperature regulation G694”, page 151](#)

⇒ [“2.11 Removing and installing coolant valves”, page 151](#)

2.1 Exploded view - coolant pump/thermostat

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All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump/thermostat.

2.2 Exploded view - electric coolant pump

⇒ [“2.2.1 Exploded view - electric coolant pump, vehicles with 2.9 ltr. engine”, page 135](#)

⇒ [“2.2.2 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine without particulate filter”, page 137](#)

⇒ [“2.2.3 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine with particulate filter”, page 138](#)

2.2.1 Exploded view - electric coolant pump, vehicles with 2.9 ltr. engine



1 - Bolt

- ☐ 1.5 Nm

2 - Spacer sleeve

3 - Grommet

4 - Bracket

- ☐ For continued coolant circulation pump - V51-
- ☐ Some versions are fitted with damping elements

5 - Bolt

- ☐ 9 Nm

6 - Bolt

- ☐ 1.5 Nm

7 - Bolt

- ☐ 20 Nm

8 - Bracket

- ☐ For coolant circulation pump - V50-

9 - Coolant circulation pump - V50-

- ☐ For equipment version without auxiliary heater
- ☐ Removing and installing
⇒ ["2.4.1 Removing and installing coolant circulation pump V50 - vehicles with 2.9 ltr. engine", page 139](#)

10 - Retaining bracket

11 - Bolt

- ☐ 9 Nm

12 - Charge air cooling pump - V188-

- ☐ Removing and installing
⇒ ["2.4.3 Removing and installing charge air cooling pump V188 - vehicles with 2.9 ltr. engine", page 142](#)

13 - Bolt

- ☐ 9 Nm

14 - Bracket

- ☐ For charge air cooling pump - V188-

15 - Bolt

- ☐ 9 Nm

16 - O-ring

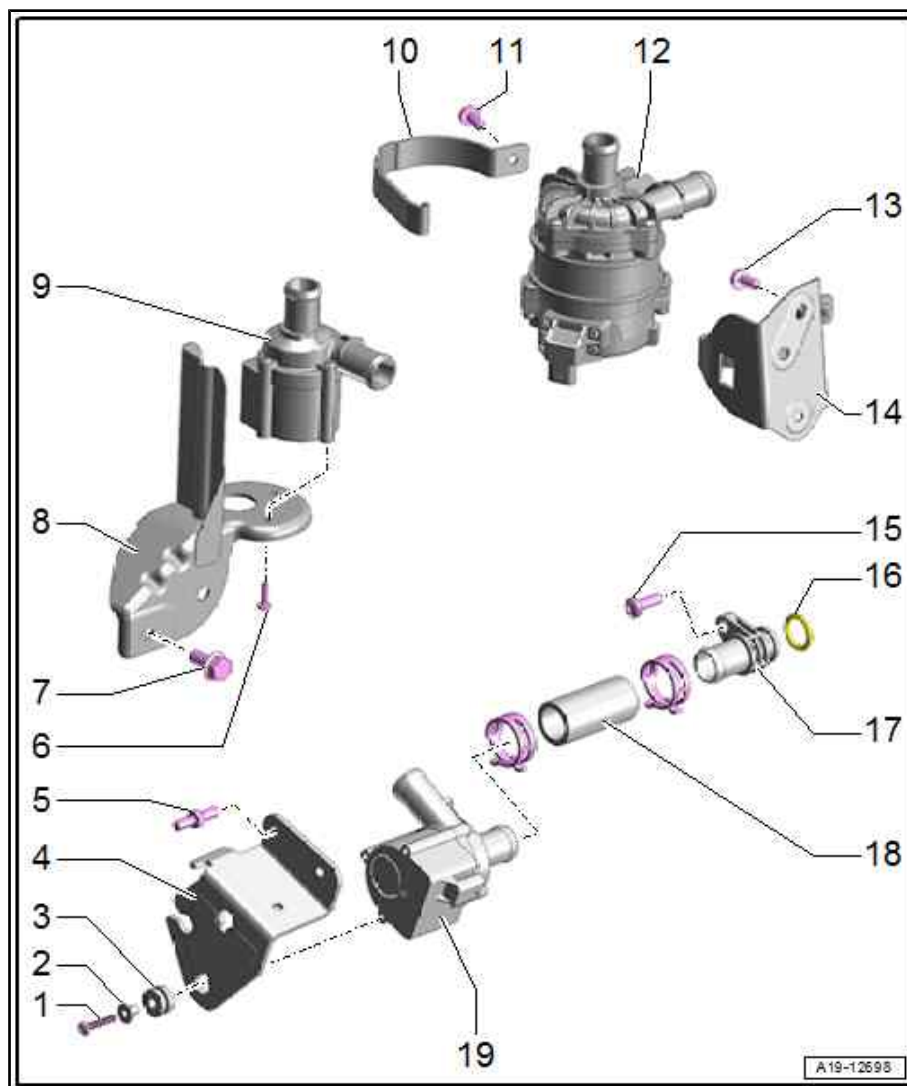
- ☐ Renew after removing

17 - Connection

18 - Coolant hose

19 - Continued coolant circulation pump - V51-

- ☐ Removing and installing
⇒ ["2.4.2 Removing and installing continued coolant circulation pump V51 - vehicles with 2.9 ltr. engine", page 140](#)





2.2.2 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine without particulate filter

1 - Bolt

- ☐ 1.5 Nm

2 - Bracket

- ☐ For continued coolant circulation pump - V51-
- ☐ Some versions are fitted with damping elements

3 - Bolt

- ☐ 9 Nm

4 - Nut

- ☐ 9 Nm

5 - Bracket

- ☐ For coolant circulation pump - V50-

6 - Bolt

- ☐ 1.5 Nm

7 - Bracket

- ☐ For coolant circulation pump - V50-

8 - Coolant circulation pump - V50-

- ☐ For equipment version without auxiliary heater
- ☐ Removing and installing
⇒ ["2.4.4 Removing and installing coolant circulation pump V50 - vehicles with 3.0 ltr. engine without particulate filter", page 143](#)

9 - Coolant hose

10 - Bolt

- ☐ 9 Nm

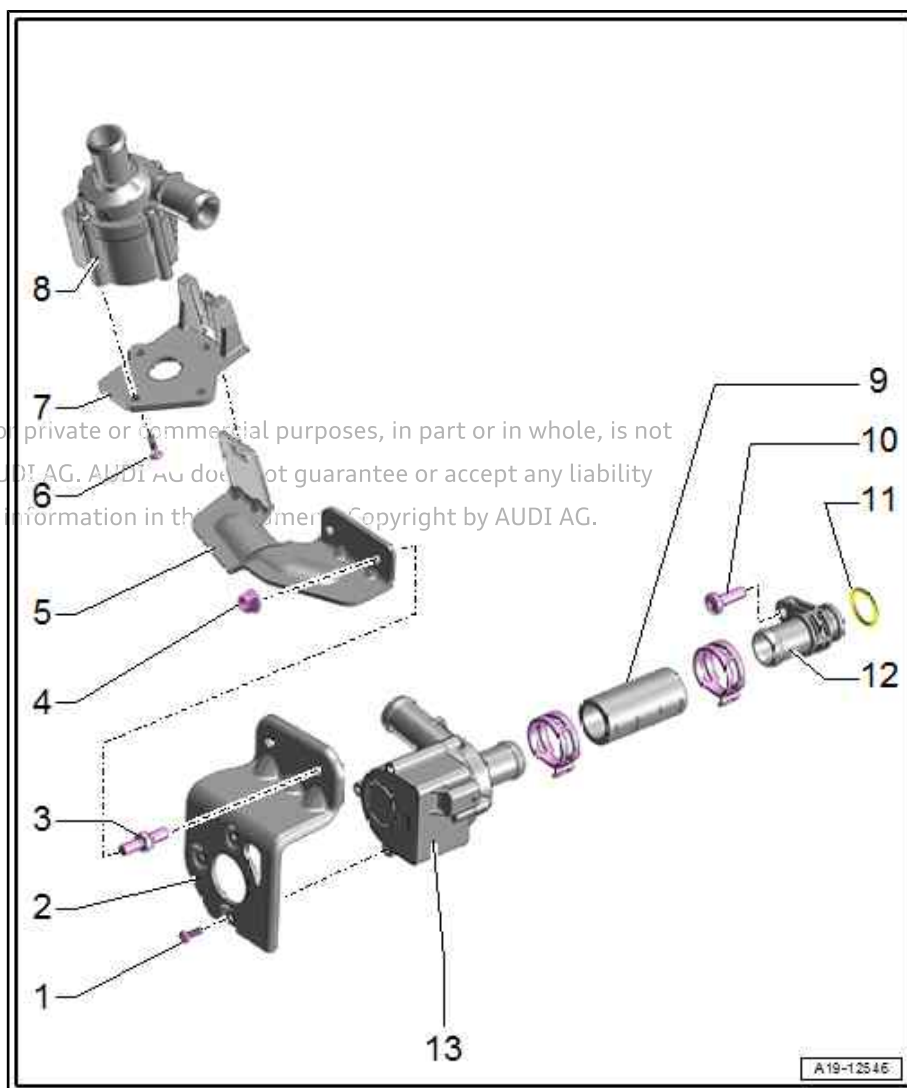
11 - O-ring

- ☐ Renew after removing

12 - Connection

13 - Continued coolant circulation pump - V51-

- ☐ Removing and installing
⇒ ["2.4.6 Removing and installing continued coolant circulation pump V51 - vehicles with 3.0 ltr. engine without particulate filter", page 146](#)





2.2.3 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine with particulate filter

1 - Coolant hose

- ☐ For specific equipment version

2 - O-ring

- ☐ Renew after removing

3 - Connection

4 - Bolt

- ☐ 1.5 Nm

5 - Rubber bush

6 - Bracket

- ☐ For coolant circulation pump - V50-
- ☐ Different versions

7 - Nut

- ☐ 20 Nm

8 - Coolant hose

9 - Coolant circulation pump - V50-

- ☐ Removing and installing
⇒ ["2.4.5 Removing and installing coolant circulation pump V50 - vehicles with 3.0 ltr. engine with particulate filter", page 144](#)

10 - Coolant hose

11 - Bolt

- ☐ 9 Nm

12 - Bracket

- ☐ For continued coolant circulation pump - V51-

13 - Spacer bush

14 - Bolt

- ☐ 1.5 Nm

15 - Rubber bush

16 - Coolant hose

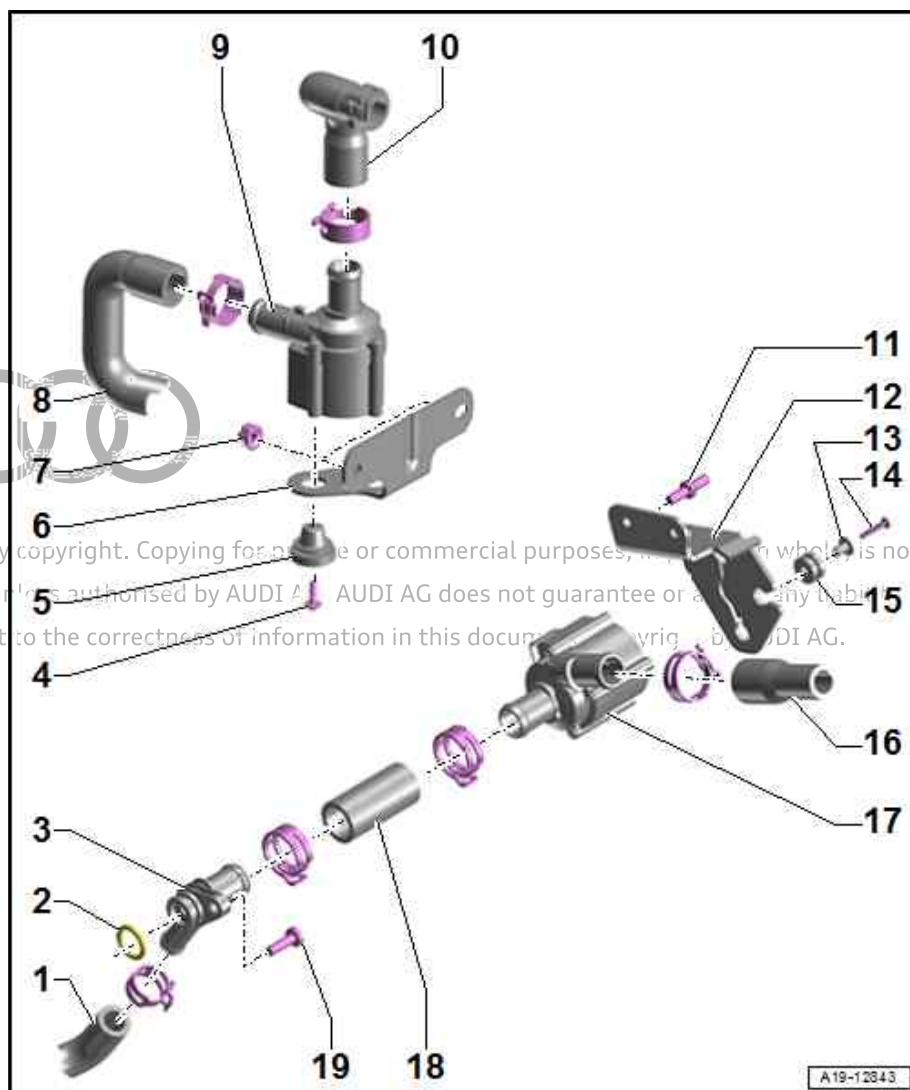
17 - Continued coolant circulation pump - V51-

- ☐ Removing and installing
⇒ ["2.4.7 Removing and installing continued coolant circulation pump V51 - vehicles with 3.0 ltr. engine with particulate filter", page 147](#)

18 - Coolant hose

19 - Bolt

- ☐ 9 Nm





2.3 Exploded view - coolant temperature senders

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; 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 coolant circulation pump V50 - vehicles with 2.9 ltr. engine”, page 139](#)

⇒ [“2.4.2 Removing and installing continued coolant circulation pump V51 - vehicles with 2.9 ltr. engine”, page 140](#)

⇒ [“2.4.3 Removing and installing charge air cooling pump V188 - vehicles with 2.9 ltr. engine”, page 142](#)

⇒ [“2.4.4 Removing and installing coolant circulation pump V50 - vehicles with 3.0 ltr. engine without particulate filter”, page 143](#)

⇒ [“2.4.5 Removing and installing coolant circulation pump V50 - vehicles with 3.0 ltr. engine with particulate filter”, page 144](#)

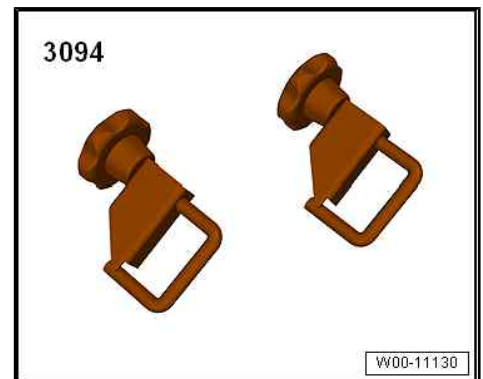
⇒ [“2.4.6 Removing and installing continued coolant circulation pump V51 - vehicles with 3.0 ltr. engine without particulate filter”, page 146](#)

⇒ [“2.4.7 Removing and installing continued coolant circulation pump V51 - vehicles with 3.0 ltr. engine with particulate filter”, page 147](#)

2.4.1 Removing and installing coolant circulation pump - V50- - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

◆ Hose clamps, up to 25 mm - 3094-



◆ Hose clip pliers - VAS 6362-

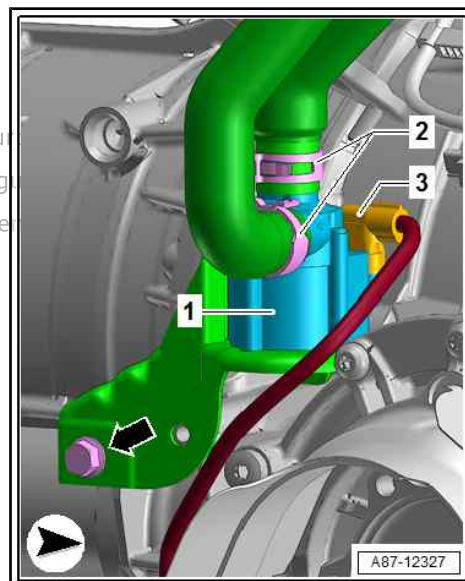


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Removing

- Remove front silencer (right-side)
⇒ [“1.2 Removing and installing front silencers”, page 264](#) .
- Unplug electrical connector -3-.
- Push heat shield slightly upwards.
- Clamp off coolant hoses using hose clamps up to 25 mm -3094- , release hose clips -2- and disconnect hoses.
- Remove bolt -arrow- and detach coolant circulation pump -V50- with bracket.

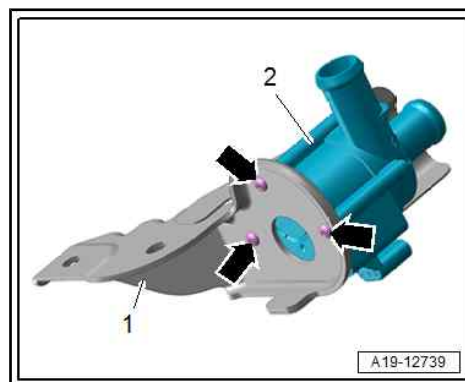


- Unscrew bolts -arrows- and detach coolant pump -2- from bracket -1-.

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 silencer (right-side)
⇒ [“1.2 Removing and installing front silencers”, page 264](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



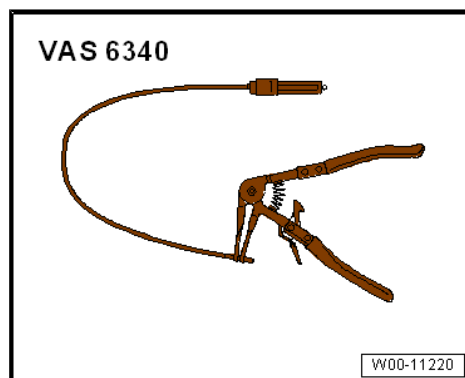
Tightening torques

- ♦ ⇒ [“2.2.1 Exploded view - electric coolant pump, vehicles with 2.9 ltr. engine”, page 135](#)

2.4.2 Removing and installing continued coolant circulation pump - V51- - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ♦ Hose clip pliers - VAS 6340-





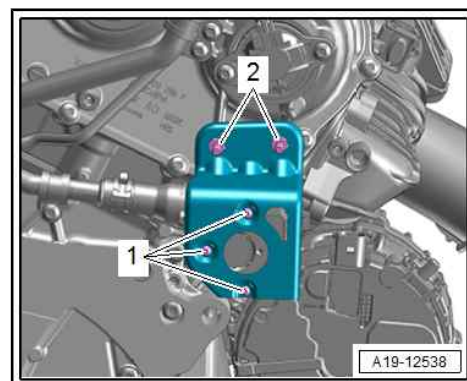
- ◆ Socket Torx T30 - T10405-



Removing



- Remove catalytic converter (right-side)
⇒ [“2.2 Removing and installing catalytic converter”, page 275](#) , place it to one side with Lambda probe connected and secure (move wiring clear).
- Drain coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .
- Remove centre hex studs -2- and bolts -1-, then detach bracket for continued coolant circulation pump - V51- .

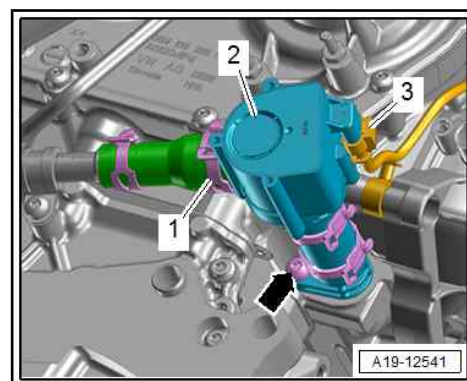


- Unplug electrical connector -3-.
- Unscrew bolt -arrow- using socket Torx T30 - T10405- .
- Release hose clip -1- and detach continued coolant circulation pump - V51- -item 2-.

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 catalytic converter (right-side)
⇒ [“2.2 Removing and installing catalytic converter”, page 275](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



Tightening torques

- ◆ ⇒ [“2.2.1 Exploded view - electric coolant pump, vehicles with 2.9 ltr. engine”, page 135](#)



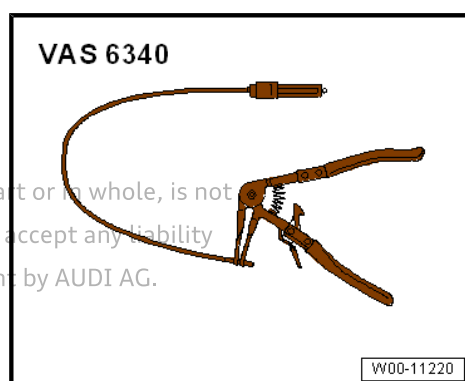
2.4.3 Removing and installing charge air cooling pump - V188- - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

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



- ◆ Hose clip pliers - VAS 6340-



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Removing

- Drain coolant
⇒ ["1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine", page 122](#) .
- Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Release bumper cover (bottom) at lock carrier ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .

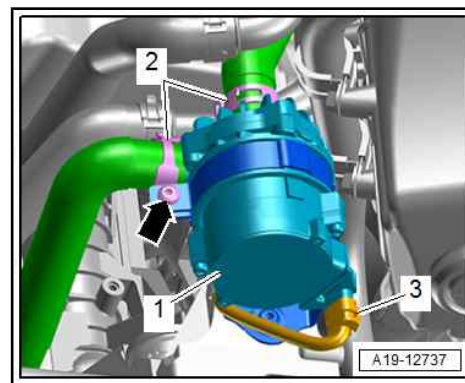


- Unplug electrical connector -3-.
- Remove bolt -arrow- and detach retaining bracket.
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Release hose clips -2- and disconnect coolant hoses.

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 up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



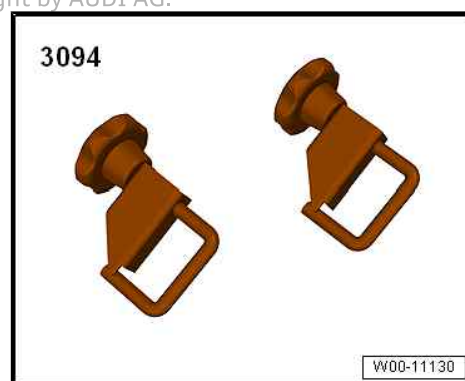
Tightening torques

- ◆ ⇒ [“2.2.1 Exploded view - electric coolant pump, vehicles with 2.9 ltr. engine”, page 135](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

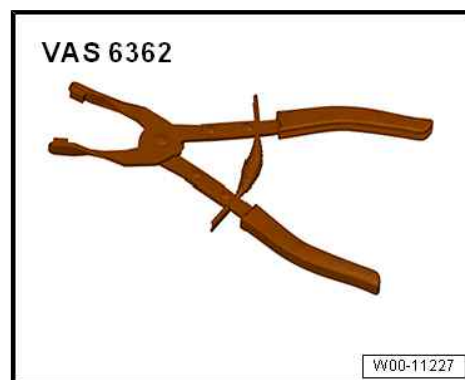
2.4.4 Removing and installing coolant circulation pump - V50- - vehicles with 3.0 ltr. engine without particulate filter

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



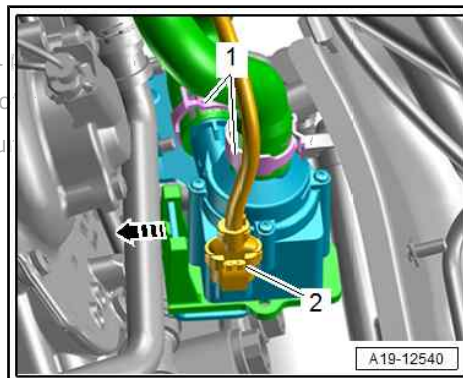
- ◆ Hose clip pliers - VAS 6362-





Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Unplug electrical connector -2-.
- Release fastener -arrow- and detach coolant circulation pump - V50- .
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -1- and disconnect hoses.



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 up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- Install engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ♦ ⇒ [“2.2.2 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine without particulate filter”, page 137](#)

2.4.5 Removing and installing coolant circulation pump - V50- - vehicles with 3.0 ltr. engine with particulate filter

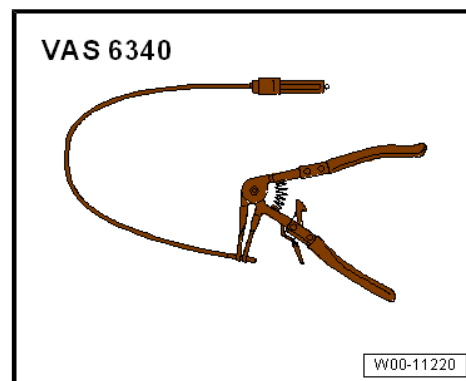
Special tools and workshop equipment required

- ♦ Hose clamps, up to 25 mm - 3094-

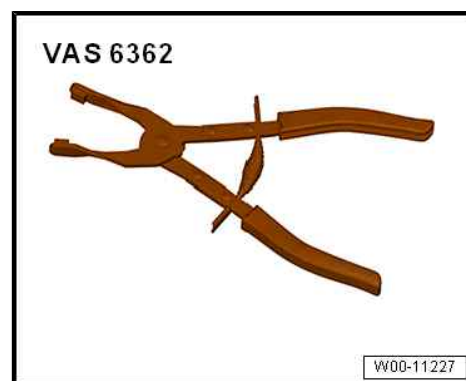




- ◆ Hose clip pliers - VAS 6340-



- ◆ Hose clip pliers - VAS 6362-



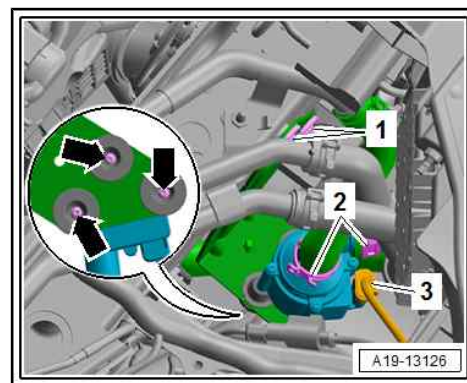
Removing

- Remove air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#) .
- Unplug electrical connector -3-.
- Remove nuts -1-.
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -2- and disconnect hoses.
- Remove bolts -arrows- and detach coolant circulation pump - V50- 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.
- Install air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#) .
- Fill up with coolant
⇒ ["1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine", page 128](#) .



Tightening torques

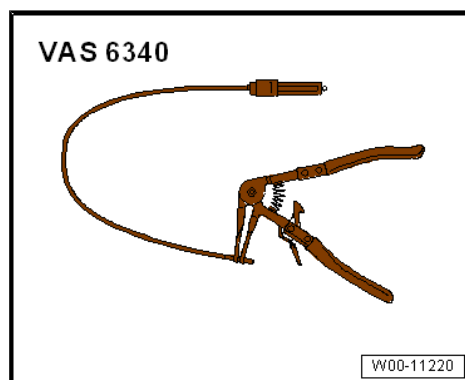
- ◆ ⇒ ["2.2.3 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine with particulate filter", page 138](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)



2.4.6 Removing and installing continued coolant circulation pump - V51- - vehicles with 3.0 ltr. engine without particulate filter

Special tools and workshop equipment required

◆ Hose clip pliers - VAS 6340-



◆ Socket Torx T30 - T10405-

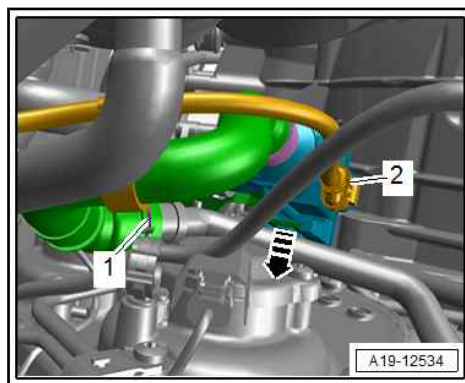


Removing

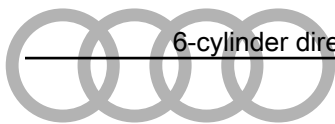
- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Drain coolant
⇒ ["1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine", page 128](#) .

Vehicle without auxiliary heater:

- Lift retaining clip -1- and disconnect coolant hose.
- Release fastener -arrow- and press coolant circulation pump - V50- to one side.

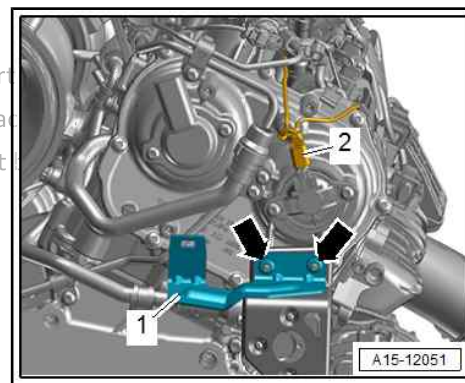


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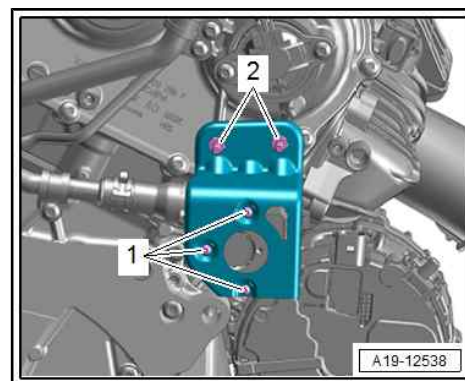
- Remove nuts -arrows- and detach bracket -1- for coolant circulation pump - V50- .

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All vehicles (continued):

- Remove centre hex studs -2- and bolts -1-, then detach bracket for continued coolant circulation pump - V51- .

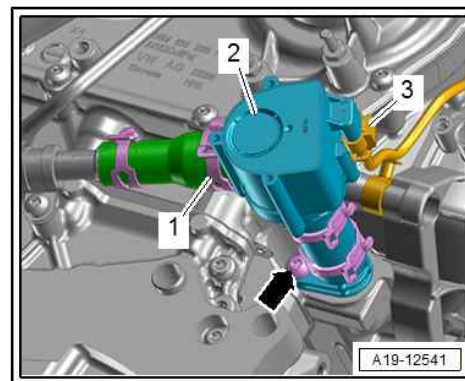


- Unplug electrical connector -3-.
- Unscrew bolt -arrow- using socket Torx T30 - T10405- .
- Release hose clip -1- and detach continued coolant circulation pump - V51- -item 2-.

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.
- Connect coolant hose with plug-in connector ⇒ [page 176](#) .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- Install engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

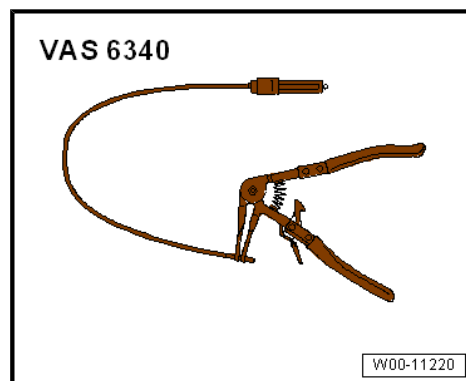
- ◆ ⇒ [“2.2.2 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine without particulate filter”, page 137](#)

2.4.7 Removing and installing continued coolant circulation pump - V51- - vehicles with 3.0 ltr. engine with particulate filter

Special tools and workshop equipment required



- ◆ Hose clip pliers - VAS 6340-



- ◆ Socket Torx T30 - T10405-

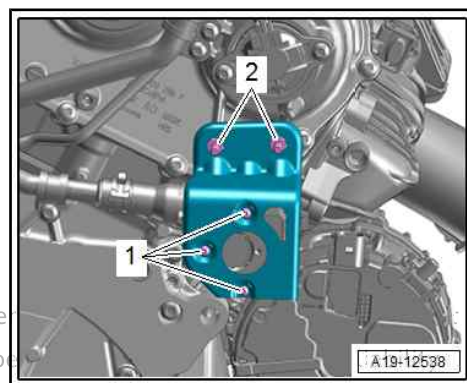


Removing

- Remove catalytic converter
⇒ ["2.2.4 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine with particulate filter", page 282](#) .
- Drain coolant
⇒ ["1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine", page 128](#) .
- Remove centre hex studs -2- and bolts -1-, then detach bracket for continued coolant circulation pump - V51- .



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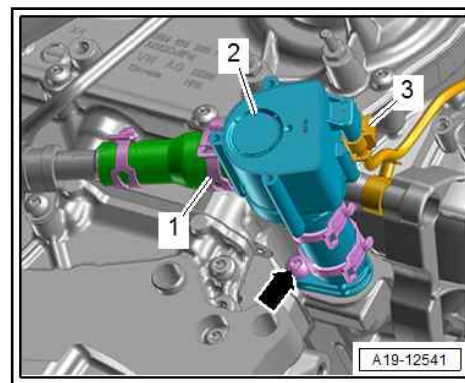


- Unplug electrical connector -3-.
- Unscrew bolt -arrow- using socket Torx T30 - T10405- .
- Release hose clip -1- and detach continued coolant circulation pump - V51- -item 2-.

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 catalytic converter
⇒ [“2.2.4 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine with particulate filter”, page 282](#) .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .



Tightening torques

- ◆ ⇒ [“2.2.3 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine with particulate filter”, page 138](#)

2.5 Removing and installing coolant pump

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant pump .

2.6 Removing and installing map-controlled engine cooling system thermostat - F265-

Removing

- Remove radiator with radiator cowl
⇒ [“4.4 Removing and installing radiator”, page 181](#) .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing map-controlled engine cooling system thermostat - F265-

Installing

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- Install radiator with radiator cowl
⇒ [“4.4 Removing and installing radiator”, page 181](#) .

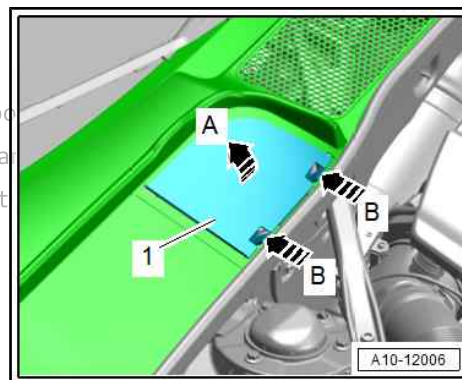


2.7 Removing and installing coolant temperature sender - G62-

Removing

- Release catches -arrows B- and open cover -1- -arrow A-.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant temperature sender - G62-



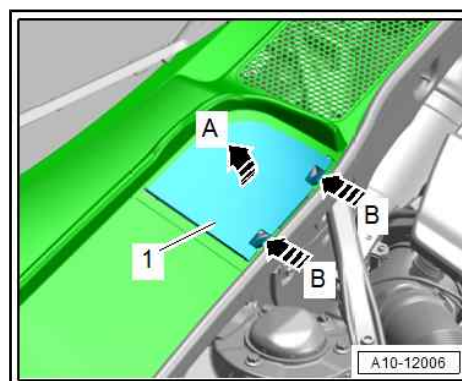
2.8 Removing and installing engine outlet coolant temperature sender - G82-

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly ; Removing and installing engine outlet coolant temperature sender - G82- .

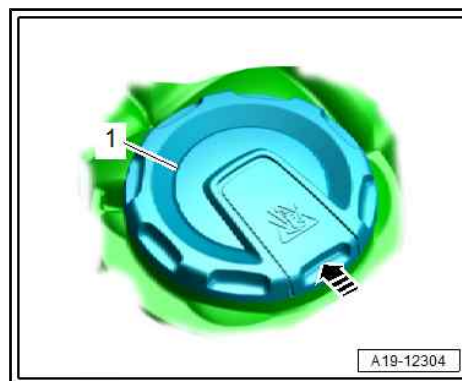
2.9 Removing and installing radiator outlet coolant temperature sender - G83-

Procedure

- Release catches -arrows B- and open cover -1- -arrow A-.



- Engine cold.
- To relieve residual pressure in cooling system, release fastener -arrow- and briefly open filler cap -1- on coolant expansion tank.
- Close filler cap again (make sure it engages).
- Vehicles with 2.9 ltr. engine: Remove front wheel spoiler (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Vehicles with 3.0 ltr. engine: Remove air intake grille (right-side) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



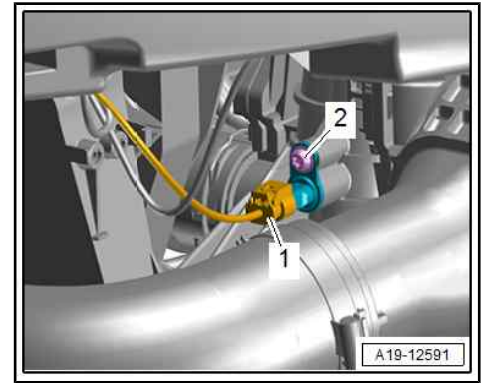


- Unplug electrical connector -1-.
- Place a cloth underneath to catch escaping coolant.
- Unscrew bolt -2- and pull off radiator outlet coolant temperature sender - G83- . (Shown on vehicles with 3.0 ltr. engine)

Note:

If an O-ring remains lodged in cylinder block, lift out O-ring with a piece of wire.

- Renew O-rings after removing.
- Fit new coolant temperature sender immediately so that as little coolant as possible is lost.
- Vehicles with 3.0 ltr. engine: Install air intake grille ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Check coolant level
⇒ ["1.3 Draining and filling cooling system", page 122](#) .



Tightening torques

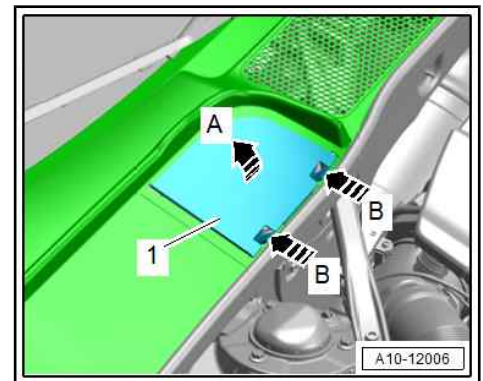
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

2.10 Removing and installing temperature sender for engine temperature regulation - G694-

Removing

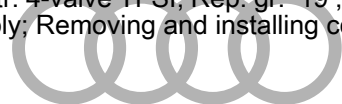
- Release catches -arrows B- and open cover -1- -arrow A-.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing temperature sender for engine temperature regulation - G694- .



2.11 Removing and installing coolant valves

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves .



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3 Coolant pipes

⇒ "3.1 Exploded view - coolant pipes", page 152

⇒ "3.2 Removing and installing coolant pipes", page 157

3.1 Exploded view - coolant pipes

⇒ "3.1.1 Exploded view - coolant pipes (engine end), vehicles with 2.9 ltr. engine", page 152

⇒ "3.1.2 Exploded view - coolant pipes (engine end), vehicles with 3.0 ltr. engine", page 154

⇒ "3.1.3 Exploded view - coolant pipes (gearbox end)", page 156

3.1.1 Exploded view - coolant pipes (engine end), vehicles with 2.9 ltr. engine

- Markings on coolant pipes and on ends of hoses must align.

1 - O-ring

- ☐ Renew after removing

2 - Bolt

- ☐ 9 Nm

3 - Coolant pipe (front left)

- ☐ Removing and installing
⇒ "3.2.3 Removing and installing coolant pipe (front left) - vehicles with 2.9 ltr. engine", page 160

4 - Bolt

- ☐ 9 Nm

5 - O-ring

- ☐ Renew after removing

6 - Bolt

- ☐ 9 Nm

7 - Coolant pipe (front)

- ☐ Renew after removing
- ☐ Removing and installing
⇒ "3.2.1 Removing and installing coolant pipe (front) - vehicles with 2.9 ltr. engine", page 157

8 - Bolt

- ☐ 9 Nm

9 - O-rings

- ☐ Renew after removing

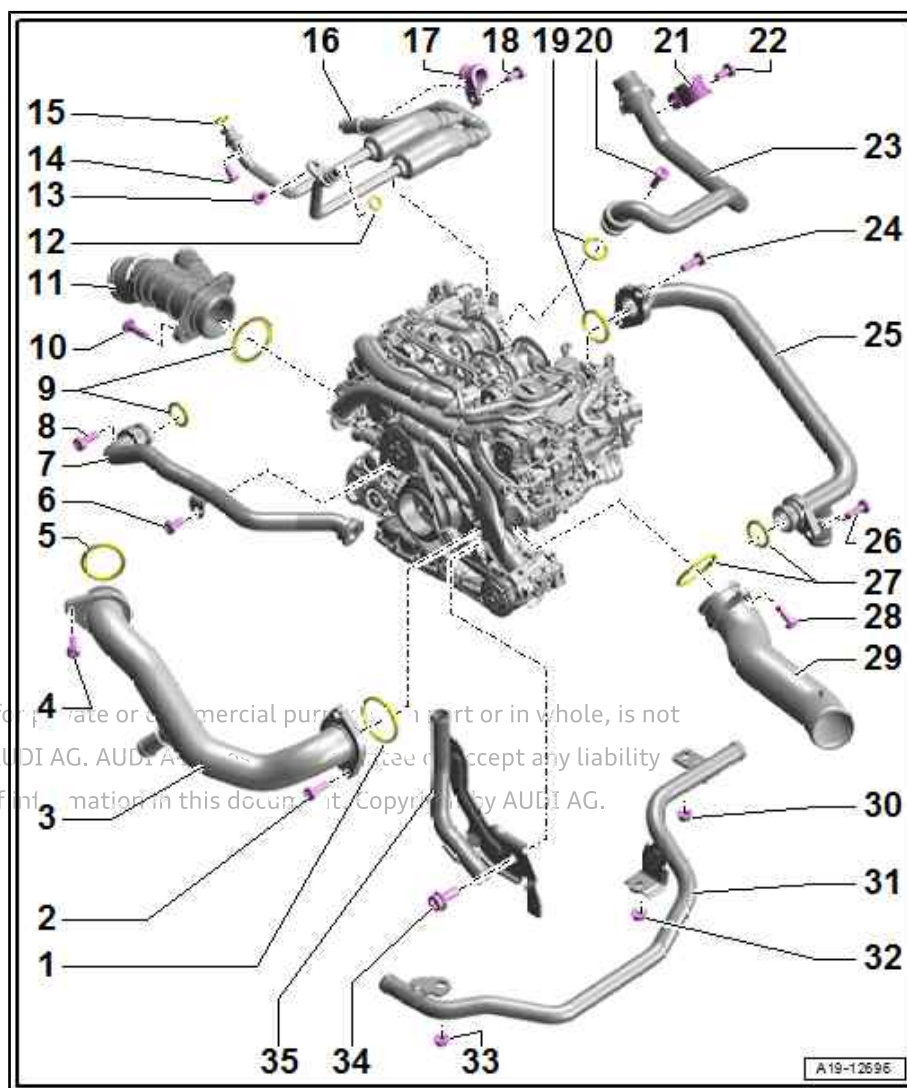
10 - Bolt

- ☐ 9 Nm

11 - Connection

12 - O-ring

- ☐ Renew after removing





13 - Bolt

- ☐ 9 Nm

14 - Bolt

- ☐ 9 Nm

15 - O-ring

- ☐ Renew after removing

16 - Large coolant pipe (rear right)

- ☐ Removing and installing
⇒ [“3.2.12 Removing and installing large coolant pipe \(rear right\) - vehicles with 2.9 ltr. engine”, page 171](#)

17 - Retaining clamp

18 - Bolt

- ☐ 9 Nm

19 - O-rings

- ☐ Renew after removing

20 - Bolt

- ☐ 9 Nm

21 - Retaining clamp

22 - Bolt

- ☐ 9 Nm

23 - Small coolant pipe (rear right)

- ☐ Removing and installing
⇒ [“3.2.10 Removing and installing small coolant pipe \(rear right\) - vehicles with 2.9 ltr. engine”, page 169](#)

24 - Bolt

- ☐ 9 Nm

25 - Coolant pipe (rear left)

- ☐ Removing and installing
⇒ [“3.2.8 Removing and installing coolant pipe \(rear left\) - vehicles with 2.9 ltr. engine”, page 167](#)

26 - Bolt

- ☐ 9 Nm

27 - O-rings

- ☐ Renew after removing

28 - Bolt

- ☐ 9 Nm

29 - Connection

30 - Nut

- ☐ 9 Nm

31 - Coolant pipe (left-side)

- ☐ Removing and installing
⇒ [“3.2.6 Removing and installing coolant pipe \(left-side\) - vehicles with 2.9 ltr. engine”, page 163](#)

32 - Nut

- ☐ 9 Nm

33 - Nut

- ☐ 9 Nm

34 - Bolt

- ☐ 20 Nm



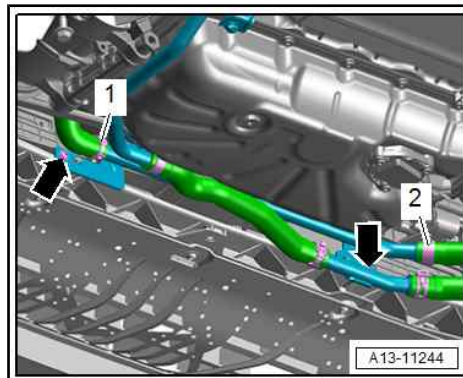
35 - Coolant pipe (bottom front)

- ❑ Removing and installing

⇒ ["3.2.5 Removing and installing coolant pipe \(bottom front\) - vehicles with 2.9 ltr. engine", page 162](#)

Coolant pipes at lock carrier (bottom) - tightening torque

- Tighten bolts -arrows- to 4.5 Nm.



