



Workshop Manual

Audi A4 2015 ➤

Audi A5 2016 ➤

6-cylinder TDI engine, 3.0 ltr. 4-valve common rail (EA 897 - Gen. II, S4, S5)

Engine ID	DEW A	DEW B							
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Edition 02.2019



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List of Workshop Manual Repair Groups

Repair Group

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10 - Removing and installing engine

13 - Crankshaft group

15 - Cylinder head, valve gear

17 - Lubrication

19 - Cooling

21 - Turbocharging/supercharging

23 - Mixture preparation - injection

26 - Exhaust system

28 - Glow plug system

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

(ARL005114; Edition 02.2019)

All information can be found in ⇒ Servicing 6-cylinder TDI engine,
common rail; Rep. gr. 00 ; Identification .



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2 Safety precautions

All information can be found in ⇒ Servicing 6-cylinder TDI engine,
common rail; Rep. gr. 00 ; Safety precautions .



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3 Repair instructions

All information can be found in ⇒ Servicing 6-cylinder TDI engine,
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10 – Removing and installing engine

1 Removing and installing engine

⇒ [“1.1 Removing engine”, page 4](#)

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

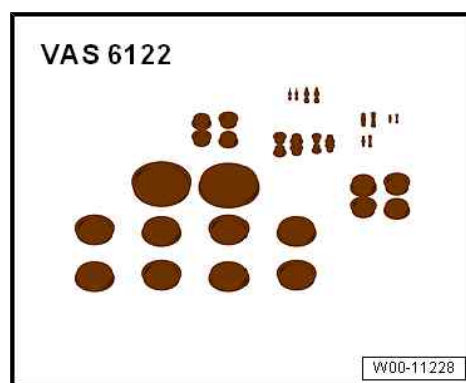
⇒ [“1.3 Securing engine to engine and gearbox support”, page 26](#)

⇒ [“1.4 Installing engine”, page 29](#)

1.1 Removing engine

Special tools and workshop equipment required

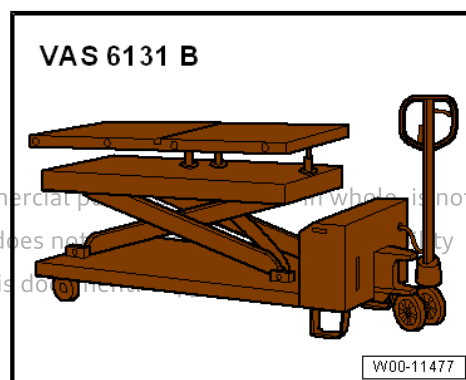
- ♦ Engine bung set - VAS 6122-



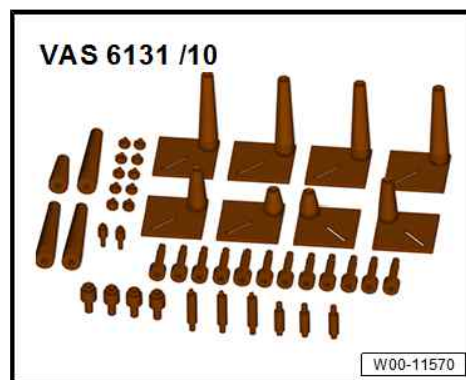
- ♦ Scissor-type assembly platform - VAS 6131 B-



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



- ♦ Adapter -VAS 6131/11-1- from support set, Audi A8 >2002 - VAS 6131/11- (not illustrated)



- ◆ Adapter (2x) -VAS 6131/13-2- from support set, Audi Q7 >2005 - VAS 6131/13-



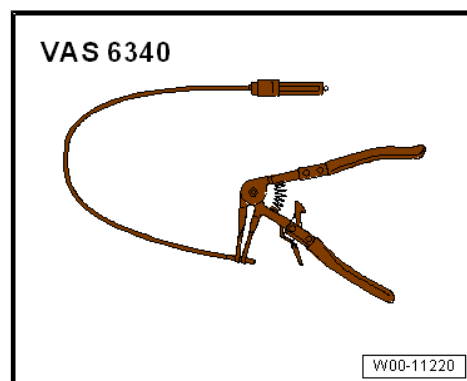
- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6362-



- ◆ Hose clip pliers - VAS 6340-



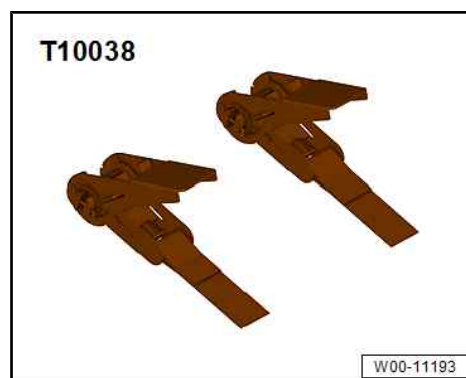
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◆ Ball joint ejector - VAS 251 805-



◆ Tensioning strap - T10038-



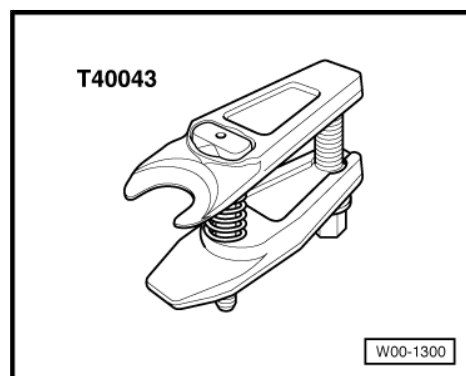
◆ Assembly tool - T10118-



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◆ Ball joint puller - T40043-





◆ Wrench, 21 mm - T40263-



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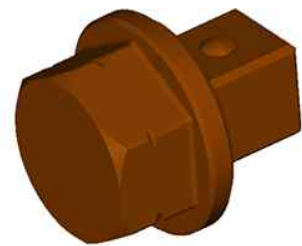
T40263



W00-11887

◆ Adapter - T40314-

T40314



W00-11649

◆ 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 TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Rules for cleanliness .
- All bolts on running gear components with bonded rubber bushes must be tightened with suspension in unladen position (vehicle unladen).
- 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). 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 instructions; Lifting suspension to unladen position (vehicles with coil springs) .
- Bring front wheels into straight-ahead position.
- The electromechanical parking brake must be released before disconnecting the battery, so that the propshaft can be turned during removal.
- De-energise 48 V electrical system and disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .



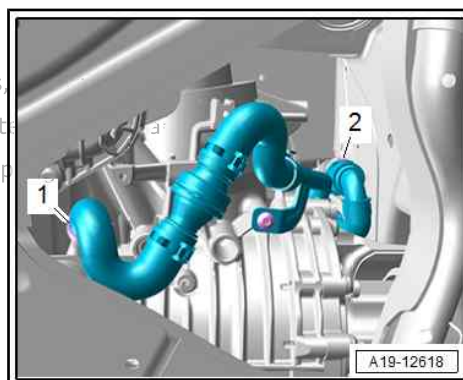
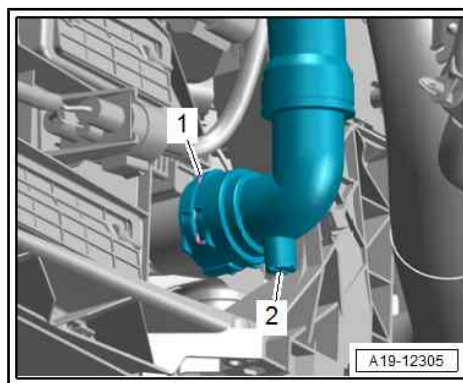
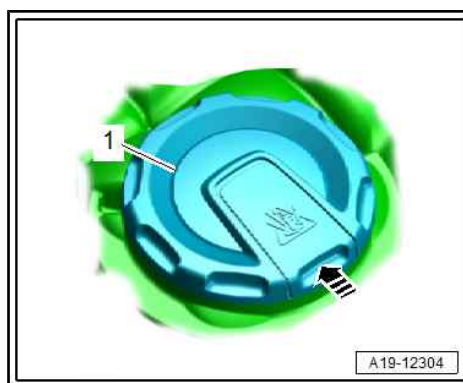
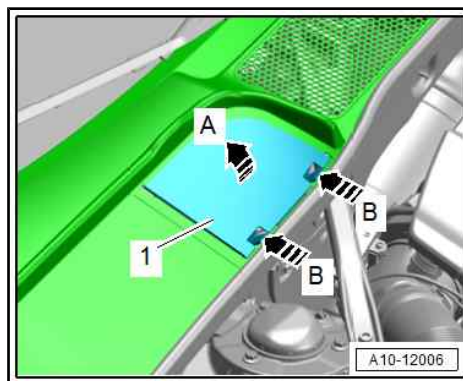
- Release catches -arrows B- and open cover -1- -arrow A-.

CAUTION

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

Danger of scalding skin and other parts of the body.

- Put on protective gloves.
 - Put on safety goggles.
 - Cover filler cap on expansion tank with a cloth and open carefully to release pressure.
-
- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
 - Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
 - Remove front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
 - Remove wheel spoilers (both sides), wheel housing liner (front right) and drive shaft cover (left-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
 - Remove noise insulation ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
 - Remove propshaft ⇒ 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.
 - Remove drain plug -2- and drain off coolant.
 - Lift retaining clip -1- and detach coolant hose from radiator.



- Release hose clip -1-, disconnect coolant hose from ATF cooler and drain off coolant.
- Lift retaining clip -2- and disconnect coolant hose.



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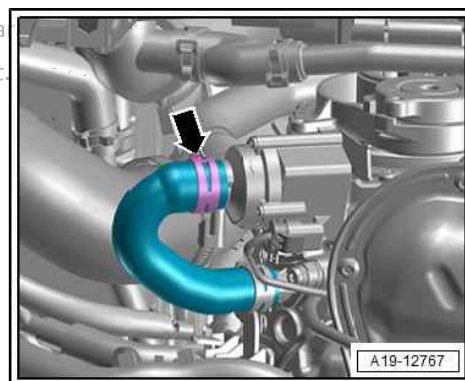
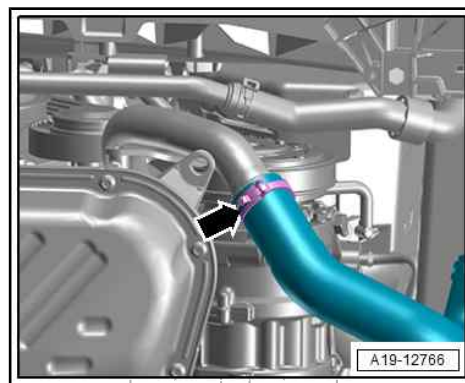


- Release hose clip -arrow-, disconnect coolant hose and drain off coolant.

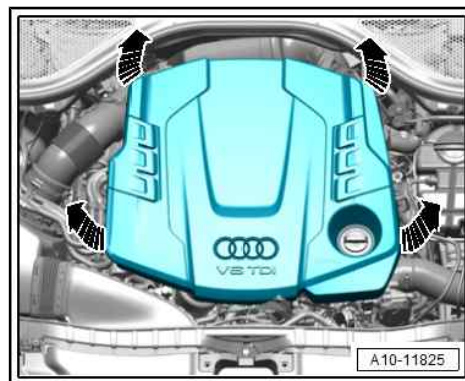


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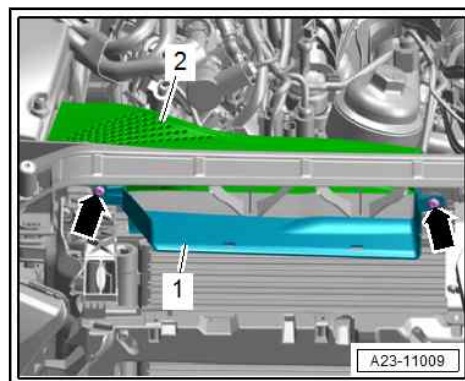
- Release hose clip -arrow-, disconnect coolant hose and drain off coolant.



- 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.

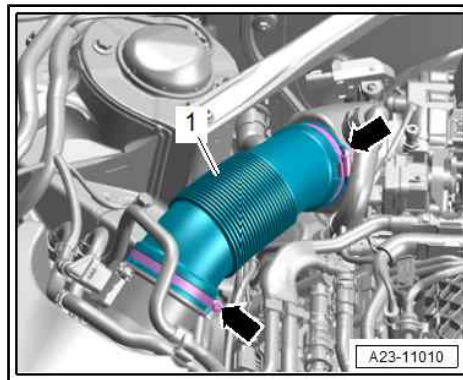


- Remove bolts -arrows- and detach air duct -2-.

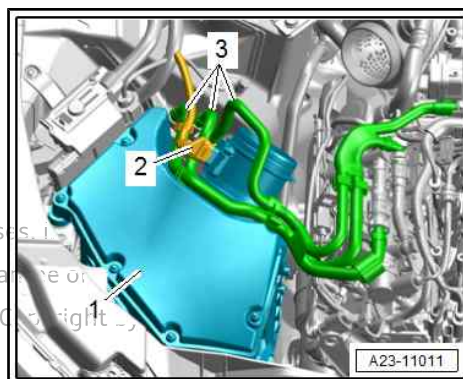




- Release hose clips -arrows- and detach air pipe -1-.

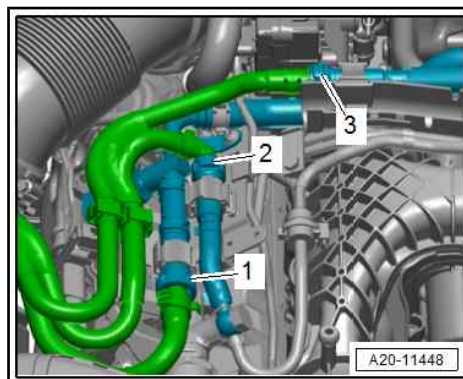


- Unplug electrical connector -2- for air mass meter - G70- .
- Move fuel hoses -3- clear and press to one side.
- Lift off air cleaner housing -1- and detach.