3.1.2 Exploded view - coolant pipes (engine end), vehicles with 3.0 ltr. engine

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

1 - Coolant pipe (front left)

- ❑ Removing and installing
⇒ ["3.2.4 Removing and installing coolant pipe \(front left\) - vehicles with 3.0 ltr. engine", page 161](#)

2 - Bolt

- ❑ 9 Nm

3 - O-ring

- ❑ Renew after removing

4 - Bolt

- ❑ 9 Nm

5 - Coolant pipe (front)

- ❑ Renew after removing
- ❑ Removing and installing
⇒ ["3.2.2 Removing and installing coolant pipe \(front\) - vehicles with 3.0 ltr. engine", page 158](#)

6 - Bolt

- ❑ 9 Nm

7 - O-ring

- ❑ Renew after removing

8 - O-ring

- ❑ Renew after removing

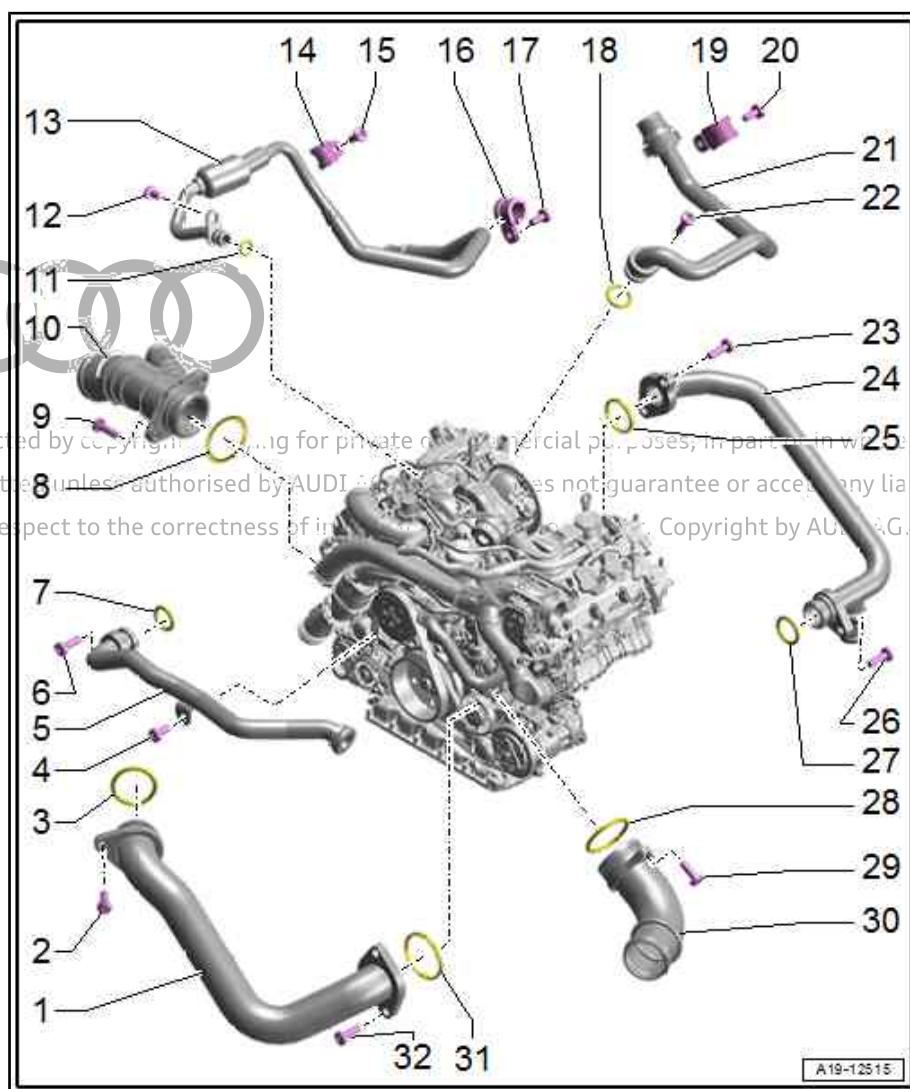
9 - Bolt

- ❑ 9 Nm

10 - Connection

11 - O-ring

- ❑ Renew after removing





12 - Bolt

- ☐ 9 Nm

13 - Large coolant pipe (rear right)

- ☐ Removing and installing:

◆ ⇒ [“3.2.13 Removing and installing large coolant pipe \(rear right\) - vehicles with 3.0 ltr. engine without particulate filter”, page 172](#)

◆ ⇒ [“3.2.14 Removing and installing large coolant pipe \(rear right\) - vehicles with 3.0 ltr. engine with particulate filter”, page 173](#)

14 - Retaining clamp

15 - Bolt

- ☐ 9 Nm

16 - Retaining clamp

17 - Bolt

- ☐ 9 Nm

18 - O-ring

- ☐ Renew after removing

19 - Retaining clamp

20 - Bolt

- ☐ 9 Nm

21 - Small coolant pipe (rear right)

- ☐ Removing and installing

⇒ [“3.2.11 Removing and installing small coolant pipe \(rear right\) - vehicles with 3.0 ltr. engine”, page 170](#)

22 - Bolt

- ☐ 9 Nm

23 - Bolt

- ☐ 9 Nm

24 - Coolant pipe (rear left)

- ☐ Removing and installing

⇒ [“3.2.9 Removing and installing coolant pipe \(rear left\) - vehicles with 3.0 ltr. engine”, page 168](#)

25 - Seal

- ☐ Renew after removing

26 - Bolt

- ☐ 9 Nm

27 - O-ring

- ☐ Renew after removing

28 - O-ring

- ☐ Renew after removing

29 - Bolt

- ☐ 9 Nm

30 - Connection

31 - Seal

- ☐ Renew after removing

32 - Bolt

- ☐ 9 Nm

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3.1.3 Exploded view - coolant pipes (gearbox end)

1 - Coolant hose

2 - Coolant pipe (right-side)

- ❑ Removing and installing
⇒ ["3.2.7 Removing and installing coolant pipe \(right-side\)", page 165](#)

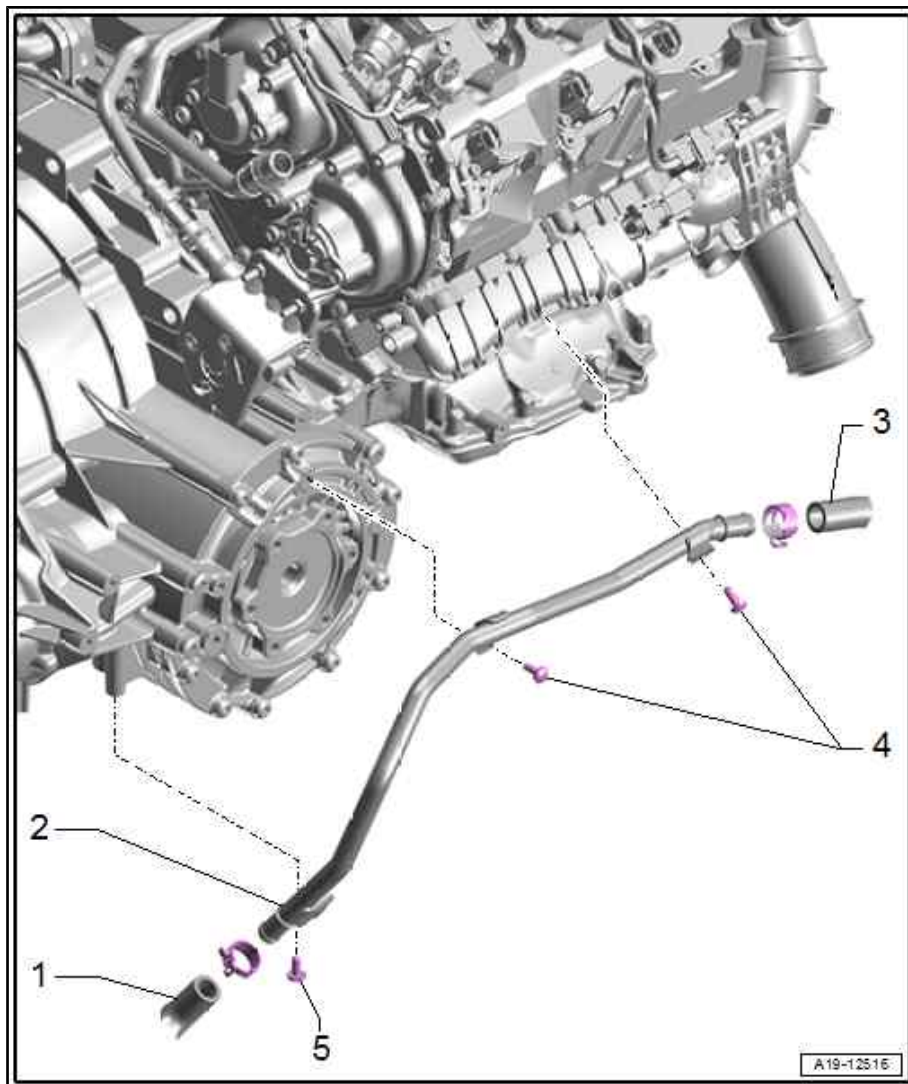
3 - Coolant hose

4 - Bolts

- ❑ 9 Nm

5 - Bolt

- ❑ 9 Nm



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3.2 Removing and installing coolant pipes

⇒ [“3.2.1 Removing and installing coolant pipe \(front\) - vehicles with 2.9 ltr. engine”, page 157](#)

⇒ [“3.2.2 Removing and installing coolant pipe \(front\) - vehicles with 3.0 ltr. engine”, page 158](#)

⇒ [“3.2.3 Removing and installing coolant pipe \(front left\) - vehicles with 2.9 ltr. engine”, page 160](#)

⇒ [“3.2.4 Removing and installing coolant pipe \(front left\) - vehicles with 3.0 ltr. engine”, page 161](#)

⇒ [“3.2.5 Removing and installing coolant pipe \(bottom front\) - vehicles with 2.9 ltr. engine”, page 162](#)

⇒ [“3.2.6 Removing and installing coolant pipe \(left-side\) - vehicles with 2.9 ltr. engine”, page 163](#)

⇒ [“3.2.7 Removing and installing coolant pipe \(right-side\)”, page 165](#)

⇒ [“3.2.8 Removing and installing coolant pipe \(rear left\) - vehicles with 2.9 ltr. engine”, page 167](#)

⇒ [“3.2.9 Removing and installing coolant pipe \(rear left\) - vehicles with 3.0 ltr. engine”, page 168](#)

⇒ [“3.2.10 Removing and installing small coolant pipe \(rear right\) - vehicles with 2.9 ltr. engine”, page 169](#)

⇒ [“3.2.11 Removing and installing small coolant pipe \(rear right\) - vehicles with 3.0 ltr. engine”, page 170](#)

⇒ [“3.2.12 Removing and installing large coolant pipe \(rear right\) - vehicles with 2.9 ltr. engine”, page 171](#)

⇒ [“3.2.13 Removing and installing large coolant pipe \(rear right\) - vehicles with 3.0 ltr. engine without particulate filter”, page 172](#)

⇒ [“3.2.14 Removing and installing large coolant pipe \(rear right\) - vehicles with 3.0 ltr. engine with particulate filter”, page 173](#)

3.2.1 Removing and installing coolant pipe (front) - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ◆ Counterhold tool - T10172A-

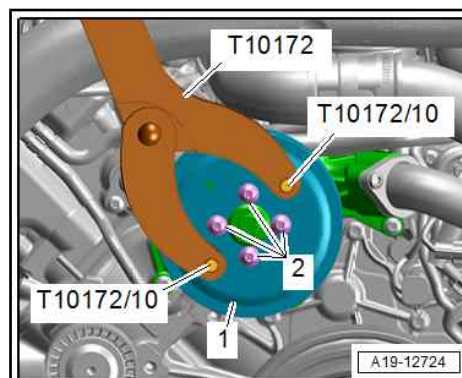


Removing

- Unbolt air pipe (top) and swivel it to left side
⇒ [“2.3.1 Removing and installing air pipe \(top\) with radiator fitted - vehicles with 2.9 ltr. engine”, page 211](#). (If radiator has been removed during preparatory work, this step is not necessary.)



- Remove poly V-belt from coolant pump pulley ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Fit counterhold tool - T10172- with adapters -T10172/10- on pulley -1- and remove bolts -2-.
- Detach pulley.

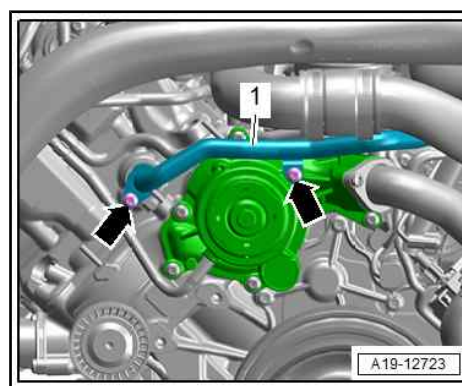


- Remove bolts -arrows- and pull coolant pipe (front) -1- off cylinder head (right-side) and shut-off valve.

Installing

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

- Renew coolant pipe and O-ring after removal.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Lubricate O-ring with coolant and fit O-ring.
- Install poly V-belt ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



- If removed previously, install coolant pipe (top)
⇒ [“2.3.1 Removing and installing air pipe \(top\) with radiator fitted - vehicles with 2.9 ltr. engine”, page 211](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .

Tightening torques

- ◆ ⇒ [“3.1.1 Exploded view - coolant pipes \(engine end\), vehicles with 2.9 ltr. engine”, page 152](#)
- ◆ ⇒ [“2.1.1 Exploded view - charge air system, vehicles with 2.9 ltr. engine”, page 208](#)
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump/thermostat

3.2.2 Removing and installing coolant pipe (front) - vehicles with 3.0 ltr. engine

Special tools and workshop equipment required

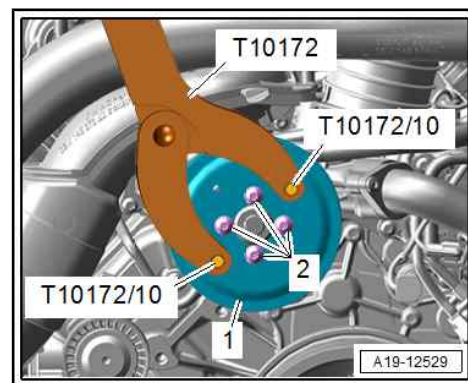


◆ Counterhold tool - T10172A-



Removing

- Drain coolant
⇒ ["1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine", page 128](#) .
- Remove air pipe (top)
⇒ ["2.3.4 Removing and installing air pipe \(top\) - vehicles with 3.0 ltr. engine", page 219](#) .
- Install poly V-belt for alternator ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Fit counterhold tool - T10172- with adapters -T10172/10- on pulley -1- and remove bolts -2-.
- Detach pulley.



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- Remove bolts -arrows- and pull coolant pipe (front) -1- off cylinder head (right-side) and shut-off valve.

Installing

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

- Renew coolant pipe and O-ring after removal.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.

- Lubricate O-ring with coolant and fit O-ring.

- Install poly V-belt ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

- Install air pipe (top)
⇒ ["2.3.4 Removing and installing air pipe \(top\) - vehicles with 3.0 ltr. engine", page 219](#) .

- Fill up with coolant
⇒ ["1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine", page 128](#) .

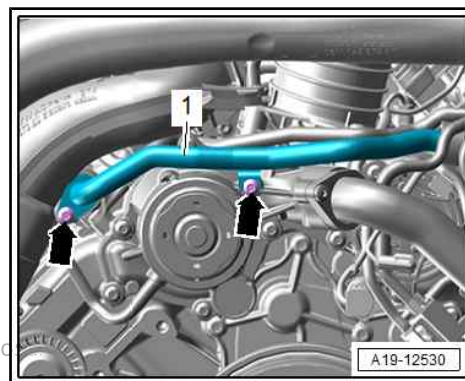
Tightening torques

- ♦ ⇒ ["3.1.2 Exploded view - coolant pipes \(engine end\), vehicles with 3.0 ltr. engine", page 154](#)
- ♦ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump/thermostat

3.2.3 Removing and installing coolant pipe (front left) - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ♦ Hose clip pliers - VAS 6362-



- ♦ Socket Torx T30 - T10405-





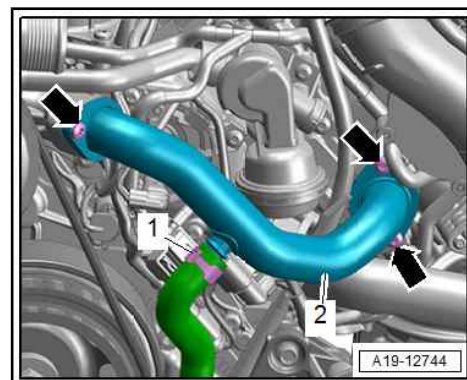
Removing

- Remove air pipe (bottom)
⇒ [“2.3.3 Removing and installing air pipe \(bottom\) - vehicles with 2.9 ltr. engine”, page 217](#) .
- Release hose clip -1- and detach air hose.
- Remove bolts -arrows- and detach coolant pipe (front left) -2- from coolant pump.

Installing

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

- Renew seal and O-ring after removal.
- Do not reuse coolant.
- Lubricate O-ring with coolant and fit O-ring.
- Install air pipe (bottom)
⇒ [“2.3.3 Removing and installing air pipe \(bottom\) - vehicles with 2.9 ltr. engine”, page 217](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



Tightening torques

- ◆ ⇒ [“3.1.1 Exploded view - coolant pipes \(engine end\), vehicles with 2.9 ltr. engine”, page 152](#)

3.2.4 Removing and installing coolant pipe (front left) - vehicles with 3.0 ltr. engine

Removing

- Drain coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- Remove poly V-belt from air conditioner compressor ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Remove air conditioner compressor from bracket and tie up to left side ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .

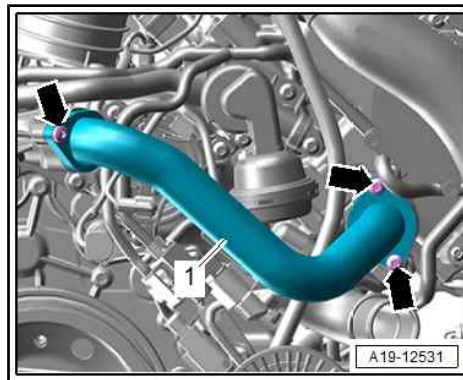


- Remove bolts -arrows- and detach coolant pipe (front left) from coolant pump.

Installing

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

- Renew seal and O-ring after removal.
- Do not reuse coolant.
- Lubricate O-ring with coolant and fit O-ring.
- Install poly V-belt for air conditioner compressor ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .



Tightening torques

- ◆ ⇒ [“3.1.2 Exploded view - coolant pipes \(engine end\), vehicles with 3.0 ltr. engine”, page 154](#)
- ◆ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit

3.2.5 Removing and installing coolant pipe (bottom front) - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

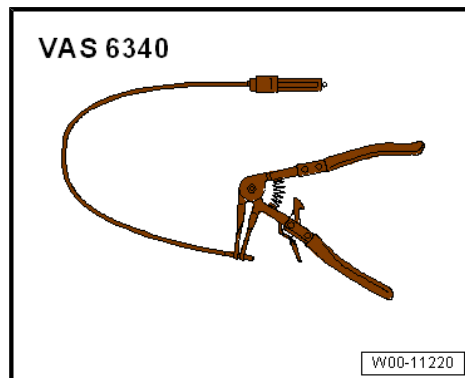
- ◆ Hose clamps, up to 25 mm - 3094-



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- ◆ Hose clip pliers - VAS 6340-





- ◆ Hose clip pliers - VAS 6362-



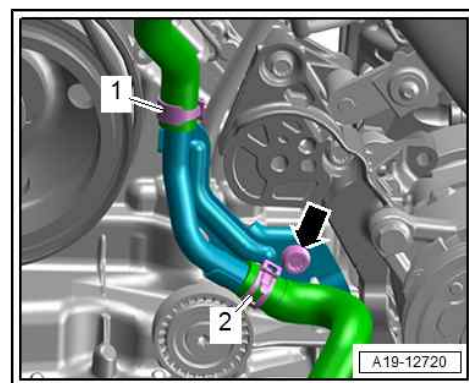
Removing

- Remove poly V-belt tensioner for air conditioner compressor
⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Clamp off coolant hoses using hose clamps, up to 25 mm - 3094- , release hose clips -1 and 2- and disconnect hoses.
- Unscrew bolt -arrow- and detach coolant pipe.

Installing

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

- Do not reuse coolant.
- Install poly V-belt tensioner for air conditioner compressor ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belts .
- Fill up with coolant
⇒ ["1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine", page 122](#) .



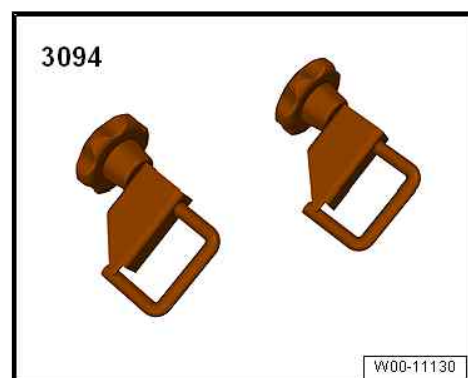
Tightening torques

- ◆ ⇒ ["3.1.1 Exploded view - coolant pipes \(engine end\), vehicles with 2.9 ltr. engine", page 152](#)

3.2.6 Removing and installing coolant pipe (left-side) - vehicles with 2.9 ltr engine

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

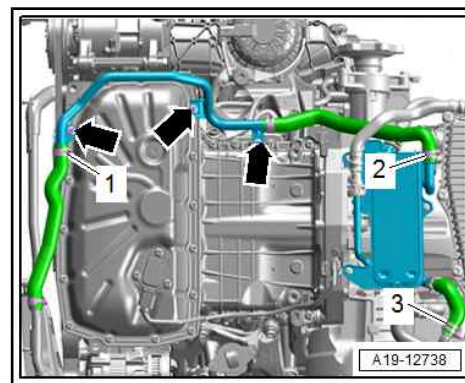
- Support engine in installation position
⇒ ["2.2 Supporting engine in installation position", page 80](#) and take up weight with spindle - 10-222A/11- until load on engine mounting (left-side) is relieved.
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



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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 hose -3- with hose clamp, up to 25 mm - 3094- .
- Clamp off coolant hose using hose clamp up to 25 mm - 3094- , release hose clip -1- and disconnect hose.
- Release hose clip -2- and disconnect coolant hose.
- Unscrew nuts -arrows-, lift engine slightly and detach coolant pipe towards front.



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.
- Remove engine support bracket ⇒ [page 80](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 152](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3.2.7 Removing and installing coolant pipe (right-side)

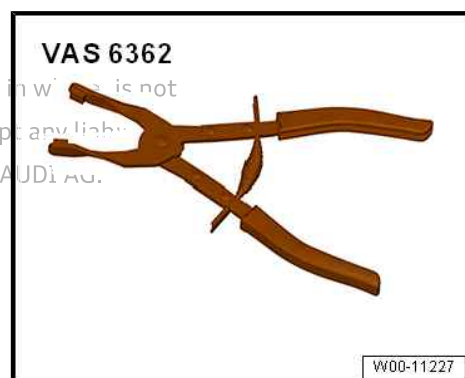
Special tools and workshop equipment required

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



- ◆ Hose clip pliers - VAS 6362-

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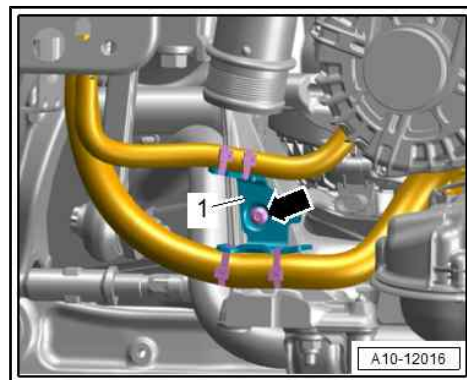


◆ Socket Torx T30 - T10405-



Removing

- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Drain coolant
⇒ ["1.3 Draining and filling cooling system", page 122](#) .
- Remove cover for drive shaft (right-side) and wheel spoiler (front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- Remove heat shield for drive shaft (right-side) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield for drive shaft .
- Remove bolt -arrow- and move bracket -1- with electrical wiring harness to one side.
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.



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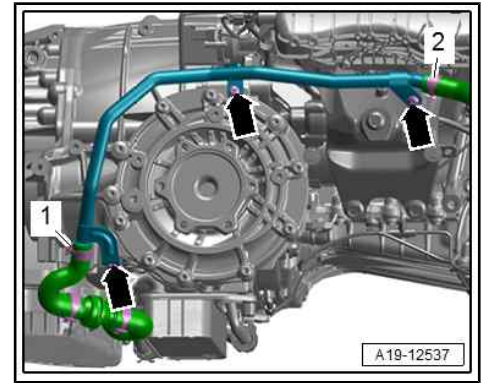


- Release hose clips -1, 2- and disconnect coolant hoses.
- Unscrew bolts -arrows- using socket Torx T30 - T10405- and detach coolant pipe. (Shown on vehicles with 3.0 ltr. engine)

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 .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Fill up with coolant
⇒ [“1.3 Draining and filling cooling system”, page 122](#) .



Tightening torques

- ◆ ⇒ [“3.1.3 Exploded view - coolant pipes \(gearbox end\)”, page 156](#)
- ◆ ⇒ 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
- ◆ ⇒ Electrical system; Rep. gr. 27 ; Alternator; Exploded view - alternator
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing heat shield for drive shaft

3.2.8 Removing and installing coolant pipe (rear left) - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ◆ Socket Torx T30 - T10405-



Removing

- Drain coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Vehicles with particulate filter: Remove catalytic converter (left-side)
⇒ [“2.2.2 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine with particulate filter”, page 277](#) .



- Remove bolt -1-.
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Move electrical wiring clear.
- Unscrew bolts -arrows- and remove coolant pipe -2-.

Installing

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

- Renew seal and O-ring after removal.
- Do not reuse coolant.
- Lubricate gasket and O-ring with coolant and fit.
- Vehicles with particulate filter: Install catalytic converter (left-side)
⇒ [“2.2.2 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine with particulate filter”, page 277](#) .
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .

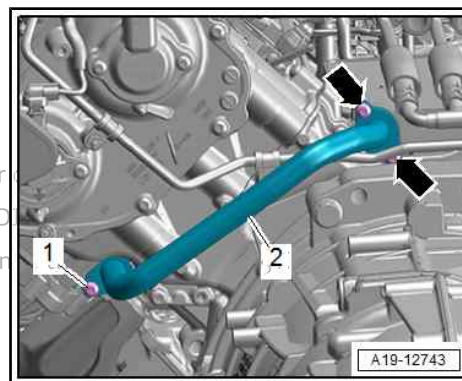
Tightening torques

- ◆ ⇒ [“3.1.1 Exploded view - coolant pipes \(engine end\), vehicles with 2.9 ltr. engine”, page 152](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3.2.9 Removing and installing coolant pipe (rear left) - vehicles with 3.0 ltr. engine

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



Removing

- Drain coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

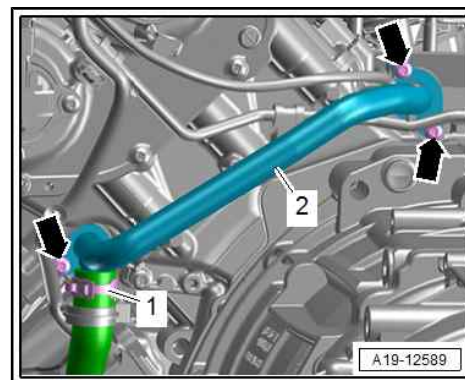


- Vehicles with particulate filter: Remove noise insulation (rear)
⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove bolts -arrows-.
- Release hose clip -1- and detach coolant pipe -2-.

Installing

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

- Renew seal and O-ring after removal.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Lubricate gasket and O-ring with coolant and fit.
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .



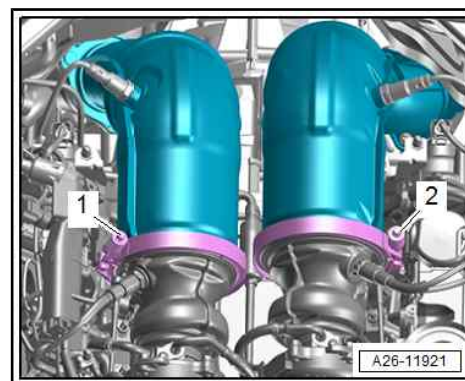
Tightening torques

- ◆ ⇒ [“3.1.2 Exploded view - coolant pipes \(engine end\), vehicles with 3.0 ltr. engine”, page 154](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3.2.10 Removing and installing small coolant pipe (rear right) - vehicles with 2.9 ltr. engine

Removing

- Drain coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#)
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI EA 839; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Vehicles without particulate filter: Loosen screw-type clip -1- and press catalytic converter slightly to side.
- Vehicles with particulate filter: Remove catalytic converter (right-side)
⇒ [“2.2.2 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine with particulate filter”, page 277](#) .



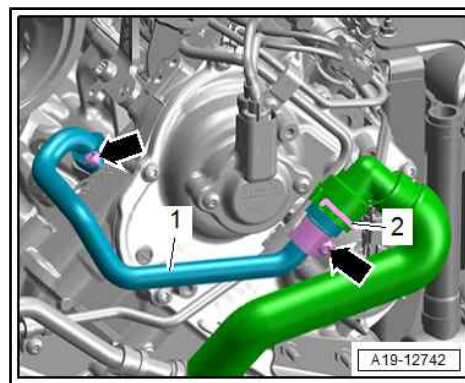


- Lift retaining clip -2- and disconnect coolant hose.
- Unscrew bolts -arrows- and remove coolant pipe -1-.

Installing

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

- Renew O-ring after removal.
- Do not reuse coolant.
- Lubricate O-ring with coolant and fit O-ring.
- Install catalytic converter
⇒ [“2.2 Removing and installing catalytic converter”, page 275](#) .
- Connect coolant hose with plug-in connector
⇒ [Fig. “Connecting coolant hose with plug-in connector””, page 176](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ [“3.1.1 Exploded view - coolant pipes \(engine end\), vehicles with 2.9 ltr. engine”, page 152](#)

3.2.11 Removing and installing small coolant pipe (rear right) - vehicles with 3.0 ltr. engine

Removing

- Drain coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



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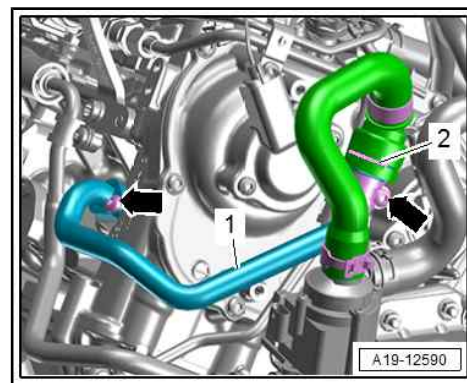


- Lift retaining clip -2- and disconnect coolant hose.
- Unscrew bolts -arrows- and remove coolant pipe -1-.

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
⇒ [Fig. “Connecting coolant hose with plug-in connector”](#),
[page 176](#) .
- Install heat shield and engine cover panel ⇒ Servicing 6-cyl-
inder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine
cover panel; Removing and installing engine cover panel .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0
ltr. engine”](#), [page 128](#) .



Tightening torques

- ◆ ⇒ [“3.1.2 Exploded view - coolant pipes \(engine end\), vehicles
with 3.0 ltr. engine”](#), [page 154](#)

3.2.12 Removing and installing large coolant pipe (rear right) - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



Removing

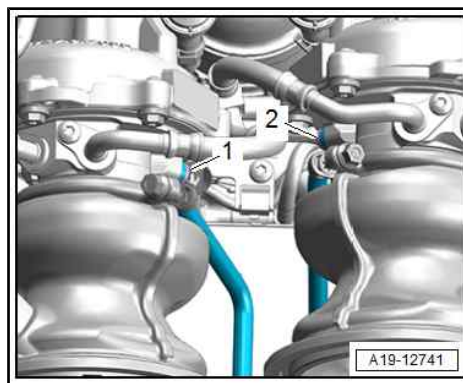
- Drain coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9
ltr. engine”](#), [page 122](#) .
- Remove catalytic converter (right-side)
⇒ [“2.2 Removing and installing catalytic converter”](#),
[page 275](#) , place it to one side with Lambda probe connected
and secure (move wiring clear).



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- Unscrew bolts -1, 2- and detach coolant pipes from turbochargers.

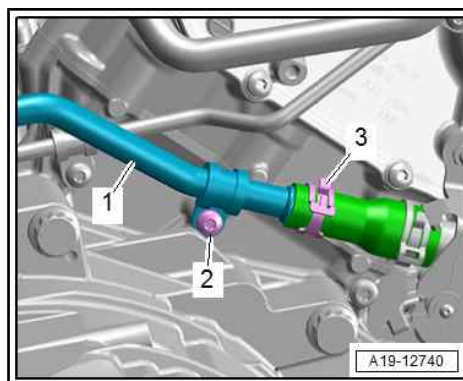


- Remove bolt -2-.
- Release hose clip -3- and detach coolant pipe -1-.

Installing

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

- Renew O-rings after removing.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Lubricate O-rings with coolant.
- Install catalytic converter (right-side)
⇒ [“2.2 Removing and installing catalytic converter”, page 275](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



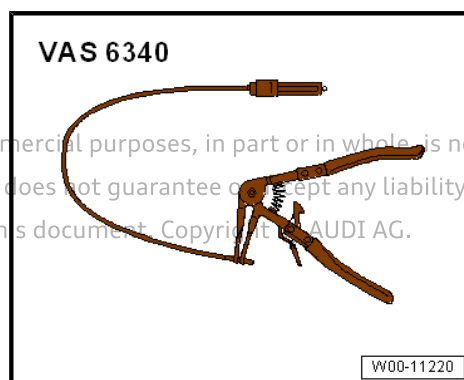
Tightening torques

- ♦ ⇒ [“3.1.1 Exploded view - coolant pipes \(engine end\), vehicles with 2.9 ltr. engine”, page 152](#)

3.2.13 Removing and installing large coolant pipe (rear right) - vehicles with 3.0 ltr. engine without particulate filter

Special tools and workshop equipment required

- ♦ Hose clip pliers - VAS 6340-

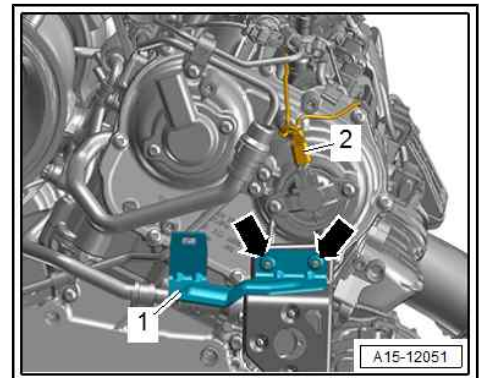
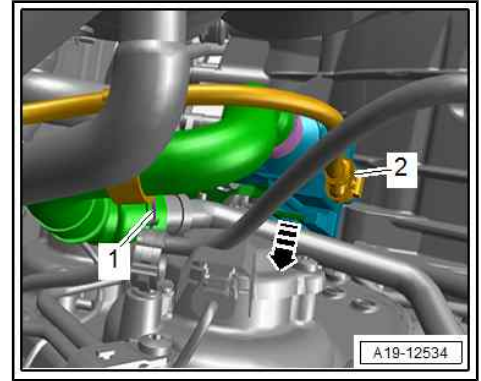


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Removing

- Drain coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Lift retaining clip -1- and disconnect coolant hose.
- Release fastener -arrow- and press coolant circulation pump - V50- to one side.
- Remove nuts -arrows- and detach bracket -1- for coolant circulation pump - V50- .

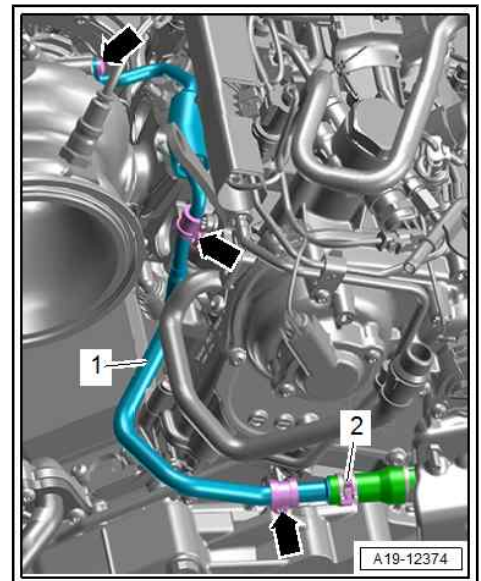


- Remove bolts -arrows-.
- Release hose clip -2- and detach coolant pipe -1-.

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.
- Lubricate O-ring with coolant.
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Connect coolant hose with plug-in connector ⇒ [page 176](#) .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .



Tightening torques

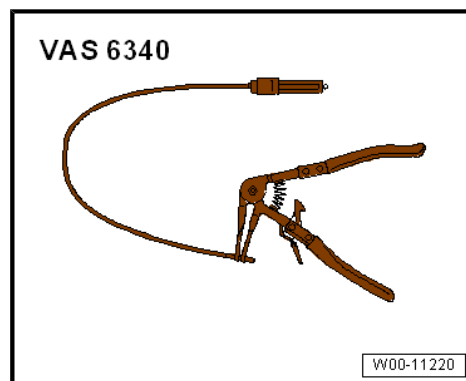
- ◆ ⇒ [“3.1.2 Exploded view - coolant pipes \(engine end\), vehicles with 3.0 ltr. engine”, page 154](#)

3.2.14 Removing and installing large coolant pipe (rear right) - vehicles with 3.0 ltr. engine with particulate filter

Special tools and workshop equipment required



- ◆ Hose clip pliers - VAS 6340-



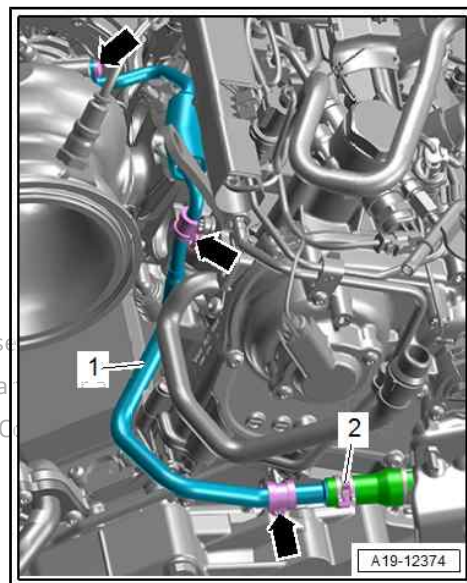
Removing

- Drain coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- Remove catalytic converter (right-side)
⇒ [“2.2.4 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine with particulate filter”, page 282](#) .
- Remove bolts -arrows-.
- Release hose clip -2- and detach coolant pipe -1-.

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.
- Lubricate O-ring with coolant.
- Install catalytic converter
⇒ [“2.2.4 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine with particulate filter”, page 282](#) .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .



Tightening torques

- ◆ ⇒ [“3.1.2 Exploded view - coolant pipes \(engine end\), vehicles with 3.0 ltr. engine”, page 154](#)



4 Radiator/radiator fan(s)

⇒ [“4.1 Exploded view - radiator/radiator fans”, page 175](#)

⇒ [“4.2 Exploded view - radiator blind”, page 179](#)

⇒ [“4.3 Exploded view - auxiliary radiator”, page 180](#)

⇒ [“4.4 Removing and installing radiator”, page 181](#)

⇒ [“4.5 Removing and installing radiator cowl”, page 189](#)

⇒ [“4.6 Removing and installing radiator fan V7”, page 192](#)

⇒ [“4.7 Removing and installing radiator blind”, page 193](#)

⇒ [“4.8 Removing and installing radiator blind control motor V544”, page 194](#)

⇒ [“4.9 Removing and installing auxiliary radiator”, page 195](#)

4.1 Exploded view - radiator/radiator fans

Radiator

Radiator cowl with one radiator fan ⇒ [page 176](#)

Radiator cowl with two radiator fans ⇒ [page 177](#)

1 - Coolant hose

- ☐ Lift retaining clip to detach

- ☐ Connecting

⇒ [Fig. “Connecting coolant hose with plug-in connector”, page 176](#)

2 - Radiator

- ☐ Removing and installing
⇒ [“4.4 Removing and installing radiator”, page 181](#)

- ☐ If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00; Repair notes; Installing radiators and condensers

- ☐ Renew radiator if fasteners on condenser, charge air cooler or auxiliary radiator are damaged

3 - O-ring

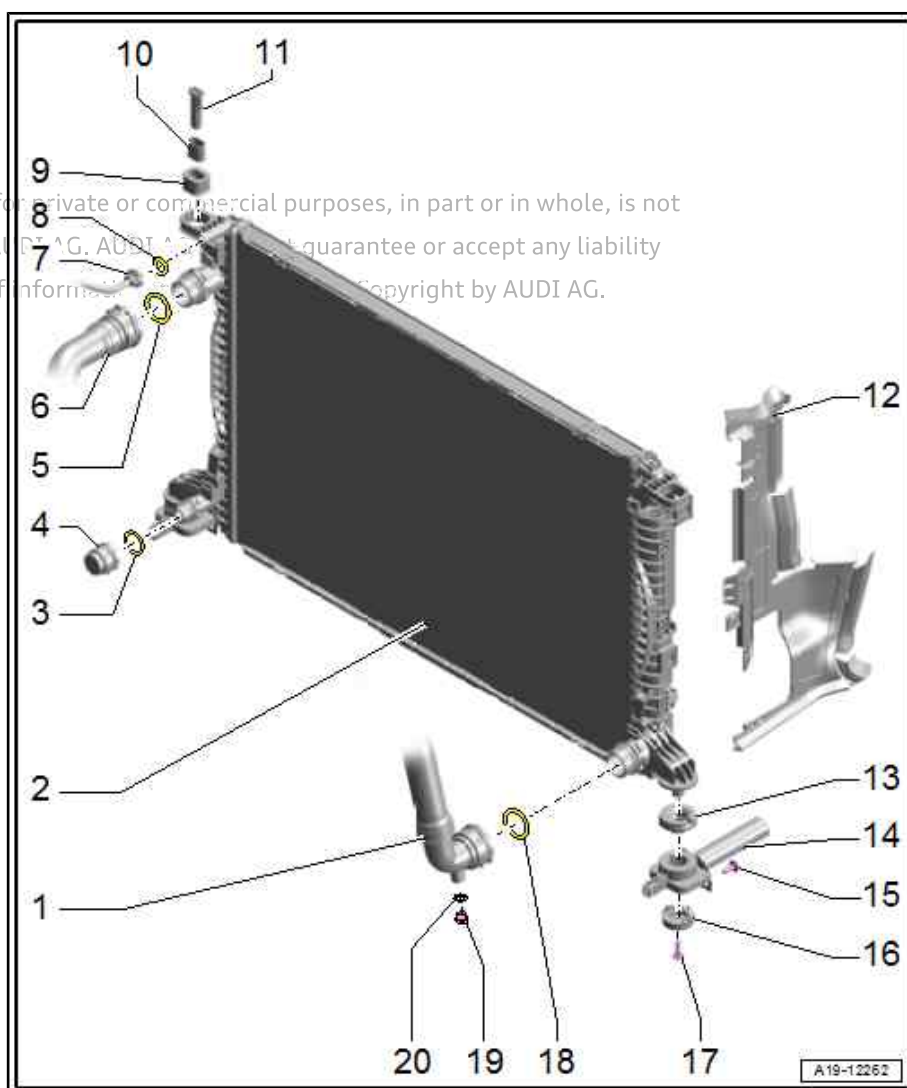
- ☐ Renew after removing

4 - Sealing plug

- ☐ Lift retaining clip to detach

- ☐ Connecting

⇒ [Fig. “Connecting coolant hose with plug-in connector”, page 176](#)





5 - O-ring

- ☐ Renew after removing

6 - Coolant hose

- ☐ Lift retaining clip to detach
- ☐ Connecting ⇒ [Fig. "Connecting coolant hose with plug-in connector", page 176](#)

7 - Coolant pipe

- ☐ To coolant expansion tank
- ☐ Lift retaining clip to detach
- ☐ Connecting ⇒ [Fig. "Connecting coolant hose with plug-in connector", page 176](#)

8 - O-ring

- ☐ Renew after removing

9 - Rubber bush

- ☐ For radiator

10 - Sleeve

11 - Retaining pin

- ☐ Use screwdriver to release and pull off

12 - Air duct

13 - Rubber bush

- ☐ For radiator

14 - Radiator bracket

15 - Bolt

- ☐ 5 Nm

16 - Support

17 - Bolt

- ☐ 4.5 Nm

18 - O-ring

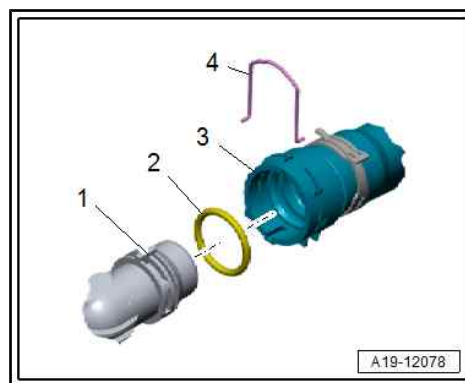
- ☐ Renew after removing

19 - Not fitted

20 - Not fitted

Connecting coolant hose with plug-in connector

- If damaged, renew retaining clip -4-.
- If damaged, renew O-ring -2-. To do so, remove O-ring 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 with one radiator fan

Radiator ⇒ [page 175](#)

Radiator cowl with two radiator fans ⇒ [page 177](#)



1 - Radiator cowl

- ❑ Removing and installing
⇒ ["4.5 Removing and installing radiator cowl"](#),
[page 189](#)

2 - Bolt

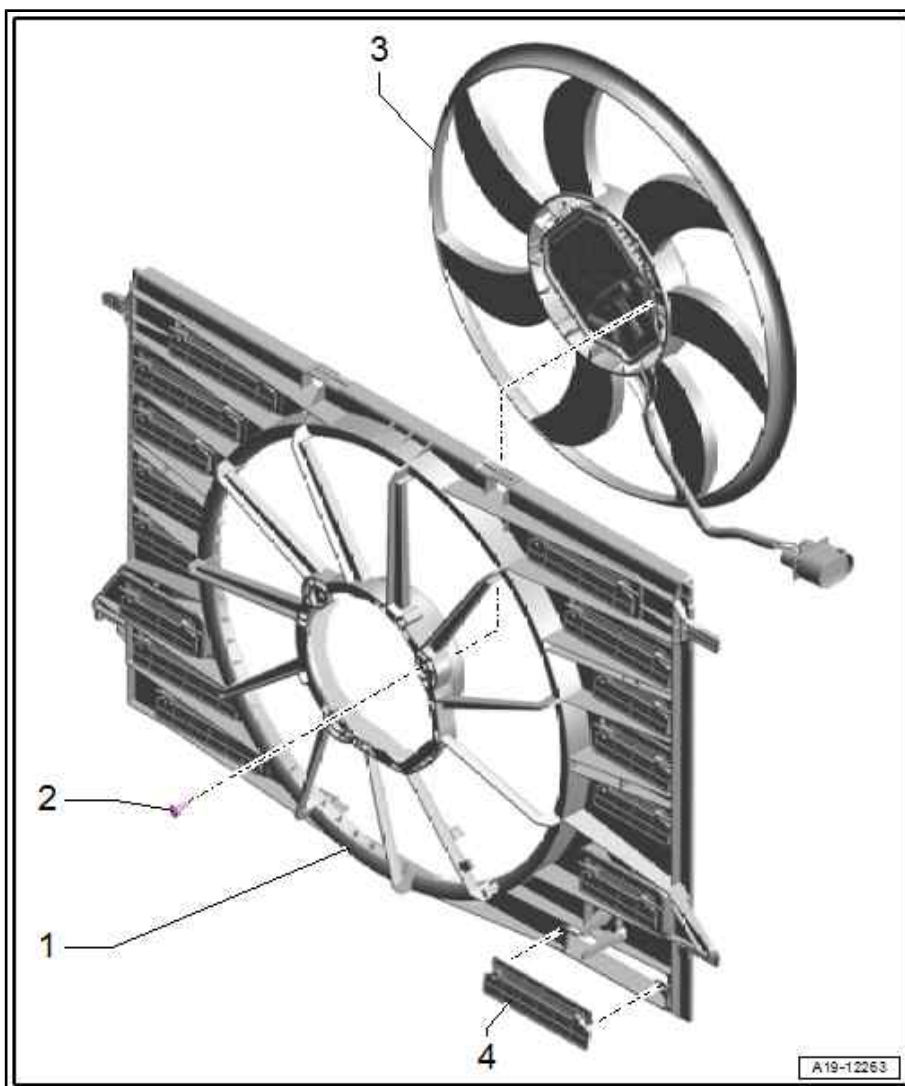
- ❑ 5 Nm

3 - Radiator fan - V7-

- ❑ With radiator fan control unit - J293-
- ❑ Removing and installing
⇒ ["4.6 Removing and installing radiator fan V7"](#),
[page 192](#)

4 - Air flap

- ❑ Different versions available ⇒ Electronic parts catalogue



Radiator cowl with two radiator fans

Radiator ⇒ [page 175](#)

Radiator cowl with one radiator fan ⇒ [page 176](#)



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1 - Bolt

- 5 Nm

2 - Radiator cowl

- Removing and installing
⇒ ["4.5 Removing and installing radiator cowl"](#),
[page 189](#)

3 - Bolt

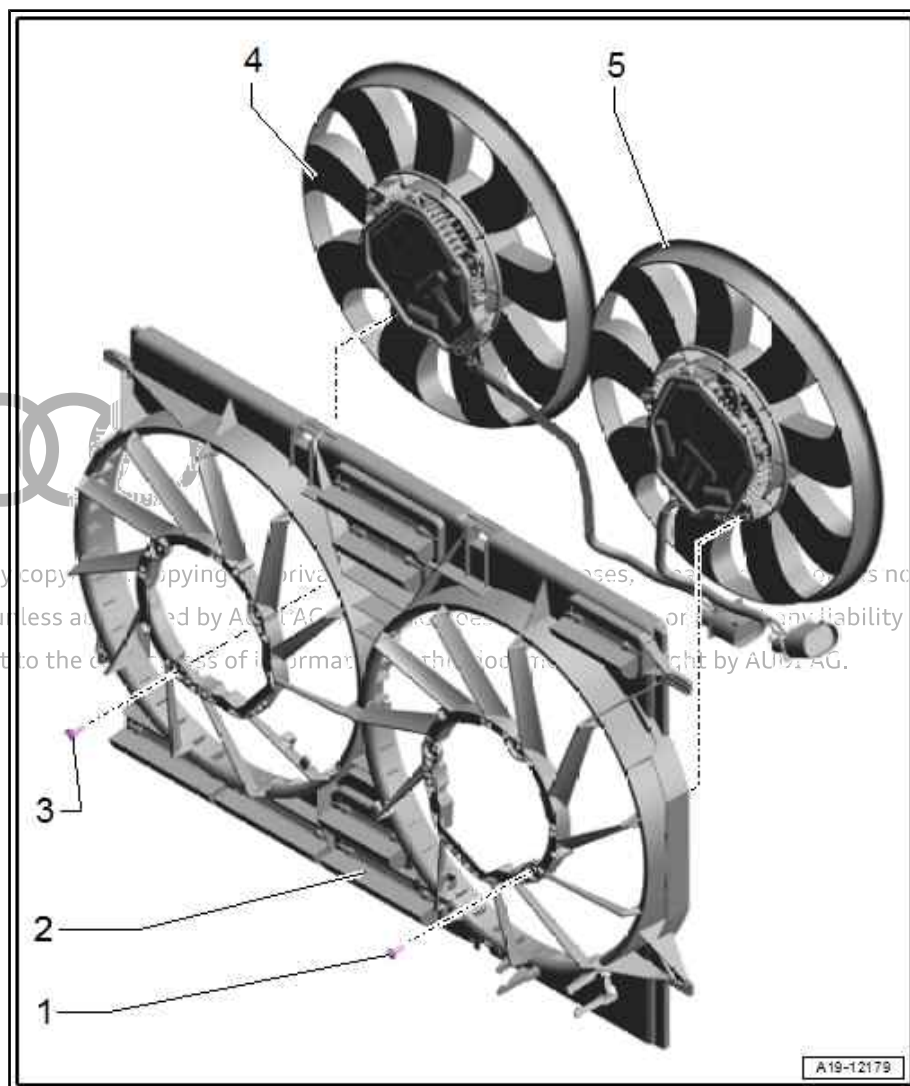
- 5 Nm

4 - Radiator fan - V7-

- With radiator fan control
unit - J293-
- Removing and installing
⇒ ["4.6 Removing and installing radiator fan V7"](#),
[page 192](#)

5 - Radiator fan 2 - V177-

- With radiator fan control
unit 2 - J671-
- Removing and installing
⇒ ["4.6 Removing and installing radiator fan V7"](#),
[page 192](#)





4.2 Exploded view - radiator blind

1 - Air guide

2 - Radiator blind

- ❑ Removing and installing
⇒ ["4.7 Removing and installing radiator blind"](#),
page 193

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
⇒ ["4.8 Removing and installing radiator blind control motor V544"](#),
page 194

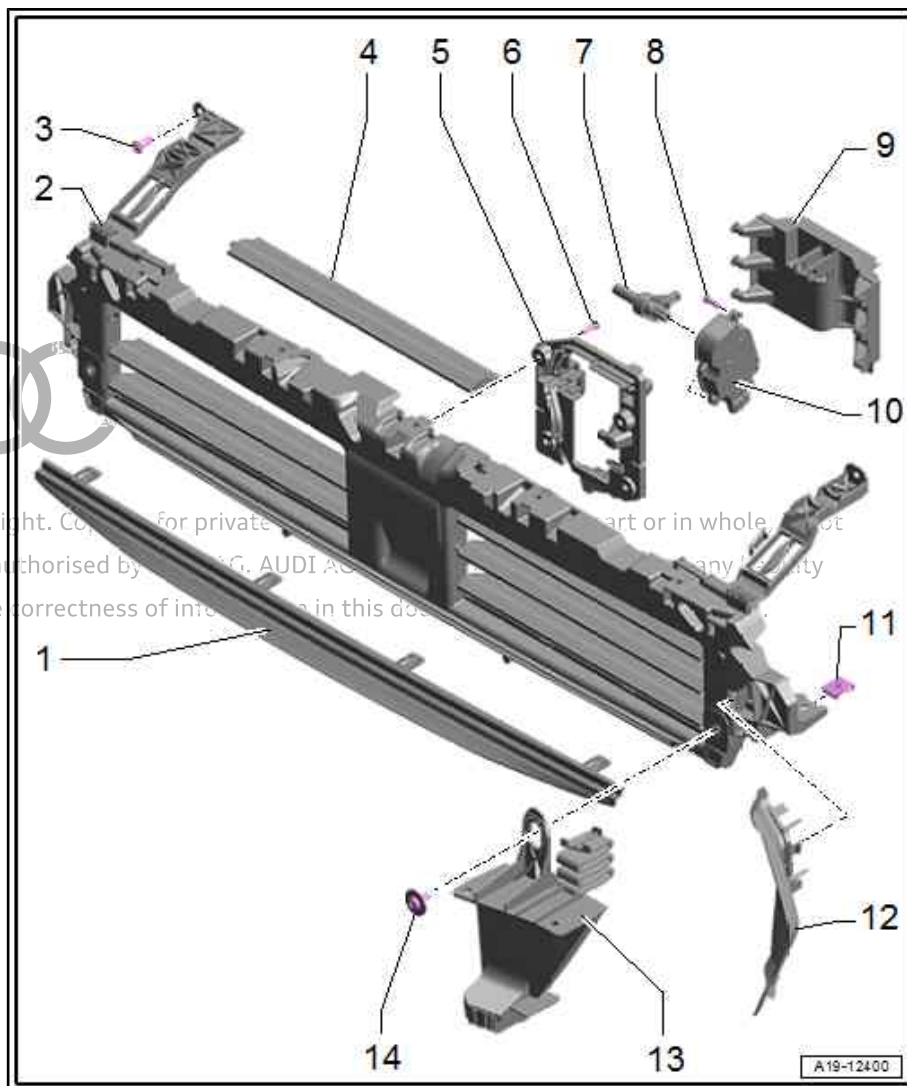
11 - Speed nut

12 - Air guide

13 - Spring element

14 - Bolt

- ❑ 8 Nm





4.3 Exploded view - auxiliary radiator

1 - Air duct

2 - Auxiliary radiator (bottom front)

- ☐ Removing and installing
⇒ [“4.9.1 Removing and installing auxiliary radiator \(bottom front\) - vehicles with 2.9 ltr. engine”, page 195](#)

3 - Grommet

4 - Bolt

- ☐ Tightening torque:

- ◆ Radiator with cast chamber: 6 Nm
- ◆ Radiator with plastic chamber: 3.4 Nm

5 - Air duct

6 - Cooler for gearbox coolant circuit

7 - Grommet

8 - Coolant hose

9 - Nut

- ☐ 9 Nm

10 - O-ring

- ☐ Renew after removing

11 - Bleeder screw

- ☐ Screw in by hand until contact is made

12 - Air duct

13 - Auxiliary radiator (front right)

- ☐ Removing and installing
⇒ [“4.9.4 Removing and installing auxiliary radiator \(right-side\) - vehicles with 2.9 ltr. engine”, page 202](#)

14 - Nut

- ☐ 20 Nm

15 - Grommet

16 - Bracket

- ☐ For auxiliary radiator

17 - Nut

- ☐ 9 Nm

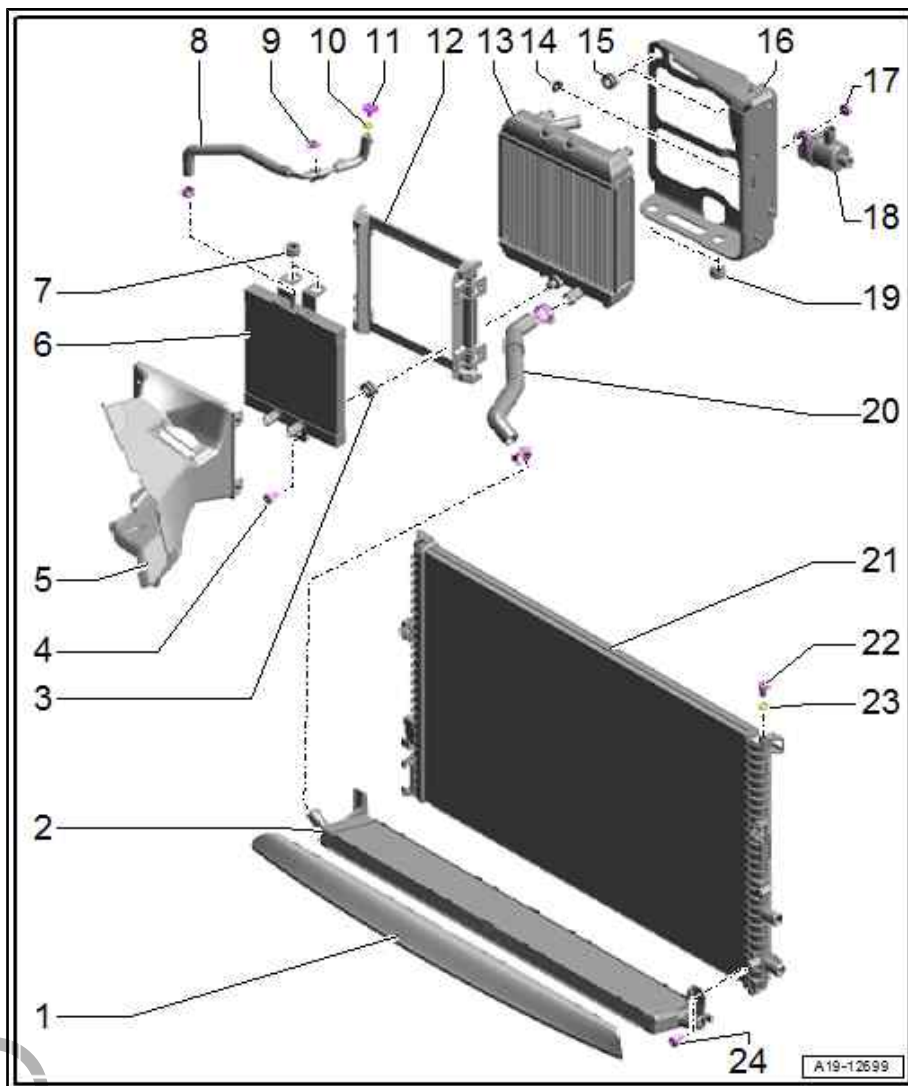
18 - Thermostat

19 - Grommet

20 - Coolant hose

21 - Auxiliary radiator (front)

- ☐ Removing and installing
⇒ [“4.9.2 Removing and installing auxiliary radiator \(front\) - vehicles with 2.9 ltr. engine”, page 198](#)





- ❑ Renew auxiliary radiator if fasteners for condenser are damaged

22 - Bleeder screw

- ❑ 2 Nm

23 - O-ring

24 - Bolt

- ❑ 5 Nm

4.4 Removing and installing radiator

⇒ [“4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine”, page 181](#)

⇒ [“4.4.2 Removing and installing radiator - vehicles with 3.0 ltr. engine”, page 185](#)

4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine

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

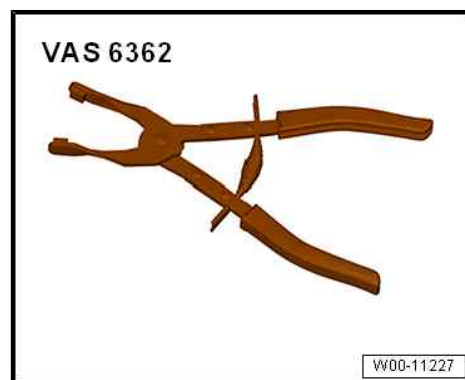
Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



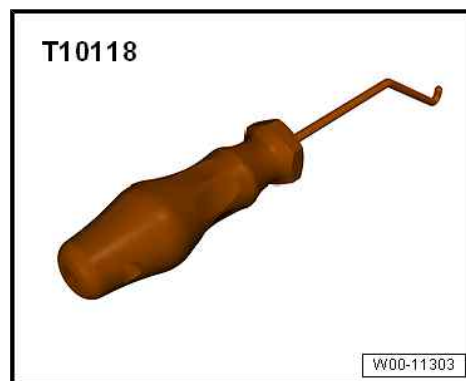
- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-

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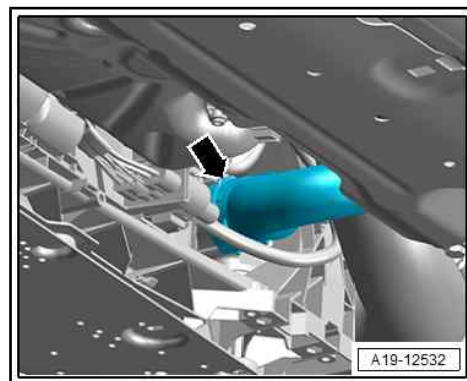


◆ Assembly tool - T10118-



Removing

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove bracket for bumper cover together with impact bar ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -arrow-, disconnect coolant hose from radiator and drain off coolant.

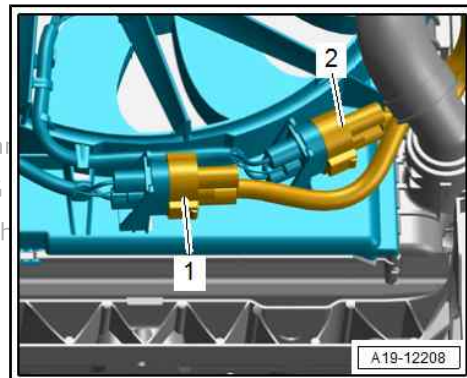


WARNING

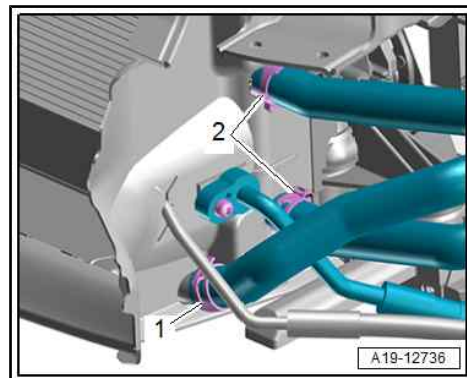
Your hands can be injured if the radiator fan starts up automatically.

- ***Do not reach into the radiator fan when unplugging the connector.***

- Unplug electrical connectors -1, 2- for radiator fan.

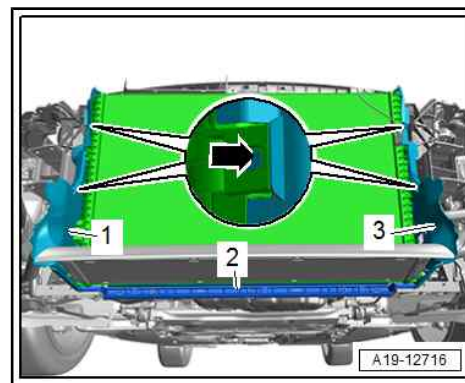


- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Release hose clip -1- on both sides and detach coolant hose.
- Release hose clips -2, 3- and disconnect coolant hoses.

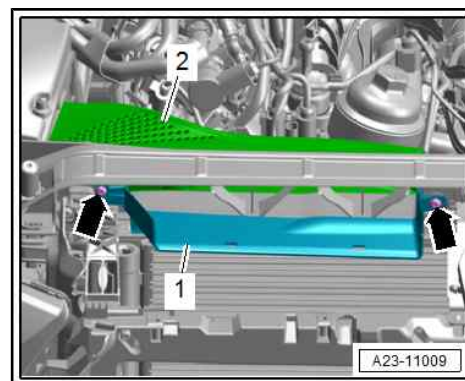




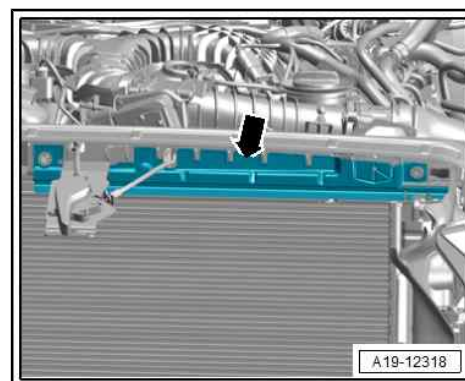
- Release fasteners -arrow-.
- Detach air duct -1- and unfasten air duct -3-, leaving it in installation position.
- Unclip air duct -2-.



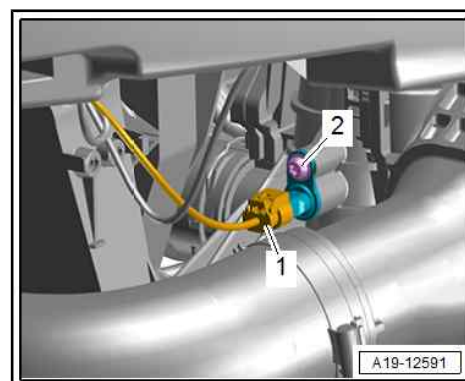
- Remove bolts -arrows- and detach air duct -1-.



- Detach air duct (top) -arrow-.



- Unplug electrical connector -1- for radiator outlet coolant temperature sender - G83- .



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- Unplug electrical connector -1- for high-pressure sender - G65- .



Caution

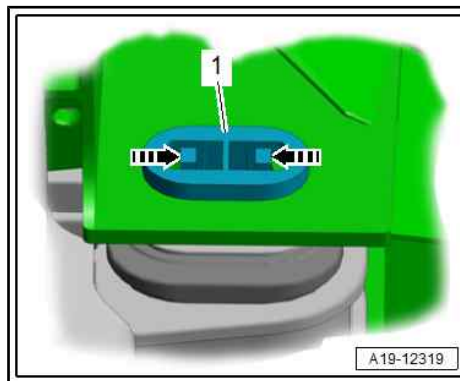
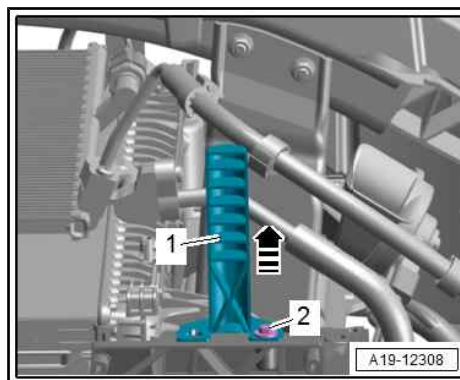
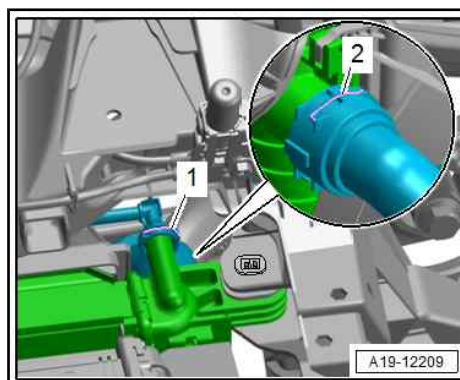
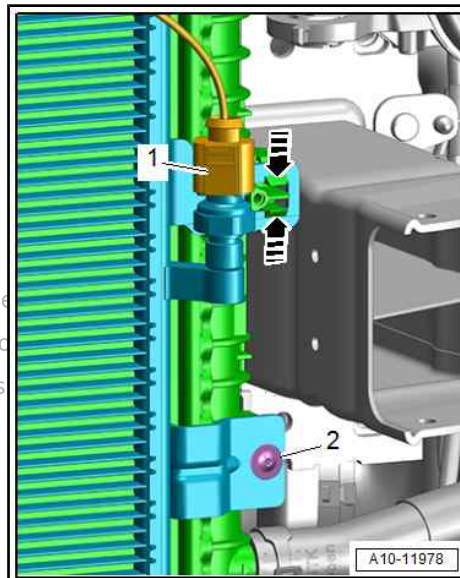
Risk of irreparable damage to auxiliary radiator (front).

- ◆ **The auxiliary radiator (front) must be renewed if the fasteners are damaged.**

Risk of damage to refrigerant lines and hoses

- ◆ **Do NOT stretch, kink or bend refrigerant lines and hoses.**

- Remove bolt -1-.
- Release fasteners -arrows- on both sides, disengage condenser -2- from radiator and tie up to one side.
- Lift retaining clips -1, 2-, detach coolant connection from radiator and move connection clear.
- 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.
- If necessary, detach auxiliary radiators (front and bottom front).



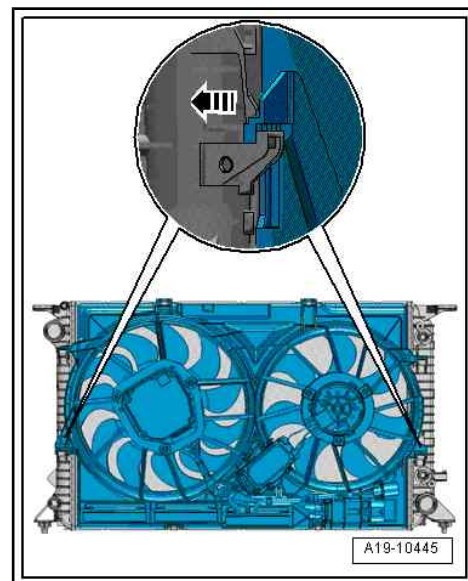


- Press locking tabs on left and right sides of radiator cowl together -arrow- and lift radiator cowl off radiator.

Installing

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

- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers .
- Renew radiator if fasteners are damaged.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install condenser ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit .
- Connect coolant hose and coolant connection with plug-in connector
⇒ Fig. [“Connecting coolant hose with plug-in connector”](#), page 176 .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”](#), page 122 .



Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”](#), page 175
- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”](#), page 244
- ◆ ⇒ 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

4.4.2 Removing and installing radiator - vehicles with 3.0 ltr. engine

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

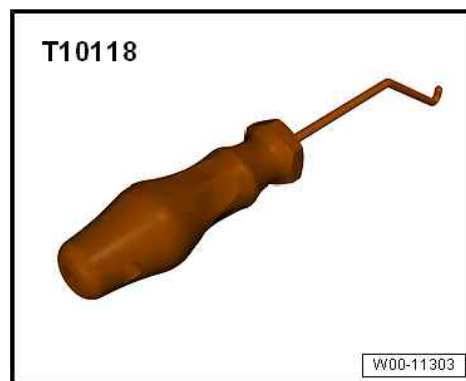
Special tools and workshop equipment required

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



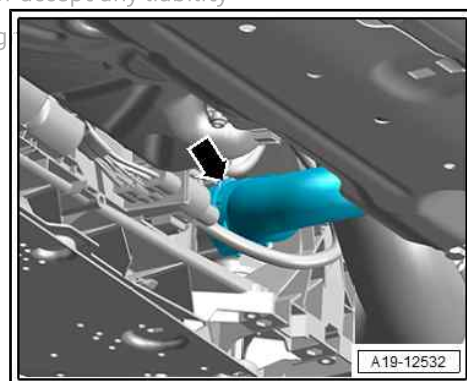


◆ Assembly tool - T10118-



Removing

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Equipment version 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 .
- Equipment version with radiator blind: Remove impact bar together with radiator blind ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
- A4 with LED and matrix LED headlights: Remove headlight (left side) ⇒ Electrical system; Rep. gr 94 ; Headlights; Removing and installing headlights .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -arrow-, disconnect coolant hose from radiator and drain off coolant.

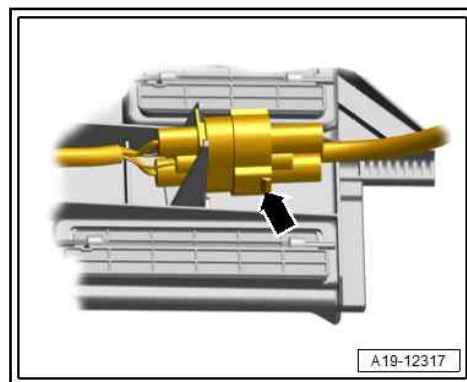


WARNING

Your hands can be injured if the radiator fan starts up automatically.

- *Do not reach into the radiator fan when unplugging the connector.*

- Unplug electrical connector -arrow- for radiator fan.



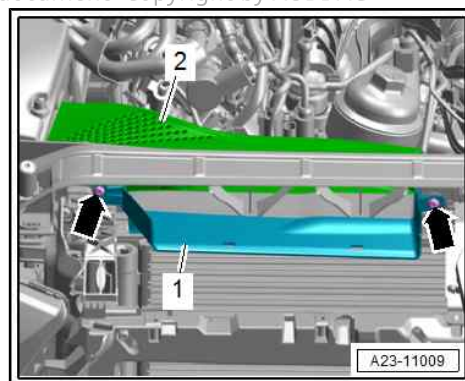
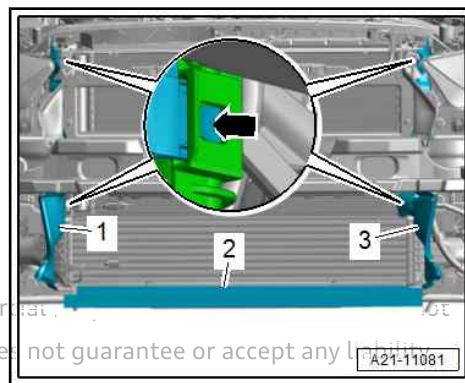


- Release catches -arrow- and detach air ducts -1, 3-.
- Unclip air duct -2-.

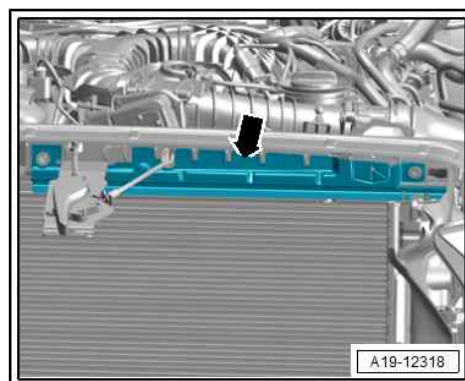


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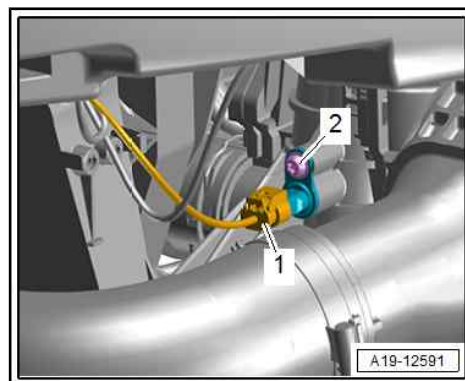
- Remove bolts -arrows- and detach air duct -1-.



- Detach air duct (top) -arrow-.



- Unplug electrical connector -1- for radiator outlet coolant temperature sender - G83- .
- Remove charge air cooler
⇒ [“2.4.2 Removing and installing charge air cooler - vehicles with 3.0 ltr. engine”, page 223](#) .





- Unplug electrical connector -2- for high-pressure sender - G65- .



Caution

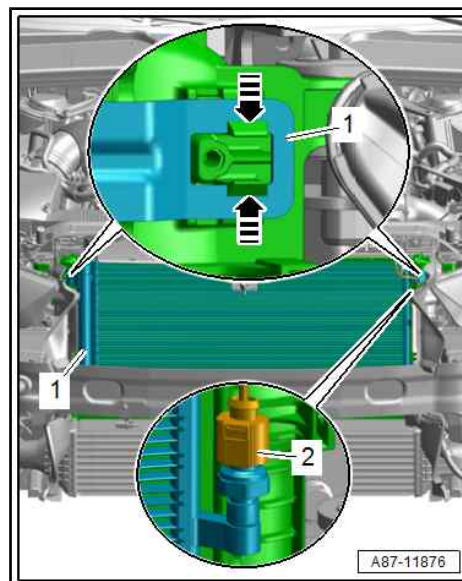
Risk of irreparable damage to radiator.

- ◆ **The radiator must be renewed if the fasteners are damaged.**

Risk of damage to refrigerant lines and hoses

- ◆ **Do NOT stretch, kink or bend refrigerant lines and hoses.**

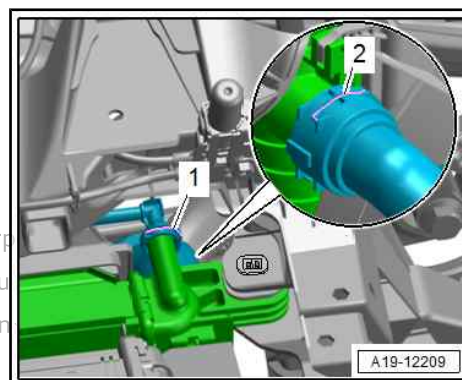
- Release fasteners -arrows- on both sides, disengage condenser -1- from radiator and tie up to one side.



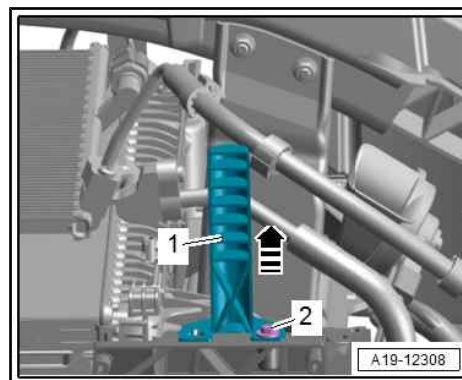
- Lift retaining clips -1, 2-, detach coolant connection from radiator and move connection clear.



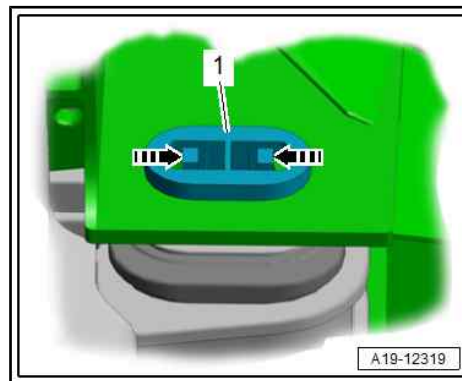
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- Remove bolt -2- on both sides and press radiator bracket -1- with radiator towards front -arrow-.



- 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:

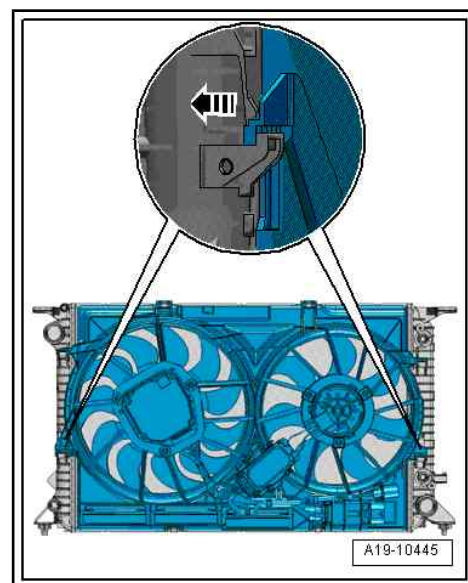
- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers .
- Renew radiator if fasteners are damaged.
- Do not reuse coolant.
- Install charge air cooler
⇒ [“2.4.2 Removing and installing charge air cooler - vehicles with 3.0 ltr. engine”, page 223](#) .
- Connect coolant hose and coolant connection with plug-in connector
⇒ Fig. [““Connecting coolant hose with plug-in connector””, page 176](#) .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .
- If removed: Install headlight (left-side) ⇒ Electrical system; Rep. gr. 94 ; Headlights; Removing and installing headlights .

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 175](#)

- ◆ ⇒ 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



4.5 Removing and installing radiator cowl

⇒ [“4.5.1 Removing and installing radiator cowl - vehicles with 2.9 ltr. engine”, page 189](#)

⇒ [“4.5.2 Removing and installing radiator cowl - vehicles with 3.0 ltr. engine”, page 189](#)

4.5.1 Removing and installing radiator cowl - vehicles with 2.9 ltr. engine

The radiator cowl is removed and installed together with the radiator

⇒ [“4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine”, page 181](#) .

4.5.2 Removing and installing radiator cowl - vehicles with 3.0 ltr. engine

Special tools and workshop equipment required



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



Removing

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove charge air cooler
⇒ ["2.4.2 Removing and installing charge air cooler - vehicles with 3.0 ltr. engine", page 223](#) .
- Unplug electrical connector -2- for high-pressure sender - G65- .



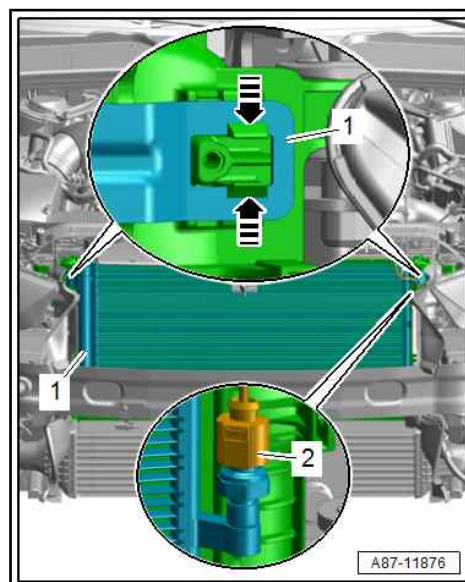
Caution

Risk of irreparable damage to radiator.

- ◆ *The radiator must be renewed if the fasteners are damaged.*

Risk of damage to refrigerant lines and hoses.

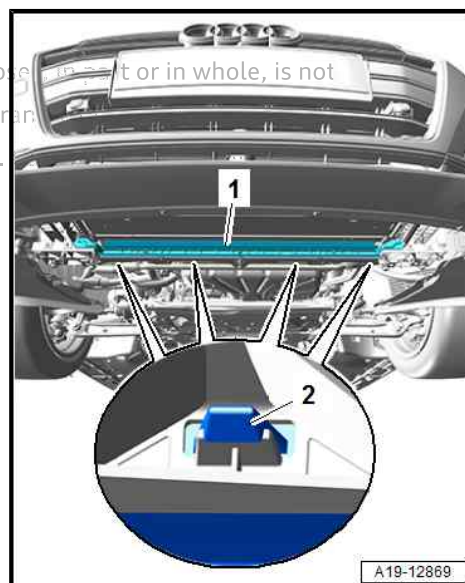
- ◆ *Do NOT stretch, kink or bend refrigerant lines and hoses.*



- Release fasteners -arrows- on both sides, disengage condenser -1- from radiator and tie up to one side.



- Release catches -2- and detach air duct (bottom) -1- for radiator.



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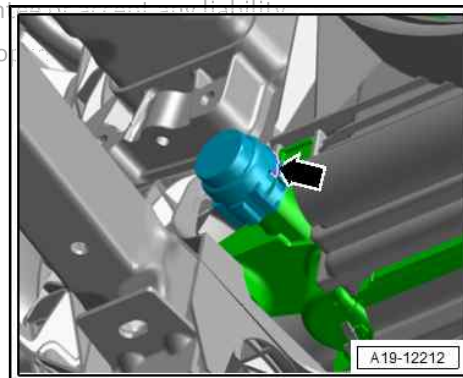
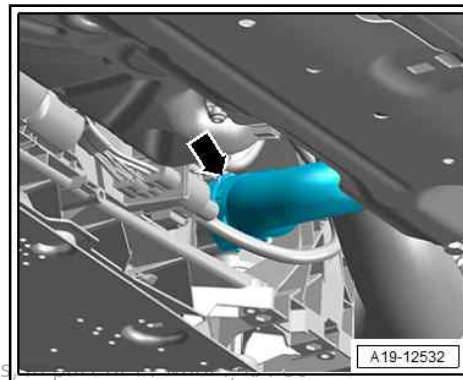


- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Lift retaining clip -arrow-, disconnect coolant hose from radiator and drain off coolant.



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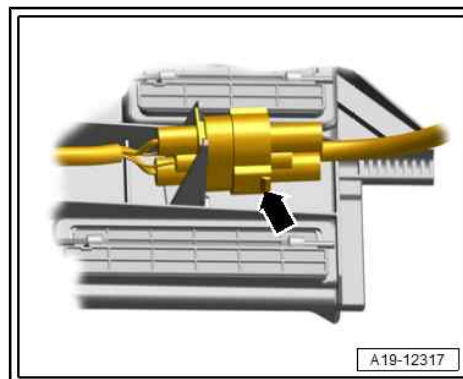
- Lift retaining clip -arrow- and remove sealing plug (bottom left) on radiator.



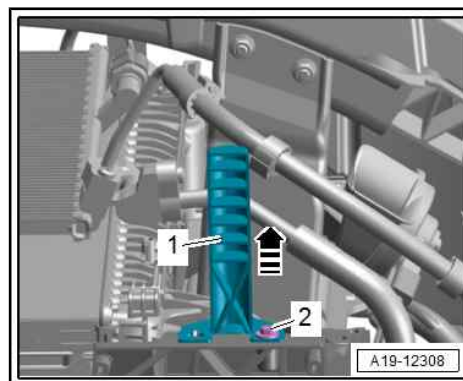
WARNING

Your hands can be injured if the radiator fan starts up automatically.

- *Do not reach into the radiator fan when unplugging the connector.*



- Unplug electrical connector -arrow- for radiator fan.
- Remove bolt -2- (both sides) for radiator bracket -1-.

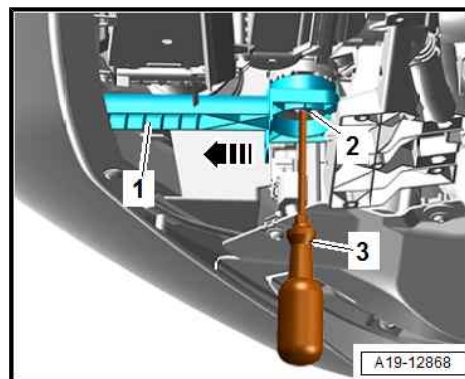




- Remove bolt -2- (both sides) for radiator bracket -1- using suitable tool -3-.
- Detach radiator bracket -1- (both sides) in direction of -arrow-.

Note:

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

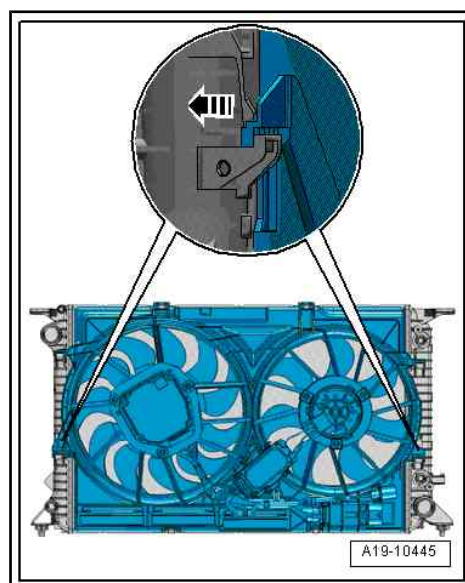


- Press locking tabs on left and right sides of radiator cowl -arrow- and at the same time lift radiator cowl off radiator.
- Take radiator cowl out downwards between radiator and lock carrier, pressing bottom of radiator module as far forwards as possible.