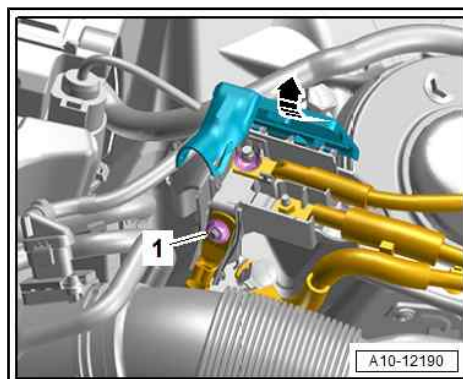


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- Disconnect fuel hoses -1, 2, 3- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Move coolant hoses clear and tie up to right side.
- Seal off open lines and connections with plugs (thoroughly cleaned)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

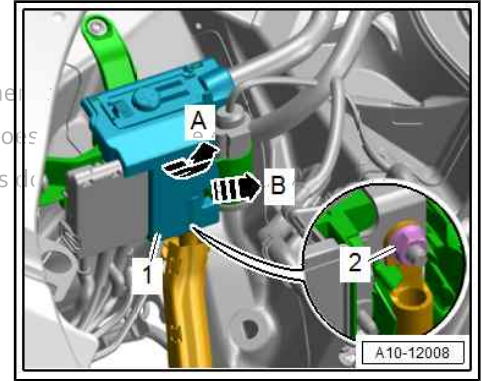


- Open electronics box -2- for 48 Volt system -arrow-.
- Remove nut -1- and move electrical wire clear.

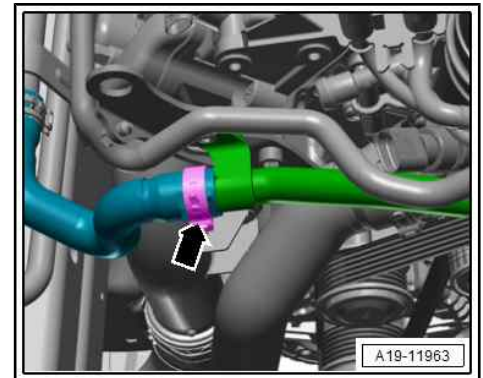




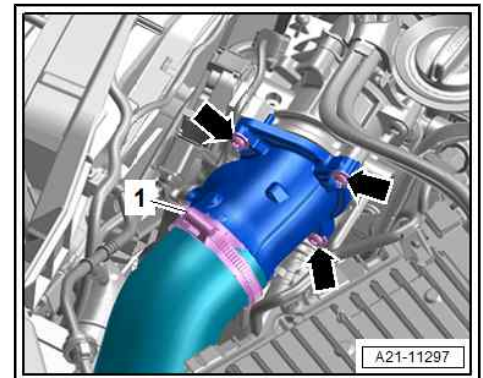
- Release catch -arrow B- and open electronics box -1- -arrow A-.
- Remove nut -2- and move B+ wire clear.
- Move wiring duct clear at top.



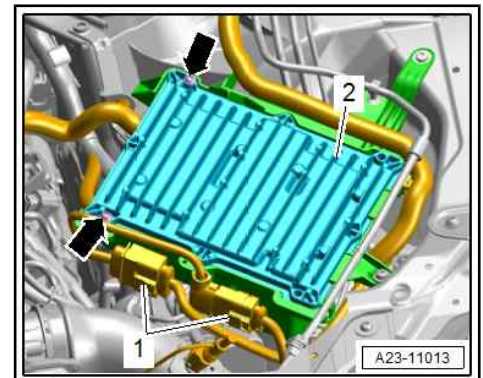
- Release hose clip -arrow- and disconnect coolant hose from coolant pipe (front).



- Unscrew bolts -arrows-, detach connection upwards and tie up to left side.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .

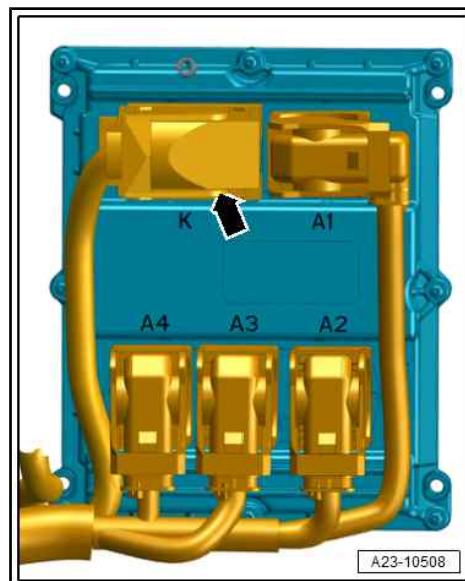


- Detach electrical connectors -1- from bracket, unplug and move electrical wiring clear.
- Remove bolts -arrows- and detach engine control unit - J623- -item 2-.

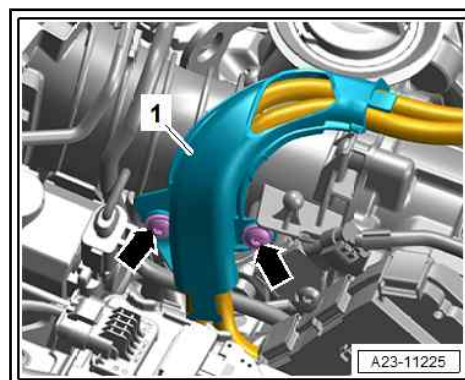




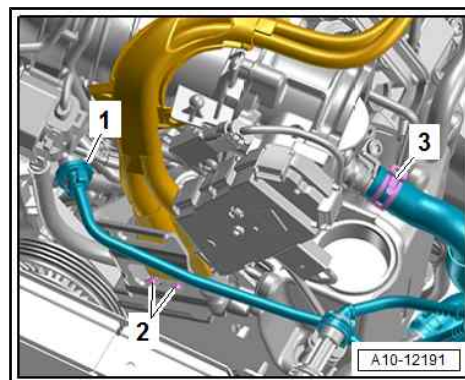
- Unplug electrical connector "K" -arrow-.
- Place engine control unit - J623- on engine and secure to prevent it from dropping.



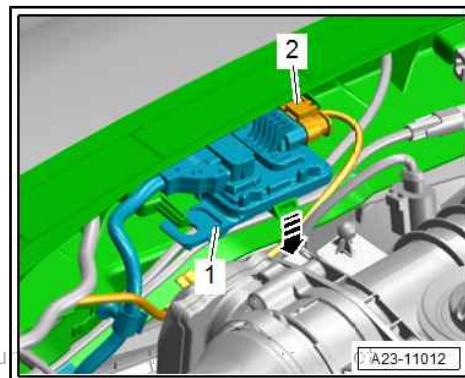
- Remove bolts -arrows- and move wiring duct -1- clear.



- Unplug electrical connectors -2- at electric compressor and move wiring clear.
- Release hose clip -3- and disconnect coolant hose.
- Lift retaining clip -1- and disconnect coolant hose.



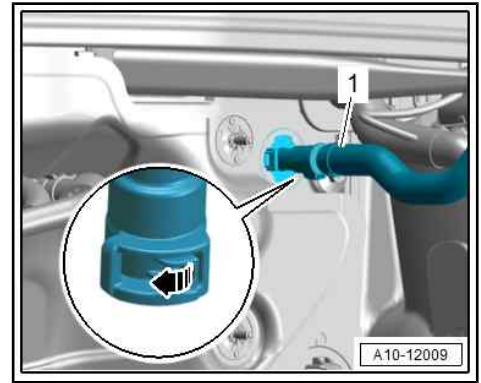
- Unplug electrical connector -2-.
- Release catch -arrow- and detach control unit for NOx sender - J583- -item 1-; move control unit clear and place it on engine.
- Move wiring harness clear if engine and gearbox are to be separated later.



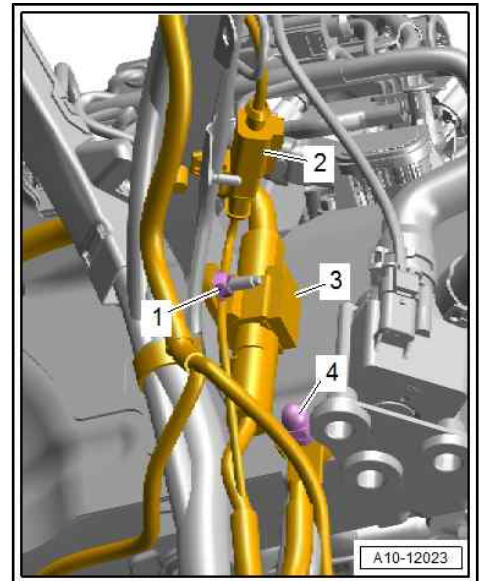
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- Release catch -arrow- and disconnect vacuum hose -1-.



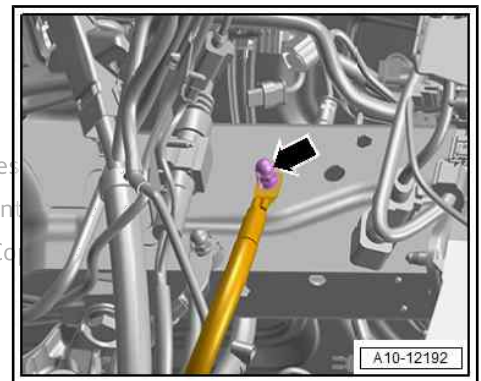
- Unplug electrical connector -2- and move electrical wire clear.
- Loosen nut -1- a few turns, move electrical connector -3- clear and unplug.
- Remove nut -4- and move earth wires clear.



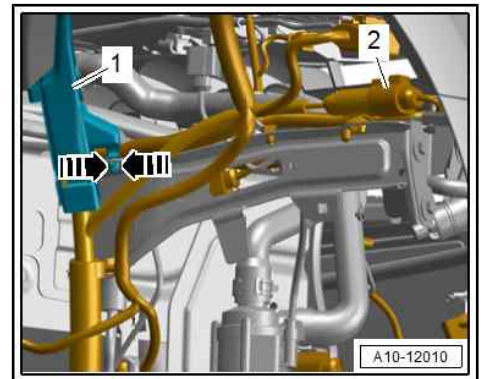
- Remove nut -arrow- and move earth wire clear.



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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.
- Vehicles with auxiliary/supplementary heater: Remove exhaust system ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82 ; Auxiliary/supplementary heater; Removing and installing auxiliary/supplementary heater exhaust system .



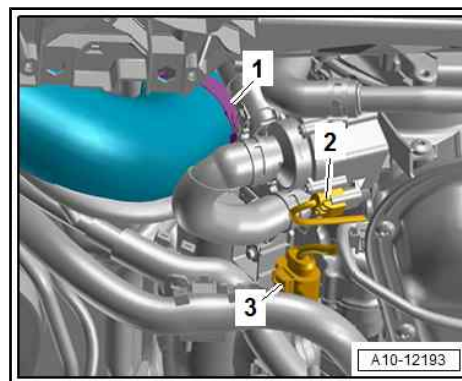


– Release hose clip -1- and detach air hose from air pipe.

– Unplug electrical connectors:

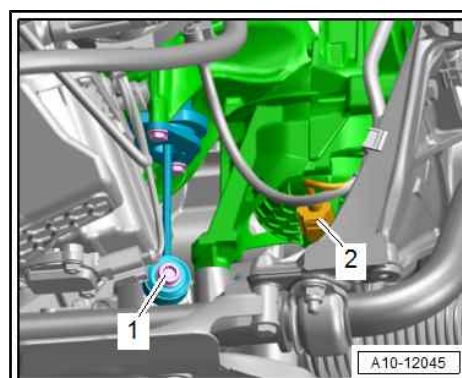
2 - For starter-alternator coolant pump - V621-

3 - For starter-alternator - C29-

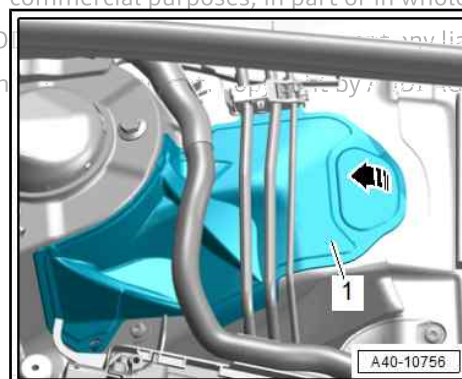


– Unplug electrical connector -2- for electrohydraulic engine mounting solenoid valve on both sides and move wiring clear.

– If you intend to secure engine to engine and gearbox support in a later step, unscrew bolt -1- for support mounting on both sides.



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

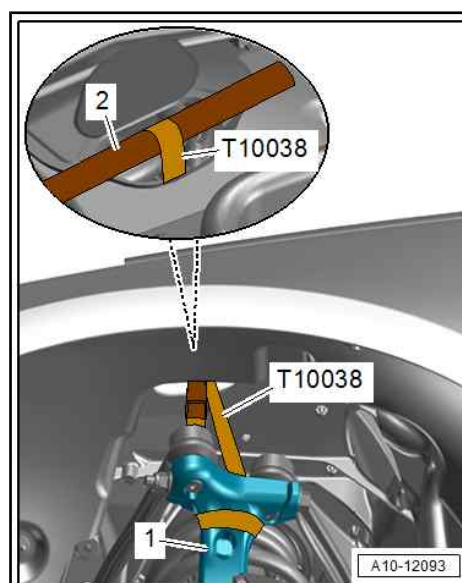


NOTICE

Risk of damage if joints of upper suspension links are overstrained.

– Support wheel bearing housing.

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





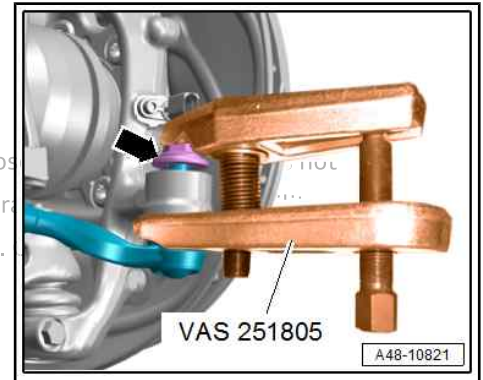
- To protect thread, unscrew nut -arrow- on joint pin of track rod ball joint until nut is flush with thread of joint pin.
- To prevent damage to ball joint puller, make sure the two lever arms of the puller are parallel when maximum force is exerted.

⚠ CAUTION

Track rod ball joint is released abruptly when it is pressed out - risk of injury.

Risk of contusions.

- Secure tools by placing engine and gearbox jack underneath.



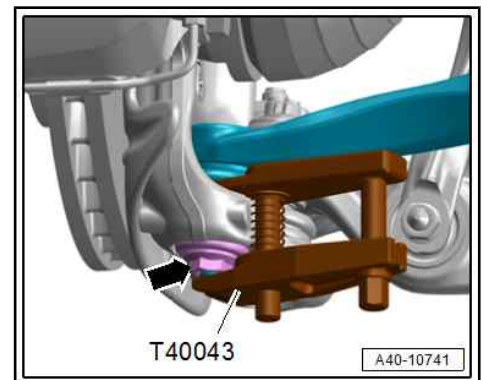
- Press track rod ball joint off wheel bearing housing using ball joint ejector - VAS 251 805- .
- Then unscrew nut; if necessary, counterhold at joint pin with a 6 mm hexagon socket.
- To protect thread, unscrew nut -arrow- on joint pin of guide link until nut is flush with thread of joint pin. Counterhold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

⚠ CAUTION

Swivel joint is released abruptly when it is pressed out - risk of injury.

Risk of contusions.

- Secure tools by placing engine and gearbox jack underneath.

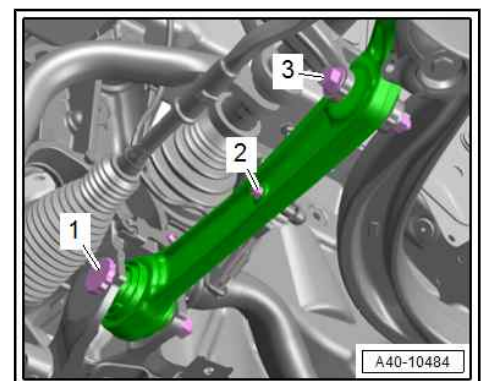


- Press joint pin of guide link out of tapered seat using ball joint puller - T40043- , taking care not to damage boot.
- Unscrew nut and move guide link clear at wheel bearing housing; if necessary, counterhold at joint pin with a TX 40 socket wrench.
- On appropriate versions: Remove nut -2- and move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

Note:

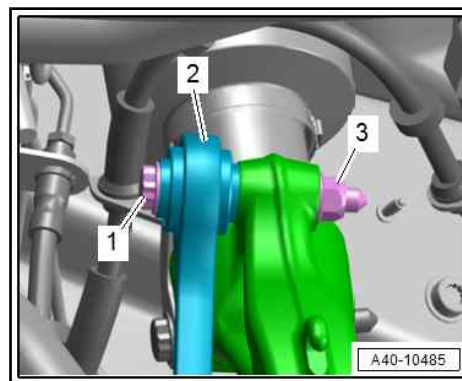
To remove bolt -1-, turn steering to full left/right lock.

- Repeat procedure on opposite side of vehicle.

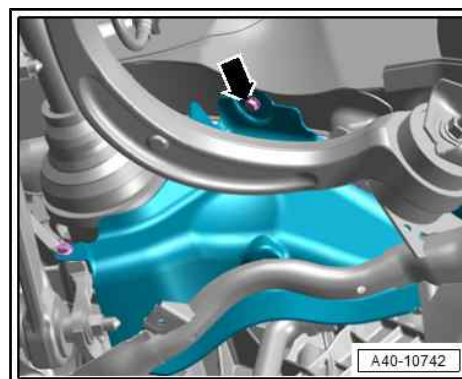




- On both sides, unscrew nut -3- and pull out bolt -1- for coupling rod -2-.
- Unbolt drive shaft (left and right) from gearbox ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Removing and installing drive shaft .



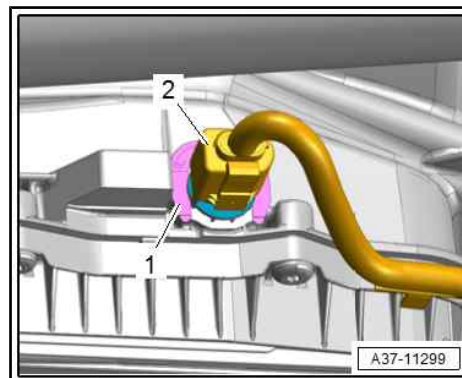
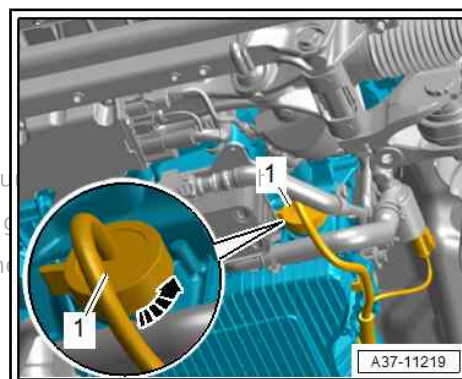
- Remove bolt -arrow- for subframe shield on both sides.
- Detach intermediate steering shaft from steering rack and move clear by telescoping together ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Remove poly V-belt from air conditioner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



NOTICE

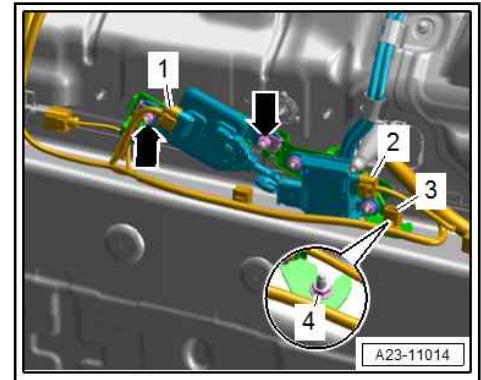
Risk of irreparable damage due to electrostatic discharge.

- **Do not touch connector contacts with your hands.**
- **Touch the lifting platform or other earthed object to discharge static electricity.**
- Turn retainer catch anti-clockwise -arrow- and unplug electrical connector -1- at gearbox.
- Unplug electrical connector -2- on right side of gearbox and move electrical wiring clear:
- Remove underbody trim (front left and centre left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .





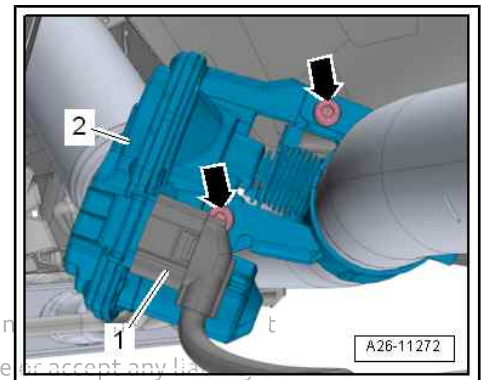
- Unplug electrical connectors -1, 2- and move them clear.
- Pull clip -3- off stud.
- Remove nuts -arrows- and loosen (do not remove) nut -4-.
- Tie bracket with control unit for NOx sender 2 - J881- to front exhaust pipe.



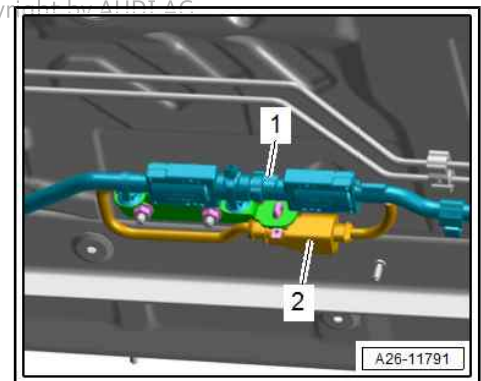
- Unplug electrical connector -1- for exhaust flap control unit - J883- .



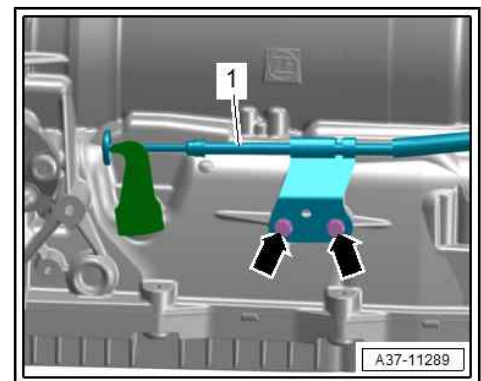
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- Unplug electrical connector -2-.
- Disconnect SCR supply line -1- ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .



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



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

- Set up scissor-type assembly platform - VAS 6131 B- as follows:

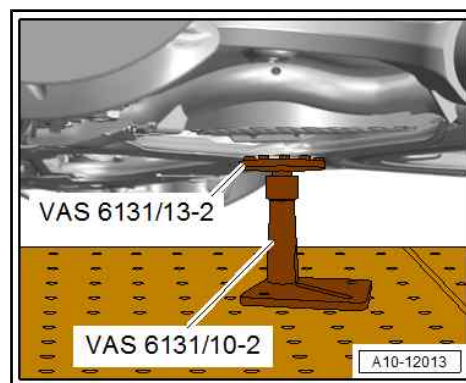
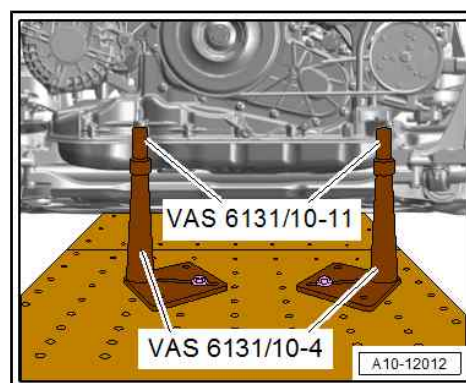
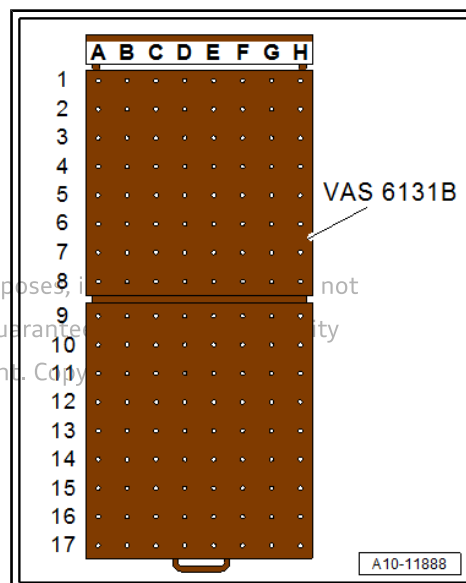
Platform coordinates	Parts from -VAS 6131/10- , adapter -VAS 6131/11-1- and adapter -VAS 6131/13-2-			
C4	/10-1	/10-4	/10-5	/10-11
E4	/10-1	/10-4	/10-5	/10-11
E10	/10-1	/10-2	/10-5	/13-2
B15	/10-1	/10-3	/10-5	/11-1
F15	/10-1	/10-2	/10-5	/10-6
F17	/10-1	/10-2	/10-5	/13-2

- 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, as shown.
- Make sure that threaded spindles are screwed in completely.

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

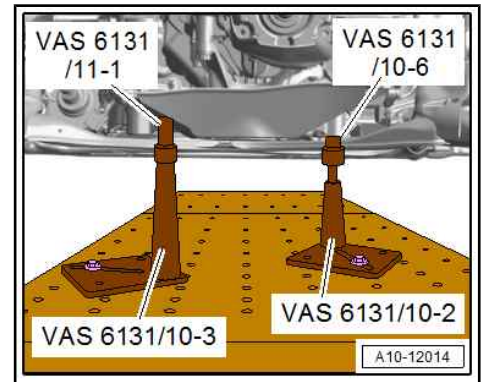
Note:

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

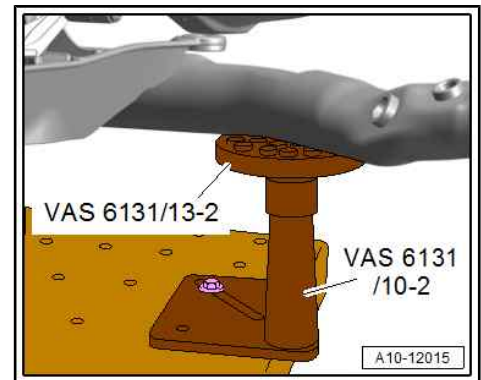




- Position support elements from -VAS 6131/10- and adapter - VAS 6131/11-1- at tunnel cross member, as shown.



- Position support elements from -VAS 6131/10- and adapter - VAS 6131/13-2- under front exhaust pipe, as shown.
- 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 .

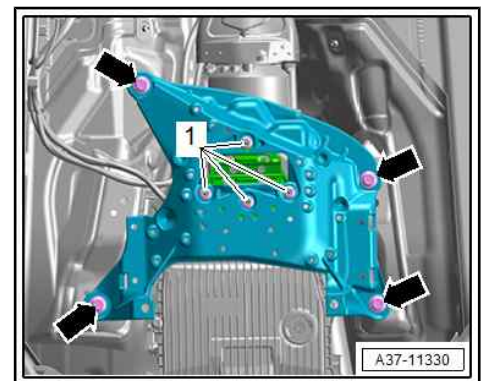


- Remove bolts -arrows- on tunnel cross member.

NOTICE

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

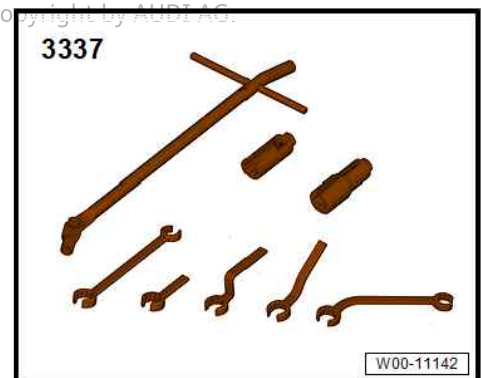
- Check that all connections between engine, gearbox, subframe and body have been detached.
- Carefully guide out engine/gearbox assembly with subframe from engine compartment when lowering.
- Lower scissor-type assembly platform - VAS 6131 B- with engine/gearbox assembly and pull out from underneath vehicle.
- Tie up drive shafts.