Installing

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

- Do not reuse coolant.
- Install charge air cooler
⇒ [“2.4.2 Removing and installing charge air cooler - vehicles with 3.0 ltr. engine”, page 223](#) .
- Connect sealing plug with plug-in connector
⇒ [Fig. “Connecting coolant hose with plug-in connector”, page 176](#) .
- Fill up with coolant
⇒ [“1.3.2 Draining and filling cooling system - vehicles with 3.0 ltr. engine”, page 128](#) .



Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 175](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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4.6 Removing and installing radiator fan - V7-

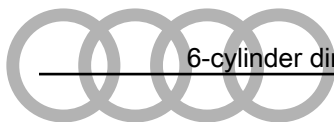
⇒ [“4.6.1 Removing and installing radiator fan V7 / V177 - vehicles with 2.9 ltr. engine”, page 192](#)

⇒ [“4.6.2 Removing and installing radiator fan V7 - vehicles with 3.0 ltr. engine”, page 193](#)

4.6.1 Removing and installing radiator fan - V7- / -V177- - vehicles with 2.9 ltr. engine

Removing

- Secure all cable ties in the same locations when re-installing.
- Remove radiator
⇒ [“4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine”, page 181](#) .



- Move electrical wiring harness clear.

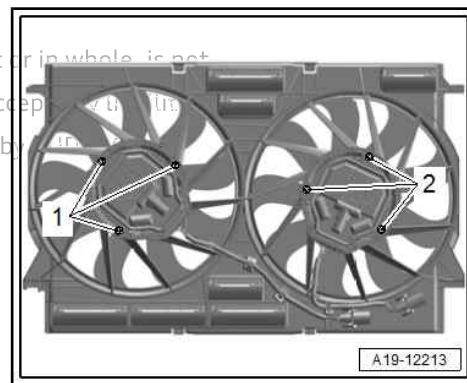
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- Unscrew bolts -1- or -2- and remove the corresponding radiator fan.

Installing

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

- Install radiator
⇒ [“4.4.1 Removing and installing radiator - vehicles with 2.9 ltr. engine”, page 181](#) .



4.6.2 Removing and installing radiator fan - V7- - vehicles with 3.0 ltr. engine

Removing

- Secure all cable ties in the same locations when re-installing.
- Remove radiator cowl
⇒ [“4.5.2 Removing and installing radiator cowl - vehicles with 3.0 ltr. engine”, page 189](#) .
- Move electrical wiring harness clear.
- Unscrew bolts -arrows- and remove radiator fan.

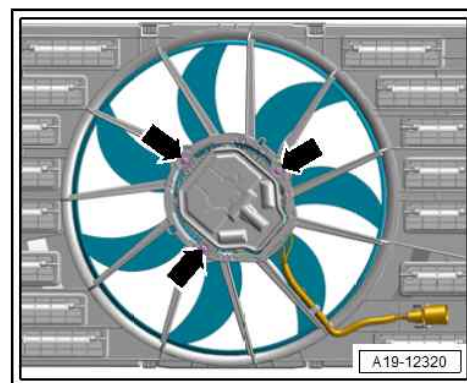
Note:

Missing balancing clamps on fan wheel can cause noises due to imbalances.

Installing

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

- Install radiator cowl
⇒ [“4.5.2 Removing and installing radiator cowl - vehicles with 3.0 ltr. engine”, page 189](#) .



Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 175](#)

4.7 Removing and installing radiator blind

Removing

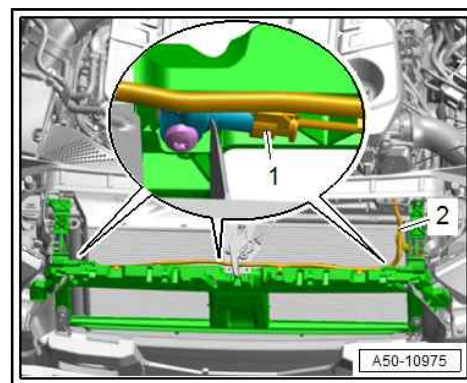
- Remove impact bar ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing impact bar .



WARNING

Risk of injury if components are triggered inadvertently.

- ◆ *Before handling pyrotechnic components (e.g. plugging in the electrical connector) the mechanic must discharge any static electricity. This can be done by briefly touching the door striker plate, or similar.*



- Equipment version 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 -1- towards front.

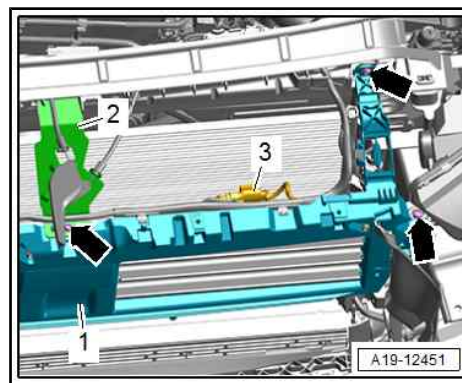
Installing

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

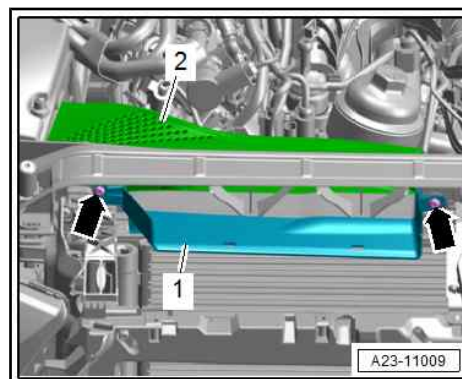
- ♦ ⇒ ["4.2 Exploded view - radiator blind", page 179](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 55 ; Bonnet; Exploded view - Bowden cable



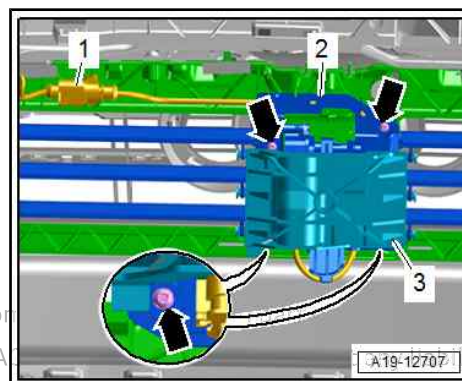
4.8 Removing and installing radiator blind control motor - V544-

Removing

- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove bolts -arrows- and detach air duct -1-.



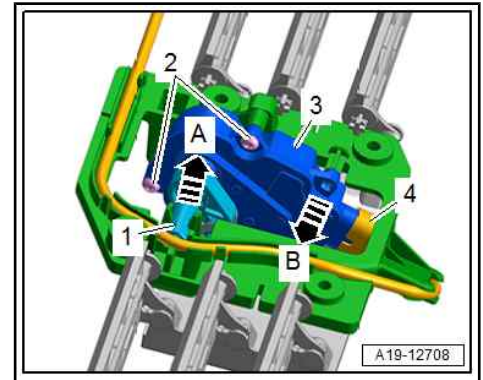
- Take electrical connector -1- for radiator blind control motor - V544- out of bracket and unplug it.
- Carefully press connecting piece -3- upwards/downwards and unscrew bolts -arrows-.
- Detach control motor with bracket -2- and fins.



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- Unplug electrical connector -4- at radiator blind control motor - V544- -item 3-.
- Remove bolts -2-.
- Carefully unclip coupling -1- -arrow A- and at the same time, detach it from bracket -5- together with control motor -arrow B-.
- Pull off and detach control motor from coupling.

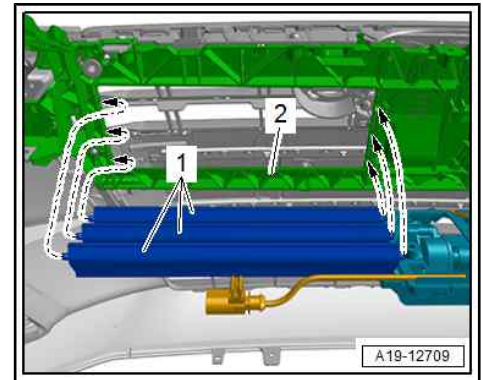


Installing

- Bring radiator blind control motor - V544- with bracket and fins into installation position:
- Insert fins -1- one after another on both sides into holes on radiator blind -2- -left arrows-.
- On both sides, guide fins into recesses on radiator blind -right arrows-.

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

- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



- If radiator blind control motor - V544- was renewed, perform corresponding adaption listed in Guided Function "0001 - Functions, engine mechanics" ⇒ Vehicle diagnostic tester.

Tightening torques

- ◆ ⇒ ["4.2 Exploded view - radiator blind", page 179](#)
- ◆ ⇒ ["3.1 Exploded view - air cleaner housing", page 244](#)

4.9 Removing and installing auxiliary radiator

⇒ ["4.9.1 Removing and installing auxiliary radiator \(bottom front\) - vehicles with 2.9 ltr. engine", page 195](#)

⇒ ["4.9.2 Removing and installing auxiliary radiator \(front\) - vehicles with 2.9 ltr. engine", page 198](#)

⇒ ["4.9.3 Removing and installing cooler for gearbox coolant circuit - vehicles with 2.9 ltr. engine", page 200](#)

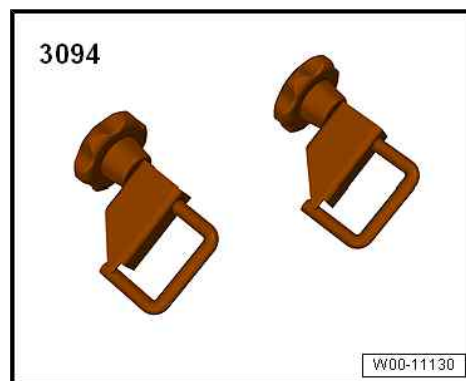
⇒ ["4.9.4 Removing and installing auxiliary radiator \(right-side\) - vehicles with 2.9 ltr. engine", page 202](#)

4.9.1 Removing and installing auxiliary radiator (bottom front) - vehicles with 2.9 ltr. engine

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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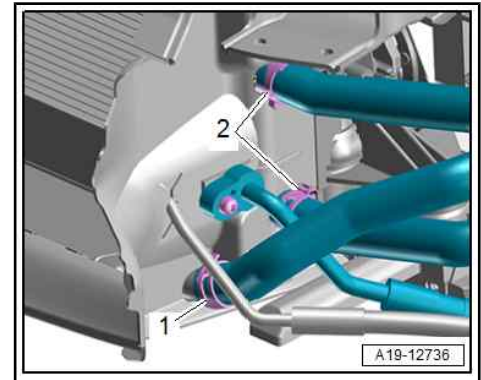


Removing

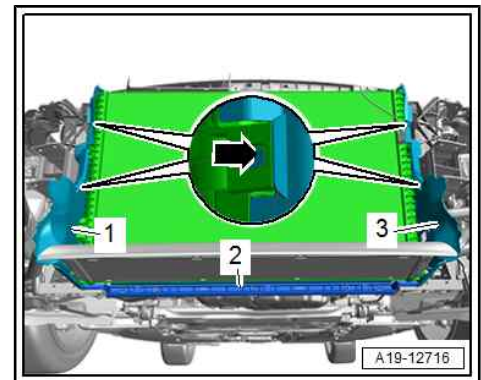
- Remove bracket for bumper cover together with impact bar ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier .
- Vehicles with particulate filter: Remove catalytic converter (left-side)
⇒ [“2.2.2 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine with particulate filter”, page 277](#) .



- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Clamp off and detach coolant hoses using hose clamps up to 25 mm - 3094- on both sides (release hose clip -1- to do so).



- Release fasteners -arrow-.
- Detach air duct -1- and unfasten air duct -3-, leaving it in installation position.
- Unclip air duct -2-.



- Unplug electrical connector -2- for high-pressure sender - G65- .



Caution

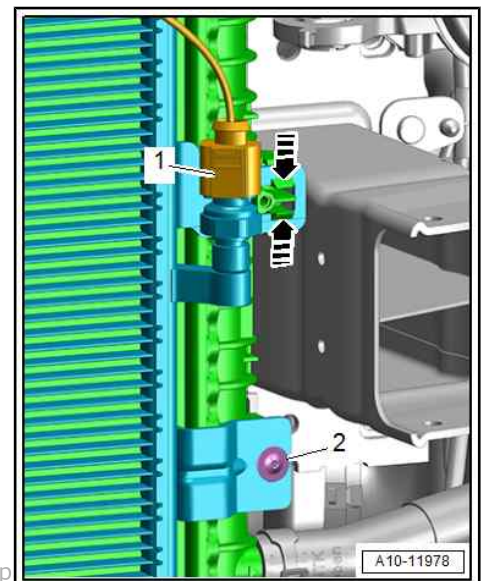
Risk of irreparable damage to auxiliary radiator (front).

- ◆ ***The auxiliary radiator (front) must be renewed if the fasteners are damaged.***

Risk of damage to refrigerant lines and hoses

- ◆ ***Do NOT stretch, kink or bend refrigerant lines and hoses.***

- Remove bolt -2-.
- Release fasteners -arrows- on both sides, disengage condenser from radiator and tie up to one side.



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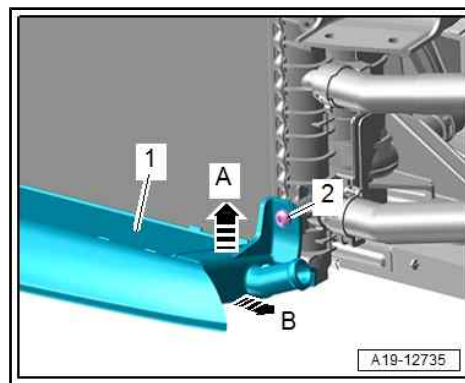


- Remove bolt -arrow-.
- Disengage left side of auxiliary radiator -1-upwards -arrow A- and detach it towards left side -arrow B-.

Installing

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

- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers .
- Renew radiator if fasteners are damaged.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install condenser ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit .
- If removed previously, install catalytic converter
⇒ [“2.2.2 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine with particulate filter”, page 277](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



Tightening torques

- ♦ ⇒ [“4.3 Exploded view - auxiliary radiator”, page 180](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier

4.9.2 Removing and installing auxiliary radiator (front) - vehicles with 2.9 ltr. engine

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-

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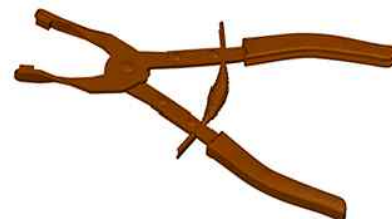
VAS 6208



W00-11209

- ◆ Hose clip pliers - VAS 6362-

VAS 6362



W00-11227



Removing

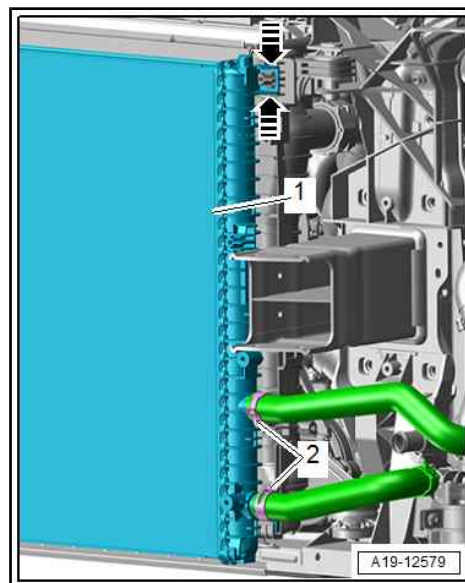
- Remove auxiliary radiator (bottom front)
⇒ [“4.9.1 Removing and installing auxiliary radiator \(bottom front\) - vehicles with 2.9 ltr. engine”, page 195](#) .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -2- and disconnect hoses.



Caution

Risk of irreparable damage to radiator.

- ◆ *The radiator must be renewed if the fasteners are damaged.*



- Release fastener -arrow- on both sides, disengage auxiliary radiator -1- from radiator and detach.

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Installation is carried out in reverse order; note the following: not guarantee or accept any liability

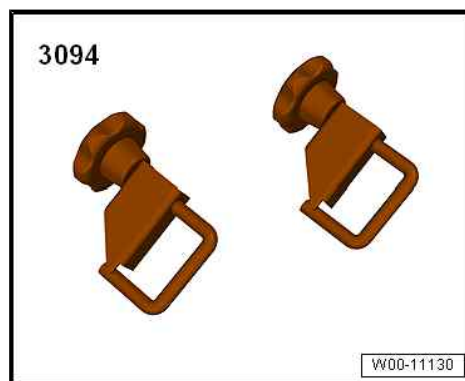
- If there are slight impressions on the fins, refer to → Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers .

- Renew radiator if fasteners are damaged.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install auxiliary radiator (bottom front)
⇒ [“4.9.1 Removing and installing auxiliary radiator \(bottom front\) - vehicles with 2.9 ltr. engine”, page 195](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .

4.9.3 Removing and installing cooler for gear-box coolant circuit - vehicles with 2.9 ltr. engine

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-



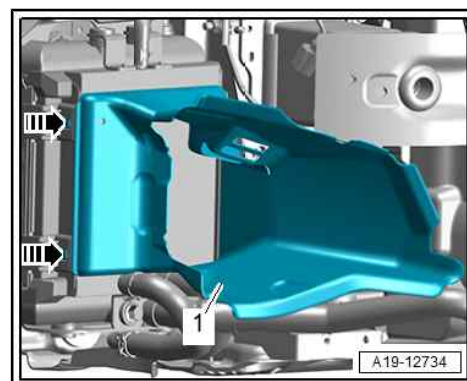
- ◆ Hose clip pliers - VAS 6362-



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Removing

- Remove bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Release fasteners -arrows- on both sides and detach air duct -1-.



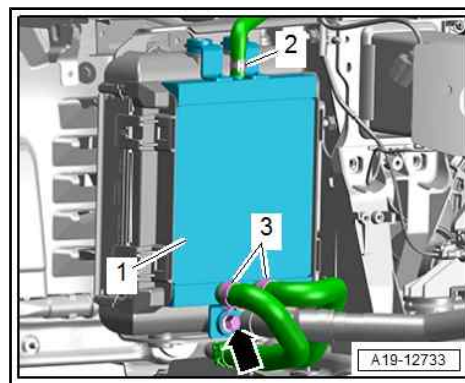


- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -3- and disconnect hoses.
- Release hose clip -1- and disconnect coolant hose.
- Unscrew bolt -arrow-, disengage bottom of cooler -1- towards front and then upwards and detach it.

Installing

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

- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers .
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



Tightening torques

- ◆ ⇒ [“4.3 Exploded view - auxiliary radiator”, page 180](#)

4.9.4 Removing and installing auxiliary radiator (right-side) - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



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



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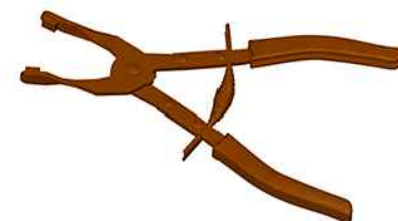
- ◆ Hose clip pliers - VAS 6362-

VAS 6208



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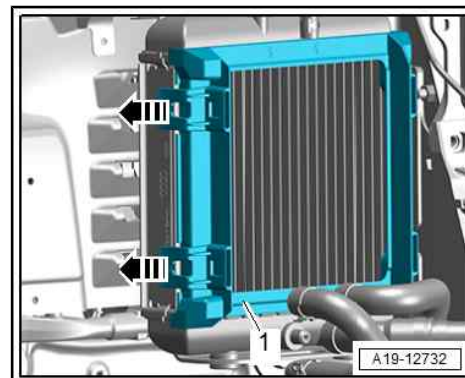
VAS 6362



W00-11227

Removing

- Remove cooler for gearbox coolant circuit
⇒ [“4.9.3 Removing and installing cooler for gearbox coolant circuit - vehicles with 2.9 ltr. engine”, page 200](#) .
- Release fasteners -arrows- on both sides and detach air duct -1-.



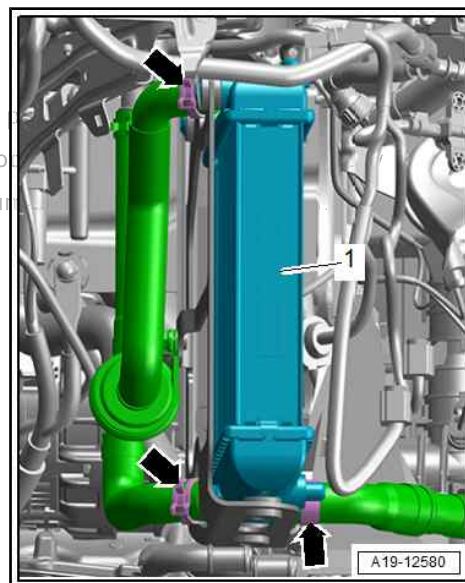
A19-12732



- 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 -arrows- and disconnect hoses.
- Disengage top of auxiliary radiator -1- forwards and then upwards and detach it.

Installing

- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers .
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Install cooler for gearbox coolant circuit
⇒ [“4.9.3 Removing and installing cooler for gearbox coolant circuit - vehicles with 2.9 ltr. engine”, page 200](#) .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .





21 – Turbocharging/supercharging

1 Turbochargers

⇒ [“1.1 Exploded view - turbochargers”, page 205](#)

⇒ [“1.2 Removing and installing turbocharger”, page 205](#)

⇒ [“1.3 Renewing vacuum unit for turbocharger”, page 207](#)

⇒ [“1.4 Removing and installing temperature sender for engine cover panel G765”, page 207](#)

1.1 Exploded view - turbochargers

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21; Turbochargers; Exploded view - turbocharger .

1.2 Removing and installing turbocharger

⇒ [“1.2.1 Removing and installing turbocharger, cylinder bank 1 \(right-side\) - vehicles with 2.9 ltr. engine”, page 205](#)

⇒ [“1.2.2 Removing and installing turbocharger, cylinder bank 2 \(left-side\) - vehicles with 2.9 ltr. engine”, page 205](#)

⇒ [“1.2.3 Removing and installing turbocharger - vehicles with 3.0 ltr. engine”, page 206](#)

1.2.1 Removing and installing turbocharger, cylinder bank 1 (right-side) - vehicles with 2.9 ltr. engine

Removing

- Unbolt air pipe (top)
⇒ [“2.3 Removing and installing air pipe”, page 211](#) and swivel it to left side.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21; Turbochargers; Removing and installing turbochargers .

Installing

Additional work:

- Install air pipe (top)
⇒ [“2.3 Removing and installing air pipe”, page 211](#).

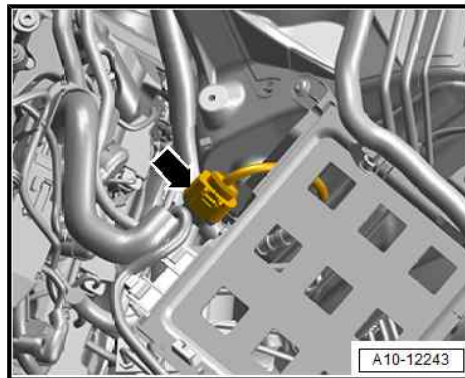
1.2.2 Removing and installing turbocharger, cylinder bank 2 (left-side) - vehicles with 2.9 ltr. engine

Removing

- Unbolt air pipe (top)
⇒ [“2.3 Removing and installing air pipe”, page 211](#) and swivel it to left side.
- Remove engine control unit - J623-
⇒ [“9.2 Removing and installing engine/motor control unit J623”, page 257](#) .



- Move electrical connector -arrow- clear.



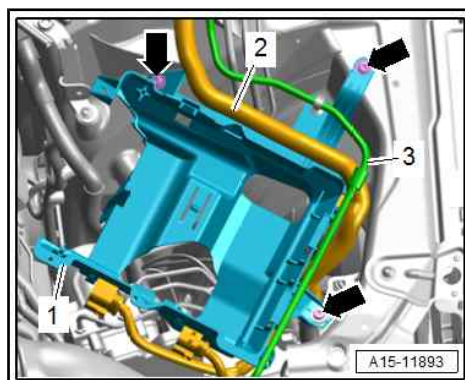
- Move coolant line -3- and electrical wiring harness clear.
- Remove bolts -arrows- and detach bracket -1- for engine control unit.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Removing and installing turbochargers .

Installing

Additional work:

- Install air pipe (top)
⇒ [“2.3 Removing and installing air pipe”, page 211](#) .



Tightening torques

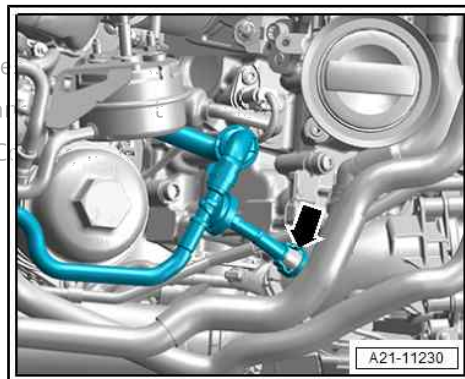
- ♦ ⇒ [“9.1 Exploded view - engine control unit”, page 257](#)

1.2.3 Removing and installing turbocharger - vehicles with 3.0 ltr. engine

Removing

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove air pipe (top)
⇒ [“2.3 Removing and installing air pipe”, page 211](#) .
- Remove air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .
- Press release tabs on both sides and disconnect hose -arrow- for activated charcoal filter system.

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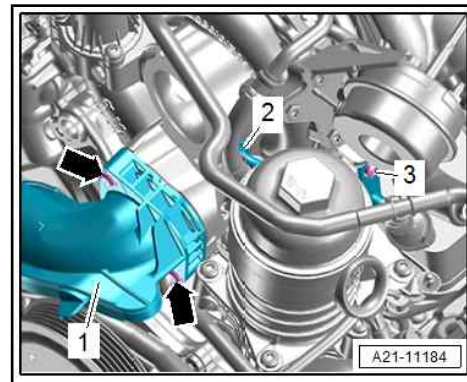
- Remove bolts -arrows- for air pipe -1-.
- Unscrew bolt -3-, detach line -2- for activated charcoal filter system and move it to one side.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Removing and installing turbochargers .

Installing

Additional work:

- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .



1.3 Renewing vacuum unit for turbocharger

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Renewing vacuum unit for turbocharger .

1.4 Removing and installing temperature sender for engine cover panel - G765-

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers ; Removing and installing temperature sender for engine cover panel - G765- .



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2 Charge air system

⇒ [“2.1 Exploded view - charge air system”, page 208](#)

⇒ [“2.2 Exploded view - hose connections for charge air system”, page 211](#)

⇒ [“2.3 Removing and installing air pipe”, page 211](#)

⇒ [“2.4 Removing and installing charge air cooler”, page 221](#)

⇒ [“2.5 Removing and installing charge pressure sender G31 ”, page 225](#)

⇒ [“2.6 Removing and installing charge air temperature sender”, page 226](#)

⇒ [“2.7 Removing and installing overrun air recirculation valve”, page 226](#)

⇒ [“2.8 Checking charge air system for leaks”, page 227](#)

2.1 Exploded view - charge air system

⇒ [“2.1.1 Exploded view - charge air system, vehicles with 2.9 ltr. engine”, page 208](#)

⇒ [“2.1.2 Exploded view - charge air system, vehicles with 3.0 ltr. engine”, page 210](#)

⇒ [“2.1.3 Exploded view - charge air system \(engine end\)”, page 210](#)

2.1.1 Exploded view - charge air system, vehicles with 2.9 ltr. engine



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1 - Coolant pipes

2 - Bolt

☐ 9 Nm

3 - Bolt

☐ 9 Nm

4 - Washer

5 - Grommet

6 - Bracket

For charge air cooler

7 - Air hose

8 - Nut

☐ 9 Nm

9 - Grommet

10 - Bonded rubber bush

11 - Nut

☐ 9 Nm

12 - Bracket

☐ For air pipe

13 - Air hose

14 - Bolt

☐ 9 Nm

15 - O-ring

☐ Renew after removing

16 - Bolt

☐ Repair method if fastener breaks off

☐ Thread-forming

☐ 7 Nm

17 - Charge pressure sender - G31-

☐ Removing and installing ⇒ ["2.5 Removing and installing charge pressure sender G31", page 225](#)

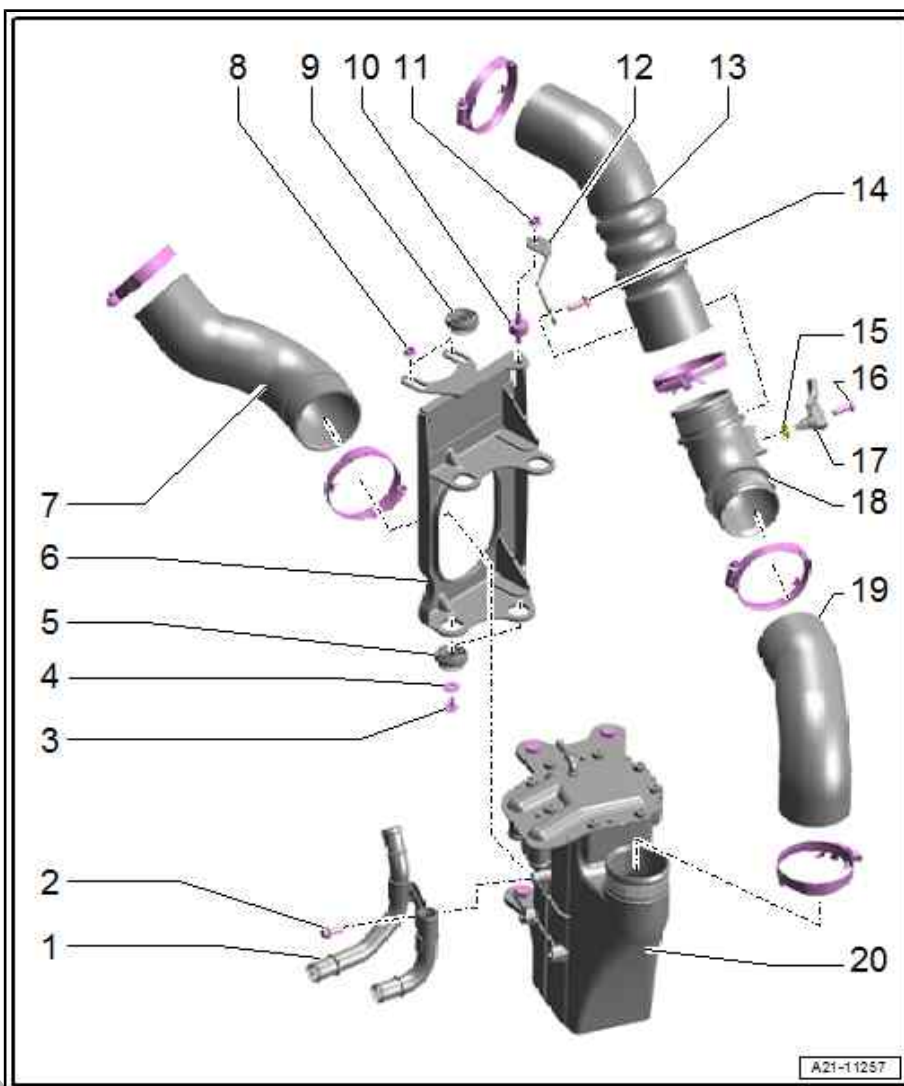
18 - Air pipe

19 - Air hose

20 - Charge air cooler

☐ Removing and installing

⇒ ["2.4.1 Removing and installing charge air cooler - vehicles with 2.9 ltr. engine", page 221](#)





2.1.2 Exploded view - charge air system, vehicles with 3.0 ltr. engine

1 - Charge air cooler

- ☐ Removing and installing
⇒ ["2.4.2 Removing and installing charge air cooler - vehicles with 3.0 ltr. engine", page 223](#)
- ☐ If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers

2 - Air hose

- ☐ Must be free of oil and grease when installing

3 - From turbocharger

4 - To intake manifold

5 - Seal

- ☐ Renew if damaged

6 - Charge pressure sender G31-

- ☐ Removing and installing
⇒ ["2.5 Removing and installing charge pressure sender G31", page 225](#)

7 - Bolt

- ☐ Repair method if fastener breaks off
- ☐ Thread-forming
- ☐ Fit and screw in bolt by hand so that it is screwed into old thread. Then tighten bolt to torque
- ☐ 7 Nm

8 - O-ring

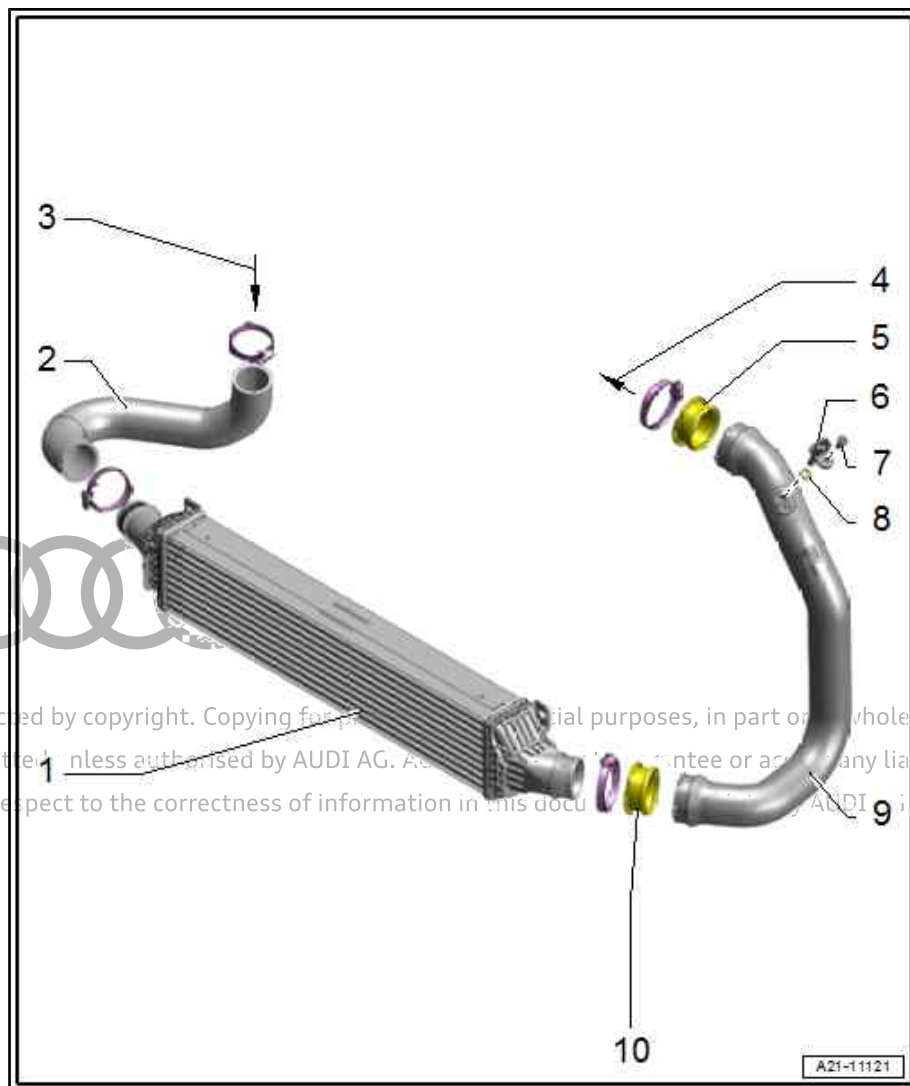
- ☐ Renew after removing

9 - Air pipe

- ☐ Must be free of oil and grease when installing

10 - Seal

- ☐ Renew if damaged



2.1.3 Exploded view - charge air system (engine end)

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system .



2.2 Exploded view - hose connections for charge air system

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system .

2.3 Removing and installing air pipe

⇒ "2.3.1 Removing and installing air pipe (top) with radiator fitted - vehicles with 2.9 ltr. engine", page 211

⇒ "2.3.2 Removing and installing air pipe (top) with radiator removed - vehicles with 2.9 ltr. engine", page 215

⇒ "2.3.3 Removing and installing air pipe (bottom) - vehicles with 2.9 ltr. engine", page 217

⇒ "2.3.4 Removing and installing air pipe (top) - vehicles with 3.0 ltr. engine", page 219

2.3.1 Removing and installing air pipe (top) with radiator fitted - vehicles with 2.9 ltr. engine

Complete procedure if radiator has NOT been removed during preparatory work

Special tools and workshop equipment required

- ◆ Socket Torx T30 - T10405-



- ◆ Insert tool, 8 mm - T10572-

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- ◆ Locking tool - T40098-



- ◆ Angled screwdriver - T40398- (not illustrated)

Removing

- Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

- Detach poly V-belt from air conditioner compressor using - T40098-
⇒ ["1.3 Removing and installing poly V-belts", page 85](#) .

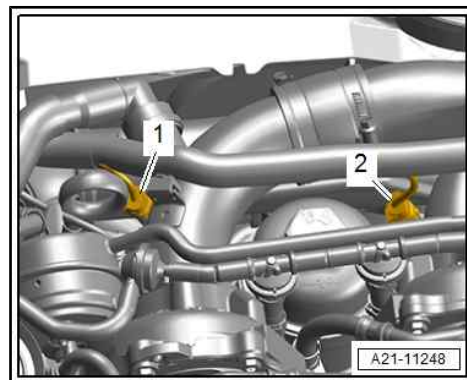
- Remove tensioner for air conditioner compressor and move it to one side ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket

- Remove air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#) .

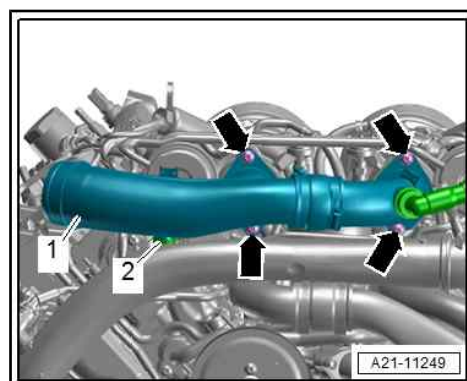
- Unplug electrical connectors and move electrical wiring harness clear:

- 1 - For temperature sender 2 for charge air cooler - G764-
- 2 - For temperature sender 1 for charge air cooler - G763-

- Remove oil filter element (⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter) and cover opening with a clean cloth.

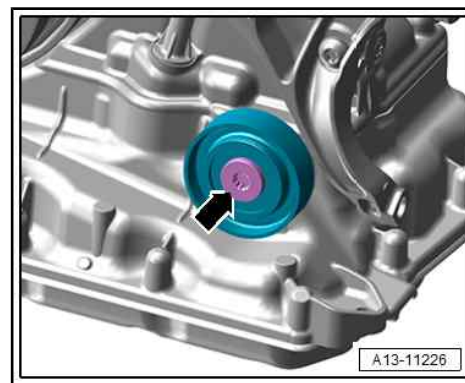


- Remove bolts -arrows-.
- Press release tabs on both sides and disconnect crankcase breather hose -2-.
- Move air pipe -1- to one side.

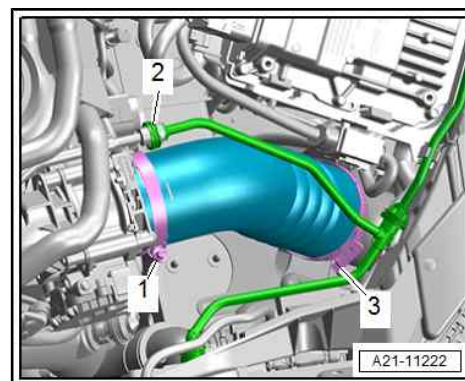




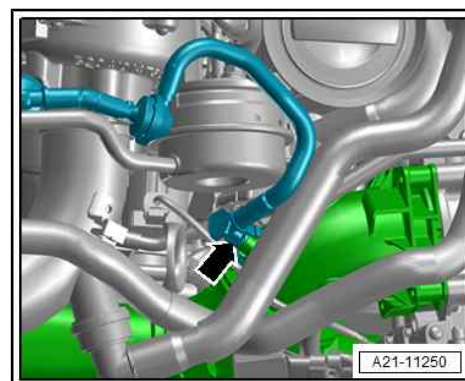
- Remove cover.
- Unscrew bolt -arrow- and remove idler roller.



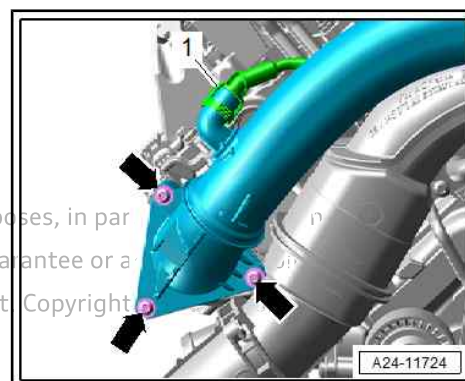
- Move coolant line -2- clear.
- Release hose clips -1, 2- and detach air hose.



- Press release tabs on both sides and detach hose -arrow- for activated charcoal filter system.



- Move electrical wiring harness clear.
- Remove bolts -arrows-.
- Press release tabs on both sides and disconnect crankcase breather hose -1-.



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- Unplug electrical connectors and move electrical wiring harness -2- clear:
- 4 - For intake manifold pressure sender - G71-
- 5 - For throttle valve module - GX3-
- Press release tabs on both sides and unplug vacuum hose -6- and crankcase breather hose -3-.
- Unscrew bolts -arrows-; use angled screwdriver - T40398- if necessary.
- Carefully swivel air pipe -1- to left side.



- Release screw-type clip -2- and detach air hose.
- Unscrew bolts -arrows-; use -T10572- if necessary.
- Remove air pipe (bottom) -1-.
- Remove air pipe (top).

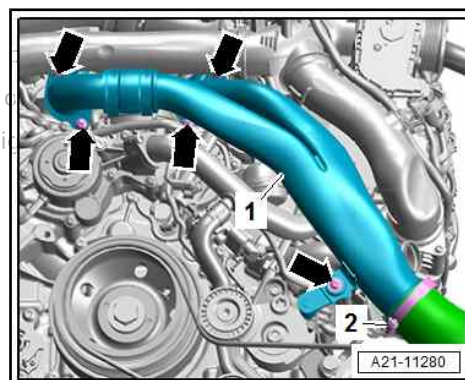
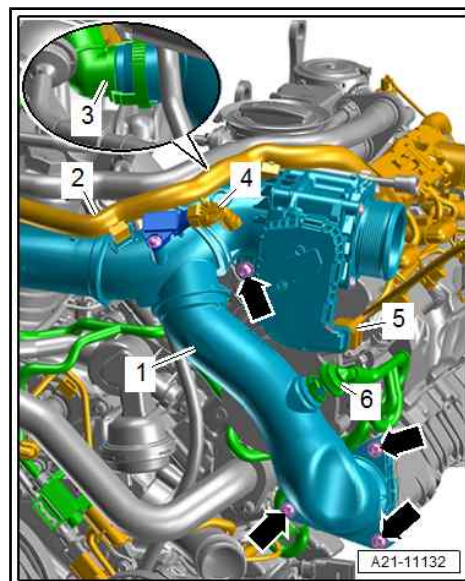
Installing

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

- Check O-rings for damage ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system .
- Renew seals and O-ring after removal.
- After removing, renew bolts tightened with specified tightening angle.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install oil filter element ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter .
- Install air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#) .
- Install poly V-belt
⇒ ["1.3 Removing and installing poly V-belts", page 85](#) .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



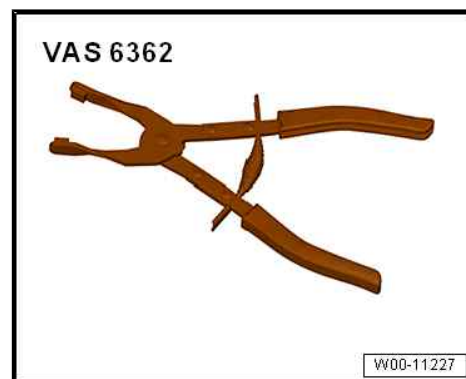


2.3.2 Removing and installing air pipe (top) with radiator removed - vehicles with 2.9 ltr. engine

Simplified procedure if radiator has been removed during preparatory work

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-

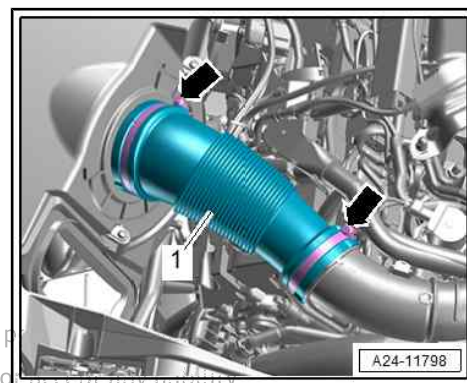


- ◆ Socket Torx T30 - T10405-



Removing

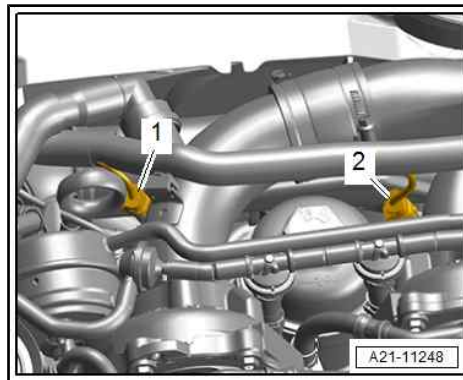
- Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- Release hose clips -arrows- and detach air hose -1-.



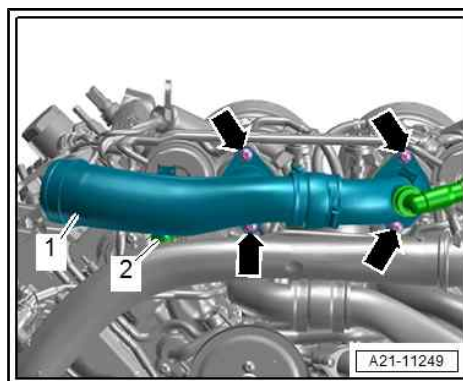
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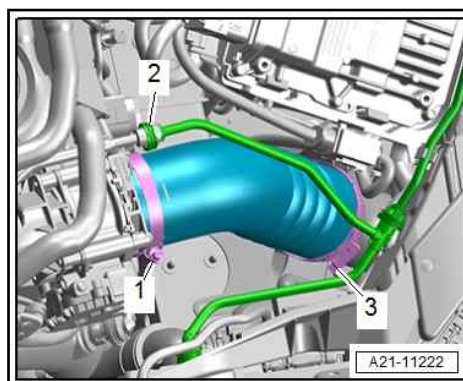
- Unplug electrical connectors and move electrical wiring harness clear:
- 1 - For temperature sender 2 for charge air cooler - G764-
- 2 - For temperature sender 1 for charge air cooler - G763-
- Remove oil filter element (⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter) and cover opening with a clean cloth.



- Remove bolts -arrows-.
- Press release tabs on both sides and disconnect crankcase breather hose -2-.
- Move air pipe -1- to one side.

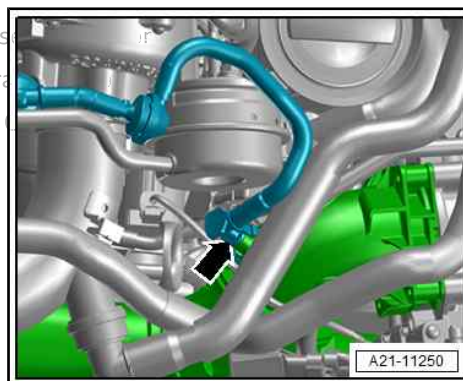


- Move coolant line -2- clear.
- Release hose clips -1, 2- and detach air hose.



- Press release tabs on both sides and detach hose -arrow- for activated charcoal filter system.

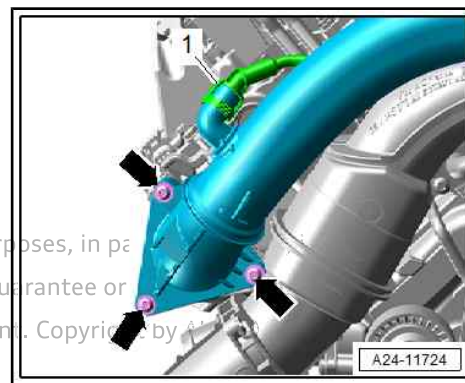
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- Move electrical wiring harness clear.
- Remove bolts -arrows-.
- Press release tabs on both sides and disconnect crankcase breather hose -1-.

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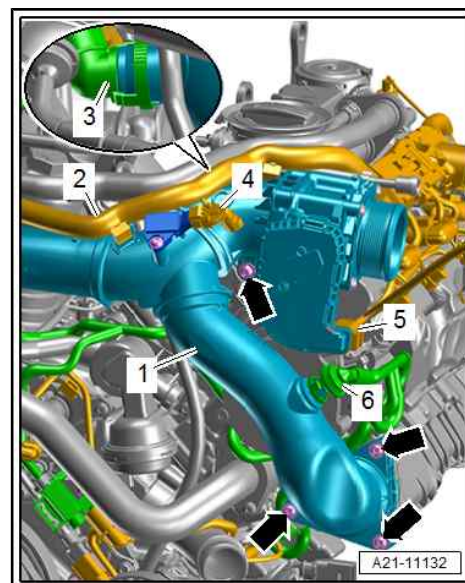


- Unplug electrical connectors and move electrical wiring harness -2- clear:
- 4 - For intake manifold pressure sender - G71-
5 - For throttle valve module - GX3-
- Press release tabs on both sides and unplug vacuum hose -6- and crankcase breather hose -3-.
 - Remove bolts -arrows-.
 - Carefully swivel air pipe -1- to left side and detach.

Installing

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

- Check O-rings for damage ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system .
- Renew seals after removing.
- After removing, renew bolts tightened with specified tightening angle.
- Install oil filter element ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter .



Tightening torques

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

2.3.3 Removing and installing air pipe (bottom) - vehicles with 2.9 ltr. engine

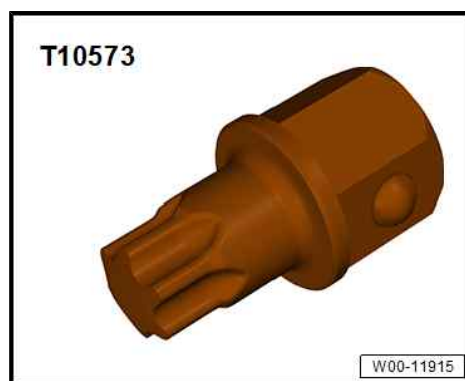
Special tools and workshop equipment required



- ◆ Socket Torx T30 - T10405-



- ◆ Bit - T10573-

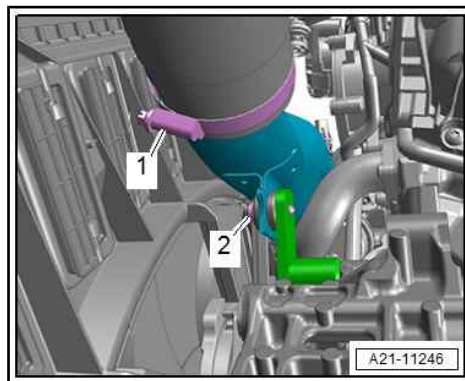


Removing

- Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .

Procedure if radiator has NOT been removed during preparatory work:

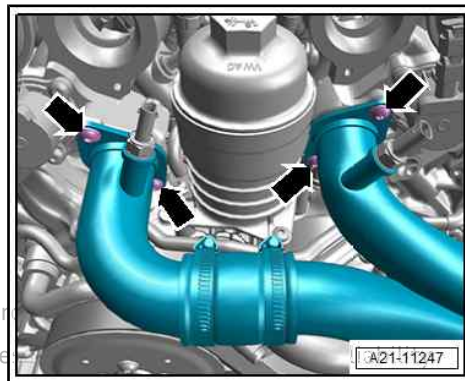
- Remove air pipe (top)
⇒ ["2.3.1 Removing and installing air pipe \(top\) with radiator fitted - vehicles with 2.9 ltr. engine", page 211](#) .
- Remove bolt -2-.
- Release screw-type clip -1- and detach air hose.



- Remove bolts -arrows-. Detach air pipe (bottom).

Procedure if radiator has been removed during preparatory work:

- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove temperature senders for charge air cooler -G763- and -G764- ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Removing and installing charge air temperature sender .
- Remove coolant pipe (front)
⇒ ["3.2.1 Removing and installing coolant pipe \(front\) - vehicles with 2.9 ltr. engine", page 157](#) .



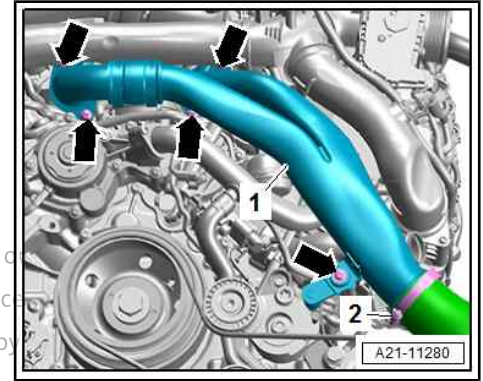


- Release screw-type clip -2- and detach air hose.
- Remove bolts -arrows-. Detach air pipe (bottom) -1-.

Installing

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

- Renew seals after removing.
- After removing, renew bolts tightened with specified tightening angle.
- If removed previously, install coolant pipe (front)
⇒ "3.2.1 Removing and installing coolant pipe (front) vehicles with 2.9 ltr. engine", page 157 .
- If removed previously, install engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- If removed previously, install coolant pipe (top)
⇒ "2.3.1 Removing and installing air pipe (top) with radiator fitted - vehicles with 2.9 ltr. engine", page 211 .



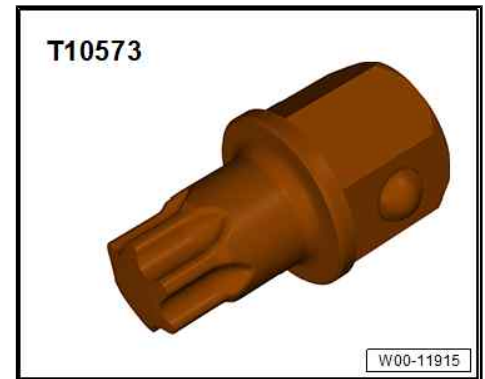
Tightening torques

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

2.3.4 Removing and installing air pipe (top) - vehicles with 3.0 ltr. engine

Special tools and workshop equipment required

- ◆ Bit - T10573-

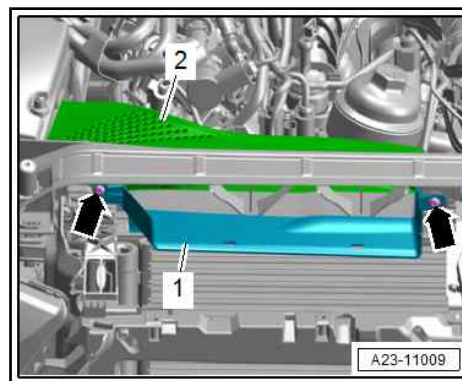


Removing

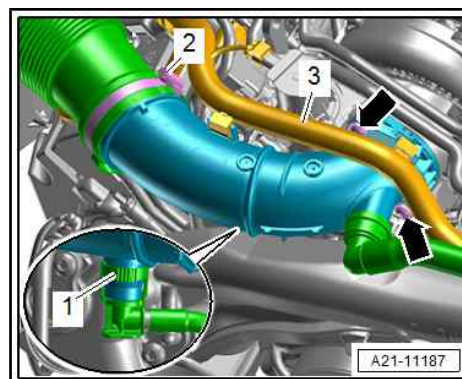
- Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



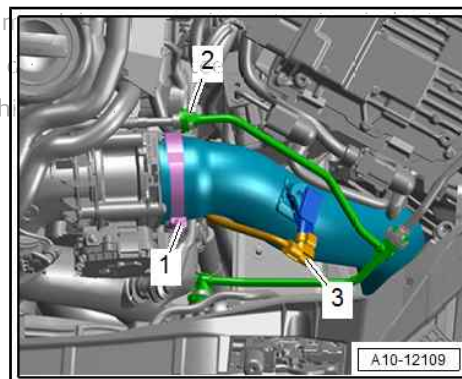
- Remove bolts -arrows- and detach air duct -2-.



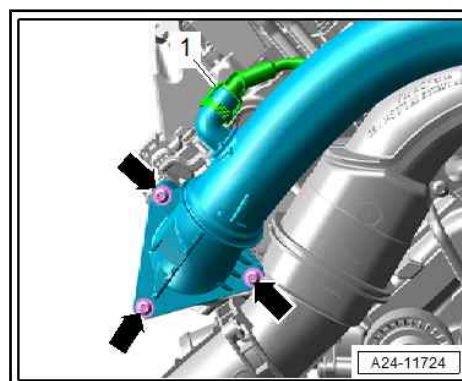
- Move electrical wiring harness -3- clear.
- Release hose clip -2- and detach air pipe.
- Remove bolts -arrows-.
- Detach connection and remove crankcase breather hose -1-. To do so, press release tabs on both sides.
- Move connection to side.



- Unplug electrical connector 3- for charge pressure sender or component G31- .
- Move clear coolant bleeder line -2-.
- Release hose clip -1-, detach air pipe and tie up to left side.

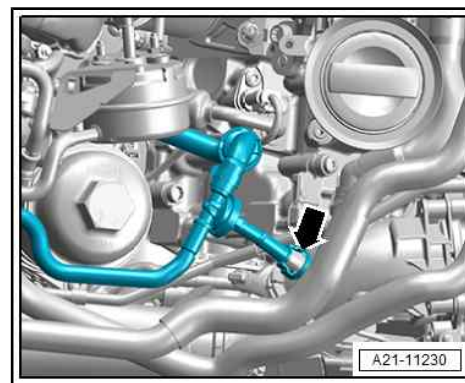


- Move electrical wiring harness clear.
- Remove bolts -arrows-.
- Press release tabs on both sides and disconnect crankcase breather hose -1-.





- If fitted, disconnect hose -arrow- for activated charcoal filter system by pressing release tabs on both sides.



- Unplug electrical connectors and move electrical wiring harness -2- clear:

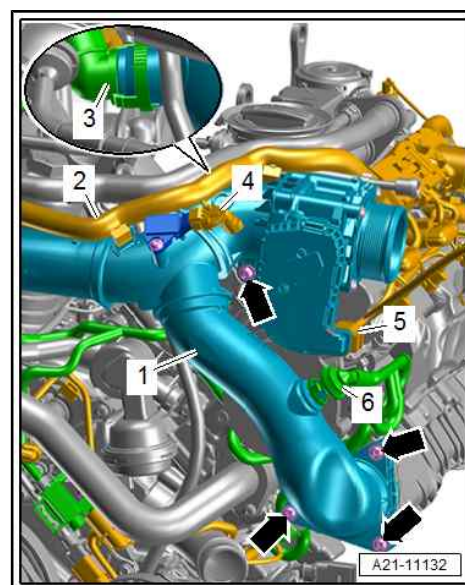
4 - For intake manifold pressure sender - G71-

5 - For throttle valve module - GX3-

- Remove bolts -arrows-.

- Press release tabs on both sides and unplug vacuum hose -6- and crankcase breather hose -3-.

- Detach air pipe -1-.



Installing

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

- Renew gaskets and O-rings after removal.
- After removing, renew bolts tightened with specified tightening angle.
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .
- Install engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

- ◆ ⇒ ["3.1 Exploded view - air cleaner housing", page 244](#)

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

2.4 Removing and installing charge air cooler

⇒ ["2.4.1 Removing and installing charge air cooler - vehicles with 2.9 ltr. engine", page 221](#)

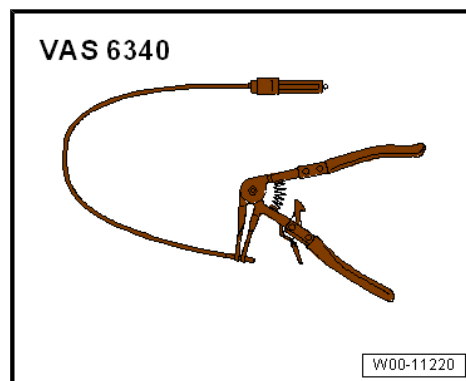
⇒ ["2.4.2 Removing and installing charge air cooler - vehicles with 3.0 ltr. engine", page 223](#)

2.4.1 Removing and installing charge air cooler - vehicles with 2.9 ltr. engine

Special tools and workshop equipment required



- ◆ Hose clip pliers - VAS 6340-



- ◆ Hose clip pliers - VAS 6362-



- ◆ Socket Torx T30 - T10405-

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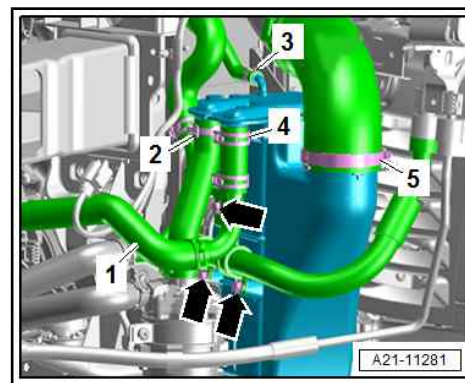


Removing

- Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- Remove bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Drain coolant
⇒ ["1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine", page 122](#) (leave collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath).



- Remove bolts -arrows-.
- Release hose clips -2, 3, 4- and disconnect coolant hoses.
- Release hose clip -5- securing air hose.

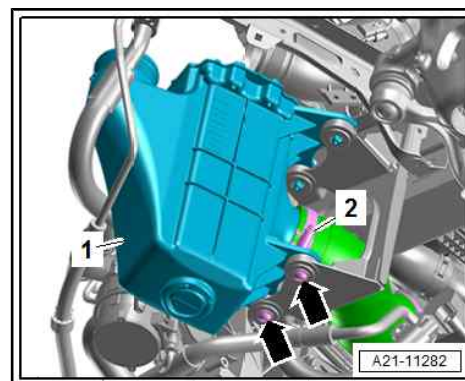


- Remove bolts -arrows-.
- Release hose clip -2- securing air hose.
- Disengage charge air cooler -1- upwards and detach it towards rear; detach air hoses at the same time.

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 bumper cover ⇒ General body repairs, exterior, Rep. gr. 63 ; Bumper (front); Removing and installing bumper cover .
- Fill up with coolant
⇒ [“1.3.1 Draining and filling cooling system - vehicles with 2.9 ltr. engine”, page 122](#) .



Tightening torques

- ◆ ⇒ [“2.1.1 Exploded view - charge air system, vehicles with 2.9 ltr. engine”, page 208](#)
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

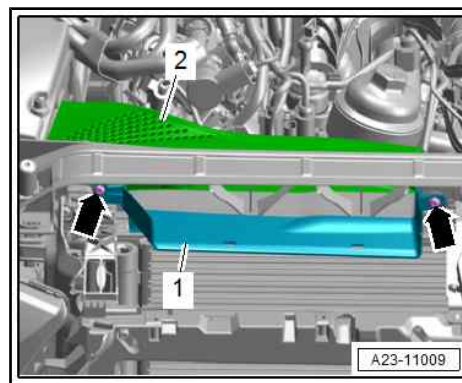
2.4.2 Removing and installing charge air cooler - vehicles with 3.0 ltr. engine

Removing

- Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- Remove lock carrier cover, air intake grille (left and right) and closure plate at bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front) .



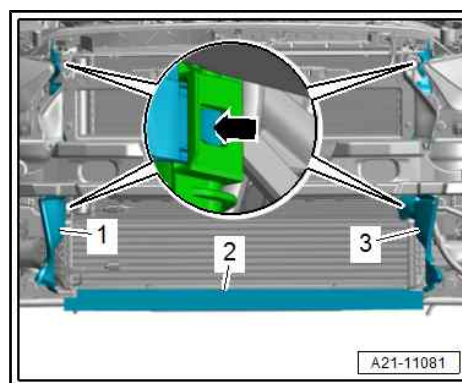
- Remove bolts -arrows- and detach air duct -1-.



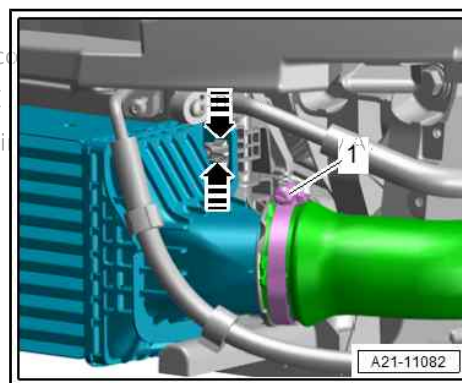
- Release catches -arrow- and detach air ducts -1, 3- from radiator; fold air ducts inwards and leave in this position.

Note:

Bottom catches can be accessed via openings for air intake grille in bumper cover.



- Release hose clip -1- on both sides and detach air pipe from charge air cooler.
- Release fasteners -arrows- on both sides and disengage charge air cooler from radiator.
- Tilt charge air cooler slightly (right side upwards) and in this position detach it downwards.



Installing

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

- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Installing radiators and condensers .
- The charge air cooler must be renewed if the fasteners are damaged.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- 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

- ◆ ⇒ [“2.1.2 Exploded view - charge air system, vehicles with 3.0 ltr. engine”, page 210](#)
- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 244](#)
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



2.5 Removing and installing charge pressure sender - G31-

⇒ ["2.5.1 Removing and installing charge pressure sender G31 - vehicles with 2.9 ltr. engine", page 225](#)

⇒ ["2.5.2 Removing and installing charge pressure sender G31 - vehicles with 3.0 ltr. engine", page 226](#)

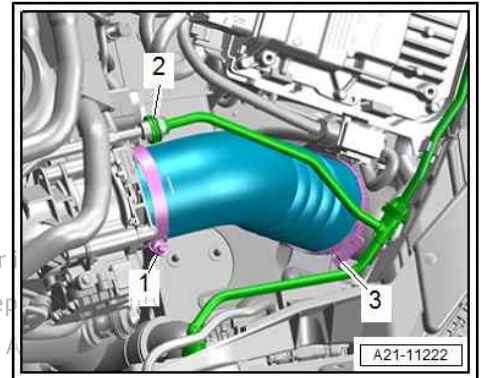
2.5.1 Removing and installing charge pressure sender - G31- - vehicles with 2.9 ltr. engine

Removing

- Release hose clips -1, 3- and detach air hose.



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- Unplug electrical connector -1-.
- Unscrew bolt -2- and remove charge pressure sender - G31- .

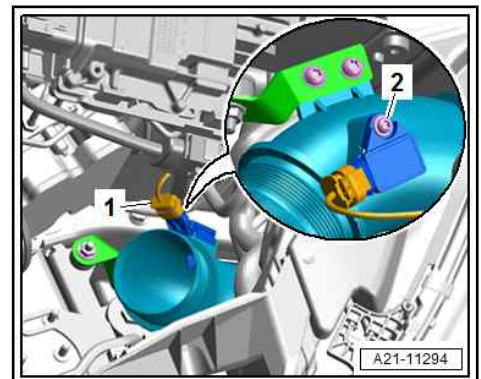
Installing

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

- Renew O-ring after removal.

Tightening torques

- ◆ ⇒ ["2.1.1 Exploded view - charge air system, vehicles with 2.9 ltr. engine", page 208](#)
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system





2.5.2 Removing and installing charge pressure sender - G31- - vehicles with 3.0 ltr. engine

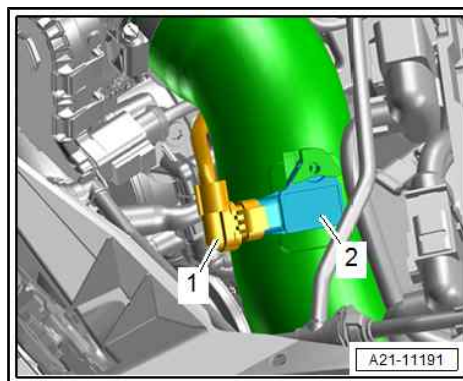
Removing

- Unplug electrical connector -1-.
- Turn charge pressure sender - G31- -item 2- anti-clockwise and pull it out of air pipe.

Installing

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

- Renew O-ring after removal.
- If fastener on air pipe has broken off, secure charge pressure sender - G31- with a bolt, refer to ⇒ Electronic parts catalogue .



Tightening torques

- ♦ ⇒ [“2.1.2 Exploded view - charge air system, vehicles with 3.0 ltr. engine”, page 210](#)

2.6 Removing and installing charge air temperature sender

Procedure applies for vehicles with 2.9 ltr. engine only.

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Removing and installing charge air temperature sender .

2.7 Removing and installing overrun air recirculation valve

⇒ [“2.7.1 Removing and installing overrun air recirculation valve - vehicles with 2.9 ltr. engine”, page 226](#)

⇒ [“2.7.2 Removing and installing overrun air recirculation valve - vehicles with 3.0 ltr. engine”, page 227](#)

2.7.1 Removing and installing overrun air recirculation valve - vehicles with 2.9 ltr. engine

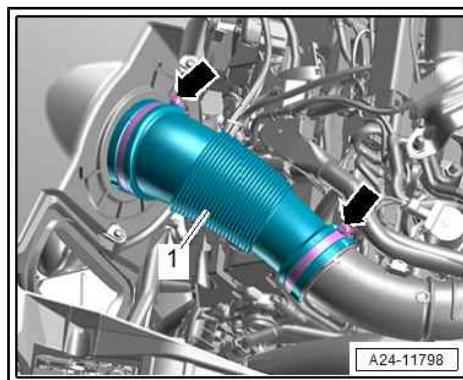
Removing

- Release hose clips -arrows- and detach air pipe -1-.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Removing and installing overrun air recirculation valve .

Tightening torques

- ♦ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system





2.7.2 Removing and installing overrun air recirculation valve - vehicles with 3.0 ltr. engine

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Removing and installing overrun air recirculation valve .

2.8 Checking charge air system for leaks

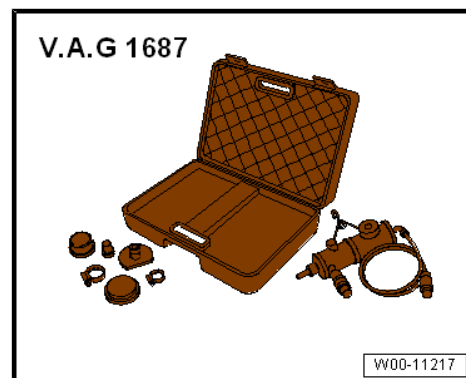
Special tools and workshop equipment required

- ◆ Charge air system tester - V.A.G 1687-



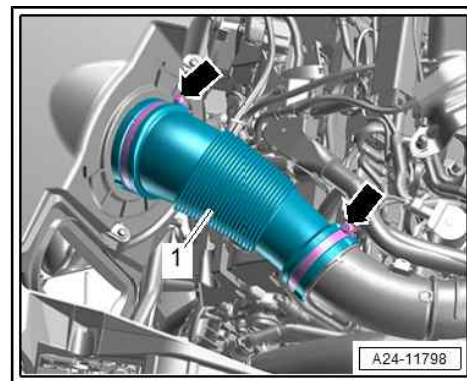
- ◆ Adapters -V.A.G 1687/11- and -V.A.G 1687/14-

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Procedure

- Observe rules for cleanliness ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Release hose clips -arrows- and detach air pipe -1-.





- Connect adapters -V.A.G 1687/11- and -V.A.G 1687/14- to connection.
- Connect hose -arrow- of charge air system tester -V.A.G 1687- to adapter.

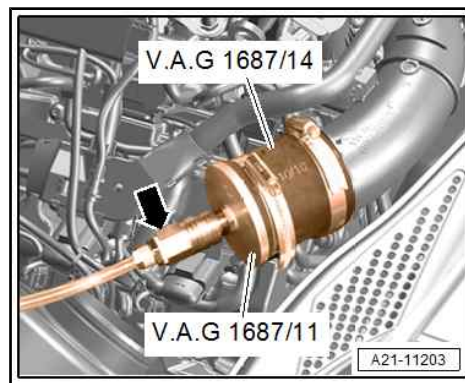
All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Checking charge air system for leaks .

Attaching

- Install engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ♦ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



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24 – Mixture preparation - injection

1 Injection system

⇒ [“1.1 Overview of fitting locations - injection system”, page 229](#)

1.1 Overview of fitting locations - injection system

Fitting locations in engine compartment - vehicles with 2.9 ltr. engine ⇒ [page 229](#)

Fitting locations in engine compartment - vehicles with 3.0 ltr. engine ⇒ [page 233](#)

Fitting locations on engine (from above), part 1 - vehicles with 2.9 ltr. engine ⇒ [page 234](#)

Fitting locations on engine (from above), part 1 - vehicles with 3.0 ltr. engine ⇒ [page 236](#)

Fitting locations on engine (from above), part 2 ⇒ [page 236](#)

Fitting locations on engine (from front) - shown on 3.0 ltr. engine ⇒ [page 237](#)

Fitting locations on engine (from right side) ⇒ [page 238](#)

Fitting locations on engine (from left side) ⇒ [page 240](#)

Fitting locations on engine (from rear) - shown on 3.0 ltr. engine ⇒ [page 241](#)

Fitting locations in engine compartment - vehicles with 2.9 ltr. engine



1 - Right electrohydraulic engine mounting solenoid valve - N145-

- ❑ Fitting location
⇒ [Fig. "Fitting location of electrohydraulic engine mounting solenoid valves -N144- / -N145-"" , page 232](#)

2 - Coolant circulation pump - V50-

- ❑ Fitting location
⇒ [Fig. "Fitting location of coolant circulation pump -V50- - vehicles with 2.9 ltr. engine"" , page 232](#)

3 - Lambda probe after catalytic converter - G130-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

4 - Lambda probe 2 after catalytic converter - G131-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

5 - Accelerator pedal module - GX2-

- ❑ Comprises:

- ◆ Accelerator position sender - G79-
- ◆ Accelerator position sender 2 - G185-
- ◆ Active accelerator pedal motor - V592-

- ❑ Fitting location ⇒ [Fig. "Fitting location of accelerator pedal module -GX2-"" , page 231](#)

6 - Brake light switch - F-

- ❑ Fitting location ⇒ [Fig. "Fitting location of brake light switch -F-"" , page 231](#)

7 - Left electrohydraulic engine mounting solenoid valve - N144-

- ❑ Fitting location
⇒ [Fig. "Fitting location of electrohydraulic engine mounting solenoid valves -N144- / -N145-"" , page 232](#)

8 - Engine control unit - J623-

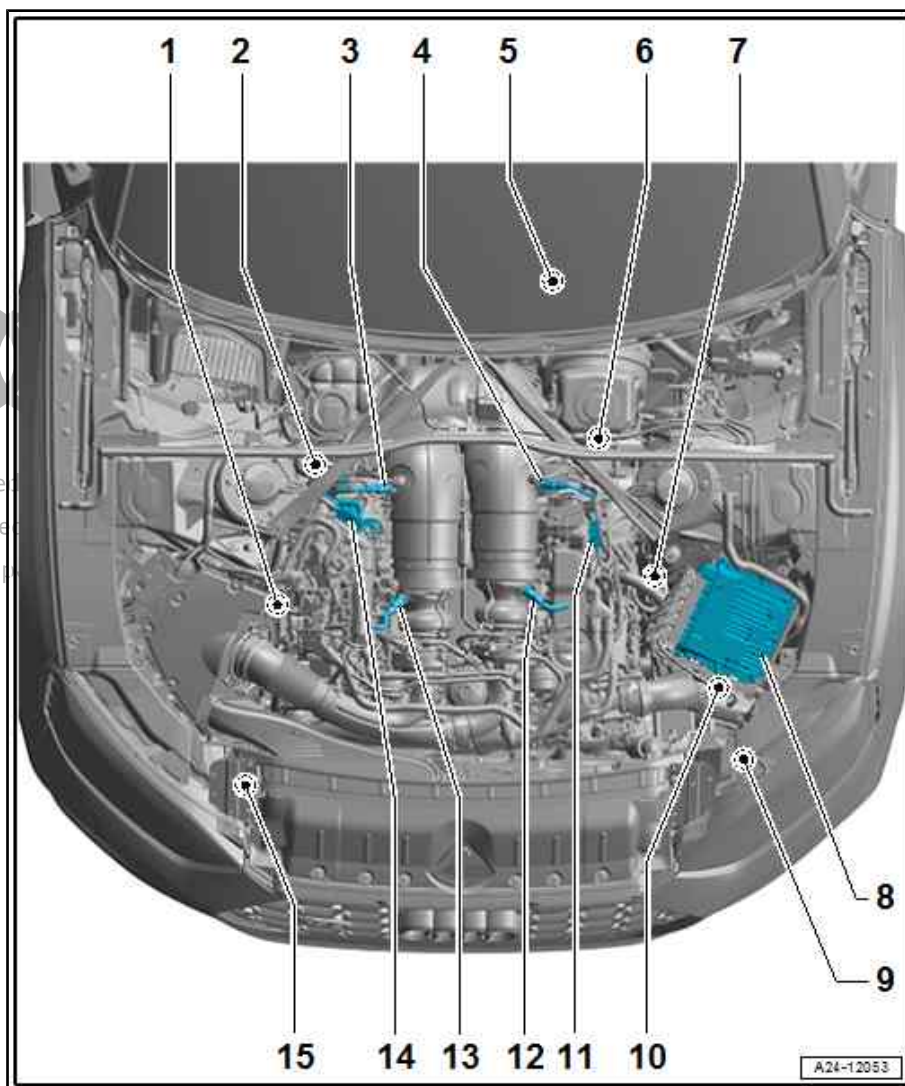
- ❑ Removing and installing ⇒ ["9.2 Removing and installing engine/motor control unit J623" , page 257](#)

9 - Charge air cooling pump - V188-

- ❑ Fitting location
⇒ [Fig. "Fitting location of charge air cooling pump -V188- - vehicles with 2.9 ltr. engine"" , page 232](#)

10 - Charge pressure sender - G31-

- ❑ Fitting location
⇒ [Fig. "Fitting location of charge pressure sender -G31- - vehicles with 2.9 ltr. engine"" , page 233](#)





11 - Pressure differential sender 2 for particulate filter - G1038-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Senders and sensors; Exploded view - pressure differential sender

12 - Lambda probe 2 - G108-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

13 - Lambda probe - G39-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

14 - Pressure differential sender for particulate filter - G1037-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Senders and sensors; Exploded view - pressure differential sender

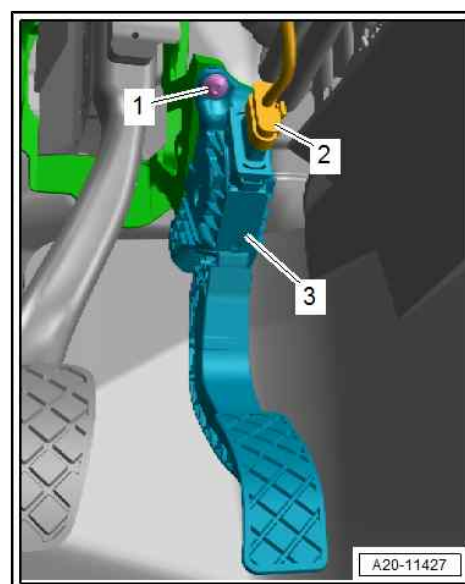
15 - Radiator outlet coolant temperature sender - G83-

- ❑ Fitting location
⇒ [Fig. "Fitting location of radiator outlet coolant temperature sender -G83- "" , page 232](#)

Fitting location of accelerator pedal module - GX2-

- ◆ On mounting bracket for pedal cluster
- ◆ The components of the accelerator pedal module -3- cannot be renewed separately.

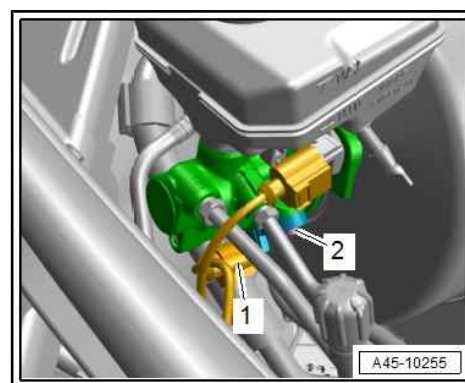
Exploded view ⇒ Fuel supply system; Rep. gr. 20 ; Accelerator mechanism; Exploded view - accelerator pedal module



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





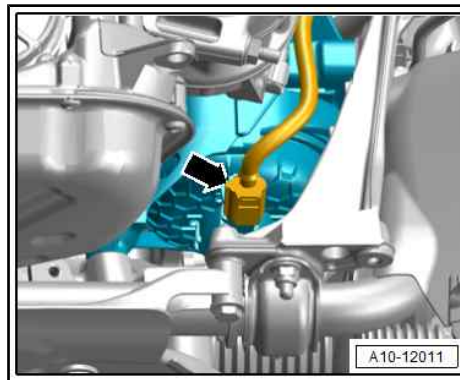
Fitting location of electrohydraulic engine mounting solenoid valves -N144- / -N145-

- ◆ 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 81](#)

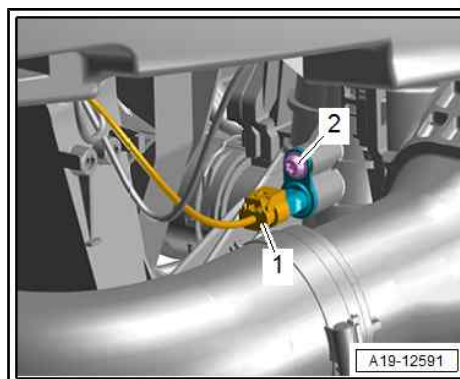


Fitting location of radiator outlet coolant temperature sender - G83-

- ◆ At bottom right of radiator

1 - Electrical connector for radiator outlet coolant temperature sender - G83-

Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders

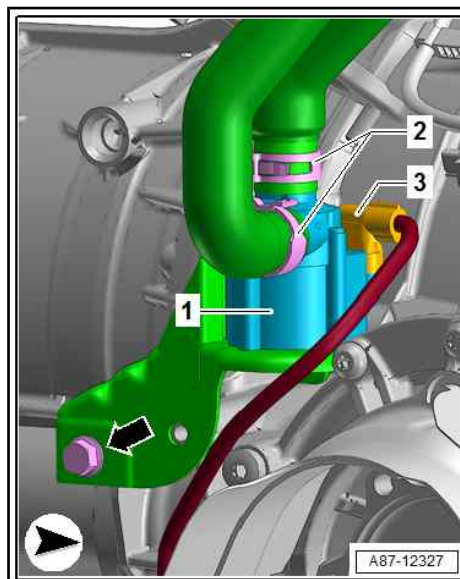


Fitting location of coolant circulation pump - V50- - vehicles with 2.9 ltr. engine

- ◆ -Item 1- at rear right of engine

Exploded view

⇒ ["2.2 Exploded view - electric coolant pump", page 135](#) .

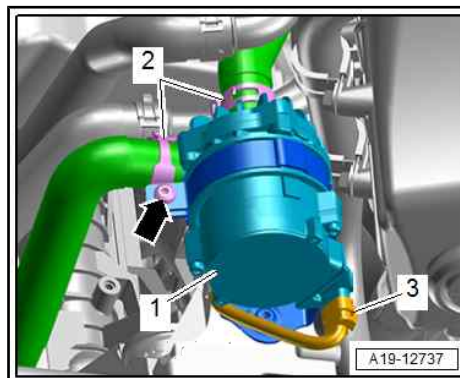


Fitting location of charge air cooling pump - V188- - vehicles with 2.9 ltr. engine

- ◆ -Item 1- at front left of charge air cooler

Exploded view

⇒ ["2.2 Exploded view - electric coolant pump", page 135](#) .



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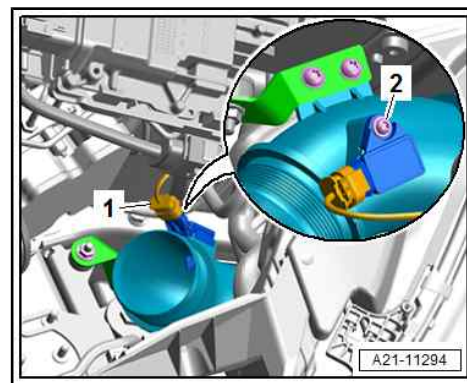
Fitting location of charge pressure sender - G31- - vehicles with 2.9 ltr. engine

- ◆ At air pipe (left-side) in engine compartment

- 1 - Connect electrical connector for charge pressure sender - G31-

Exploded view

⇒ ["2.1 Exploded view - charge air system", page 208](#) .