1.2 Separating engine and gearbox

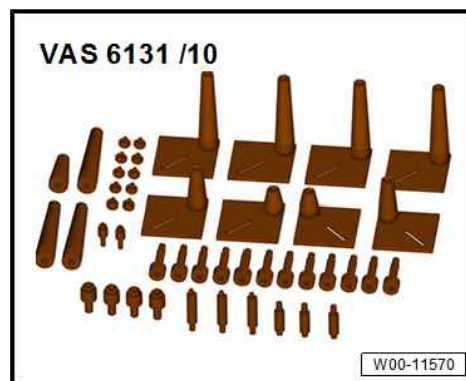
Special tools and workshop equipment required

- ◆ Lambda probe open ring spanner set - 3337-





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

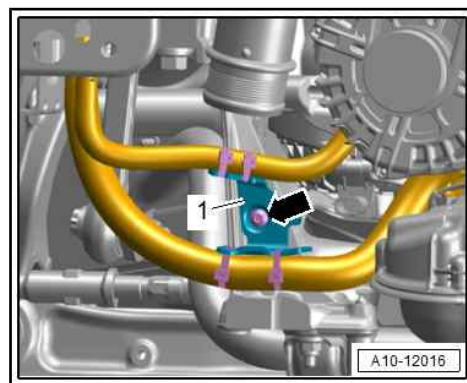


- ◆ Adapter -VAS 6131/11-1- from support set, Audi A8 >2002 - VAS 6131/11- (not illustrated)
- ◆ Adapter -VAS 6131/12-2- from support set, Audi A6 >2005 - VAS 6131/12- (not illustrated)
- ◆ Hose clip pliers - VAS 6362-



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.



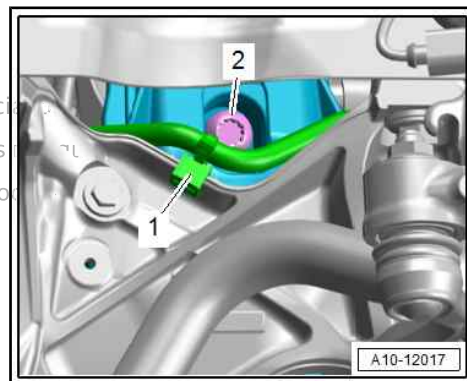
- Move SCR supply line -1- clear at subframe.

CAUTION

Risk of accident caused by high weight of subframe.

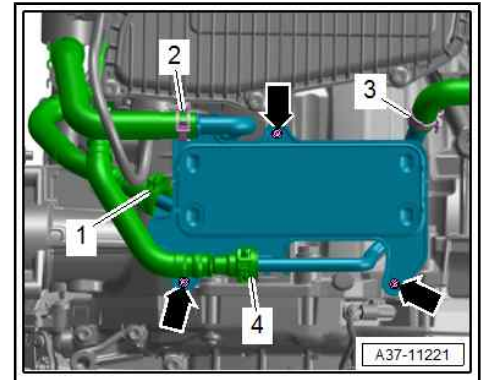
- **Perform the following work with the assistance of a second mechanic.**

- On both sides, remove bolt -2- and detach subframe to one side (remove support elements); shown with engine installed.

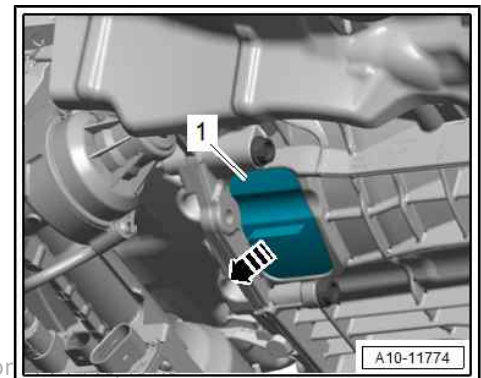




- Vehicles with flexible ATF hoses: Remove bolts -arrows- and push ATF cooler slightly to one side with hoses -1, 2, 4- attached.
- Vehicles with inflexible ATF lines: Remove ATF cooler ➔ Gearbox; Rep. gr. 37 ; ATF circuit: Removing and installing ATF cooler .



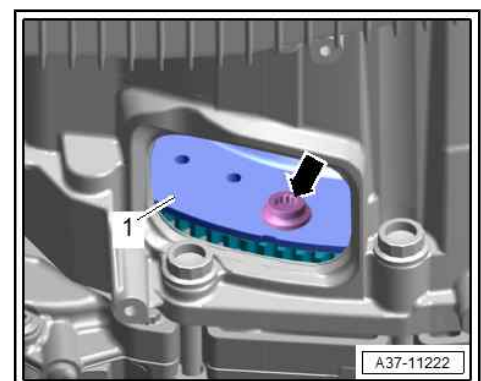
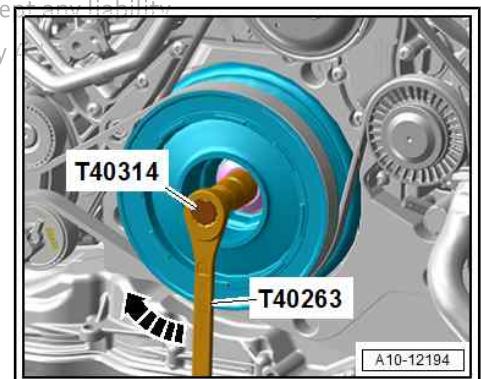
- Detach bottom cover -1- from gearbox -arrow-.



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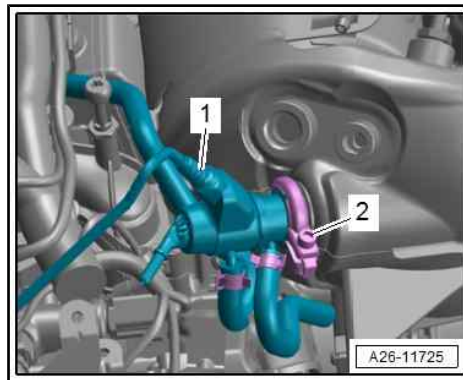
Risk of engine damage if valve gear drive slips

- Only turn engine in normal direction of rotation.
- To slacken bolts, counterhold crankshaft at vibration damper using wrench, 21 mm - T40263- and adapter -T40314- .
- Remove 6 bolts -arrow- from drive plate -1-. Turn crankshaft 60° in direction of engine rotation each time.

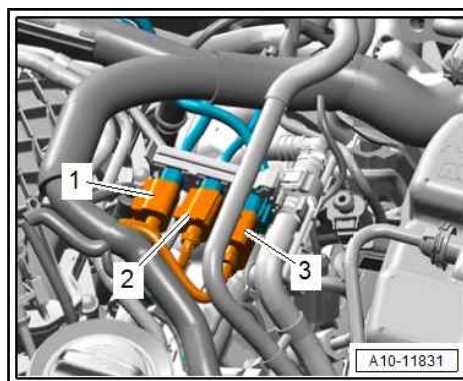




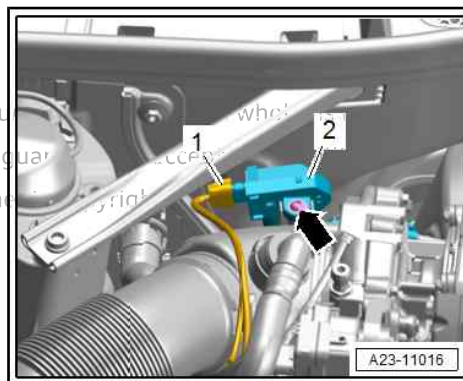
- Unscrew bolt -2- and loosen retaining clip.
- Detach injector for reducing agent - N474- -item 1- and press to one side.



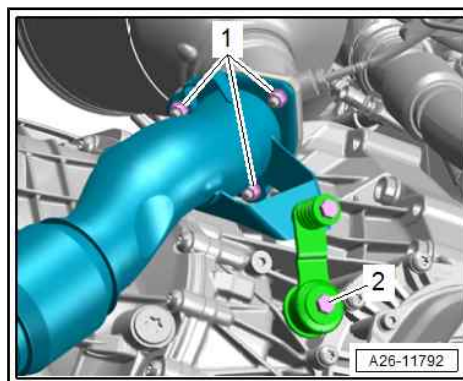
- Unplug electrical connectors -1, 2, 3- and move electrical wiring clear.



- Remove bolt -arrow-.
- Unplug electrical connector -1-.
- Move bracket -2- with pressure differential sender G505- clear.



- Remove nuts -1- at bracket for front exhaust pipe.





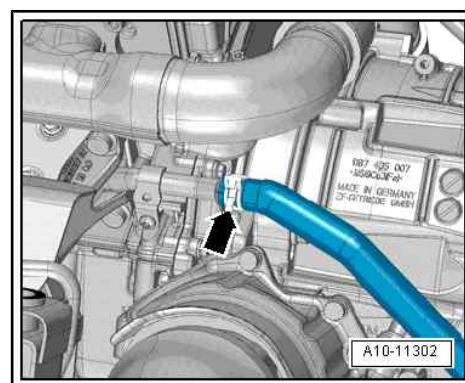
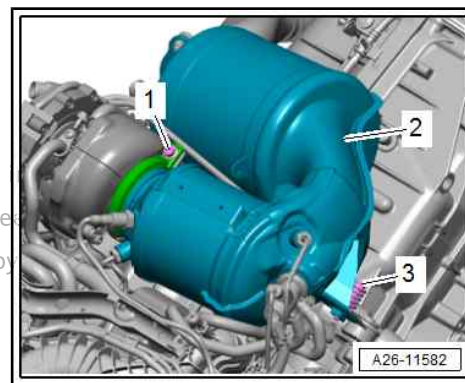
- Remove bolt -3- on bracket.

⚠ CAUTION

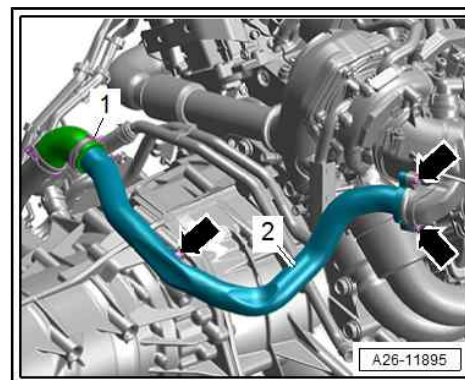
Risk of injury caused by soot particles in the air.

Eyes and skin can suffer irritation or injuries.

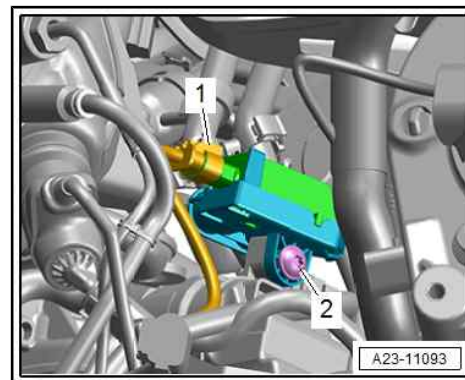
- Put on safety goggles.
- Put on protective gloves.
- Open screw-type clip -1- and place it on intake funnel of emission control module -2-.
- Detach emission control module with front exhaust pipe.
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Release hose clip -arrow- and detach coolant hose.



- Remove bolts -arrows-.
- Release screw-type clip -1- and detach exhaust gas recirculation pipe -2-.



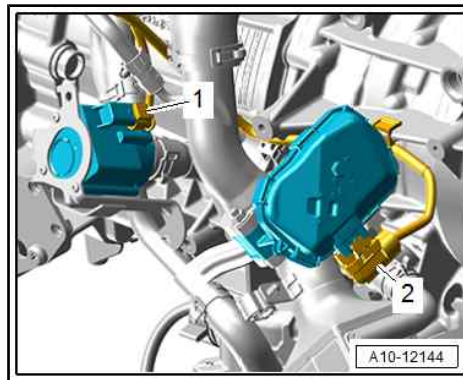
- Unplug electrical connector -1-.
- Remove bolt -2- and move pressure differential sender 2 - G524- clear.





– Unplug electrical connectors and move electrical wiring clear:

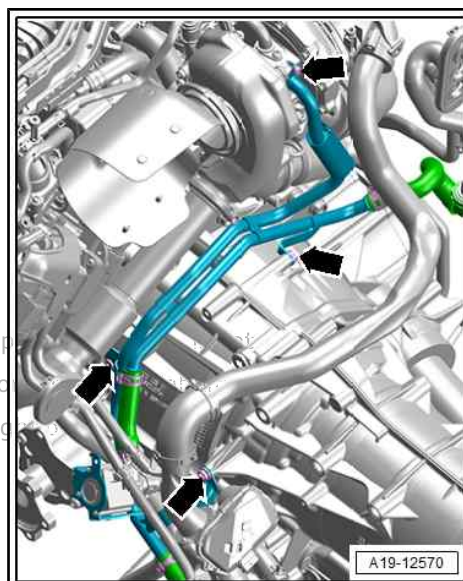
- 1 - Continued coolant circulation pump - V51-
- 2 - Exhaust gas recirculation control motor 2 - V339-



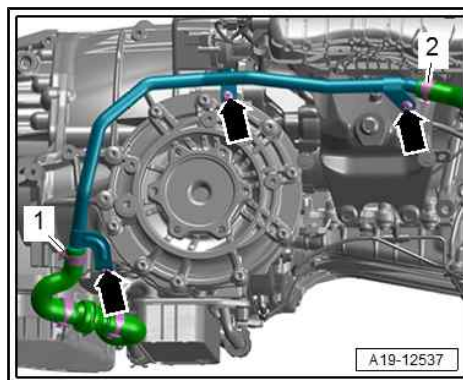
– Remove bolts -arrows- and move coolant pipes (rear) to one side.



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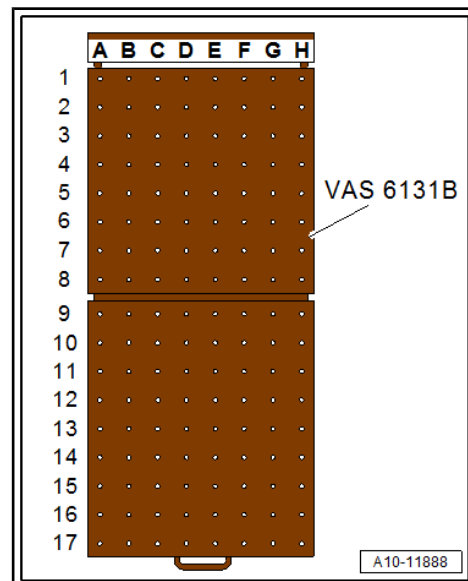
– Remove bolts -arrows- and move coolant pipe (right-side) to one side.