Fitting locations in engine compartment - vehicles with 3.0 ltr. engine

1 - Right electrohydraulic engine mounting solenoid valve - N145-

- Fitting location
⇒ [Fig. "Fitting location of electrohydraulic engine mounting solenoid valves -N144- / -N145-"" , page 232](#)

2 - Coolant circulation pump - V50-

- Exploded view
⇒ ["2.2 Exploded view - electric coolant pump", page 135](#)
- Fitting location on vehicles with particulate filter
⇒ [Fig. "Fitting location of coolant circulation pump -V50- - vehicles with 3.0 ltr. engine with particulate filter"" , page 234](#)

3 - Lambda probe after catalytic converter - G130-

- Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

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

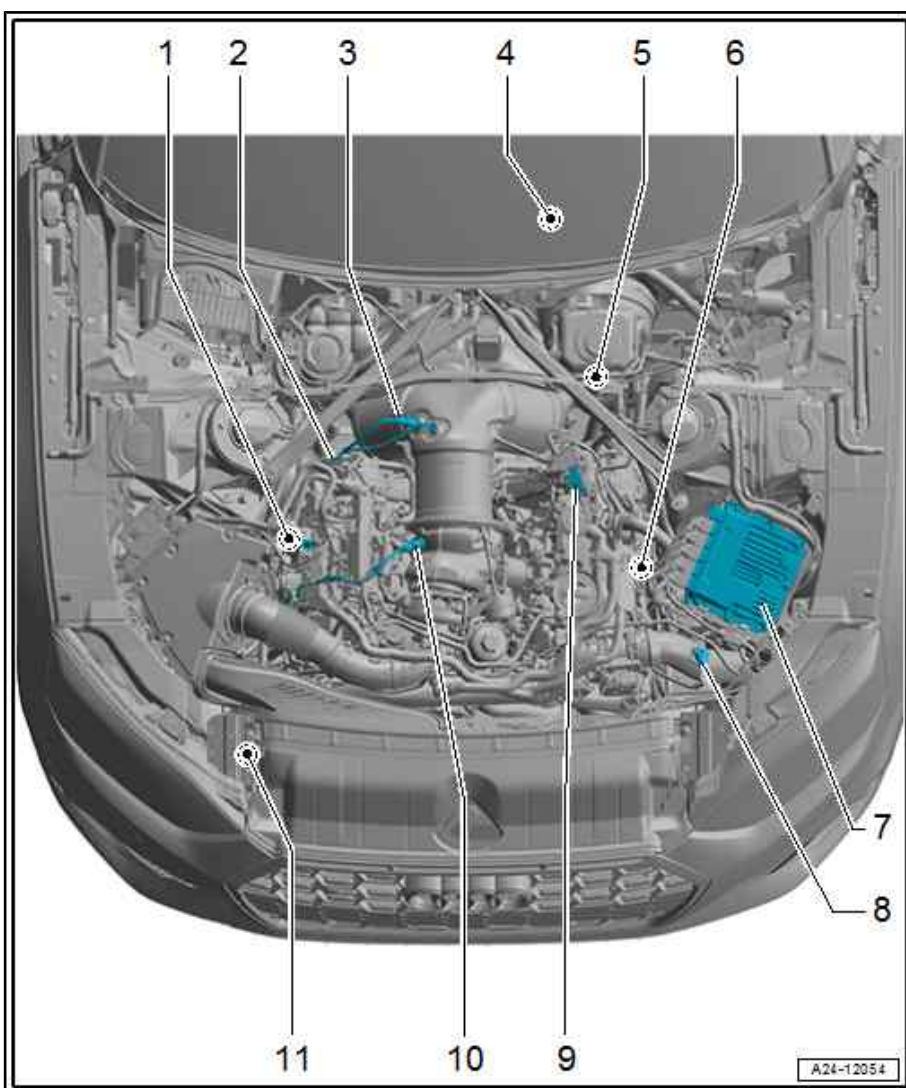
- Fitting location
⇒ [Fig. "Fitting location of accelerator pedal module -GX2- "" , page 231](#)

5 - Brake light switch - F-

- Fitting location ⇒ [Fig. "Fitting location of brake light switch -F- "" , page 231](#)

6 - Left electrohydraulic engine mounting solenoid valve - N144-

- Fitting location
⇒ [Fig. "Fitting location of electrohydraulic engine mounting solenoid valves -N144- / -N145- "" , page 232](#)





7 - Engine control unit - J623-

- ❑ Removing and installing ⇒ ["9.2 Removing and installing engine/motor control unit J623", page 257](#)

8 - Charge pressure sender - G31-

- ❑ Exploded view ⇒ ["2.1 Exploded view - charge air system", page 208](#)

9 - Pressure differential sender for particulate filter - G1037-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Senders and sensors; Exploded view - pressure differential sender

10 - Lambda probe - G39-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

11 - Radiator outlet coolant temperature sender - G83-

- ❑ Fitting location
⇒ Fig. ["Fitting location of radiator outlet coolant temperature sender -G83-"" , page 232](#)

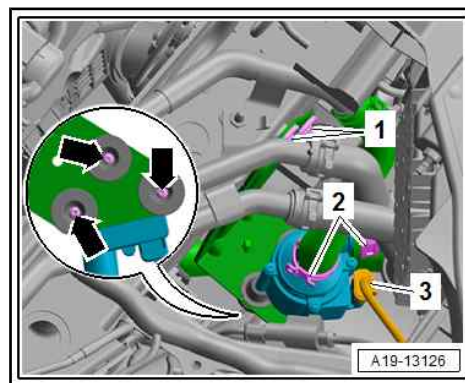
Fitting location of coolant circulation pump - V50- - vehicles with 3.0 ltr. engine with particulate filter

- ◆ In wheel housing (front right)

2 - Electrical connector for coolant circulation pump - V50-

Exploded view

⇒ ["2.2.3 Exploded view - electric coolant pump, vehicles with 3.0 ltr. engine with particulate filter", page 138](#)



Fitting locations on engine (from above), part 1 - vehicles with 2.9 ltr. engine



1 - Overrun air recirculation valve for bank 1 - N625-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Exploded view - turbocharger

2 - Switch valve for mechanical coolant pump - N649-

- ❑ Connection diagram ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Vacuum system; Connection diagram - vacuum system

3 - Tank breather pressure sensor 1 - G950-

4 - Activated charcoal filter solenoid valve 1 - N80-

5 - Fuel pressure sender for low pressure - G410-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; High-pressure pump; Exploded view - high-pressure pump

6 - Fuel metering valve - N290-

- ❑ Integrated in high-pressure pump

7 - Charge pressure control solenoid valve - N75-

- ❑ Connection diagram ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Vacuum system; Connection diagram - vacuum system

8 - Temperature sender for engine cover panel - G765-

9 - Throttle valve module - GX3-

- ❑ With throttle valve module - J338- , throttle valve drive for electric throttle - G186- , throttle valve drive angle sender 1 for electric throttle - G187- and throttle valve drive angle sender 2 for electric throttle - G188-
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

10 - Intake manifold pressure sender - G71-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

11 - Overrun air recirculation valve for bank 2 - N626-

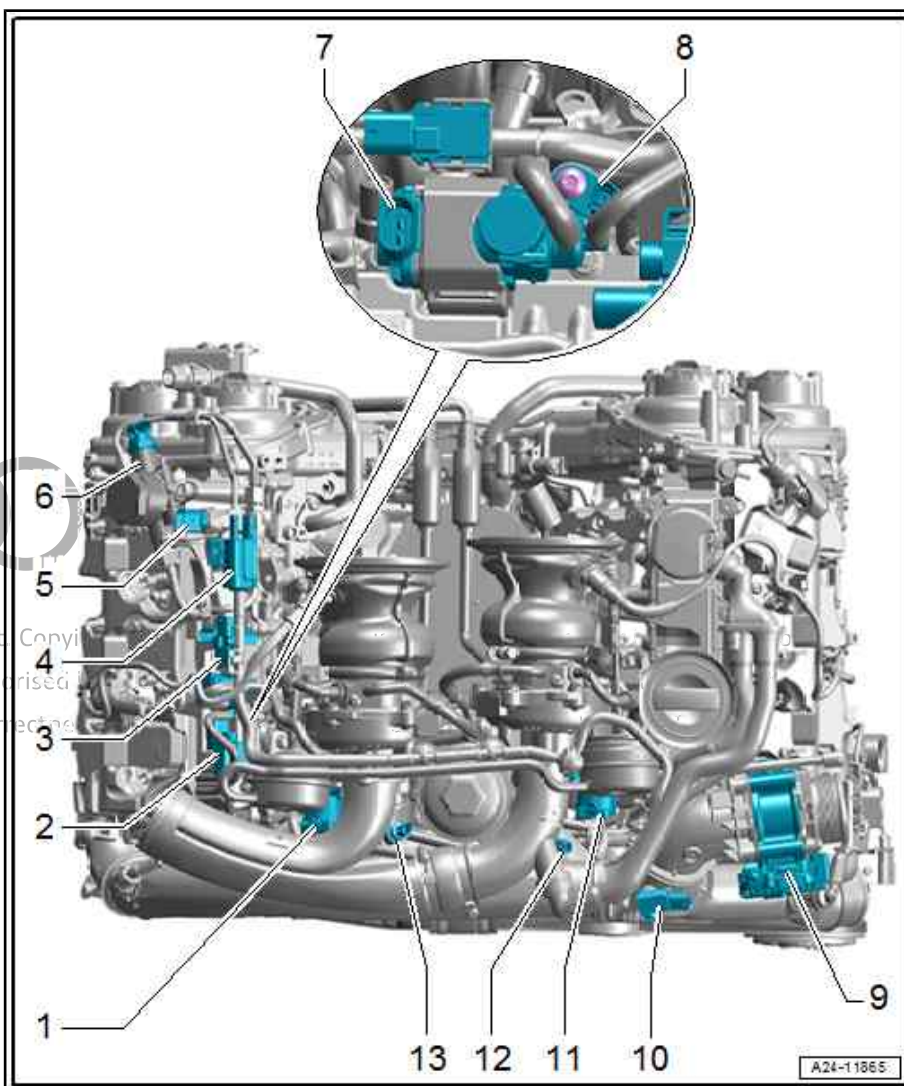
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Exploded view - turbocharger

12 - Temperature sender 2 for charge air cooler - G764-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

13 - Temperature sender 1 for charge air cooler - G763-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system





Fitting locations on engine (from above), part 1 - vehicles with 3.0 ltr. engine

1 - Overrun air recirculation valve for bank 1 - N625-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Exploded view - turbocharger

2 - Switch valve for mechanical coolant pump - N649-

- ❑ Connection diagram ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Vacuum system; Connection diagram - vacuum system

3 - Tank breather pressure sensor 1 - G950-

4 - Activated charcoal filter solenoid valve 1 - N80-

5 - Fuel pressure sender for low pressure - G410-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; High-pressure pump; Exploded view - high-pressure pump

6 - Fuel metering valve - N290-

- ❑ Integrated in high-pressure pump

7 - Charge pressure control solenoid valve - N75-

- ❑ Connection diagram ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Vacuum system; Connection diagram - vacuum system

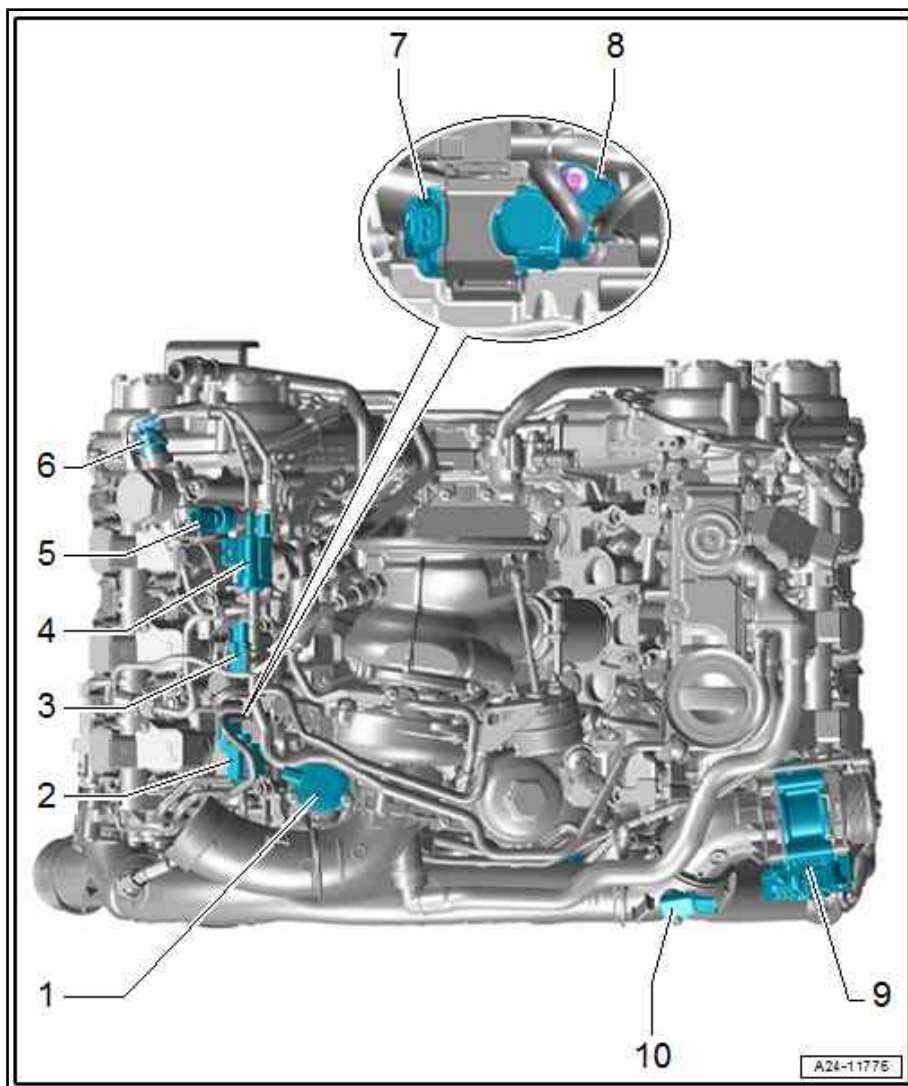
8 - Temperature sender for engine cover panel - G765-

9 - Throttle valve module - GX3-

- ❑ With throttle valve module - J338- , throttle valve drive for electric throttle - G186- , throttle valve drive angle sender 1 for electric throttle - G187- and throttle valve drive angle sender 2 for electric throttle - G188-
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system

10 - Intake manifold pressure sender - G71-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system



Fitting locations on engine (from above), part 2

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1 - Temperature sender for engine temperature regulation - G694-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders

2 - Oil pressure switch - F22-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17; Oil filter/oil pressure switches; Exploded view - oil pressure switches/oil pressure control

3 - Oil temperature sender - G8-

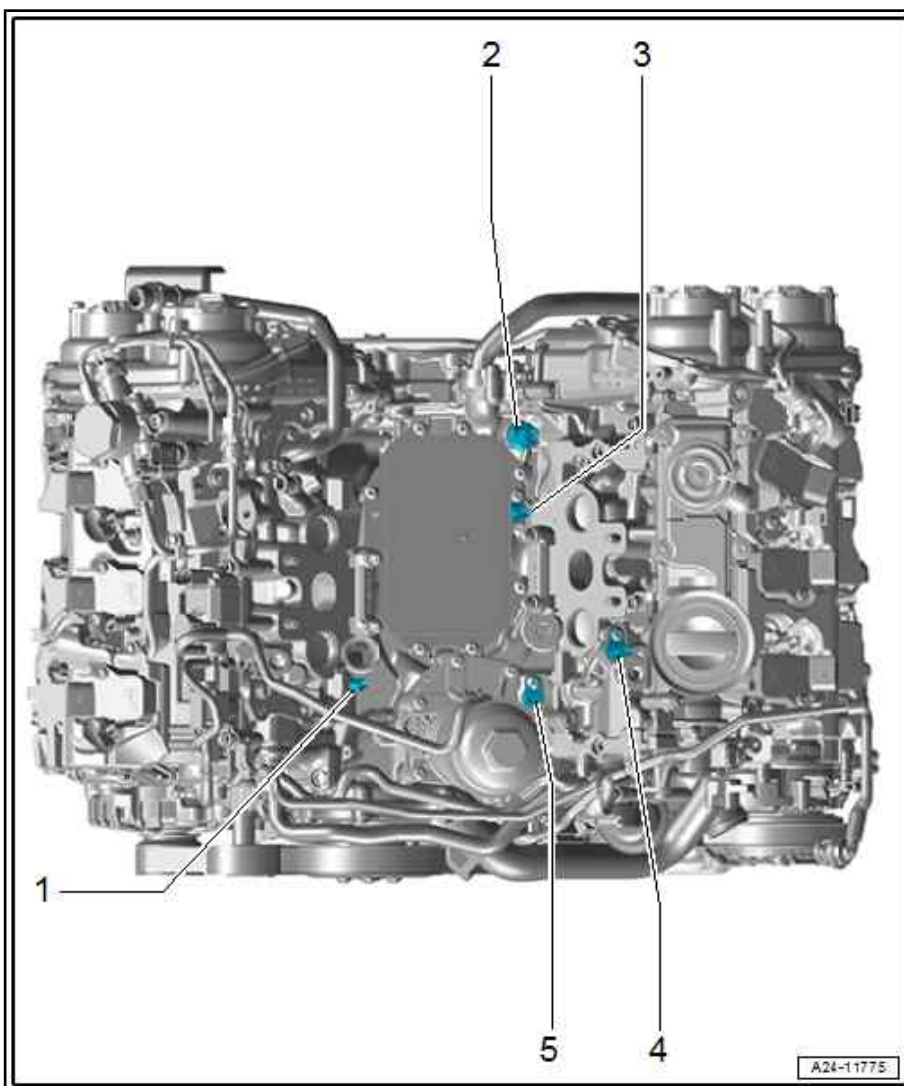
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17; Oil filter/oil pressure switches; Exploded view - oil pressure switches/oil pressure control

4 - Coolant temperature sender - G62-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders

5 - Engine outlet coolant temperature sender - G82-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders



Fitting locations on engine (from front) - shown on 3.0 ltr. engine



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1 - Oil pressure sender - G10-

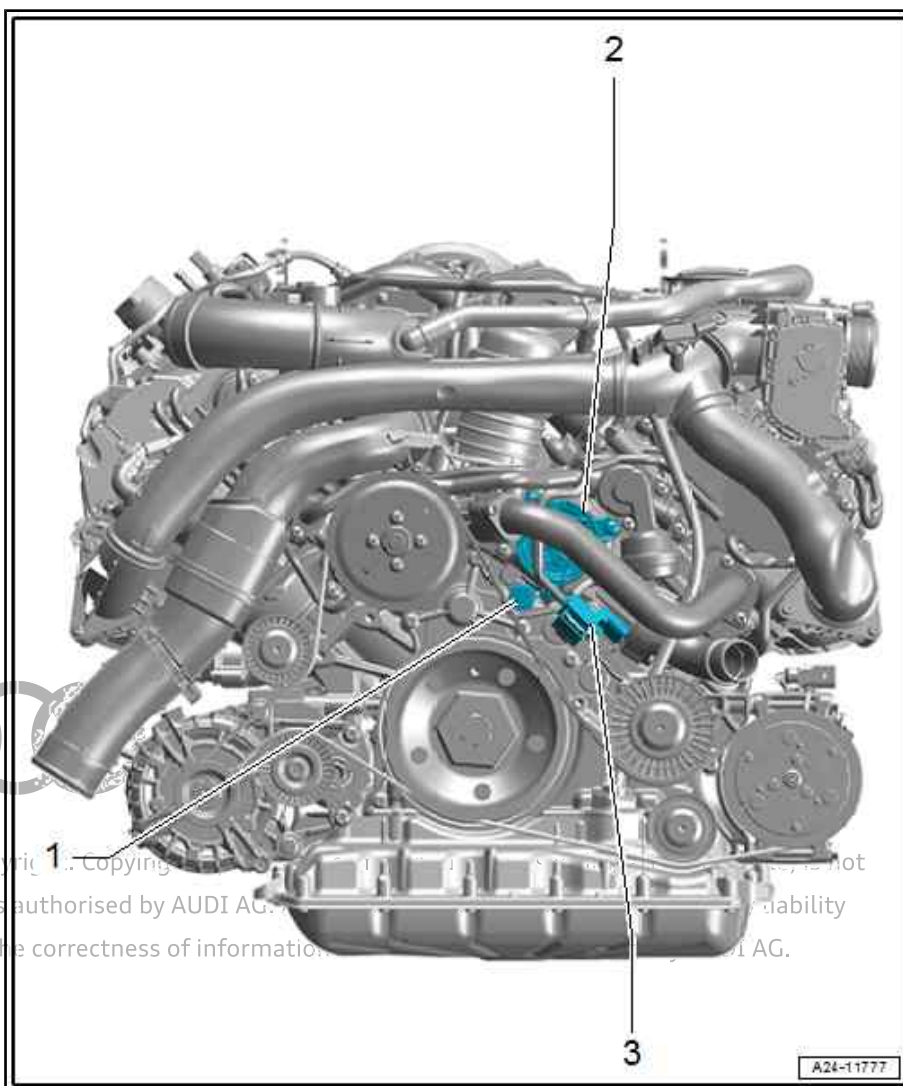
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil pressure switches/oil pressure control

2 - Map-controlled engine cooling system thermostat - F265-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump/thermostat

3 - Coolant valve for cylinder head - N489-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders



Fitting locations on engine (from right side)



1 - Knock sensor 1 - G61-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system

2 - Continued coolant circulation pump - V51-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - electric coolant pump

3 - Inlet cam actuator 1 for cylinder 2 - F452-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Exploded view - camshaft housing

4 - Inlet cam actuator 1 for cylinder 3 - F456-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Exploded view - camshaft housing

5 - Hall sender - G40-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system

6 - Fuel pressure sender - G247-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Exploded view - fuel rail with injectors

7 - Fuel metering valve - N290-

- ❑ Integrated in high-pressure pump

8 - Ignition coil 3 with output stage - N291-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system

9 - Injector, cylinder 3 - N32-

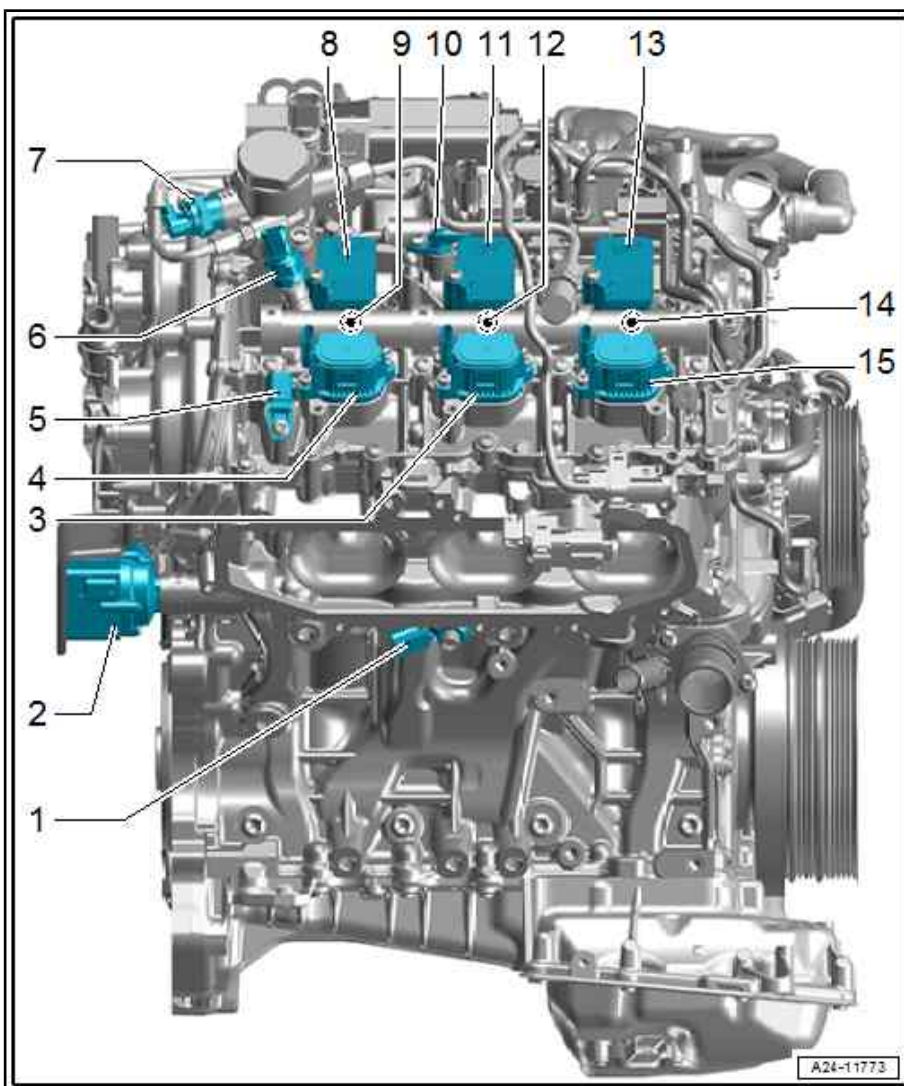
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Exploded view - fuel rail with injectors

10 - Hall sender 3 - G300-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system

11 - Ignition coil 2 with output stage - N127-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system





12 - Injector, cylinder 2 - N31-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Exploded view - fuel rail with injectors

13 - Ignition coil 1 with output stage - N70-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system

14 - Injector, cylinder 1 - N30-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Exploded view - fuel rail with injectors

15 - Inlet cam actuator 1 for cylinder 1 - F448-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Exploded view - camshaft housing

Fitting locations on engine (from left side)

1 - Valve for oil pressure control - N428-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil pressure switches/oil pressure control

2 - Inlet cam actuator 1 for cylinder 4 - F460-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head; Exploded view - camshaft housing

3 - Injector, cylinder 4 - N33-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Exploded view - fuel rail with injectors

4 - Hall sender 4 - G301-

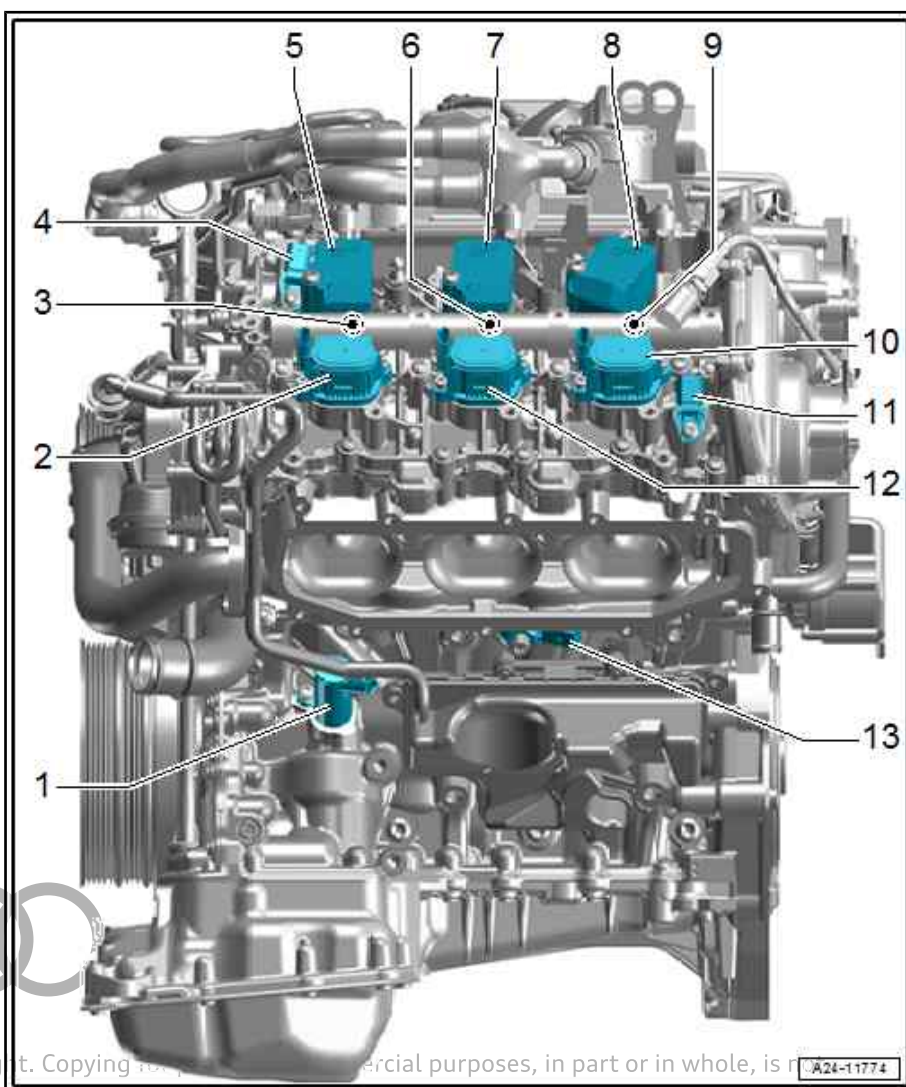
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system

5 - Ignition coil 4 with output stage - N292-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system

6 - Injector, cylinder 5 - N83-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Exploded view - fuel rail with injectors





7 - Ignition coil 5 with output stage - N323-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system;
Exploded view - ignition system

8 - Ignition coil 6 - N324-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system;
Exploded view - ignition system

9 - Injector, cylinder 6 - N84-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors;
Exploded view - fuel rail with injectors

10 - Inlet cam actuator 1 for cylinder 6 - F468-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head;
Exploded view - camshaft housing

11 - Hall sender 2 - G163-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system;
Exploded view - ignition system

12 - Inlet cam actuator 1 for cylinder 5 - F464-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Cylinder head;
Exploded view - camshaft housing

13 - Knock sensor 2 - G66-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system;
Exploded view - ignition system

Fitting locations on engine (from rear) - shown on 3.0 ltr. engine



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1 - Camshaft control valve 2 - N208-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

2 - Exhaust camshaft control valve 2 - N319-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

3 - Exhaust camshaft control valve 1 - N318-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

4 - Camshaft control valve 1 - N205-

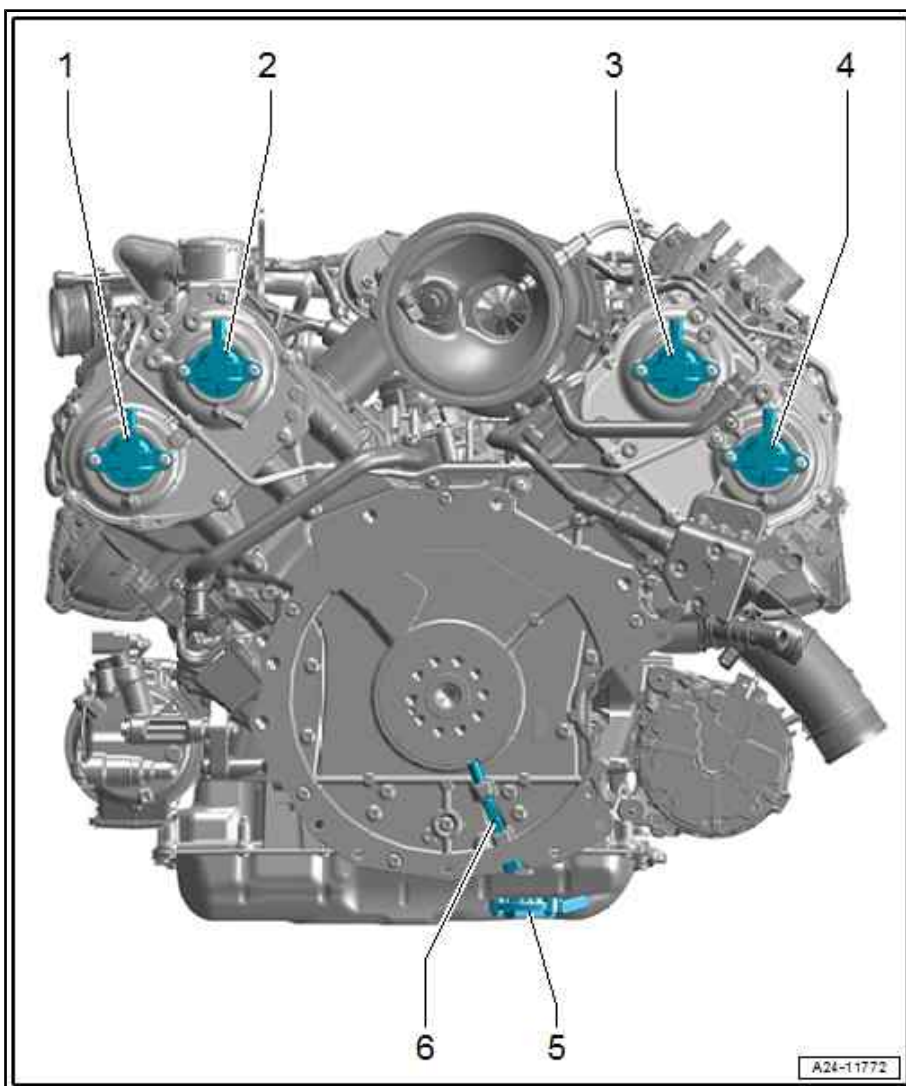
- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

5 - Oil level and oil temperature sender - G266-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

6 - Engine speed sender - G28-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system



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2 Vacuum system

All procedures and components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Vacuum system .



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3 Air cleaner

⇒ "3.1 Exploded view - air cleaner housing", page 244

⇒ "3.2 Removing and installing air cleaner housing", page 245

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 245

4 - Air cleaner (top section)

- ☐ Remove any salt deposits or dirt

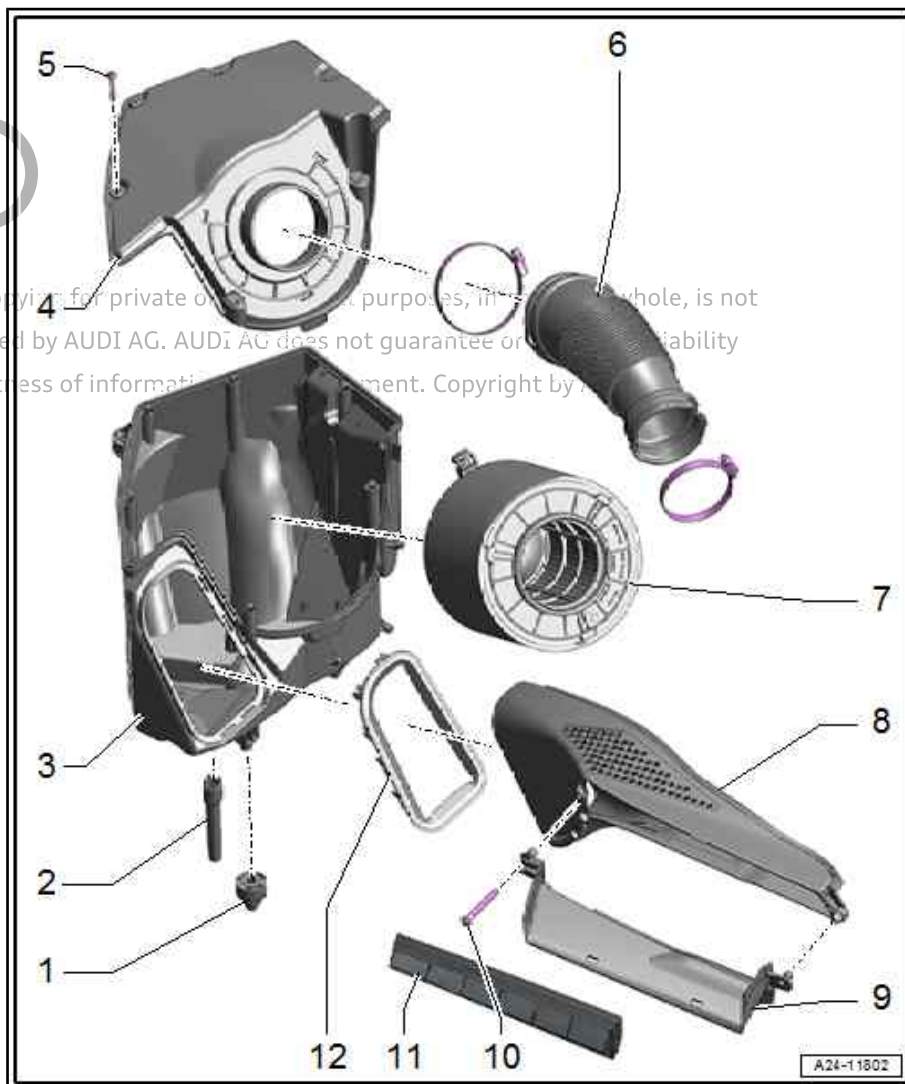
- ☐ Removing and installing ⇒ Maintenance ; Booklet 830 ; Maintenance; Air cleaner: renewing filter element and cleaning housing

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 pipe

- ☐ Observe installation markings
- ☐ Tightening torques for hose clips ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



7 - Air filter element

- ☐ Use genuine air filter element ⇒ Electronic parts catalogue
- ☐ Change intervals ⇒ Maintenance tables
- ☐ Removing and installing ⇒ Maintenance ; Booklet 830 ; Maintenance; Air cleaner: renewing filter element and cleaning housing

8 - Air duct

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

9 - Air duct

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



10 - 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

11 - Snow screen

- ☐ Country-specific version

12 - Sealing element

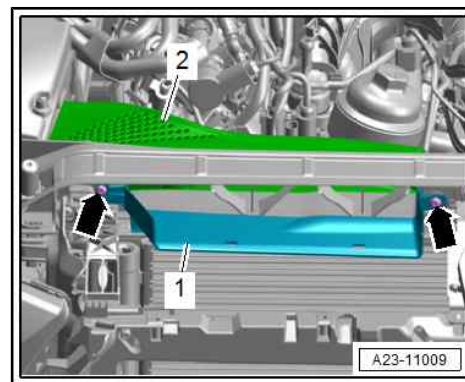
3.2 Removing and installing air cleaner housing

Special tools and workshop equipment required

- ◆ Silicone-free lubricant

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; 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) .
- Remove bolts -arrows- and detach air duct -2-.



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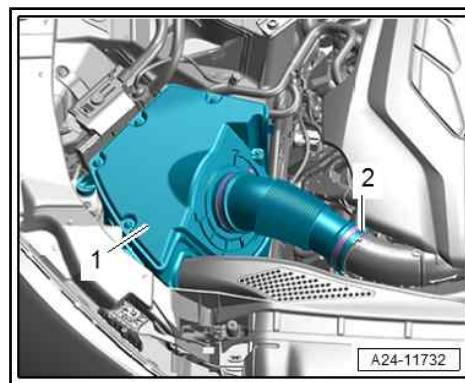


- Release hose clip -2- and detach air pipe.
- Lift off air cleaner housing -1- and detach.

Installing

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

- The air cleaner housing must always be clean.
- 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 for salt residue and dirt in air pipe (engine intake side).
- 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 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 244](#)
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



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4 Intake manifold

⇒ [“4.1 Exploded view - intake manifold”, page 247](#)

⇒ [“4.2 Removing and installing intake manifold”, page 247](#)

⇒ [“4.3 Removing and installing throttle valve module GX3”, page 248](#)

⇒ [“4.4 Cleaning throttle valve module GX3”, page 249](#)

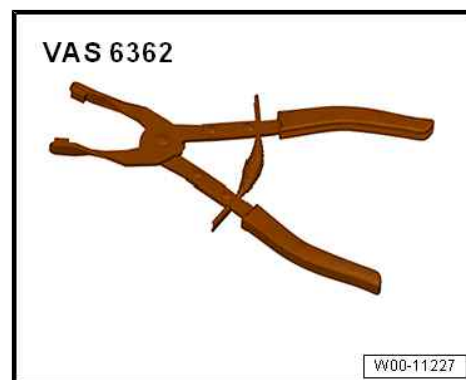
4.1 Exploded view - intake manifold

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Intake manifold; Exploded view - intake manifold .

4.2 Removing and installing intake manifold

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



Removing

- Drain coolant
⇒ [“1.3 Draining and filling cooling system”, page 122](#) .

Intake manifold (cylinder bank 1, right-side):

- Remove engine support (right-side)
⇒ [“1.7 Removing and installing engine support”, page 91](#) .
- Remove air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .
- Remove bracket for alternator ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13; Cylinder block (pulley end); Removing and installing bracket for ancillaries .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Intake manifold; Removing and installing intake manifold .

Intake manifold (cylinder bank 2, left-side):

- Remove ABS control unit with hydraulic unit ⇒ Brake system; Rep. gr. 45 ; Control unit and hydraulic unit; Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55- .
- Remove engine mounting (left-side)
⇒ [“2.3.1 Removing and installing engine mountings”, page 81](#) .



- Place a cloth underneath to catch escaping coolant.
- Remove bolts -arrows- and detach connection -2-.
- Release hose clip -1- and disconnect coolant hose.
- Detach connection.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Intake manifold; Removing and installing intake manifold .

Installing

Additional work:

Intake manifold (cylinder bank 1, right-side):

- Install bracket for alternator ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries .
- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .
- Install engine support (right-side)
⇒ [“1.7 Removing and installing engine support”, page 91](#) .

Intake manifold (cylinder bank 2, left-side):

- Install ABS control unit with hydraulic unit ⇒ Brake system; Rep. gr. 45 ; Control unit and hydraulic unit; Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55- .
- Install engine mounting (left-side)
⇒ [“2.3.1 Removing and installing engine mountings”, page 81](#) .
- Fill up with coolant
⇒ [“1.3 Draining and filling cooling system”, page 122](#) .

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4.3 Removing and installing throttle valve module - GX3-

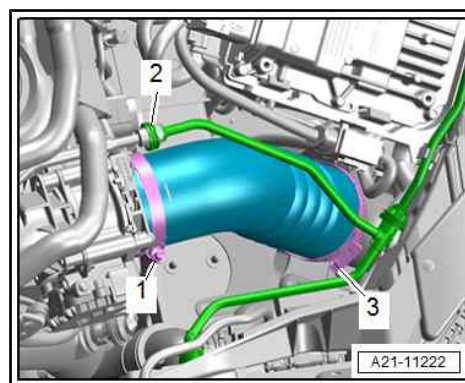
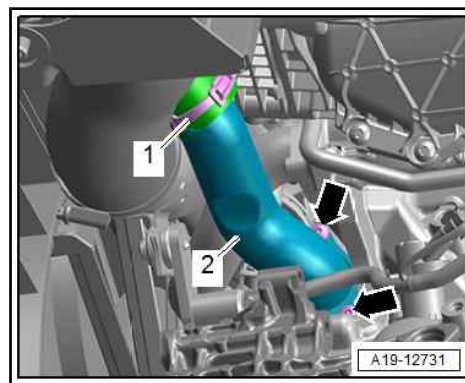
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Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

2.9 ltr. engine:

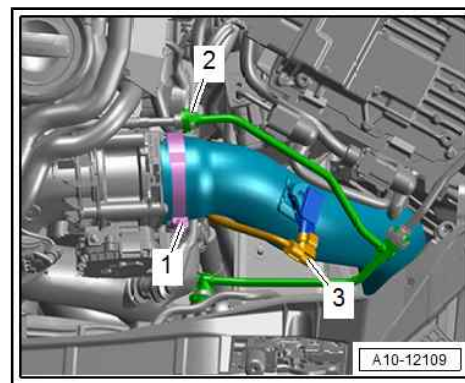
- Move clear coolant bleeder line -2-.
- Release hose clip -1-, detach air hose and tie up to left side.





3.0 ltr. engine:

- Unplug electrical connector -3- for charge pressure sender - G31- .
- Move clear coolant bleeder line -2-.
- Release hose clip -1-, detach air pipe and tie up to left side.

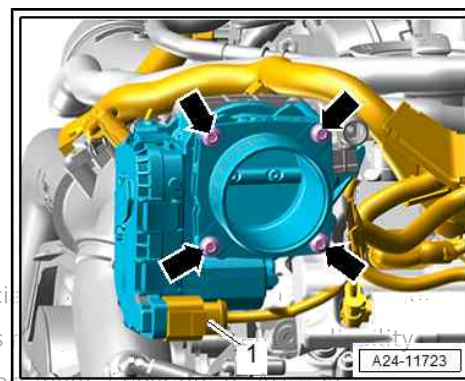


- Unplug electrical connector -1-.
- Remove bolts -arrows- and detach throttle valve module - GX3- .

Installing

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

- Renew gasket after removing.
- Install engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel
- If throttle valve module - GX3- was renewed, perform corresponding adaptations listed in Guided Function "0001 - Functions, engine mechanics" ⇒ Vehicle diagnostic tester.



Tightening torques

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - charge air system
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

4.4 Cleaning throttle valve module - GX3-

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Intake manifold; Cleaning throttle valve module .



5 Injectors

⇒ [“5.1 Exploded view - fuel rail with injectors”, page 250](#)

⇒ [“5.2 Removing and installing fuel rail”, page 250](#)

⇒ [“5.3 Removing and installing injectors”, page 250](#)

⇒ [“5.4 Cleaning injectors”, page 250](#)

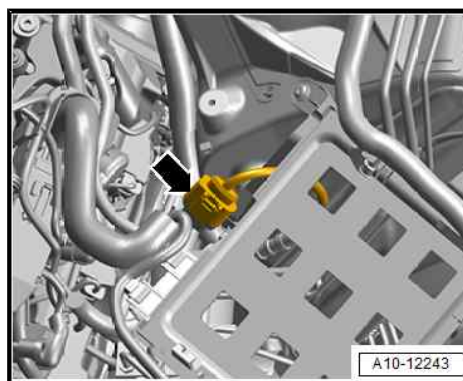
5.1 Exploded view - fuel rail with injectors

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Exploded view - fuel rail with injectors .

5.2 Removing and installing fuel rail

Removing fuel rail for cylinder bank 2 (left-side)

- Detach engine control unit - J623- from bracket and move to one side
⇒ [“9.2 Removing and installing engine/motor control unit J623”, page 257](#) .
- If fitted, move electrical connector -arrow- clear.
- Remove throttle valve module - GX3-
⇒ [“4.3 Removing and installing throttle valve module GX3”, page 248](#) .

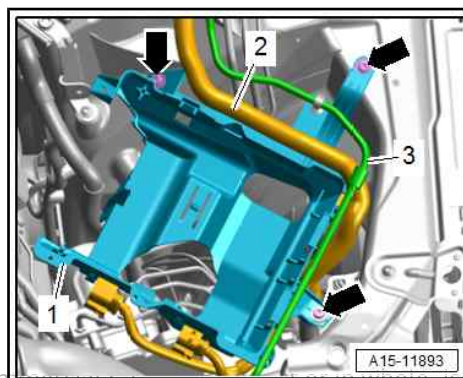


- Move coolant line -3- and electrical wiring harness clear.
- Remove bolts -arrows- and detach bracket for engine control unit - J623- .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Removing and installing fuel rail .

Tightening torques

- ◆ ⇒ [“9.1 Exploded view - engine control unit”, page 257](#)



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5.3 Removing and installing injectors

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Removing and installing injectors .

5.4 Cleaning injectors

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Injectors; Removing and installing injectors .



6 Senders and sensors

⇒ [“6.1 Exploded view - actuator for structure-borne sound and control unit for structure-borne sound”, page 251](#)

⇒ [“6.2 Removing and installing actuator for structure-borne sound R214 ”, page 252](#)

⇒ [“6.3 Removing and installing control unit for structure-borne sound J869 ”, page 252](#)

⇒ [“6.4 Removing and installing intake air temperature sender G42 / intake manifold pressure sender G71 ”, page 253](#)

⇒ [“6.5 Removing and installing fuel pressure sender G247 ”, page 253](#)

⇒ [“6.6 Removing and installing fuel pressure sender for low pressure G410 ”, page 253](#)

6.1 Exploded view - actuator for structure-borne sound and control unit for structure-borne sound

1 - Plenum chamber

2 - Control unit for structure-borne sound - J869-

- ❑ Removing and installing
⇒ [“6.3 Removing and installing control unit for structure-borne sound J869 ”, page 252](#)

3 - Nut

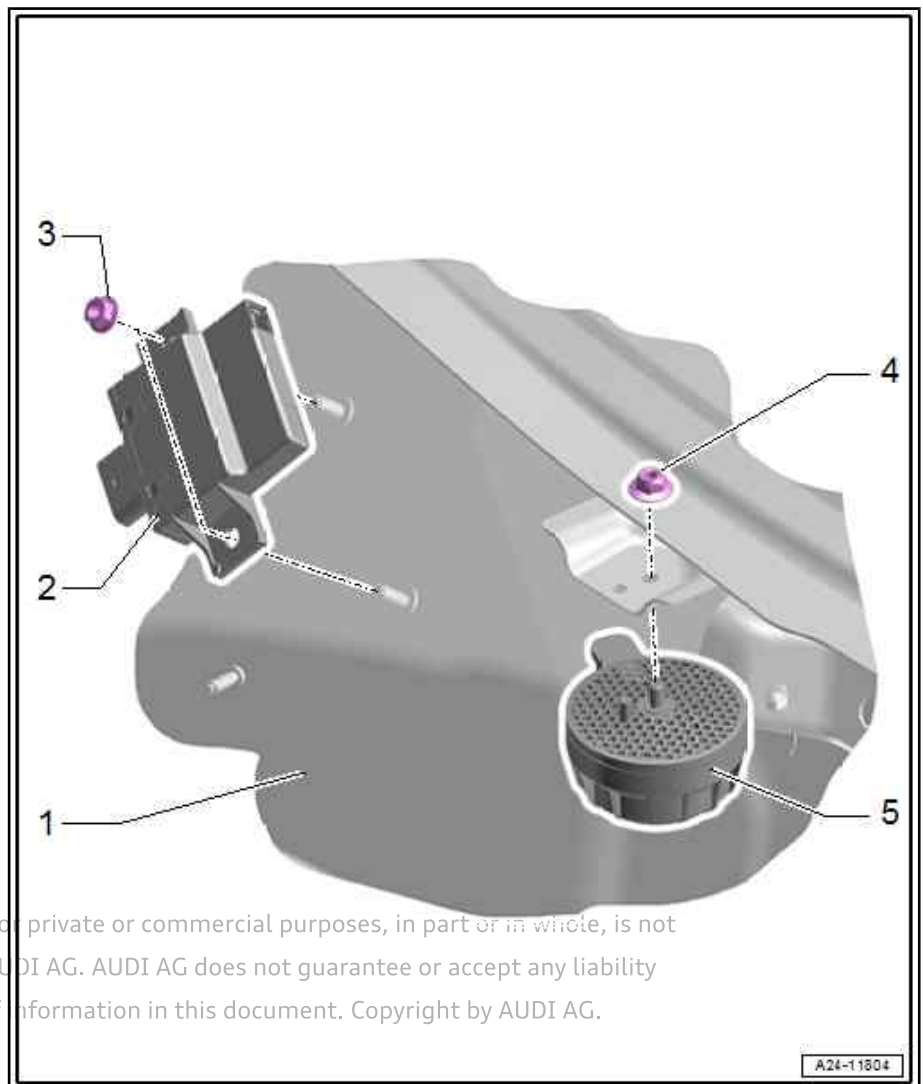
- ❑ 3 Nm

4 - Nut

- ❑ 5 Nm

5 - Actuator for structure-borne sound - R214-

- ❑ Removing and installing
⇒ [“6.2 Removing and installing actuator for structure-borne sound R214 ”, page 252](#)



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6.2 Removing and installing actuator for structure-borne sound - R214-

Removing

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Unplug electrical connector -1-.
- Remove nut -arrow- and detach actuator for structure-borne sound - R214- -item 2-.

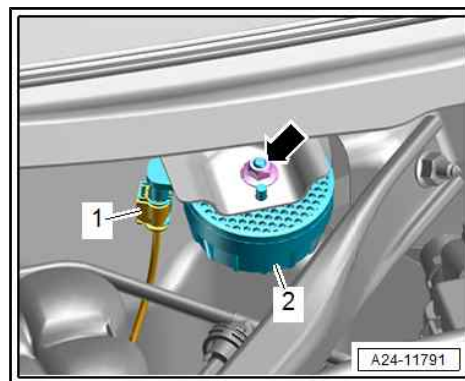
Installing

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

- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Tightening torques

- ♦ ⇒ ["6.1 Exploded view - actuator for structure-borne sound and control unit for structure-borne sound", page 251](#)



6.3 Removing and installing control unit for structure-borne sound - J869-

Removing

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Unplug electrical connector -1-.
- Remove nuts -arrows- and unclip control unit for structure-borne sound - J869- -item 2-.

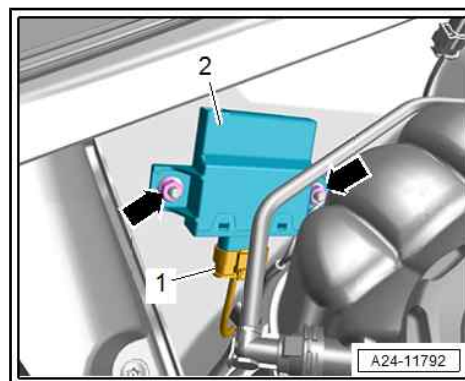
Installing

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

- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .

Tightening torques

- ♦ ⇒ ["6.1 Exploded view - actuator for structure-borne sound and control unit for structure-borne sound", page 251](#)



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6.4 Removing and installing intake air temperature sender - G42- / intake manifold pressure sender - G71-

Removing

- Unplug electrical connector -2-.
- Unscrew bolt -1- and pull intake air temperature sender - G42- / intake manifold pressure sender - G71- out of air pipe.

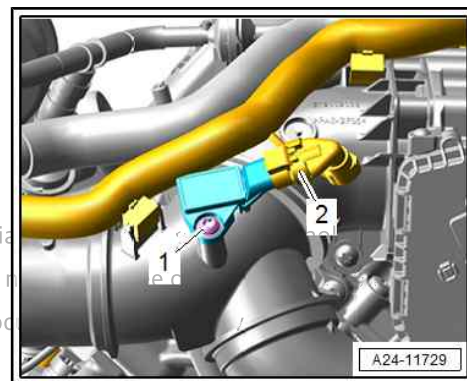
Installing

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

- Renew O-ring after removal.

Tightening torques

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI;
Rep. gr. 21 ; Charge air system; Exploded view - charge air system



6.5 Removing and installing fuel pressure sender - G247-

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Senders and sensors; Removing and installing fuel pressure sender - G247- .

6.6 Removing and installing fuel pressure sender for low pressure - G410-

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Senders and sensors ; Removing and installing fuel pressure sender for low pressure - G410- .



7 High-pressure pump

⇒ ["7.1 Exploded view - high-pressure pump", page 254](#)

⇒ ["7.2 Removing and installing high-pressure pump", page 254](#)

⇒ ["7.3 Removing and installing high-pressure pipe", page 254](#)

7.1 Exploded view - high-pressure pump

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; High-pressure pump; Exploded view - high-pressure pump .

7.2 Removing and installing high-pressure pump

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .

7.3 Removing and installing high-pressure pipe

⇒ ["7.3.1 Removing high-pressure pipe \(right-side\)", page 254](#)

⇒ ["7.3.2 Removing high-pressure pipe \(rear\)", page 254](#)

⇒ ["7.3.3 Installing high-pressure pipe", page 254](#)

7.3.1 Removing high-pressure pipe (right-side)

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Removing

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pipe .

7.3.2 Removing high-pressure pipe (rear)

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pipe .

7.3.3 Installing high-pressure pipe

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pipe .



8 Lambda probe

⇒ ["8.1 Exploded view - Lambda probe", page 255](#)

⇒ ["8.2 Removing and installing Lambda probe", page 255](#)

8.1 Exploded view - Lambda probe

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe .

8.2 Removing and installing Lambda probe

⇒ ["8.2.1 Removing and installing Lambda probe - vehicles with 2.9 ltr. engine", page 255](#)

⇒ ["8.2.2 Removing and installing Lambda probe - vehicles with 3.0 ltr. engine", page 256](#)

8.2.1 Removing and installing Lambda probe - vehicles with 2.9 ltr. engine

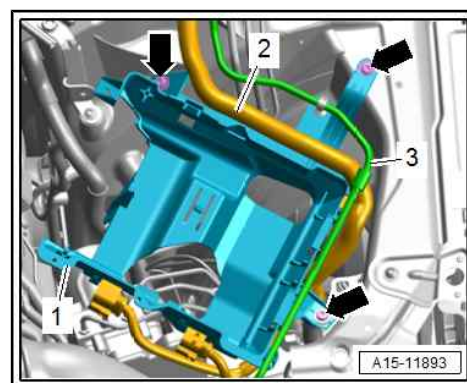
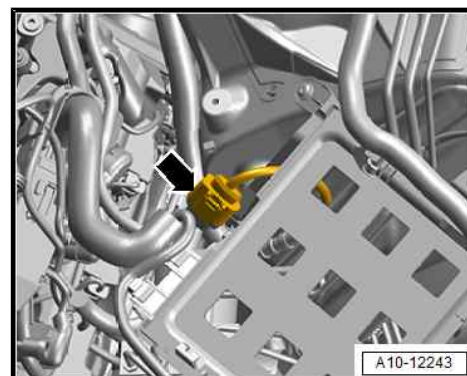
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Removing Lambda probe - G39- / Lambda probe after catalytic converter - G130-

- Remove air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#) .

Removing Lambda probe 2 - G108- / Lambda probe 2 after catalytic converter - G131-

- Remove engine control unit - J623-
⇒ ["9.2 Removing and installing engine/motor control unit J623", page 257](#) .
- Move electrical connector -arrow- clear.
- Move coolant line -3- and electrical wiring harness clear.
- Remove bolts -arrows- and detach bracket for engine control unit - J623- .





Lambda probe 2 - G108- :

- Release hose clips -1, 3- and detach air hose.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Removing and installing Lambda probe .

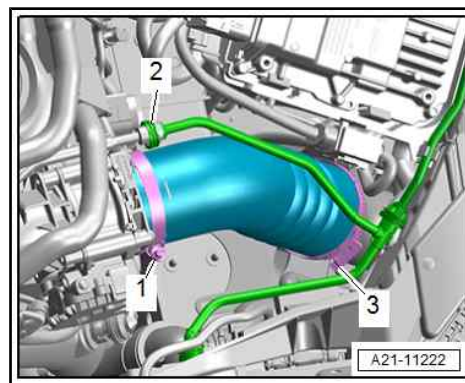
Installing

Additional work:

- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .

Tightening torques

- ♦ ⇒ [“9.1 Exploded view - engine control unit”, page 257](#)
- ♦ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



8.2.2 Removing and installing Lambda probe - vehicles with 3.0 ltr. engine

Removing

- Remove air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Removing and installing Lambda probe .

Installing

Additional work:

- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .



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9 Engine control unit

⇒ ["9.1 Exploded view - engine control unit", page 257](#)

⇒ ["9.2 Removing and installing engine/motor control unit J623 ", page 257](#)

9.1 Exploded view - engine control unit

1 - Bolt

- 7.5 Nm

2 - Bracket

- For engine control unit - J623-

3 - Bolt

- 7.5 Nm

4 - Engine control unit - J623-

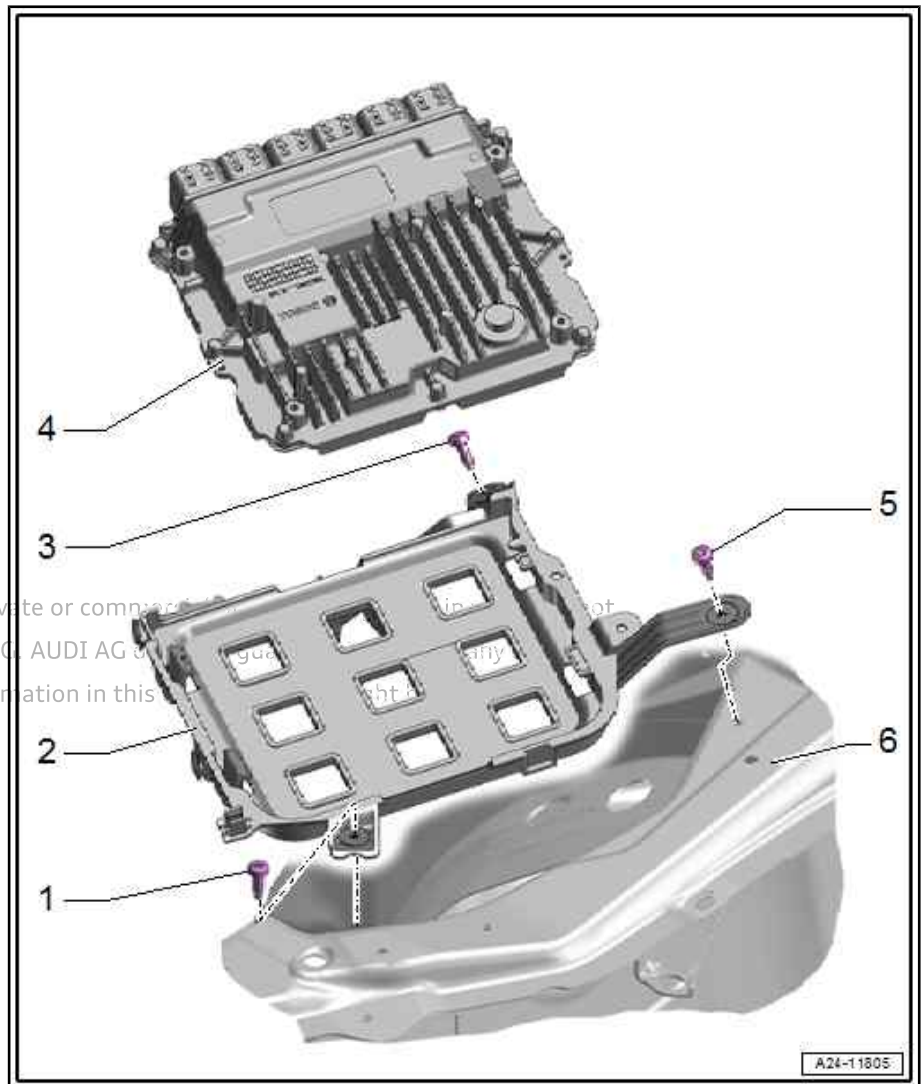
- Removing and installing
⇒ ["9.2 Removing and installing engine/motor control unit J623 ", page 257](#)

- After renewal, perform corresponding adaption listed in Guided Function "0001 - Functions, engine mechanics" ⇒ [Vehicle diagnostic tester](#)

5 - Bolt

- 7.5 Nm

6 - Suspension turret



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

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

Removing

If engine control unit - J623- is to be renewed, adaption values must be read out:

- Connect vehicle diagnostic tester , switch on ignition and select Replace engine control module in Guided functions mode.



- Switch off ignition.
- Unplug electrical connectors -1-.
- Release catches -arrows- and detach engine control unit - J623- -item 2-.

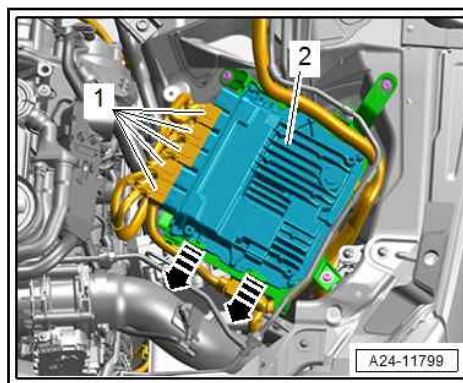
Installing

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

- If engine control unit - J623- was renewed, perform corresponding adaptations listed in Guided Function "0001 - Functions, engine mechanics" ⇒ Vehicle diagnostic tester.

Tightening torques

- ♦ ⇒ ["9.1 Exploded view - engine control unit", page 257](#)



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26 – Exhaust system

1 Exhaust pipes/silencers

⇒ [“1.1 Exploded view - silencers”, page 259](#)

⇒ [“1.2 Removing and installing front silencers”, page 264](#)

⇒ [“1.3 Separating exhaust pipes/silencers”, page 269](#)

⇒ [“1.4 Removing and installing silencers”, page 270](#)

⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#)

⇒ [“1.6 Checking exhaust system for leaks”, page 272](#)

1.1 Exploded view - silencers

⇒ [“1.1.1 Exploded view - silencers, vehicles with 2.9 ltr. engine”, page 259](#)

⇒ [“1.1.2 Exploded view - silencers, vehicles with 3.0 ltr. engine”, page 261](#)

1.1.1 Exploded view - silencers, vehicles with 2.9 ltr. engine

1 - Bolt

- ☐ 20 Nm

2 - Bracket

- ☐ For rubber mounting

3 - Rubber mounting

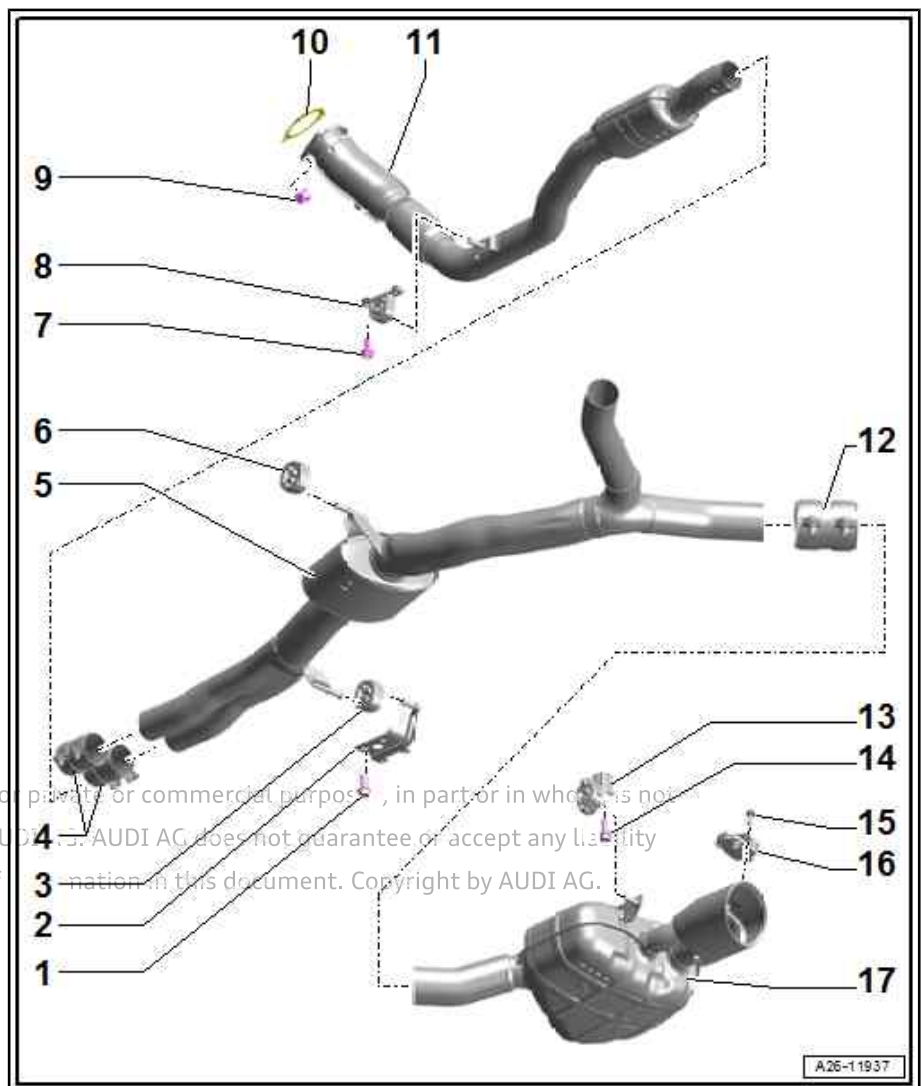
- ☐ Renew if damaged
- ☐ Align exhaust system so it is free of stress
⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#)

4 - Clamps (front)

- ☐ Installation position
⇒ [Fig. “Installation position of front clamps”, page 261](#)
- ☐ Push onto front silencer as far as stop
- ☐ Before tightening, align exhaust system so it is free of stress
⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#)
- ☐ Tighten screw connections evenly to 23 Nm

5 - Centre silencer

- ☐ Combined in one unit with rear silencers as original equipment. Can be renewed separately for repair purposes
- ☐ Removing and installing
⇒ [“1.4 Removing and installing silencers”, page 270](#)





[stalling silencers",
page 270](#)

- ☐ Cutting point ⇒ ["1.3 Separating exhaust pipes/silencers", page 269](#)
- ☐ Align exhaust system so it is free of stress ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

6 - Rubber mounting

- ☐ Renew if damaged
- ☐ Align exhaust system so it is free of stress ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

7 - Not fitted

8 - Not fitted

9 - Nut

- ☐ Renew after removing
- ☐ Coat threads with high-temperature paste; for high-temperature paste refer to ⇒ Electronic parts catalogue
- ☐ 23 Nm

10 - Gasket

- ☐ Renew after removing

11 - Front silencer

- ☐ With flexible joint; do not bend flexible joint more than 10° – otherwise it can be damaged
- ☐ Removing and installing ⇒ ["1.2 Removing and installing front silencers", page 264](#)
- ☐ Align exhaust system so it is free of stress ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

12 - Clamp (rear) Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted without the prior written consent of AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.

- ☐ For separate replacement of centre and rear silencers
- ☐ Installation position ⇒ [Fig. "Installation position of rear clamps", page 261](#)
- ☐ Before tightening, align exhaust system so it is free of stress ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)
- ☐ Tighten screw connections evenly to 23 Nm

13 - Mounting

- ☐ Renew if damaged
- ☐ Check preload ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

14 - Bolt

- ☐ 20 Nm

15 - Bolt

- ☐ Renew after removing
- ☐ 9 Nm

16 - Exhaust flap control unit

- ◆ On right side: exhaust flap control unit - J883-
- ◆ On left side: exhaust flap control unit 2 - J945-
- ☐ Removing and installing ⇒ ["2.3 Removing and installing exhaust flap control unit J883", page 284](#)

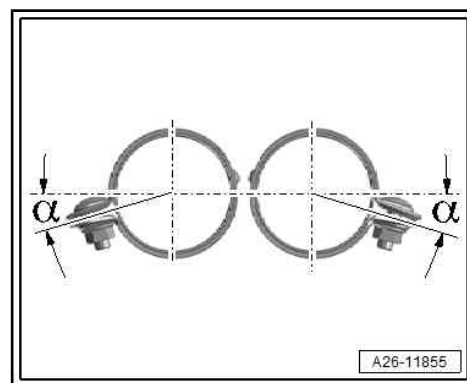
17 - Rear silencer

- ☐ Combined in one unit with centre silencer as original equipment. Can be renewed separately for repair purposes
- ☐ Removing and installing ⇒ ["1.4 Removing and installing silencers", page 270](#)
- ☐ Cutting point ⇒ ["1.3 Separating exhaust pipes/silencers", page 269](#)
- ☐ Align exhaust system so it is free of stress ⇒ [page 271](#)



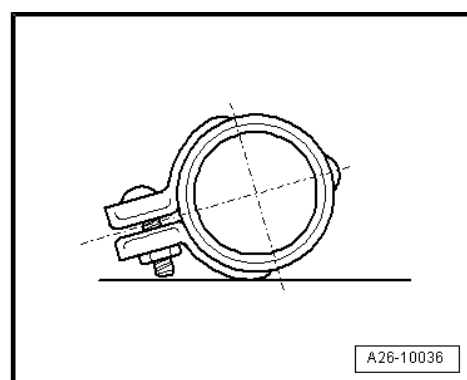
Installation position of front clamps

- Install clamps so that the bolt ends do not protrude beyond bottom of clamp.
- Installation position: bolted connections face outwards.
- Angle $\alpha = 45^\circ$



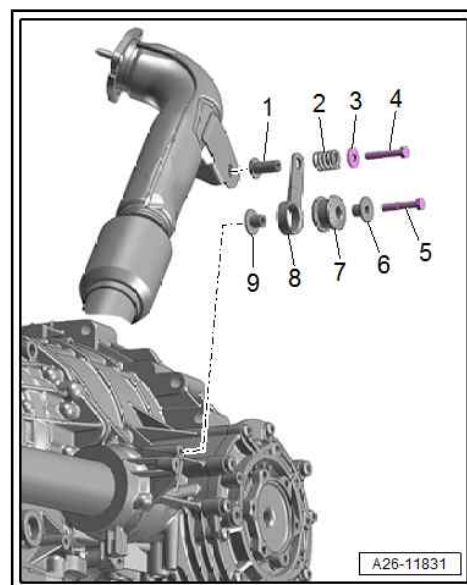
Installation position of rear clamps

- Install clamps so that the bolt ends do not protrude beyond bottom of clamp.
- Installation position: bolted connections face forwards.



Mounting components

- 1 - Spacer sleeve
- 2 - Compression spring
- 3 - Washer
- 4 - Bolt, 23 Nm
- 5 - Bolt, 23 Nm
- 6 - Spacer sleeve
- 7 - Buffer
- 8 - Retainer
- 9 - Spacer sleeve



1.1.2 Exploded view - silencers, vehicles with 3.0 ltr. engine



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1 - Bolt

- ☐ 20 Nm

2 - Bracket

- ☐ For rubber mounting

3 - Rubber mounting

- ☐ Renew if damaged
- ☐ Align exhaust system so it is free of stress

⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

4 - Clamps (front)

- ☐ Installation position
⇒ [Fig. "Installation position of front clamps", page 261](#)
- ☐ Push onto front silencer as far as stop
- ☐ Before tightening, align exhaust system so it is free of stress
⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)
- ☐ Tighten screw connections evenly to 23 Nm

5 - Centre silencer

- ☐ Combined in one unit with rear silencers as original equipment. Can be renewed separately for repair purposes

- ☐ Removing and installing
⇒ ["1.4 Removing and installing silencers", page 270](#)

- ☐ Cutting point ⇒ ["1.3 Separating exhaust pipes/silencers", page 269](#)

- ☐ Align exhaust system so it is free of stress ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

6 - Rubber mounting

- ☐ Renew if damaged
- ☐ Align exhaust system so it is free of stress ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

7 - Bolt

- ☐ 20 Nm

8 - Mounting

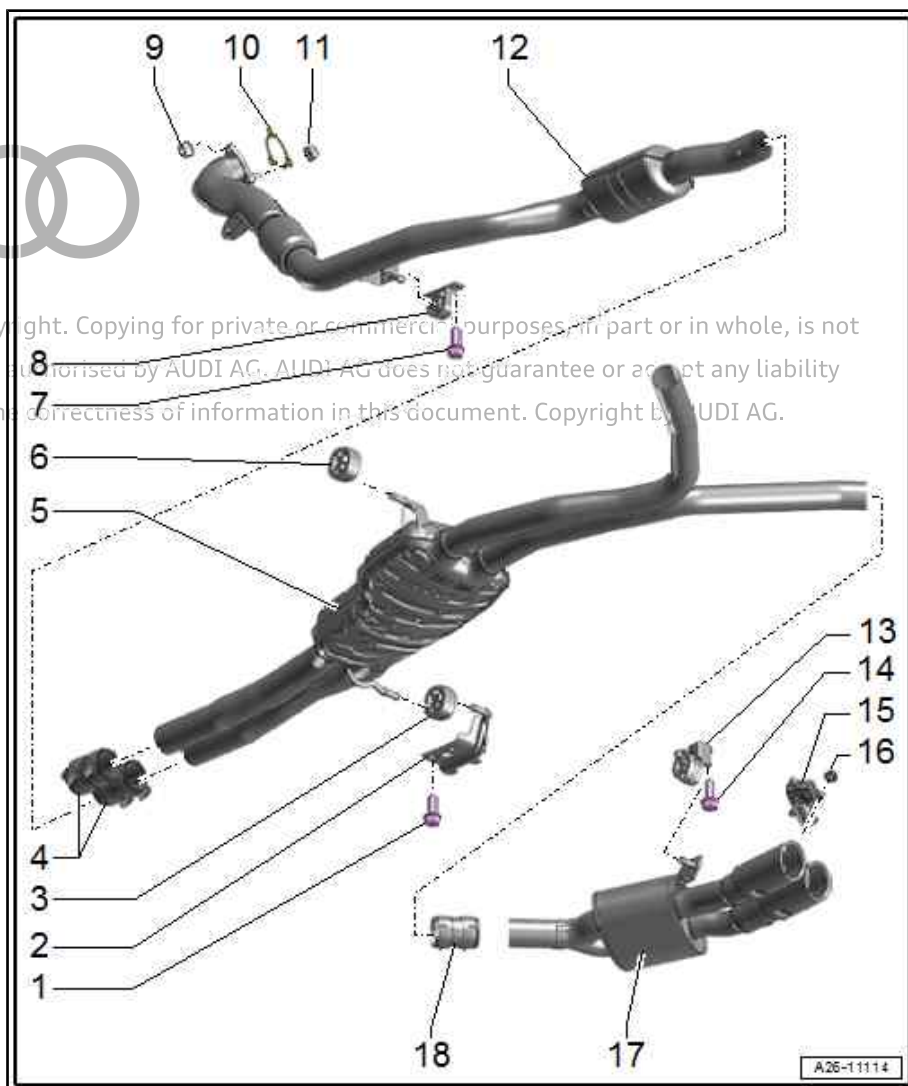
- ☐ Renew if damaged
- ☐ Check preload ⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#)

9 - Nut

- ☐ Renew after removing
- ☐ Coat threads with high-temperature paste; for high-temperature paste refer to ⇒ Electronic parts catalogue
- ☐ 23 Nm

10 - Gasket

- ☐ Renew after removing





11 - Nut

- ☐ Renew after removing
- ☐ Coat threads with high-temperature paste; for high-temperature paste refer to ⇒ Electronic parts catalogue
- ☐ 23 Nm

12 - Front silencer

- ☐ With flexible joint; do not bend flexible joint more than 10° – otherwise it can be damaged
- ☐ Removing and installing ⇒ [“1.2 Removing and installing front silencers”, page 264](#)
- ☐ Align exhaust system so it is free of stress ⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#)

13 - Mounting

- ☐ Renew if damaged
- ☐ Check preload ⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#)

14 - Bolt

- ☐ 20 Nm

15 - Exhaust flap control unit

- ◆ On right side: exhaust flap control unit - J883-
- ◆ On left side: exhaust flap control unit 2 - J945-
- ☐ Removing and installing ⇒ [“2.3 Removing and installing exhaust flap control unit J883”, page 284](#)

16 - Nut

- ☐ Renew after removing
- ☐ 3 Nm

17 - Rear silencer

- ☐ Combined in one unit with centre silencer as original equipment. Can be renewed separately for repair purposes
- ☐ Different versions available ⇒ Electronic parts catalogue
- ☐ Removing and installing ⇒ [“1.4 Removing and installing silencers”, page 270](#)
- ☐ Cutting point ⇒ [“1.3 Separating exhaust pipes/silencers”, page 269](#)
- ☐ Align exhaust system so it is free of stress ⇒ [page 271](#)

18 - Clamp (rear)

- ☐ For separate replacement of centre and rear silencers
- ☐ Installation position ⇒ [Fig. “Installation position of rear clamps”, page 261](#)
- ☐ Before tightening, align exhaust system so it is free of stress ⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#)
- ☐ Tighten screw connections evenly to 23 Nm

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1.2 Removing and installing front silencers

⇒ [“1.2.1 Removing and installing front silencers - vehicles with 2.9 ltr. engine without particulate filter”, page 264](#)

⇒ [“1.2.2 Removing and installing front silencers - vehicles with 2.9 ltr. engine with particulate filter”, page 265](#)

⇒ [“1.2.3 Removing and installing front silencers - vehicles with 3.0 ltr. engine without particulate filter”, page 266](#)

⇒ [“1.2.4 Removing and installing front silencers - vehicles with 3.0 ltr. engine with particulate filter”, page 268](#)

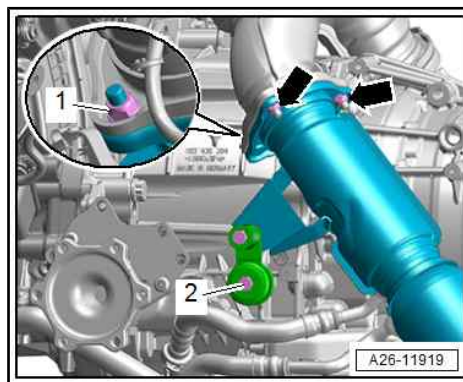
1.2.1 Removing and installing front silencers - vehicles with 2.9 ltr. engine without particulate filter

Removing

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

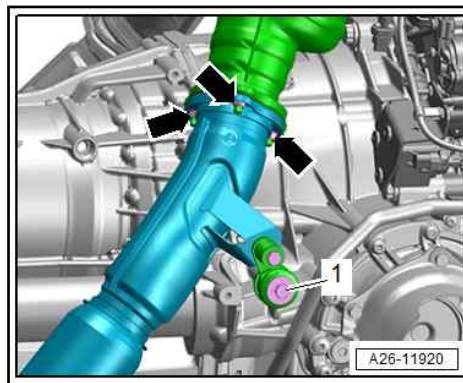
Front silencer (left-side):

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove bolt -2- and nuts -1- and -arrows- for front silencer (left-side).



Front silencer (right-side):

- Remove bolt -1- and nuts -arrows- for front silencer (right-side).



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Both sides:



Caution

Risk of damage to flexible joints in front silencer.

- ◆ **Do NOT bend the flexible joint in the front silencer more than 10°.**

- Release relevant clamp -1 or 2- and push to rear.
- Detach front silencer.

Installing

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

- Renew gaskets and self-locking nuts after removal.
- Align the exhaust system so it is free of stress
⇒ "1.5 Stress-free alignment of exhaust system", page 271
- If removed previously, install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ "1.1.1 Exploded view - silencers, vehicles with 2.9 ltr. engine", page 259
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

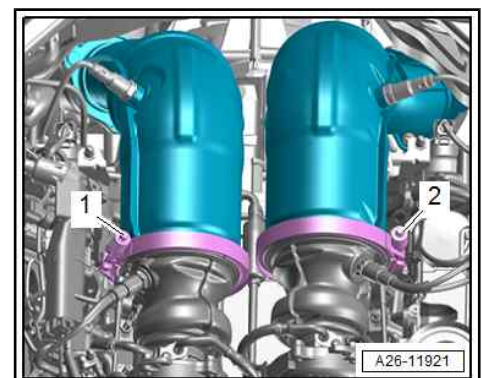
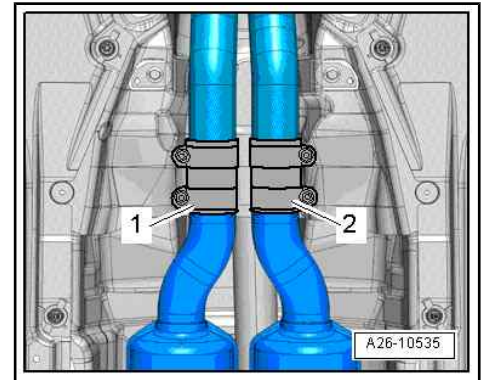
1.2.2 Removing and installing front silencers - vehicles with 2.9 ltr. engine with particulate filter

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

Front silencer (right-side):

- Remove heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Loosen bolt -1-, lift catalytic converter slightly and secure it.





Both sides:

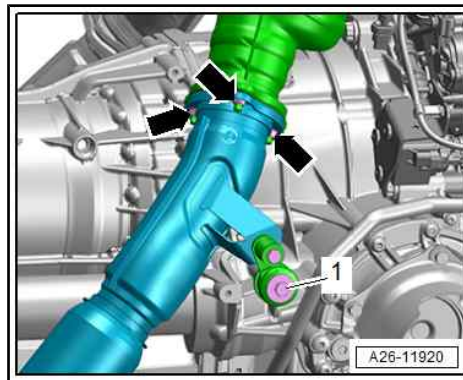
- Remove bolt -1- and nuts -arrows- for relevant front silencer.



Caution

Risk of damage to flexible joints in front silencer.

- ◆ *Do NOT bend the flexible joint in the front silencer more than 10°.*

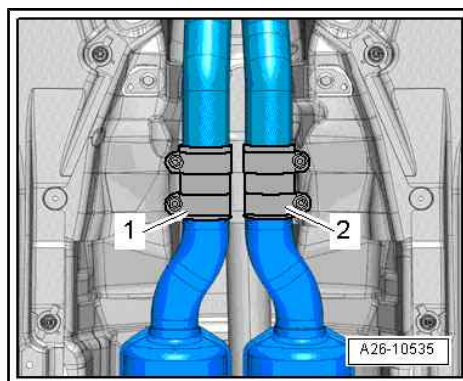


- Release relevant clamp -1 or 2- and push to rear.
- Detach front silencer.

Installing

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

- Renew gaskets and self-locking nuts after removal.
- Align the exhaust system so it is free of stress
⇒ ["1.5 Stress-free alignment of exhaust system", page 271](#) .
- If removed previously, install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ ["1.1.1 Exploded view - silencers, vehicles with 2.9 ltr. engine", page 259](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

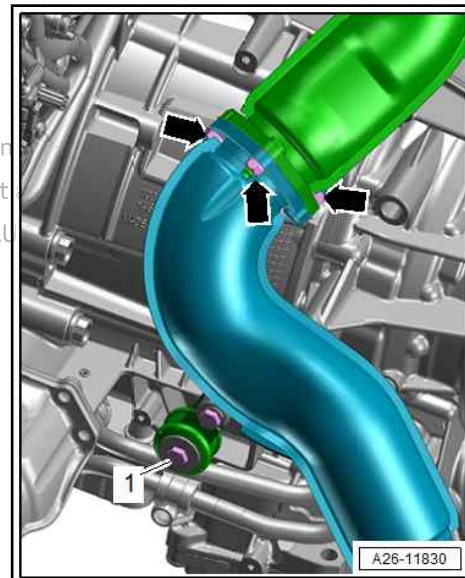
1.2.3 Removing and installing front silencers - vehicles with 3.0 ltr. engine without particulate filter

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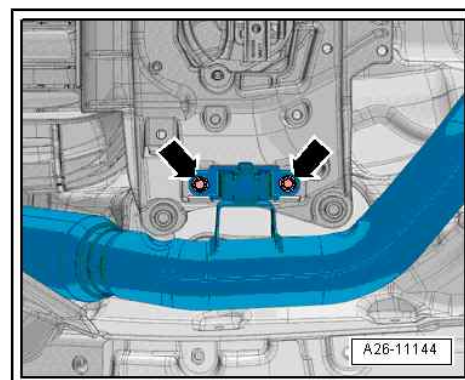
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



- Remove nuts -arrows- (illustration shows silencer on left side).
- Front silencer (right-side): Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove bolt -1-.



- Remove bolts -arrows-.



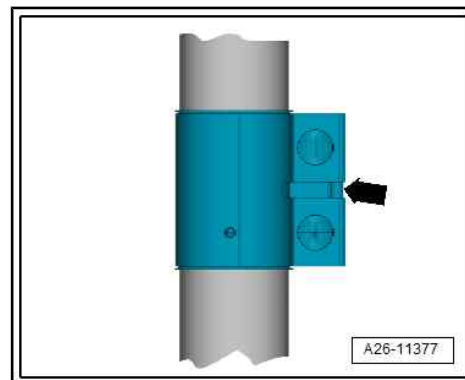
- Loosen clamp -arrow- and push towards rear.



Caution

Risk of damage to flexible joints in front silencer.

- ◆ **Do NOT bend the flexible joint in the front silencer more than 10°.**



- Detach front silencer.

Installing

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

- Renew gaskets and self-locking nuts after removal.
- Align the exhaust system so it is free of stress
⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#) .
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

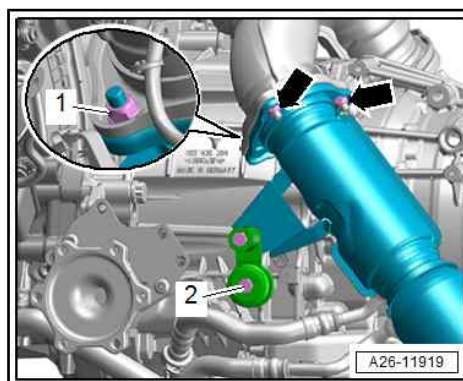
- ◆ ⇒ [“1.1.2 Exploded view - silencers, vehicles with 3.0 ltr. engine”, page 261](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



1.2.4 Removing and installing front silencers - vehicles with 3.0 ltr. engine with particulate filter

Removing

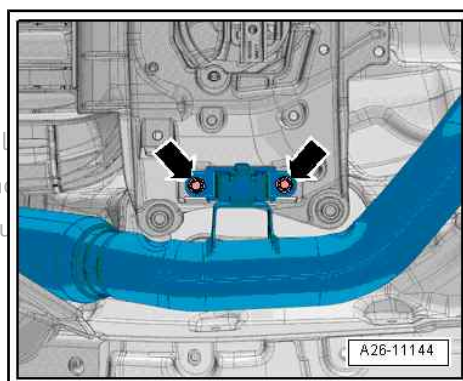
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Unscrew nut -1- (illustration shows silencer on left side).
- Remove bolt -2- and nuts -arrows-.
- Front silencer (right-side): Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



- Remove bolts -arrows-.



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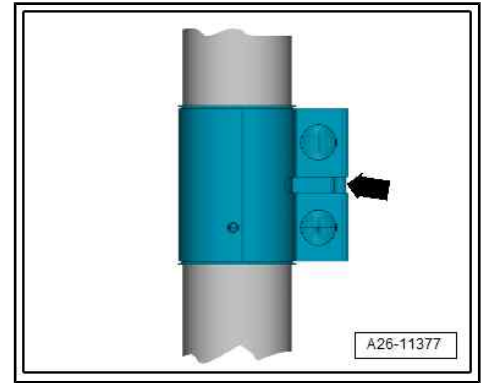
- Loosen clamp -arrow- and push towards rear.



Caution

Risk of damage to flexible joints in front silencer.

- ◆ **Do NOT bend the flexible joint in the front silencer more than 10°.**



- Detach front silencer.

Installing

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

- Renew gaskets and self-locking nuts after removal.
- Align the exhaust system so it is free of stress
⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#) .
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr./3.0 ltr. 4-valve TFSI; Rep. gr. 10; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

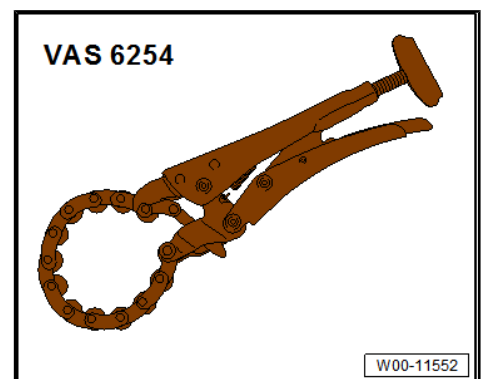
- ◆ ⇒ [“1.1.2 Exploded view - silencers, vehicles with 3.0 ltr. engine”, page 261](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

1.3 Separating exhaust pipes/silencers

- ◆ 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.
- ◆ Shown on vehicle with 3.0 ltr. engine as an example

Special tools and workshop equipment required

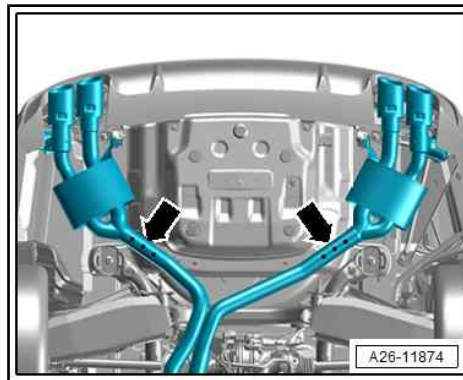
- ◆ Chain pipe cutter - VAS 6254-





Procedure

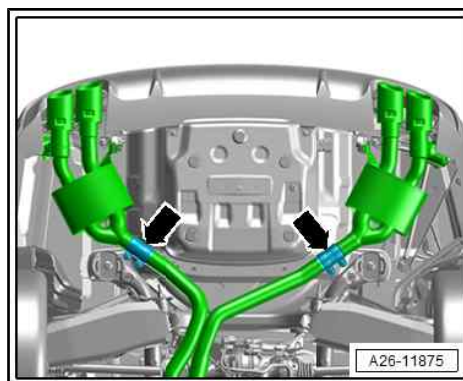
- Cut through exhaust pipes at right angles at the positions marked -arrows- using chain pipe cutter - VAS 6254- .



- Position centre of clamps -arrows- over cutting point and tighten nuts ⇒ [page 261](#) .
- Align the exhaust system so it is free of stress ⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#) .

Tightening torques

- ♦ ⇒ [“1.1 Exploded view - silencers”, page 259](#)



1.4 Removing and installing silencers

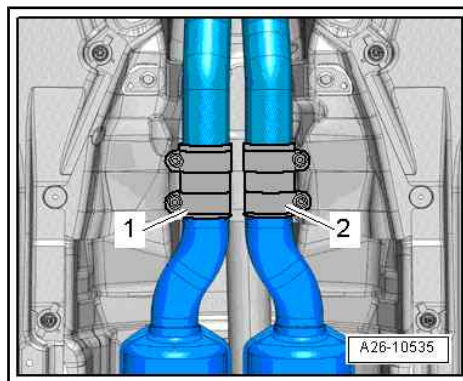
Removing

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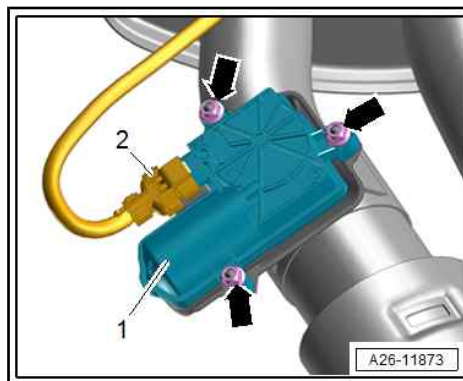
- Remove tunnel cross-piece and diagonal struts (optional equipment) ⇒ General body repairs, exterior: Rep. gr. 66 : Underbody trim; Exploded view - underbody struts .

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- Release clamps -1 and 2- and push to rear.
- Lower front silencer slightly and detach clamps.



- Unplug electrical connector -2- for exhaust flap control unit -1- on both sides. (Shown on vehicles with 3.0 ltr. engine)





WARNING

Risk of accident caused by weight of silencers.

- *Perform the following work with the assistance of a second mechanic.*

- Disengage mountings -arrows- at exhaust system (rear).
- Unscrew bolt -2- and remove silencer -1-

Installing

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

- Align the exhaust system so it is free of stress
⇒ [“1.5 Stress-free alignment of exhaust system”, page 271](#) .