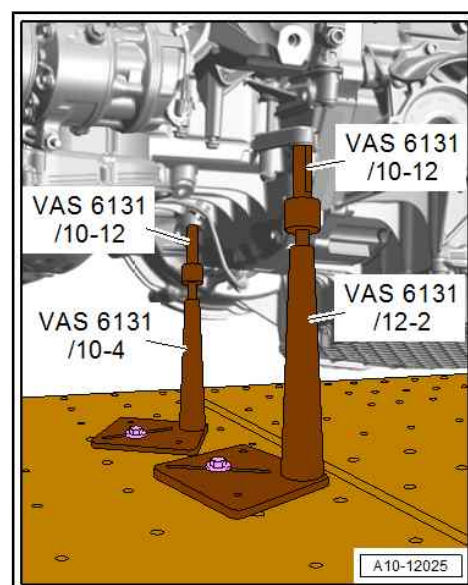


- Set up scissor-type assembly platform - VAS 6131 B- as follows:
- The other support elements remain unchanged.

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	/10-4	/10-5	/10-12
C10	/10-1	/10-4	/10-5	/10-12
F10	/10-1	/10-4	/10-5	/11-1



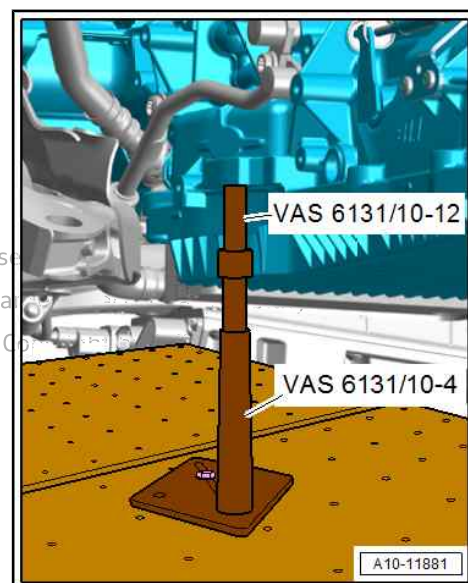
- Position support elements from -VAS 6131/10- and adapter - VAS 6131/12-2- at both sides of engine, as shown.



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

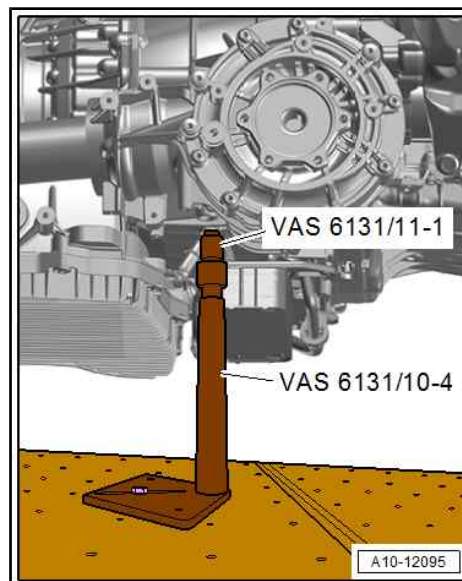


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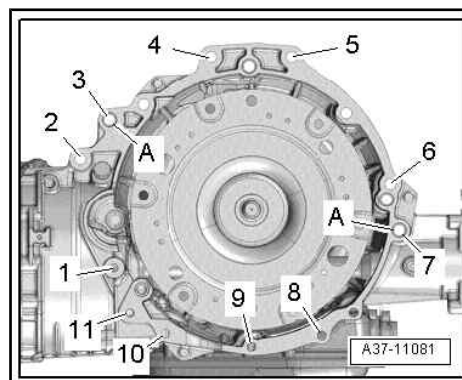




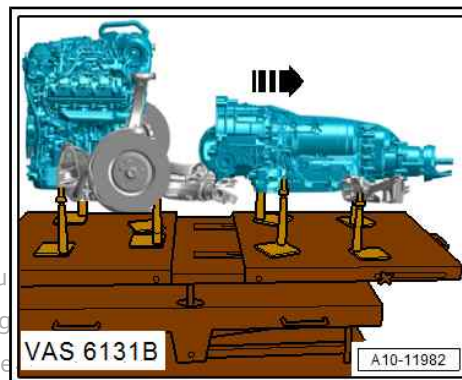
- Position support elements from -VAS 6131/10- and adapter - VAS 6131/11-1- at right of gearbox.
- Turn spindles (left and right) upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .



- 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.



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1.3 Securing engine to engine and gearbox support

Special tools and workshop equipment required



◆ Lifting tackle - 3033-

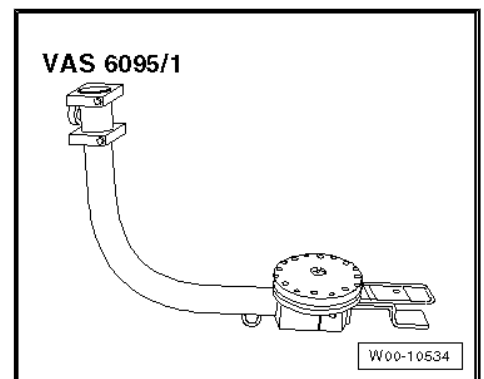


◆ Engine and gearbox support - VAS 6095A-

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◆ Universal mounting - VAS 6095/1- and bracket for V6 TDI engine - VAS 6095/1-14-

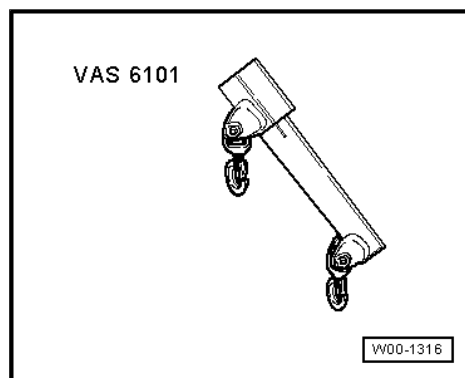


◆ Workshop hoist - VAS 6100-



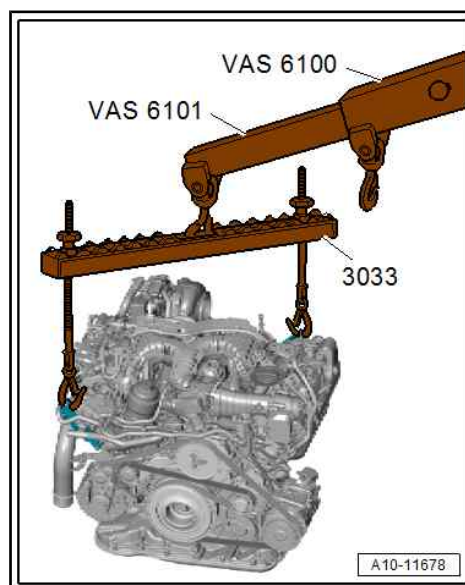


◆ Lift arm extension/workshop hoist - VAS 6101-

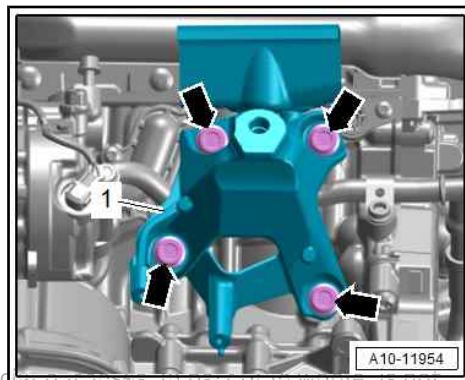


Procedure

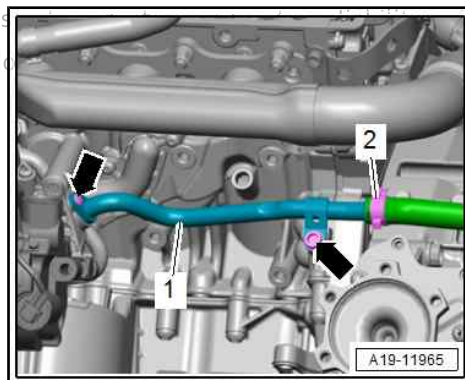
- Engine/gearbox assembly removed and secured to scissor-type assembly platform - VAS 6131 B- (with engine detached from gearbox)
- Attach lift arm extension - VAS 6101- to workshop hoist - VAS 6100- .
- Attach lifting tackle - 3033- to engine lifting eyes and workshop hoist as shown in illustration.
- Take up weight of engine with workshop hoist, but do not lift.



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

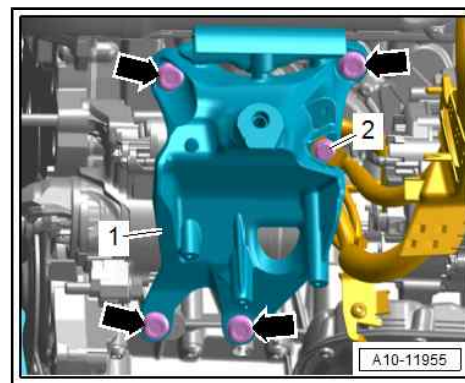


- Remove bolts -arrows- .
- Detach coolant pipe (left-side) -1- and move clear to side.

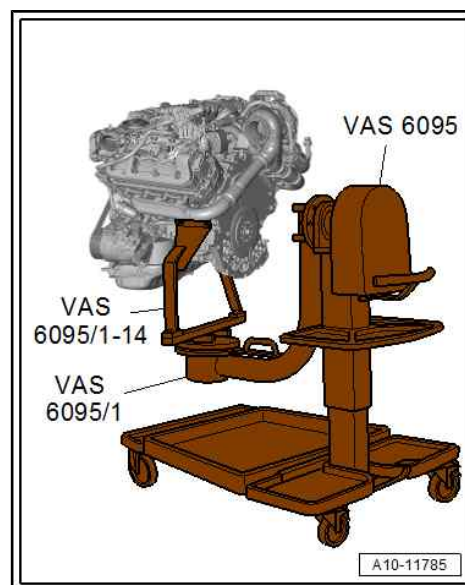




- Remove bolt -2- for earth wire.
- Remove bolts -arrows- and detach engine support -1-.
- Tie up starter on engine.



- Using universal mounting - VAS 6095/1- and bracket for V6 TDI engine - VAS 6095/1-14- , secure engine to engine and gearbox support - VAS 6095A- (40 Nm), as shown.



1.4 Installing engine

Special tools and workshop equipment required

- ◆ All special tools specified in removal procedure

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 .
- Do not reuse coolant.
- Re-install all cable ties in original positions.
- Bonded rubber bushes can only be turned to a limited extent. The suspension mountings must therefore only be tightened when the suspension is in the unladen position.
- Install coolant pipe (left-side) ⇒ [page 91](#) .
- Install engine supports and engine mountings ⇒ [page 33](#) .



- Engine with subframe positioned on scissor-type assembly platform - VAS 6131 B-
- Fit gearbox to engine ⇒ Gearbox; Rep. gr. 37 ; Removing and installing gearbox; Installing gearbox .
- Install coolant pipes (rear) and coolant pipe (right-side) ⇒ ["3.2 Removing and installing coolant pipes", page 95](#) .
- Install emission control module ⇒ [page 182](#) .
- Install front exhaust pipe ⇒ [page 176](#) .
- Install pressure differential sender ⇒ [page 163](#) .
- Install exhaust gas recirculation pipe ⇒ [page 193](#) .
- Connect SCR supply line ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .
- Install ATF cooler ⇒ Gearbox; Rep. gr. 37 ; ATF circuit; Removing and installing ATF cooler .

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

- Remove locating pins ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Fixing position of subframe .
- Install tunnel cross member ⇒ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings .
- Install manual release cable for parking lock ⇒ Rep. gr. 37 ; Selector mechanism .
- Install bracket for NOx sender 2 - G687- / particulate sensor - G784- ⇒ [page 168](#) .
- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit .
- Install poly V-belt ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Secure drive shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install subframe shield and coupling rod ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .
- Install lower suspension links ⇒ Running gear, axles, steering; Rep. gr. 40 ; Lower suspension links, swivel joint; Exploded view - lower suspension links, swivel joint .
- Install track rod ball joint ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering rack; Exploded view - steering rack .
- Vehicles with auxiliary/supplementary heater: Install exhaust system ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82 ; Auxiliary/supplementary heater; Removing and installing auxiliary/supplementary heater exhaust system .
- Install engine control unit - J623- ⇒ [page 173](#) .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

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- Connect fuel hoses ⇒ Fuel supply system, diesel engines; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

! NOTICE

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

- **Do not use a battery charger to boost starting.**
- Install air cleaner housing ⇒ [page 144](#) .
- 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) .
- Install propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- 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); Exploded view - bumper cover .
- After renewing engine, perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions .
- Bleed fuel system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injection system; Filling and bleeding fuel system .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Connect coolant hoses with plug-in connector ⇒ [page 112](#) .
- Fill up with coolant ⇒ [page 75](#) .
- Check ATF level ⇒ Gearbox; Rep. gr. 37 ; ATF; Checking ATF level .
- Install underbody trim ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .
- 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



Component		Nm
	M7	15
	M8	20
	M10	40
	M12	65

- ◆ ⇒ [“2.1 Exploded view - assembly mountings”, page 33](#)
- ◆ Gearbox to engine ⇒ Gearbox; Rep. gr. 37 ; Removing and installing gearbox; Tightening torques for gearbox



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2 Assembly mountings

⇒ "2.1 Exploded view - assembly mountings", page 33

⇒ "2.2 Supporting engine in installation position", page 35

⇒ "2.3 Removing and installing engine mounting", page 38

⇒ "2.4 Removing and installing gearbox mounting", page 41

2.1 Exploded view - assembly mountings

◆ Engine mounting ⇒ page 33

◆ Installation position of support mounting ⇒ page 34

◆ Gearbox mounting ⇒ page 34

Engine mounting

1 - Subframe

2 - Bolt

□ 20 Nm

3 - Bolt

□ 10 Nm

4 - Support mounting

□ Removing and installing

⇒ page 39

□ Installation position

⇒ page 34

5 - Bolt

□ 55 Nm

6 - Engine support

□ Removing and installing

⇒ page 47

7 - Heat shield

8 - Bolt

□ 10 Nm

9 - Bolt

□ 55 Nm

10 - Engine mounting

□ with

◆ Left electrohydraulic engine mounting solenoid valve - N144-

◆ Right electrohydraulic engine mounting solenoid valve - N145-

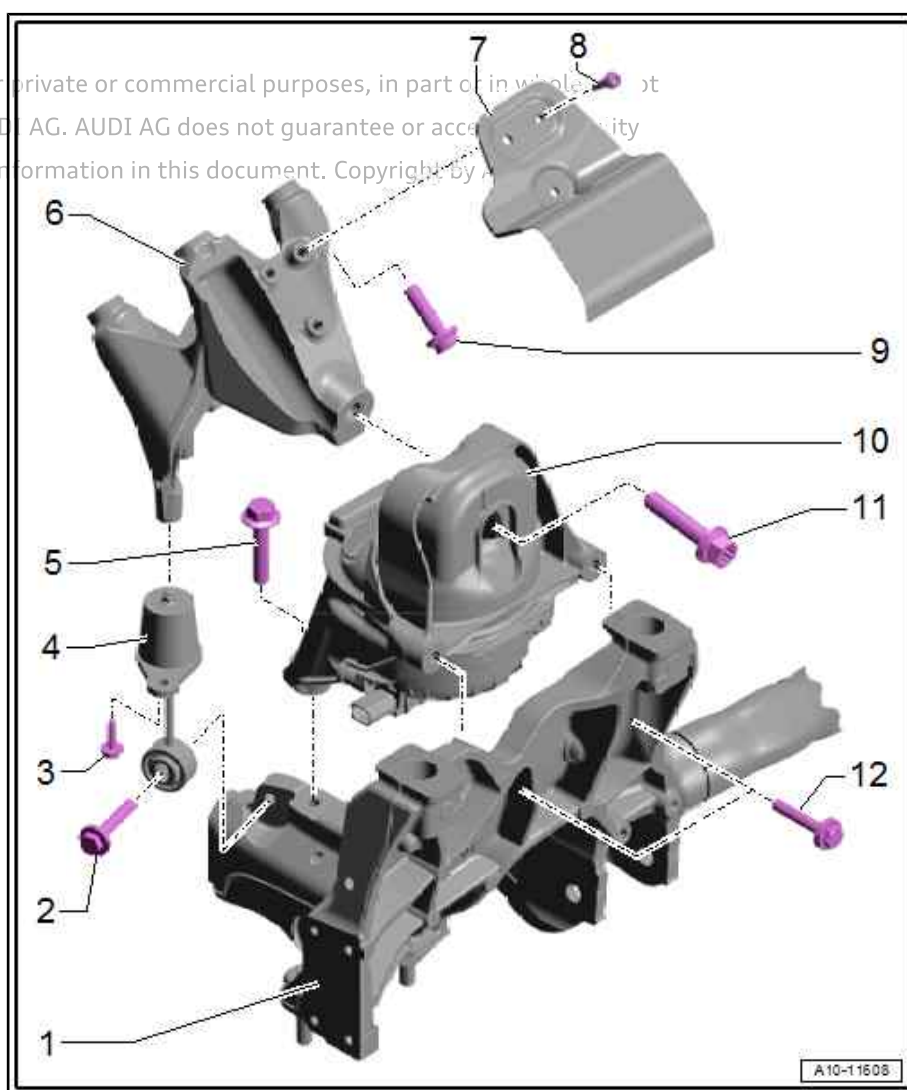
□ Removing and installing

⇒ page 38

11 - Bolt

□ Renew after removing

□ 90 Nm +90°



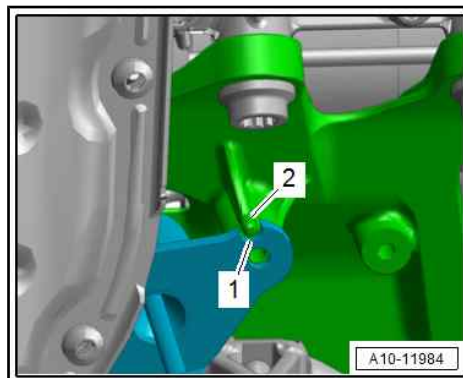


12 - Bolt

- 30 Nm

Installation position of support mounting

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



Gearbox mounting

1 - Bolt

- Tightening torques ➤ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

2 - Tunnel cross member

- Removing and installing ➤ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

3 - Nut

- Only remove if detaching gearbox mounting from gearbox support
- Tightening torques ➤ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

4 - Gearbox support

- Removing and installing ➤ [page 41](#)

5 - Bolt

- Tightening torques ➤ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

6 - Gearbox mounting

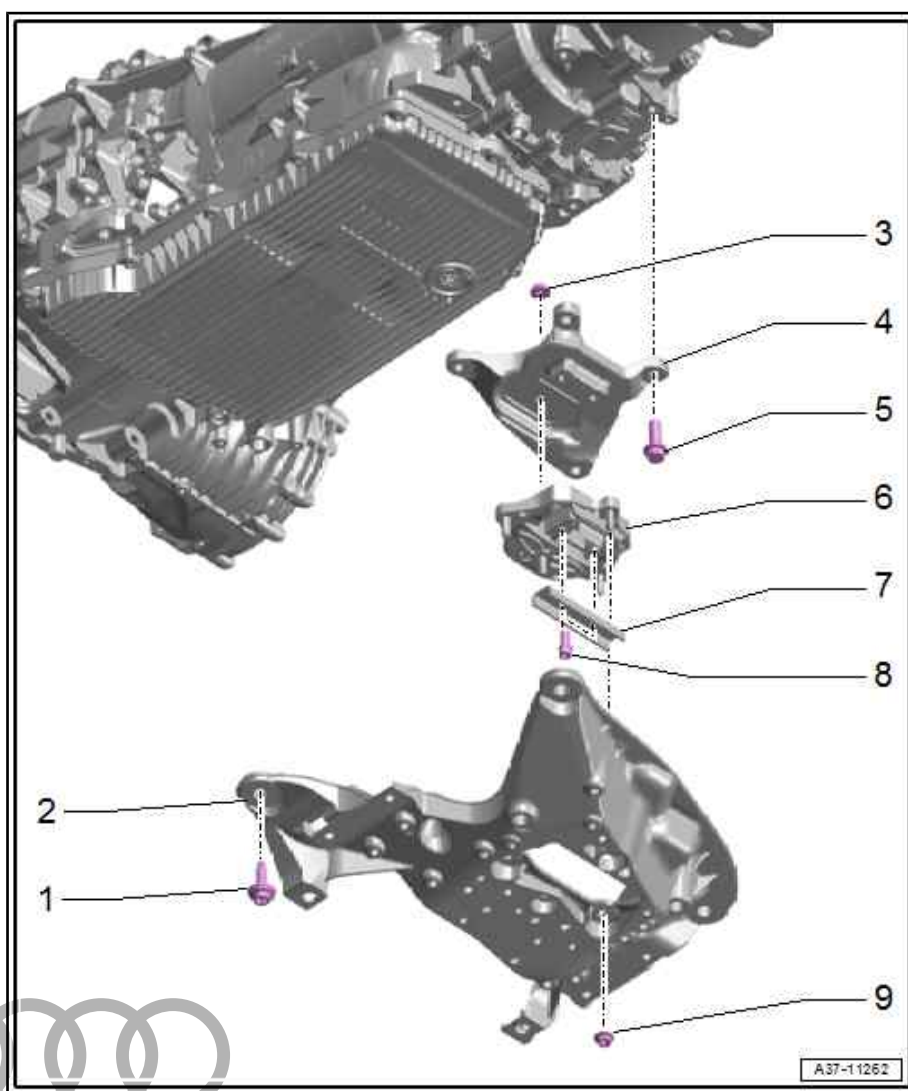
- Removing and installing ➤ [page 41](#)

7 - Stop

- For gearbox mounting

8 - Bolt

- Only remove if detaching gearbox mounting from gearbox support





- ❑ Tightening torques ⇒ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings

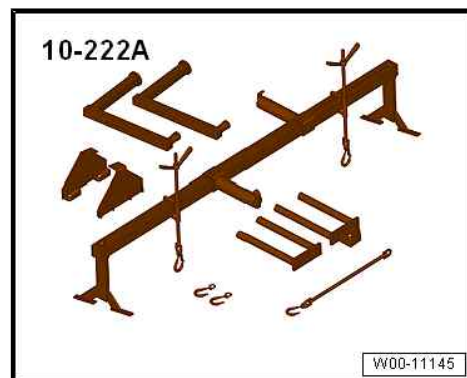
9 - Nut

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

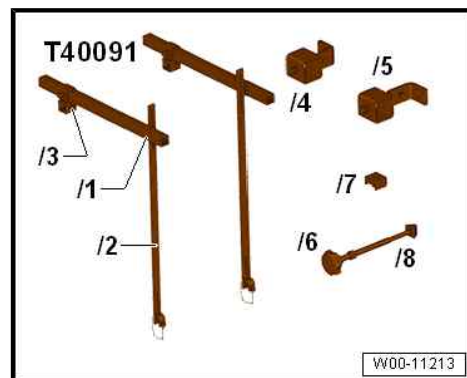
2.2 Supporting engine in installation position

Special tools and workshop equipment required

- ◆ Support bracket - 10-222A-

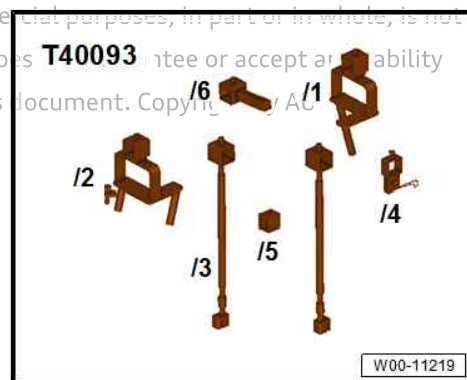


- ◆ Engine support (basic set) - T40091-



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

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Procedure

⚠ CAUTION

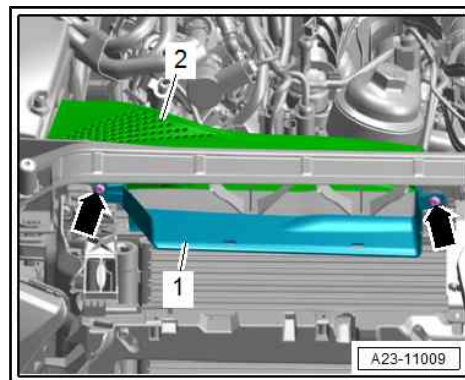
Risk of injury when weight of engine is shifted.

Danger of trapping or crushing parts of the body.

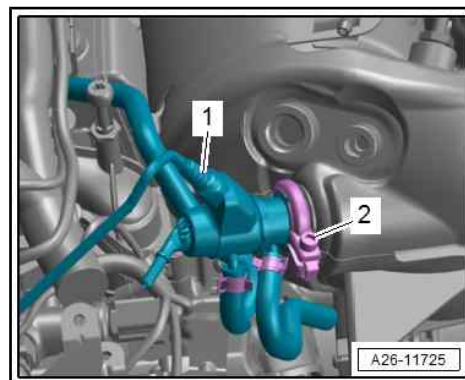
- Only support engine with gearbox and tunnel cross member installed.



- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
- Remove bolts -arrows- and detach air duct -2-.



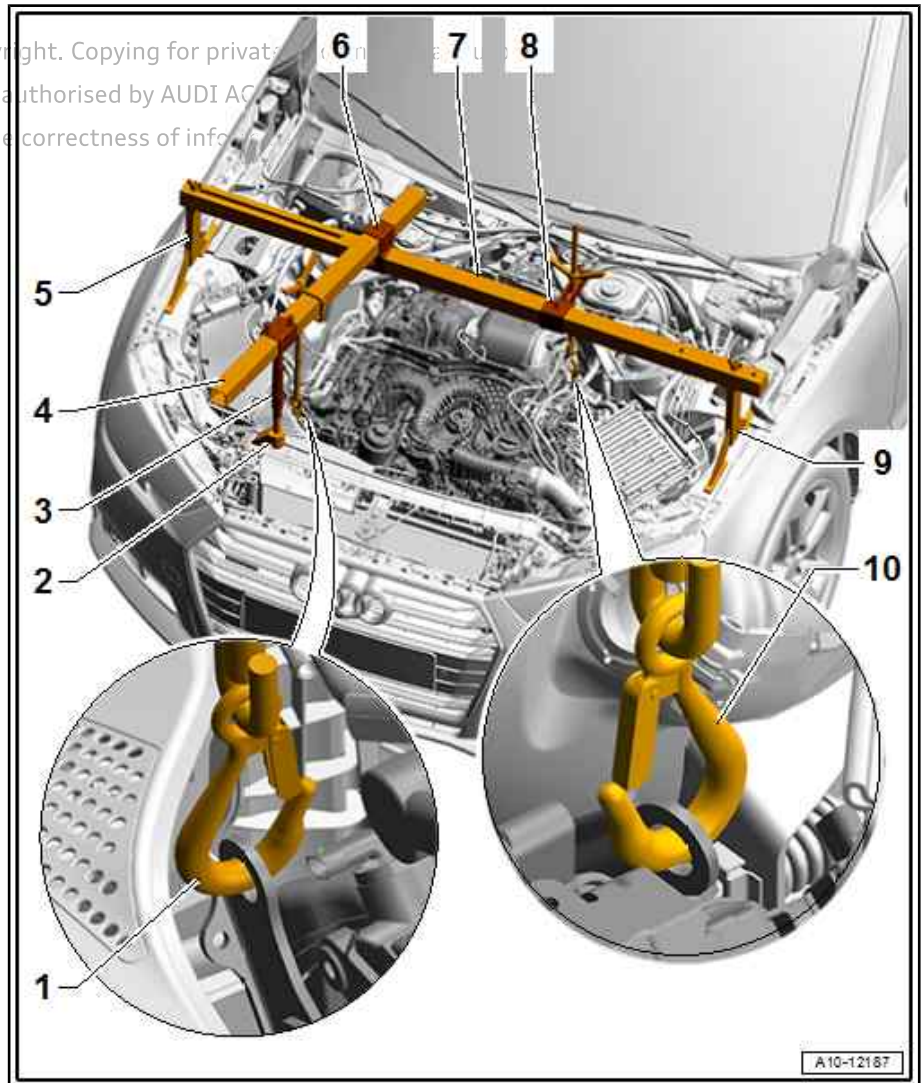
- Unscrew bolt -2- and loosen retaining clip.
- Detach injector for reducing agent - N474- -item 1- and press to one side.
- Set up support bracket - 10-222A- on wing mounting flanges and longitudinal members, as shown.