Tightening torques

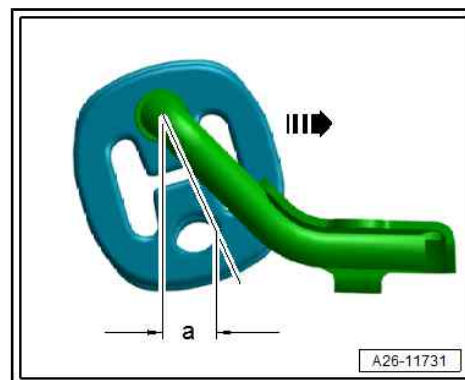
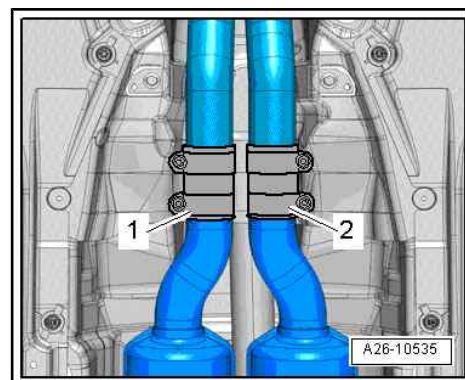
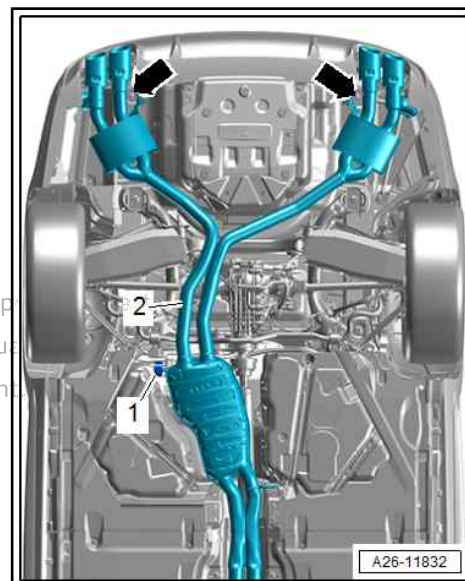
- ◆ ⇒ [“1.1 Exploded view - silencers”, page 259](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody struts

1.5 Stress-free alignment of exhaust system

Procedure

- The exhaust system must be aligned when it is cool.
- Unfasten clamps -1, 2-

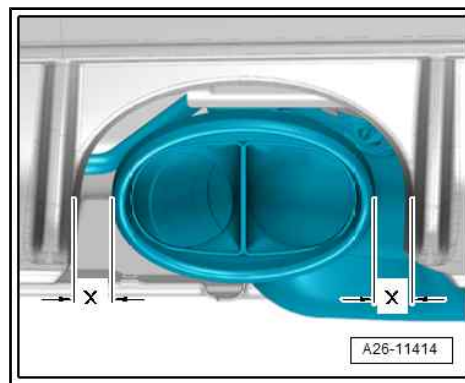
- Push exhaust system towards front of vehicle -arrow- so that mounting for exhaust pipe is preloaded by -a- = 10 ± 2 mm.
- Position clamp at front ⇒ [page 261](#) and tighten bolted connections evenly.





Vehicles with 2.9 ltr. engine:

- Check clearance between tailpipes and bumper:
- Dimension -x- (left-side) = dimension -x- (right-side)

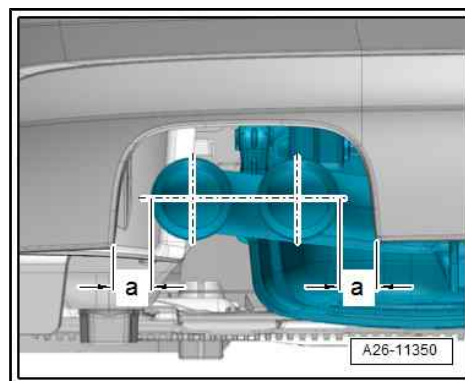


Vehicles with 3.0 ltr. engine:

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

Tightening torques

- ♦ ➔ [“1.1 Exploded view - silencers”, page 259](#)



1.6 Checking exhaust system for leaks

All procedures are described in ➔ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 26 ; Exhaust pipes/silencers; Checking exhaust system for leaks .



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2 Emission control system

⇒ [“2.1 Exploded view - emission control system”, page 273](#)

⇒ [“2.2 Removing and installing catalytic converter”, page 275](#)

⇒ [“2.3 Removing and installing exhaust flap control unit J883”, page 284](#)

2.1 Exploded view - emission control system

⇒ [“2.1.1 Exploded view - emission control system, vehicles with 2.9 ltr. engine, with or without particulate filter \(depending on version\)”, page 273](#)

⇒ [“2.1.2 Exploded view - emission control system, vehicles with 3.0 ltr. engine, with or without particulate filter \(depending on version\)”, page 274](#)

2.1.1 Exploded view - emission control system, vehicles with 2.9 ltr. engine, with or without particulate filter (depending on version)

1 - Turbocharger

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Exploded view - turbocharger

2 - Lambda probe - G39-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

3 - Seal

- ❑ Renew after removing

4 - Screw-type clip

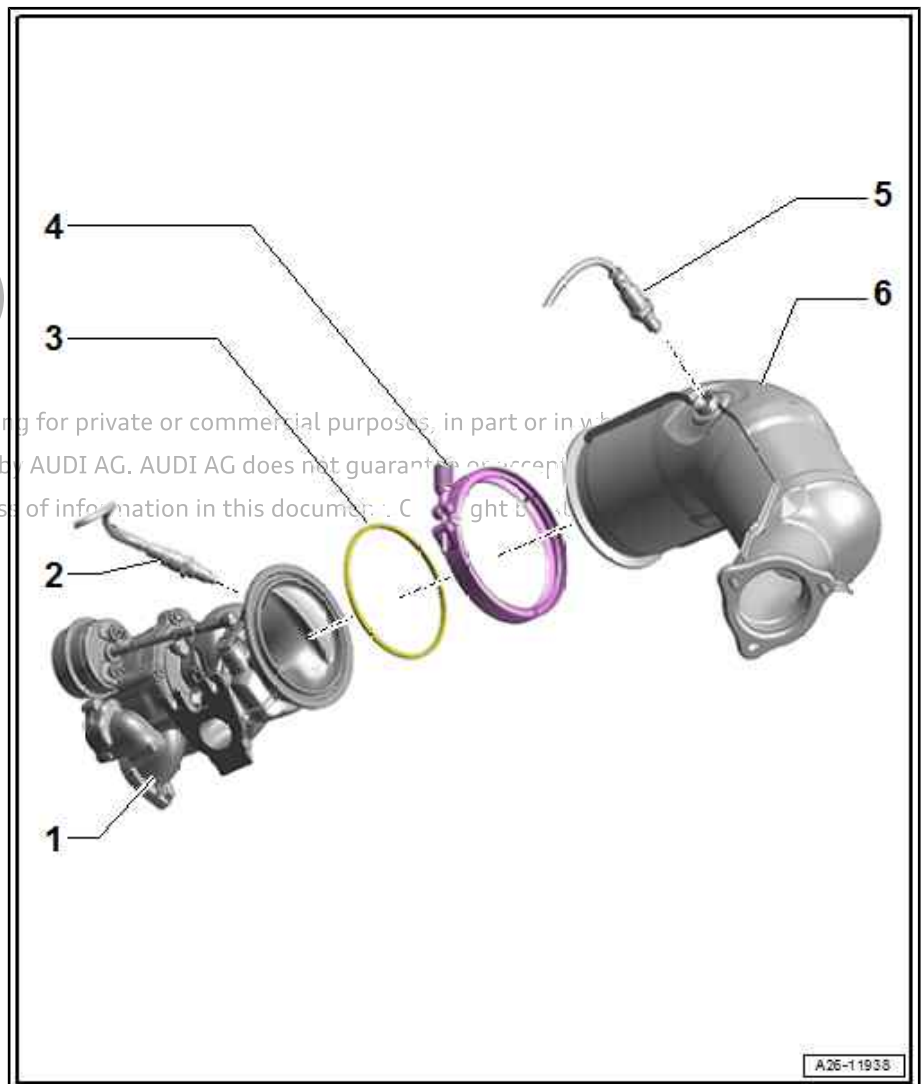
- ❑ Renew after removing
- ❑ Installation position
⇒ [Fig. “Installation position of screw-type clips for catalytic converters”](#), page 274
- ❑ 7 Nm

5 - Lambda probe after catalytic converter - G130-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

6 - Catalytic converter

- ❑ Different versions available ⇒ Electronic parts catalogue

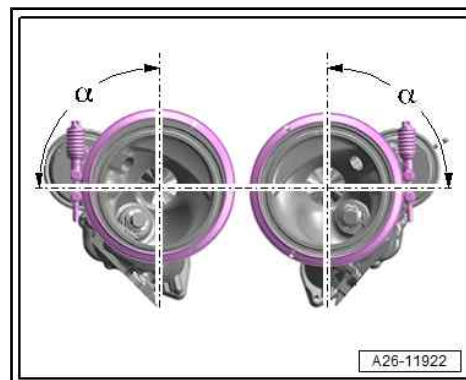




- ❑ Removing and installing ⇒ [“2.2 Removing and installing catalytic converter”, page 275](#)

Installation position of screw-type clips for catalytic converters

- Angle $-\alpha-$ = $90^\circ \pm 15^\circ$.



2.1.2 Exploded view - emission control system, vehicles with 3.0 ltr. engine, with or without particulate filter (depending on version)

1 - Turbocharger

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Turbochargers; Exploded view - turbocharger

2 - Lambda probe - G39-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

3 - Seal

- ❑ Renew after removing

4 - Screw-type clip

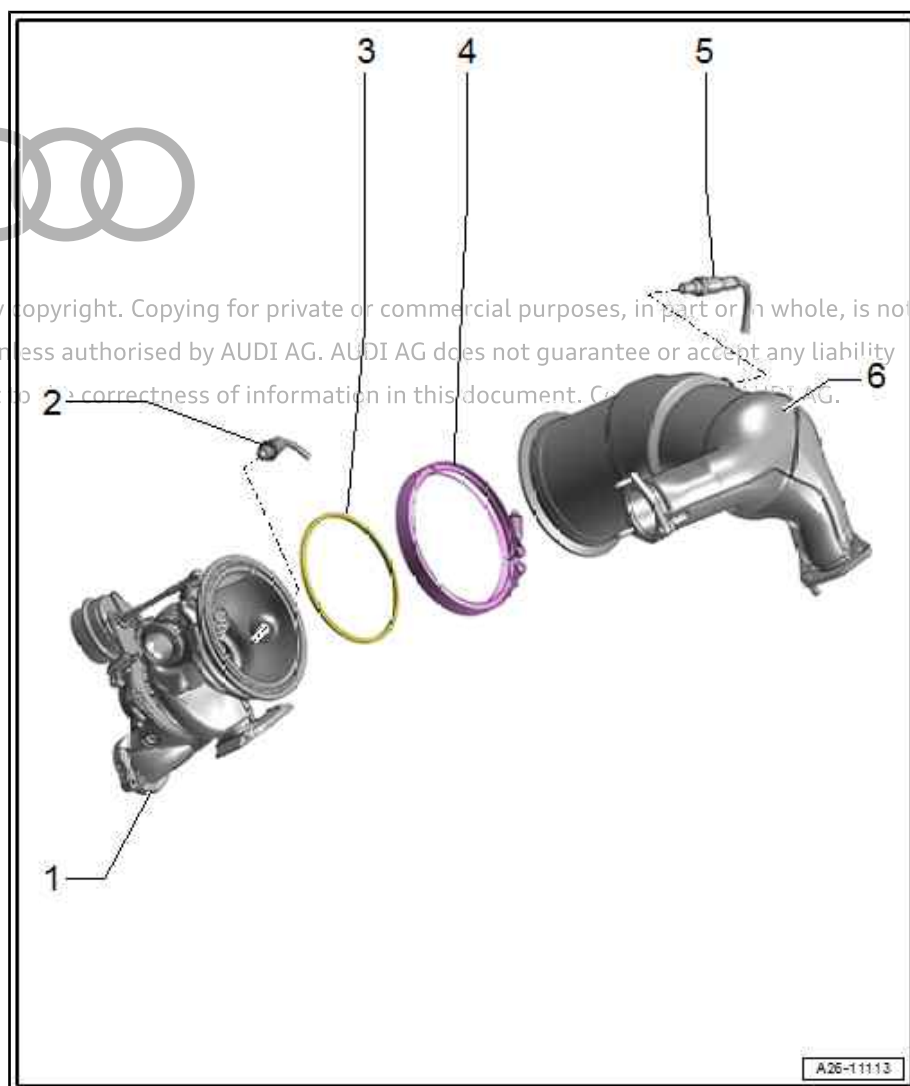
- ❑ Renew after removing
- ❑ Installation position ⇒ [Fig. “Installation position of screw-type clip for catalytic converter”](#), page 275
- ❑ 7 Nm

5 - Lambda probe after catalytic converter - G130-

- ❑ Exploded view ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe

6 - Catalytic converter

- ❑ Different versions available ⇒ Electronic parts catalogue
- ❑ Removing and installing ⇒ [“2.2 Removing and installing catalytic converter”, page 275](#)

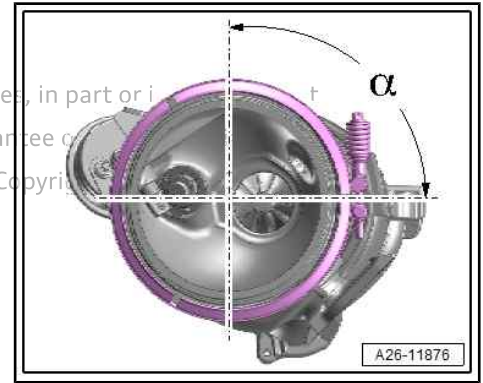




Installation position of screw-type clip for catalytic converter

- Angle α = $90^\circ \pm 15^\circ$.

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2.2 Removing and installing catalytic converter

⇒ [“2.2.1 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine without particulate filter”, page 275](#)

⇒ [“2.2.2 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine with particulate filter”, page 277](#)

⇒ [“2.2.3 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine without particulate filter”, page 280](#)

⇒ [“2.2.4 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine with particulate filter”, page 282](#)

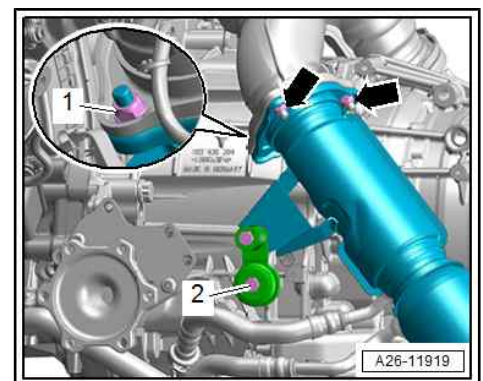
2.2.1 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine without particulate filter

Removing

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

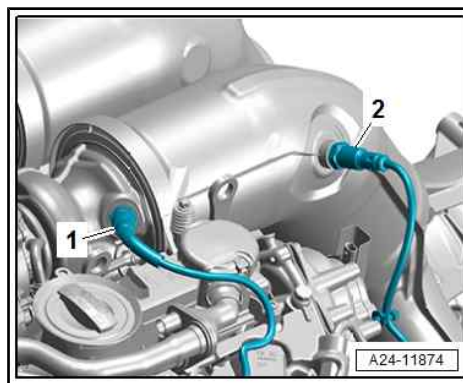
Catalytic converter (left-side):

- Remove nuts -1- and -arrows- for front silencer (left-side).

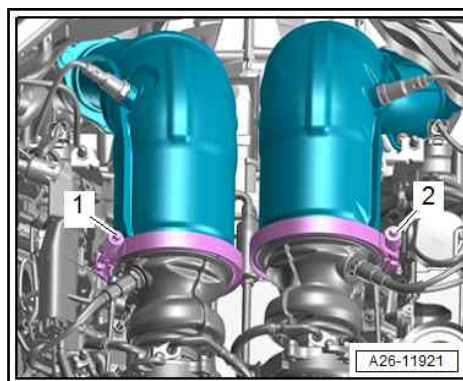




- Loosen Lambda probe 2 after catalytic converter - G131-item 2- half a turn and move electrical wire clear at cylinder head.

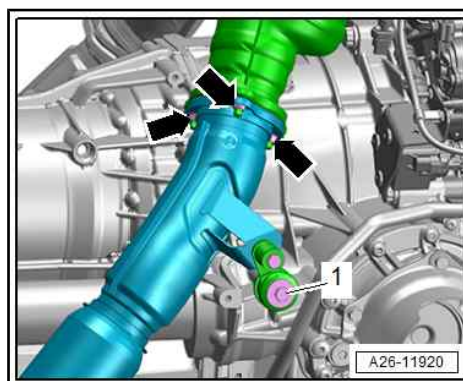


- Release screw-type clip -2-, detach catalytic converter carefully and remove it from Lambda probe.
- Electrical wire for Lambda probe must not be twisted.

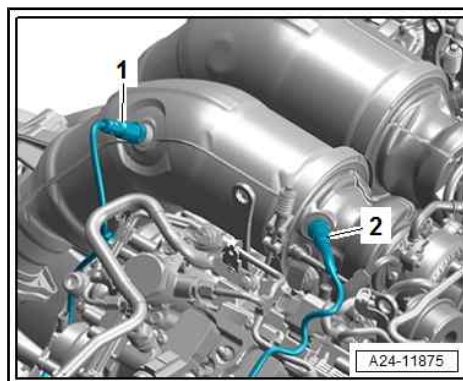


Catalytic converter (right-side):

- Unscrew nuts -arrows- for front silencer (right-side).



- Loosen Lambda probe after catalytic converter - G130-item 1- half a turn and move electrical wire clear at cylinder head.



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- Release screw-type clip -1-, detach catalytic converter carefully and remove it from Lambda probe.
- Electrical wire for Lambda probe must not be twisted.

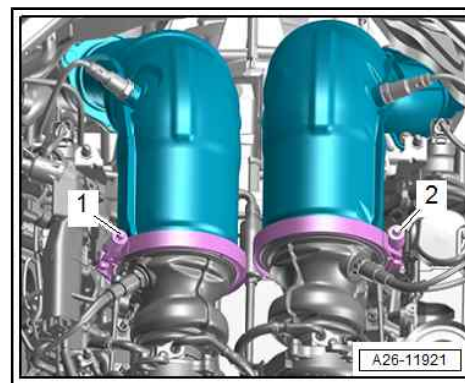
Installing

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

- Renew seals and screw-type clips after removing.
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ "1.1.1 Exploded view - silencers, vehicles with 2.9 ltr. engine", page 259
- ◆ ⇒ "2.1.1 Exploded view - emission control system, vehicles with 2.9 ltr. engine, with or without particulate filter (depending on version)", page 273
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



2.2.2 Removing and installing catalytic converter - vehicles with 2.9 ltr. engine with particulate filter

Special tools and workshop equipment required

- ◆ Socket Torx T30 - T10405-



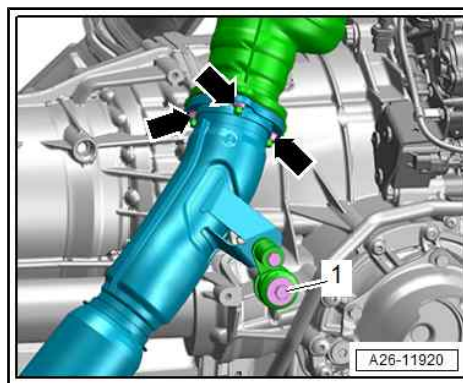
Removing

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

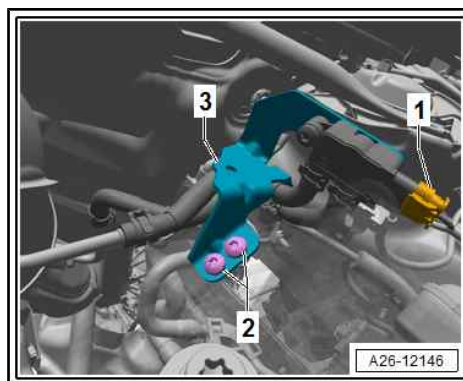


Catalytic converter (left-side):

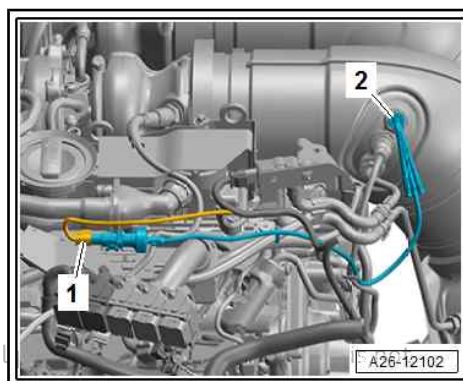
- Remove bolt -1- and nuts -arrows- for front silencer. (Illustration shows silencer on right side.)



- Unplug electrical connector -1-.
- Remove bolts -2- and move bracket -3- clear together with pressure differential sender 2 for particulate filter - G1038- .

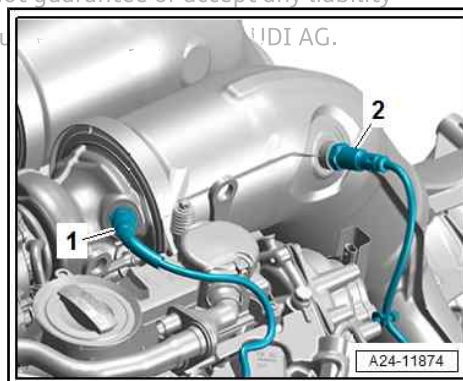


- Detach electrical connector -1- for exhaust gas temperature sender 3, bank 2 - G497- from bracket, unplug connector and move electrical wiring clear.



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- Loosen Lambda probe 2 after catalytic converter - G131- -item 2- half a turn and move electrical wire clear at cylinder head.





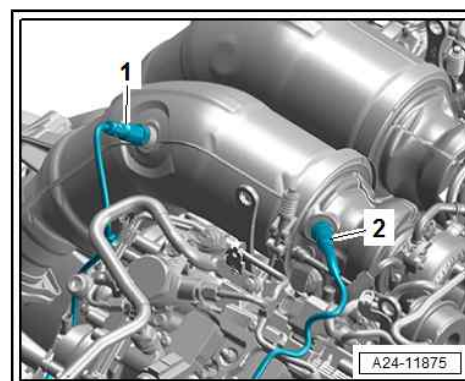
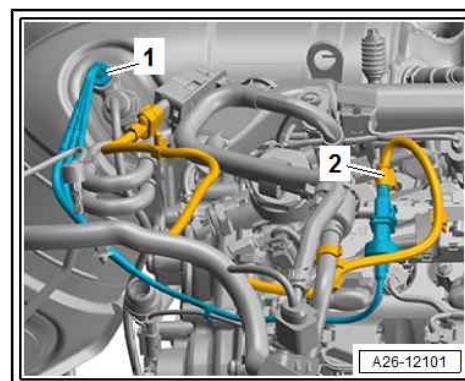
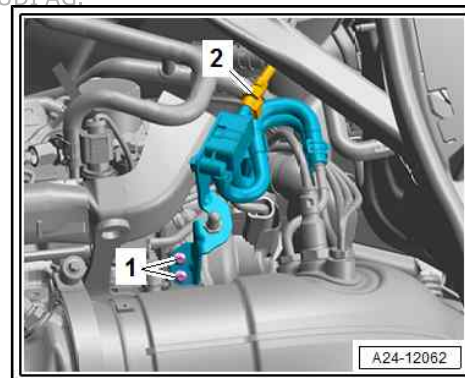
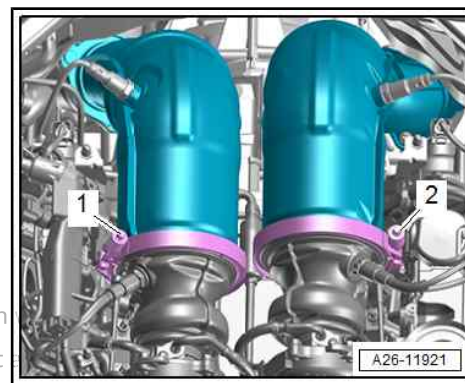
- Release screw-type clip -2-, detach catalytic converter carefully and remove it from Lambda probe.
- Electrical wire for Lambda probe must not be twisted.



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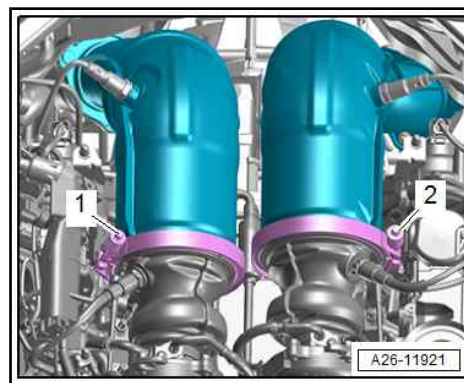
Catalytic converter (right-side):

- Unplug electrical connector -2-.
- Remove bolts -1- and move bracket clear together with pressure differential sender for particulate filter - G1037- .
- Unplug electrical connector -2- for exhaust gas temperature sender 3 - G495- from bracket, unplug it and move wiring clear.
- Loosen Lambda probe after catalytic converter - G130- -item 1- half a turn and move electrical wire clear at cylinder head.





- Release screw-type clip -1-, lift catalytic converter slightly and secure it.

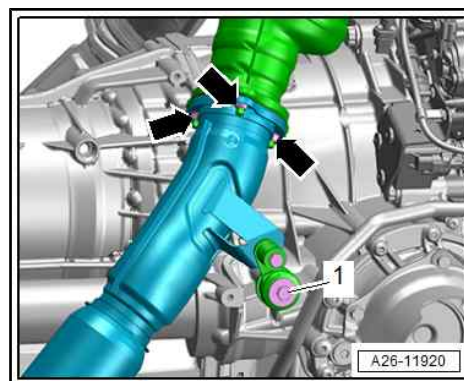


- Unscrew nuts -arrows- for front silencer (right-side), detach catalytic converter carefully and remove it from Lambda probe.
- Electrical wire for Lambda probe must not be twisted.

Installing

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

- Renew seals and screw-type clips after removing.
- Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- If catalytic converter with particulate filter was renewed, perform corresponding adaptations listed in Guided Function "0001 - Functions, engine mechanics" ⇒ Vehicle diagnostic tester.



Tightening torques

- ◆ ⇒ ["1.1.1 Exploded view - silencers, vehicles with 2.9 ltr. engine", page 259](#)
- ◆ ⇒ ["2.1.1 Exploded view - emission control system, vehicles with 2.9 ltr. engine, with or without particulate filter \(depending on version\)", page 273](#)
- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 24 ; Lambda probe; Exploded view - Lambda probe
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

2.2.3 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine without particulate filter

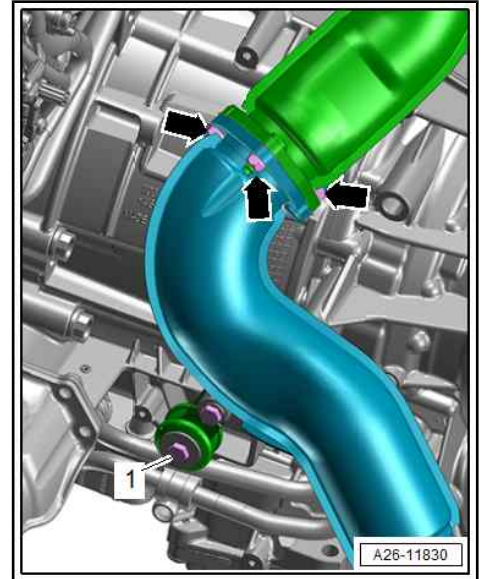
Removing

- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#)

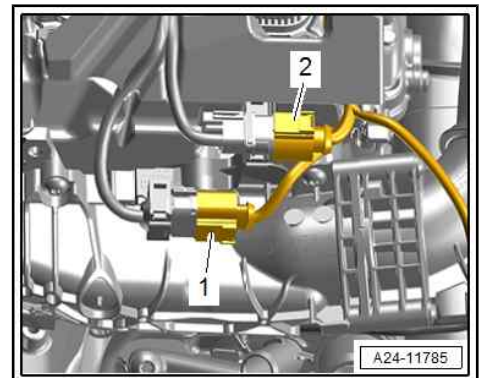
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- Remove nuts -arrows- on both sides.
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Unscrew bolt -1- and detach front silencer (left-side) from catalytic converter.



- Unplug electrical connector -1- for Lambda probe after catalytic converter - G130- and move wiring clear.

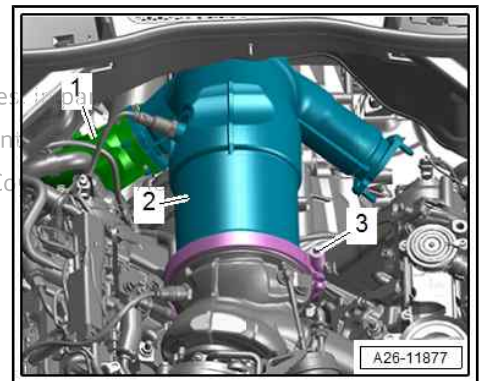


- Unfasten and detach screw-type clip -3-.
- Pull catalytic converter -2- off front silencer -1- and remove.

Installing

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

- Renew gasket and screw-type clip after removing.
- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

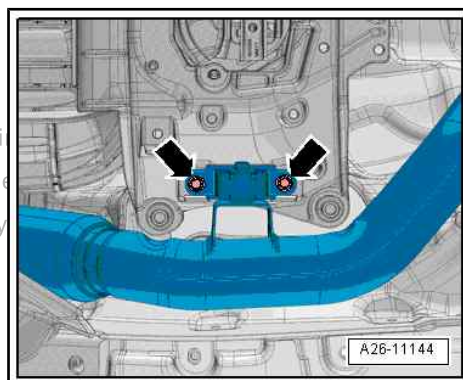
- ◆ ⇒ [“1.1.2 Exploded view - silencers, vehicles with 3.0 ltr. engine”, page 261](#)
- ◆ ⇒ [“2.1.2 Exploded view - emission control system, vehicles with 3.0 ltr. engine, with or without particulate filter \(depending on version\)”, page 274](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



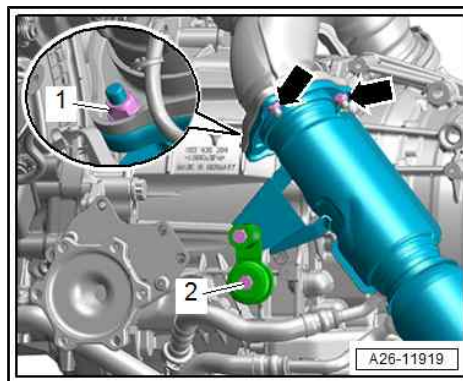
2.2.4 Removing and installing catalytic converter - vehicles with 3.0 ltr. engine with particulate filter

Removing

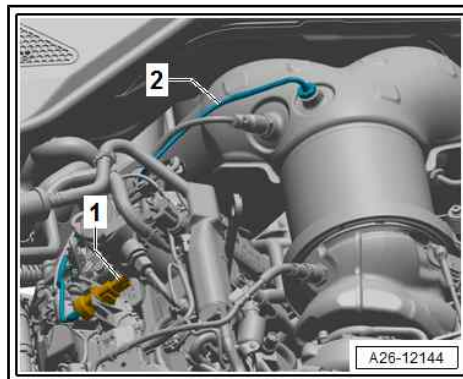
- Remove engine cover panel and heat shield ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Remove air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove bolts -arrows- (left and right).



- Remove nuts -arrows- and -1- (left and right) for front silencer (left-side).

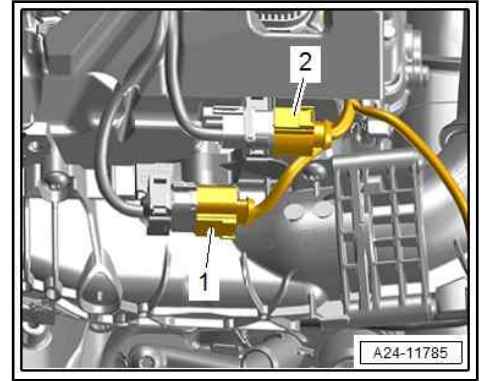


- Detach electrical connector -1- from bracket, unplug and move clear.

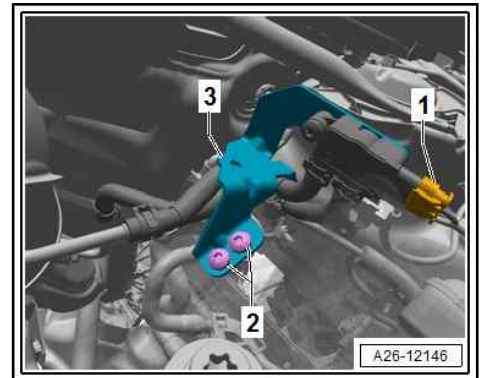




- Unplug electrical connector -1- for Lambda probe after catalytic converter - G130- and move wiring clear.



- Unplug electrical connector -1-.
- Remove bolts -2- and move bracket -3- clear together with pressure differential sender for particulate filter - G1037- .

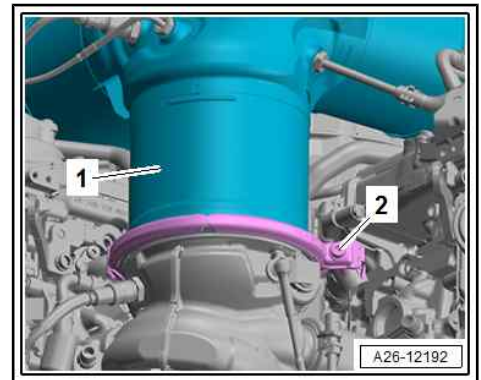


- Unfasten and detach screw-type clip -2-.
- Detach catalytic converter -1-.

Installing

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

- Renew gasket and screw-type clip after removing.
- Install air cleaner housing
⇒ ["3.2 Removing and installing air cleaner housing", page 245](#) .
- Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Install heat shield and engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- If catalytic converter with particulate filter was renewed, perform corresponding adaptations listed in Guided Function "0001 - Functions, engine mechanics" ⇒ Vehicle diagnostic tester.



Tightening torques

- ◆ ⇒ ["1.1.2 Exploded view - silencers, vehicles with 3.0 ltr. engine", page 261](#)
- ◆ ⇒ ["2.1.2 Exploded view - emission control system, vehicles with 3.0 ltr. engine, with or without particulate filter \(depending on version\)", page 274](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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2.3 Removing and installing exhaust flap control unit - J883-

⇒ [“2.3.1 Removing and installing exhaust flap control unit J883 - vehicles with 2.9 ltr. engine”, page 284](#)

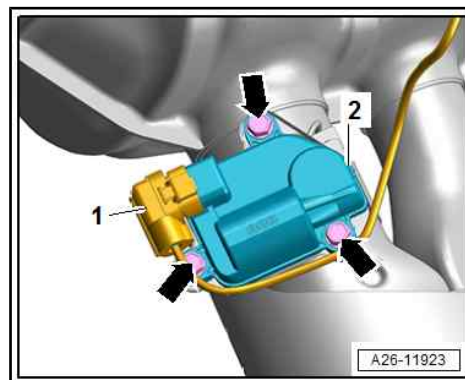
⇒ [“2.3.2 Removing and installing exhaust flap control unit J883 - vehicles with 3.0 ltr. engine”, page 284](#)

2.3.1 Removing and installing exhaust flap control unit - J883- - vehicles with 2.9 ltr. engine

Procedure applies to exhaust flap control unit - J883- and exhaust flap control unit 2 - J945- .

Removing

- Lower exhaust system (rear)
⇒ [“1.4 Removing and installing silencers”, page 270](#) .
- Unplug electrical connector -1-.
- Remove bolts -arrows- and detach exhaust flap control unit -2-.



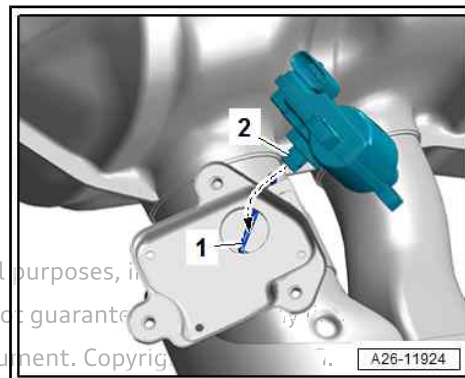
Installing

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

- Renew bolts after removing.
- Move exhaust flap control unit into installation position.
- Spring -2- must engage in groove on exhaust flap control unit -1-.

Tightening torques

- ♦ ⇒ [“1.1.1 Exploded view -silencers, vehicles with 2.9 ltr. engine”, page 259](#)

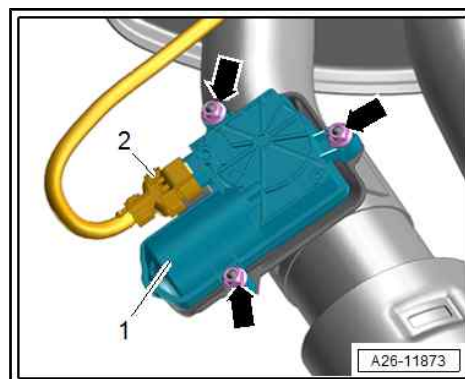


2.3.2 Removing and installing exhaust flap control unit - J883- - vehicles with 3.0 ltr. engine

Procedure applies to exhaust flap control unit - J883- and exhaust flap control unit 2 - J945- .

Removing

- Lower exhaust system (rear)
⇒ [“1.4 Removing and installing silencers”, page 270](#) .
- Unplug electrical connector -2-.
- Remove nuts -arrows- and detach exhaust flap control unit -1-.





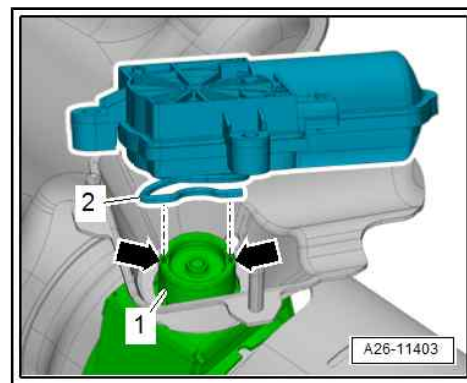
Installing

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

- Renew nuts after removing.
- Move exhaust flap control unit into installation position.
- Spring -2- must engage in grooves on exhaust flap -1-.

Tightening torques

- ◆ ⇒ ["1.1.2 Exploded view - silencers, vehicles with 3.0 ltr. engine", page 261](#)



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3 Exhaust gas temperature control

All procedures and components can be found in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 26 ; Exhaust gas temperature control .



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28 – Ignition system

1 Ignition system

⇒ [“1.1 Exploded view - ignition system”, page 287](#)

⇒ [“1.2 Removing and installing ignition coils with output stages”, page 287](#)

⇒ [“1.3 Removing and installing knock sensor 1 G61 ”, page 289](#)

⇒ [“1.4 Removing and installing Hall senders”, page 289](#)

⇒ [“1.5 Removing and installing engine speed sender G28 ”, page 290](#)

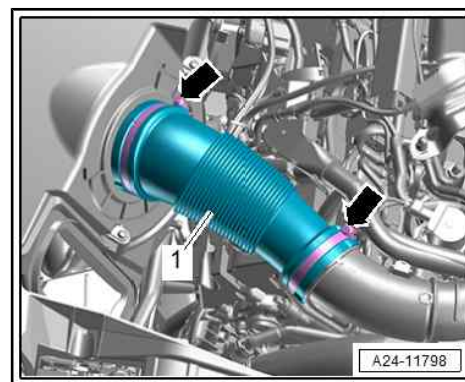
1.1 Exploded view - ignition system

All components are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Exploded view - ignition system .

1.2 Removing and installing ignition coils with output stages

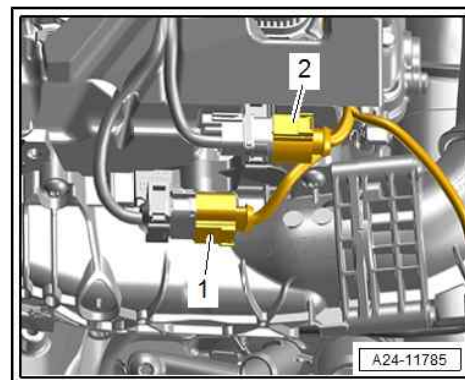
Removing ignition coil for cylinder 1

- Release hose clips -arrows- and detach air pipe -1-.



Removing ignition coils for cylinders 2 and 3

- Remove air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”, page 245](#) .
- Unplug electrical connectors -1, 2- for Lambda probes and move electrical wiring clear.

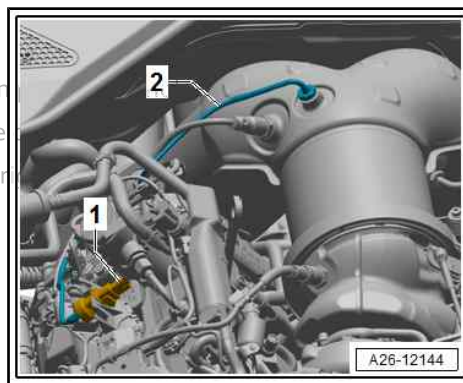


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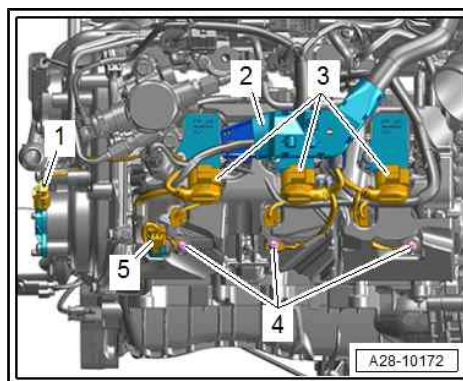


- Vehicles with particulate filter: Detach electrical connector -1- from bracket, unplug and move clear. (Shown on vehicle with 3.0 ltr. engine.)

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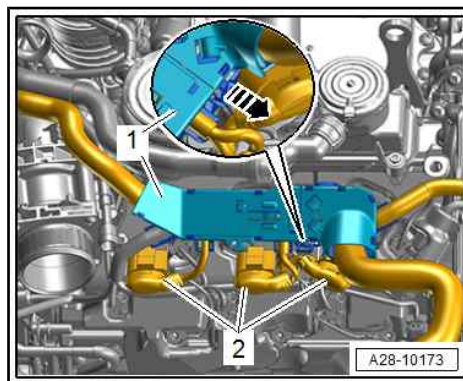


- Unplug electrical connectors:
 - 1 - For camshaft control valve 1 - N205-
 - 3 - For ignition coils
 - 5 - For Hall sender - G40-
- Remove bolts -4- and move earth wire clear.
- Detach wiring duct -2- from ball studs and press to one side.



Removing ignition coils for cylinders 4, 5, 6

- Remove engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Detach engine control unit - J623- from bracket and press slightly to side
⇒ ["9.2 Removing and installing engine/motor control unit J623", page 257](#) .





- Vehicles with 2.9 ltr. engine and particulate filter: Detach electrical connector -1- for exhaust gas temperature sender 3 for bank 2 - G497- from bracket, unplug connector and move electrical wiring clear.
- Release retainer -arrow-, detach wiring duct -1- from ball studs and press to one side. If necessary, move electrical wiring harness clear.
- Unplug electrical connectors -2-.

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Removing and installing ignition coils with output stages .

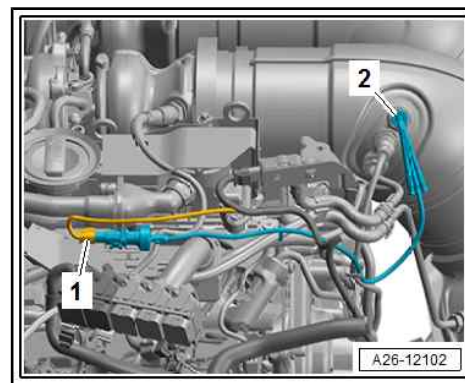
Installing

Additional work:

- Install engine control unit - J623-
⇒ [“9.2 Removing and installing engine/motor control unit J623”](#), [page 257](#) .
- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”](#), [page 245](#) .
- Install engine cover panel ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ Earth wires ⇒ Current flow diagrams, Electrical fault finding and Fitting locations



1.3 Removing and installing knock sensor 1 - G61-

Knock sensor 2 - G66- is removed in the same manner.

Removing

- Remove corresponding engine support
⇒ [“1.7 Removing and installing engine support”](#), [page 91](#) .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Removing and installing knock sensor 1 - G61- .

Installing

Additional work:

- Install engine support
⇒ [“1.7 Removing and installing engine support”](#), [page 91](#) .

1.4 Removing and installing Hall senders

Removing Hall sender - G40- (inlet camshaft)

- Remove air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”](#), [page 245](#) .

All further procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Removing and installing Hall senders .



Installing

Additional work:

- Install air cleaner housing
⇒ [“3.2 Removing and installing air cleaner housing”](#),
[page 245](#) .

1.5 Removing and installing engine speed sender - G28-

All procedures are described in ⇒ Servicing 6-cylinder engine, 2.9 ltr., 3.0 ltr. 4-valve TFSI; Rep. gr. 28 ; Ignition system; Removing and installing engine speed sender - G28- .



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