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- 1 - Spindle - 10-222A/11-
- 2 - Adapter - T40093/3-5-
- 3 - Adapter - 10-222A/31-3-
- 4 - Adapter - T40091/1-
- 5 - Support - 10-222A/1-
- 6 - Adapter - T40091/3-
- 7 - Adapter - 10-222A/4-
- 8 - Adapter - T40093/6-
- 9 - Support - 10-222A/1-
- 10 - Spindle - 10-222A/11-



- Engage spindles -10-222A/11- at engine lifting eyes (left and right).
- Tighten spindles slightly to take up weight of engine, but do not lift.

Assembling

Assembly is performed in reverse sequence; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
- Install injector for reducing agent - N474- ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Removing and installing injector for reducing agent - N474- .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 143](#)



2.3 Removing and installing engine mounting

⇒ [“2.3.1 Removing and installing engine mounting \(left-side\)”, page 38](#)

⇒ [“2.3.2 Removing and installing engine mounting \(right-side\)”, page 39](#)

⇒ [“2.3.3 Removing and installing support mounting \(left-side\)”, page 39](#)

⇒ [“2.3.4 Removing and installing support mounting \(right-side\)”, page 40](#)

2.3.1 Removing and installing engine mounting (left-side)

Removing

- Support engine in installation position ⇒ [page 35](#) and take up weight with spindle - 10-222A/11- until load on engine mounting is relieved.

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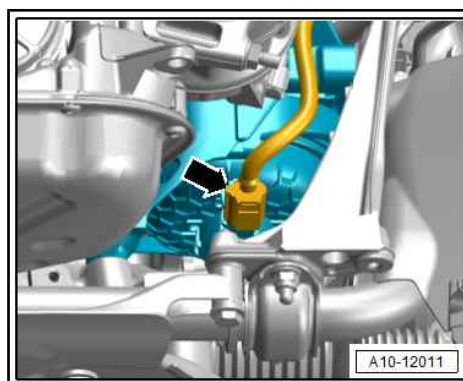
NOTICE

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Risk of damage to the drive shafts if they are allowed to knock against the suspension struts.

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- Lift the engine so that the drive shafts do not touch the suspension struts.
- Remove support mounting (left-side) ⇒ [page 39](#) .
- Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove poly V-belt from air conditioner compressor pulley ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- 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 .
- Unplug electrical connector -arrow- for left electrohydraulic engine mounting solenoid valve - N144- .



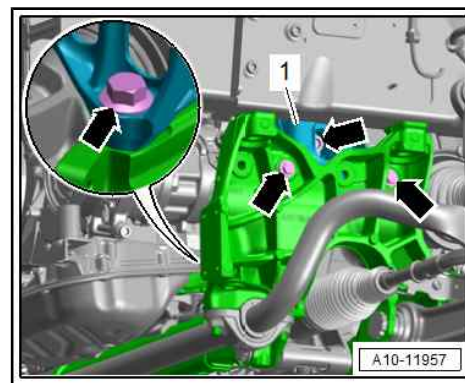


- Remove bolts -arrows-.
- Raise engine slightly with spindle - 10-222A/11- and detach engine mounting -1-.

Installing

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

- After removing, renew bolts tightened with specified tightening angle.
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install poly V-belt ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



Tightening torques

- ◆ ⇒ [“2.1 Exploded view - assembly mountings”, page 33](#)

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- ◆ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit
- ◆ ⇒ 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 engine mounting (right-side)

Removing

- Lower subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Lowering subframe .
- Remove bolts -arrows- and detach engine mounting (right-side) -1-.

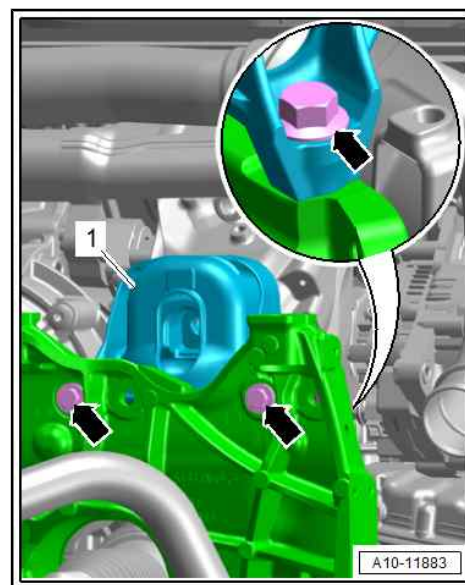
Installing

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

- After removing, renew bolts tightened with specified tightening angle.
- Install subframe ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Lowering subframe .

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - assembly mountings”, page 33](#)



2.3.3 Removing and installing support mounting (left-side)

Removing

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



- Remove bolts -arrows- and detach support mounting (left-side) -2-.

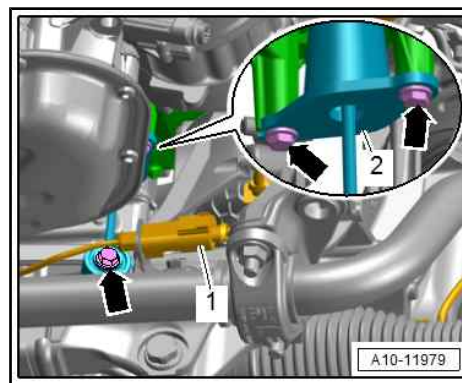
Installing

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

- After removing, renew bolts tightened with specified tightening angle.
- Installation position ➔ [page 34](#) .

Tightening torques

- ♦ ➔ [“2.1 Exploded view - assembly mountings”, page 33](#)
- ♦ ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



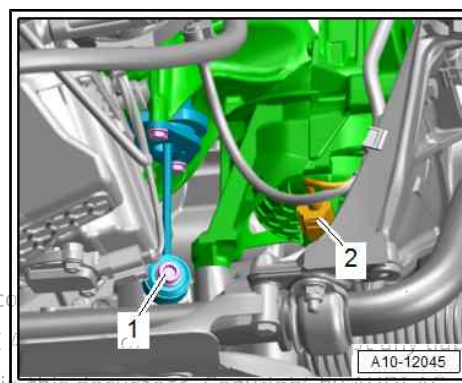
2.3.4 Removing and installing support mounting (right-side)

Removing

- Remove noise insulation (front) ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Support engine in installation position ➔ [page 35](#) .
- Remove bolt -1- for support mounting (left-side).



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- Remove bolts -arrows- for support mounting (right-side) -1-.
- Raise engine slightly with spindle - 10-222A/11- and detach support mounting towards left.

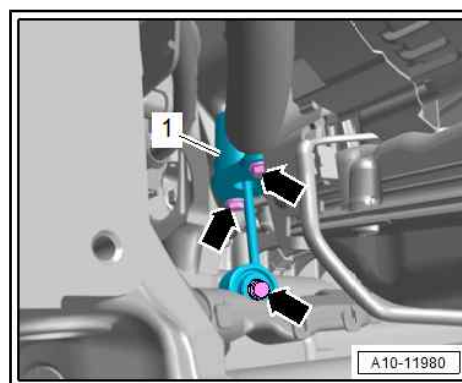
Installing

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

- Installation position ➔ [page 34](#) .

Tightening torques

- ♦ ➔ [“2.1 Exploded view - assembly mountings”, page 33](#)
- ♦ ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

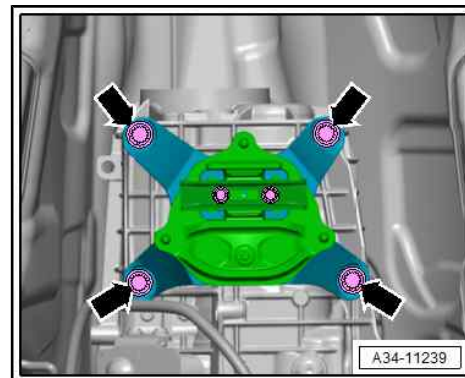




2.4 Removing and installing gearbox mounting

Removing gearbox support with gearbox mounting

- Remove tunnel cross member ⇒ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings .
- Remove bolts -arrows- and detach gearbox support 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-.

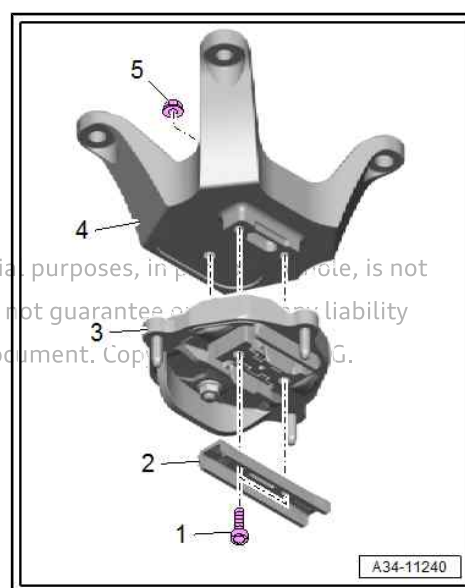
Installing

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

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

Tightening torques

- ◆ ⇒ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings





3 Engine cover panel

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel .



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13 – Crankshaft group

1 Cylinder block (pulley end)

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⇒ **"1.1 Exploded view - cylinder block (pulley end)", page 43**

⇒ **"1.2 Exploded view - sealing flange (pulley end)", page 43**

⇒ **"1.3 Removing and installing poly V-belts", page 43**

⇒ **"1.4 Removing and installing tensioner for poly V-belt", page 43**

⇒ **"1.5 Removing and installing vibration damper", page 43**

⇒ **"1.6 Removing and installing bracket for ancillaries", page 44**

⇒ **"1.7 Removing and installing engine support", page 47**

⇒ **"1.8 Renewing crankshaft oil seal (pulley end)", page 47**

⇒ **"1.9 Removing and installing sealing flange (pulley end)", page 48**

1.1 Exploded view - cylinder block (pulley end)

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end) .

1.2 Exploded view - sealing flange (pulley end)

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - sealing flange (pulley end) .

1.3 Removing and installing poly V-belts

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

1.4 Removing and installing tensioner for poly V-belt

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .

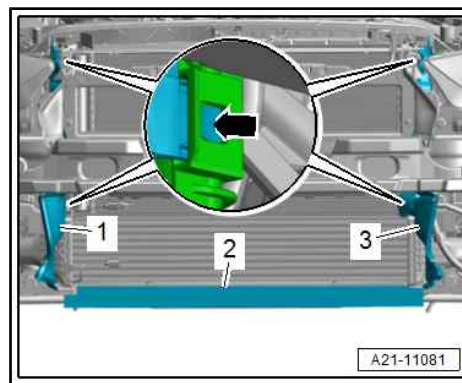
1.5 Removing and installing vibration damper

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); Exploded view - bumper cover .



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



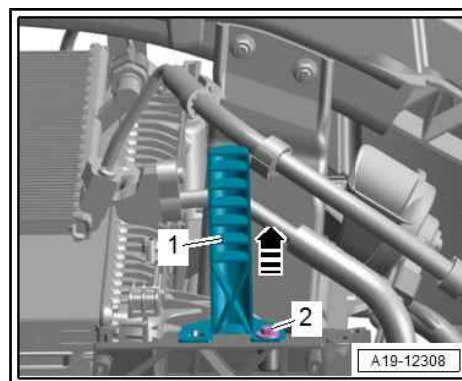
- Remove bolt -2- on both sides and press radiator bracket -1- with radiator towards front -arrow-.

All other procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; 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); Exploded view - bumper cover .



Tightening torques

- ♦ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 111](#)

1.6 Removing and installing bracket for an-cillaries

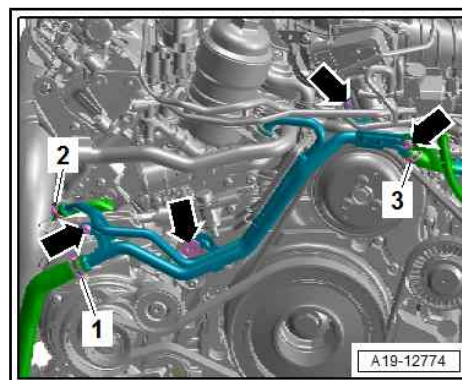
⇒ [“1.6.1 Removing and installing bracket for alternator”, page 44](#)

⇒ [“1.6.2 Removing and installing bracket for air conditioner compressor”, page 45](#)

1.6.1 Removing and installing bracket for al-ternator

Removing

- Remove poly V-belt ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- Remove alternator ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator .
- Remove bolts -arrows- and press coolant pipes slightly to one side.





- Move electrical wiring harness clear -arrows-.
- Remove bolts -2, 3- and detach bracket -1-.

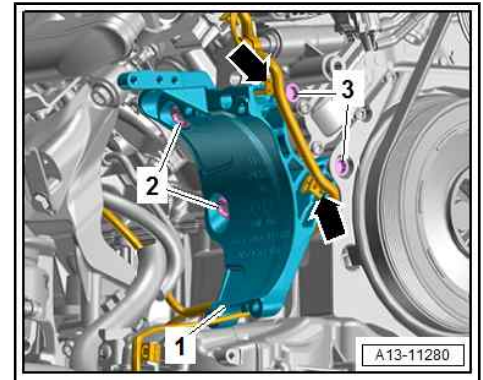
Installing

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

- Install poly V-belt ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end)
- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)
- ◆ ⇒ Electrical system; Rep. gr. 27 ; Alternator; Exploded view - alternator



1.6.2 Removing and installing bracket for air conditioner compressor

Special tools and workshop equipment required

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

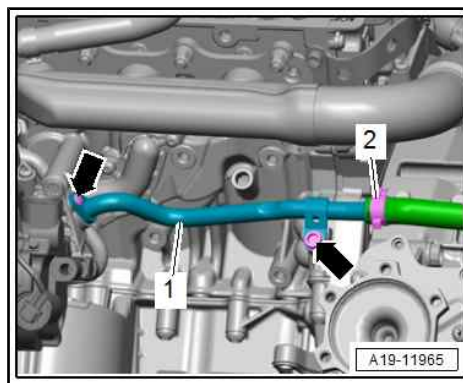


Removing

- Detach engine control unit - J623- from bracket and move aside ⇒ [page 173](#) .
- Remove coolant pipe (bottom front)
⇒ [“3.2.3 Removing and installing coolant pipe \(bottom front\)”, page 98](#) .
- Remove poly V-belt tensioner for air conditioner compressor
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .
- 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 drive shaft cover (left-side) and wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .



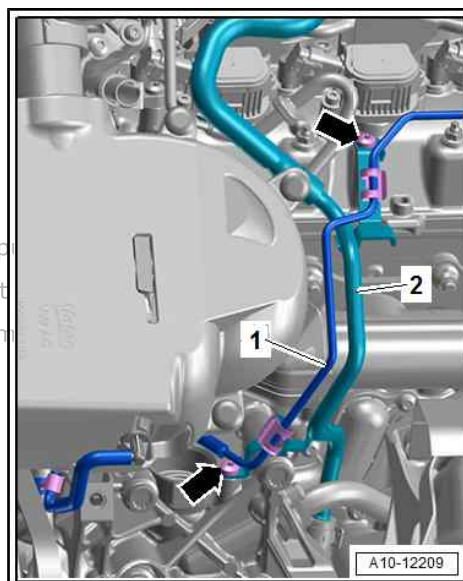
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Remove bolts -arrows-.
- Detach coolant pipe (left-side) -1- from bracket for air conditioner compressor (but leave it in installation position). (Shown with engine support removed.)



- Remove bolts -arrows- and push vacuum line to the side.



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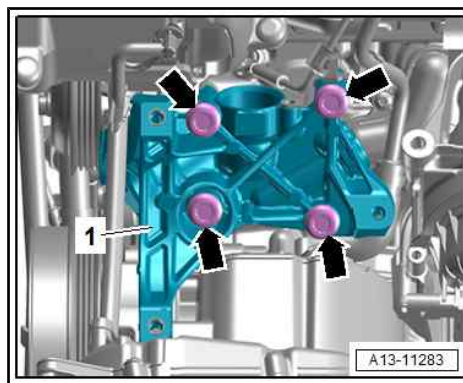


- Place a cloth underneath to catch escaping coolant.
- Unscrew bolts -arrows- and detach bracket -1- for air conditioner compressor.

Installing

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

- Renew gasket and O-ring after removal.
- Install poly V-belt tensioner for air conditioner compressor ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .
- Install engine control unit - J623- ⇒ [page 173](#) .
- Install coolant pipe (bottom front)
⇒ [“3.2.3 Removing and installing coolant pipe \(bottom front\)”, page 98](#) .



Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit



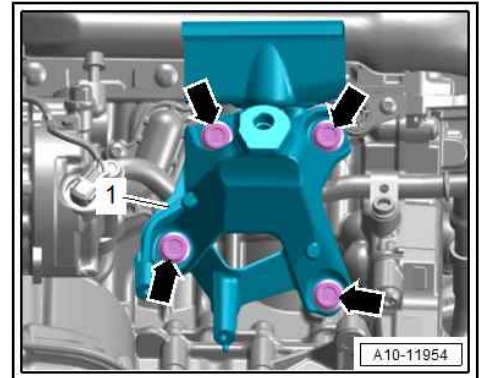
1.7 Removing and installing engine support

Removing

- Remove engine mounting ⇒ [page 38](#) .

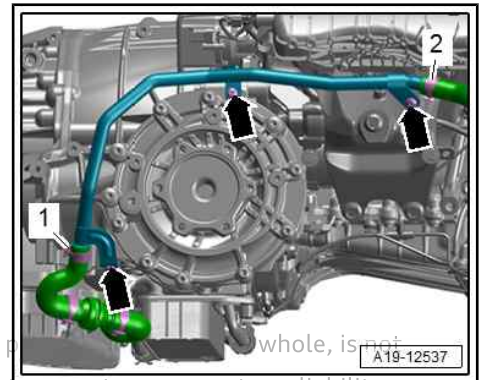
Engine support (left-side):

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



Engine support (right-side):

- Remove drive shaft cover ⇒ 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.



- Remove bolt -2- for earth wire.
- Remove bolts -arrows- and detach engine support -1-.

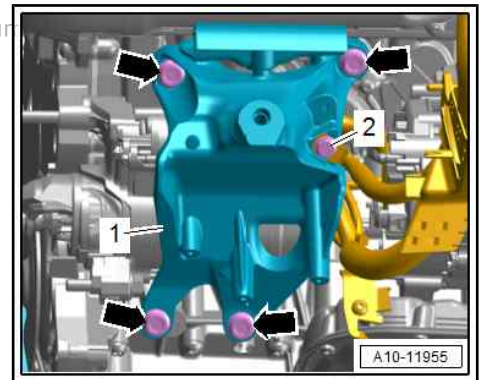
Installing

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

- Install engine mountings ⇒ [page 38](#) .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

Tightening torques

- ◆ ⇒ ["2.1 Exploded view - assembly mountings", page 33](#)
- ◆ ⇒ ["3.1 Exploded view - coolant pipes", page 91](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)



1.8 Renewing crankshaft oil seal (pulley end)

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Renewing crankshaft oil seal (pulley end) .



1.9 Removing and installing sealing flange (pulley end)

Removing

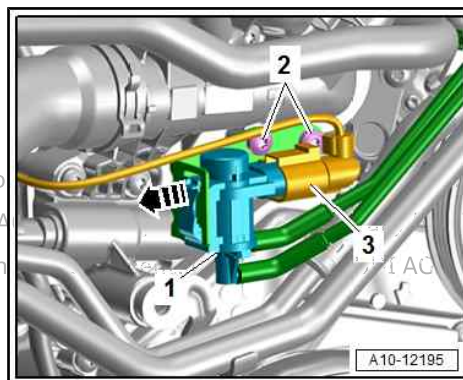
- Remove coolant pipe (front)
⇒ [“3.2.1 Removing and installing coolant pipe \(front\)”](#),
[page 95](#) .
- Remove intake manifold flap control unit - GX14-
⇒ [page 150](#) .
- Unplug electrical connector -3-.
- Release fastener -arrow-, detach changeover valve downwards from bracket and press to one side.
- Remove vibration damper ⇒ [page 43](#) .
- Remove bracket for air conditioner compressor
⇒ [“1.6.2 Removing and installing bracket for air conditioner compressor”](#), [page 45](#) .

All other procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing sealing flange (pulley end) .

Installing

Additional work:

- Install bracket for air conditioner compressor
⇒ [“1.6.2 Removing and installing bracket for air conditioner compressor”](#), [page 45](#) .
- Install vibration damper ⇒ [page 43](#) .
- Install coolant pipe (front)
⇒ [“3.2.1 Removing and installing coolant pipe \(front\)”](#),
[page 95](#) .





2 Cylinder block (gearbox end)

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (gearbox end) .



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3 Crankshaft

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Crankshaft .



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4 Balance shaft

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Balance shaft .



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5 **Pistons and conrods**

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Pistons and conrods .



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15 – Cylinder head, valve gear

1 Timing chain cover

⇒ [“1.1 Exploded view - timing chain cover”, page 53](#)

⇒ [“1.2 Removing and installing timing chain cover”, page 53](#)

1.1 Exploded view - timing chain cover

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover .

1.2 Removing and installing timing chain cover

⇒ [“1.2.1 Removing and installing timing chain cover \(top left\)”, page 53](#)

⇒ [“1.2.3 Removing and installing timing chain cover \(bottom\)”, page 54](#)

1.2.1 Removing and installing timing chain cover (top left)

Removing

- Remove coolant pipe 5 for turbocharger
⇒ [“3.2.12 Removing and installing coolant pipe 5 for turbocharger”, page 108](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Removing and installing timing chain cover .

Installing

Additional work:

- Install coolant pipe 5 for turbocharger
⇒ [“3.2.12 Removing and installing coolant pipe 5 for turbocharger”, page 108](#) .

1.2.2 Removing and installing timing chain cover (top right)

Removing

- Remove coolant pipe 3 for turbocharger
⇒ [“3.2.10 Removing and installing coolant pipes 2 and 3 for turbocharger”, page 106](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Removing and installing timing chain cover .

Installing

Additional work:

- Install coolant pipe 3 for turbocharger
⇒ [“3.2.10 Removing and installing coolant pipes 2 and 3 for turbocharger”, page 106](#) .

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1.2.3 Removing and installing timing chain cover (bottom)

Removing

- Gearbox removed ⇒ Gearbox; Rep. gr. 37 ; Removing and installing gearbox; Removing gearbox .
- Steering rack secured to subframe with original bolts (bolts should be tightened to specified torque but not turned through specified angle).
- Lower engine evenly using spindles -10-222/11- until spindle at engine lifting eye at rear right is loosened.
- Disengage spindle from engine lifting eye at rear right and move clear to one side.

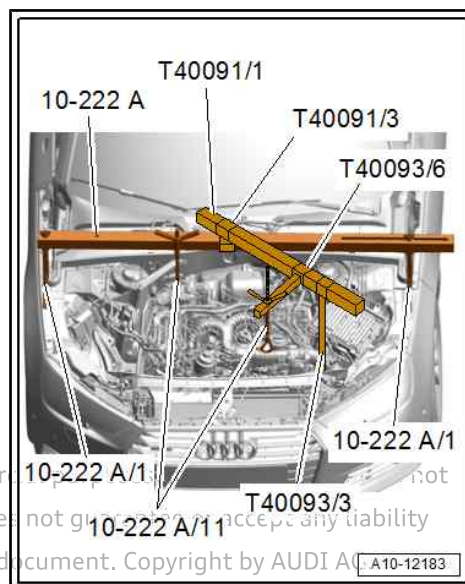
CAUTION

Risk of injury when weight of engine is shifted.

Danger of trapping or crushing parts of the body.

- **Secure engine with spindle at engine lifting eye (front left) to keep it from tipping.**

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Removing and installing timing chain cover .





2 Chain drive

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Chain drive .



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3 Cylinder head

⇒ [“3.1 Exploded view - cylinder head”, page 56](#)

⇒ [“3.2 Exploded view - cylinder head cover”, page 56](#)

⇒ [“3.3 Removing and installing cylinder head”, page 56](#)

⇒ [“3.4 Removing and installing cylinder head cover”, page 56](#)

⇒ [“3.5 Removing and installing seals for injectors”, page 59](#)

⇒ [“3.6 Checking compression”, page 59](#)

3.1 Exploded view - cylinder head

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head .

3.2 Exploded view - cylinder head cover

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover .

3.3 Removing and installing cylinder head

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Removing and installing cylinder head .

3.4 Removing and installing cylinder head cover

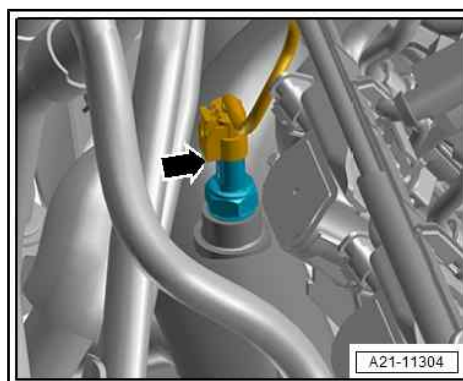
⇒ [“3.4.1 Removing cylinder head cover - bank 1 \(right-side\)”, page 56](#)

⇒ [“3.4.2 Removing cylinder head cover - bank 2 \(left-side\)”, page 57](#)

3.4.1 Removing cylinder head cover - bank 1 (right-side)

Removing

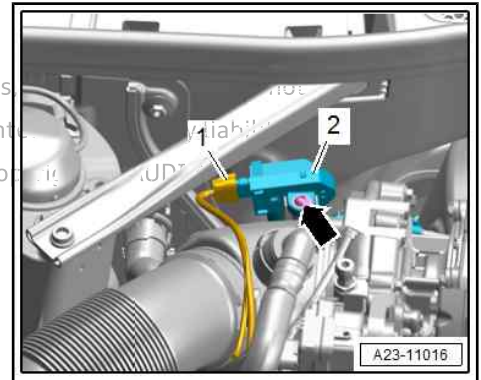
- Remove air cleaner housing ⇒ [page 144](#) .
- Unplug electrical connector -arrow- for charge air temperature sender before charge air cooler - G810- .



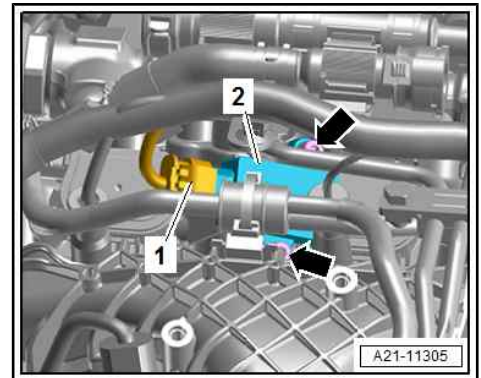


- Remove bolt -arrow-.
- Unplug electrical connector -1-.
- Move bracket -2- with pressure differential sender - G505- clear.

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- Unplug electrical connector -1- and remove bolts -arrows-.
- Move sender 1 for turbocharger speed - G688- -item 2- clear and place it to one side.



- Disconnect vacuum hose -arrow-, taking care not to damage it.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Removing and installing cylinder head .

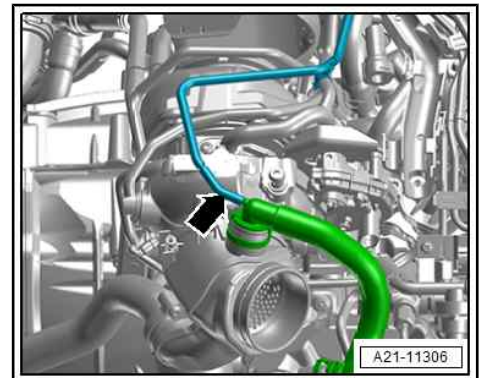
Installing

Additional work:

- Install air cleaner housing ⇒ [page 144](#) .

Tightening torques

- ◆ ⇒ Fig. ““Bracket with pressure differential sender -G505- - tightening torque”” , [page 168](#)



3.4.2 Removing cylinder head cover - bank 2 (left-side)

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- De-energise 48 V electrical system and disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

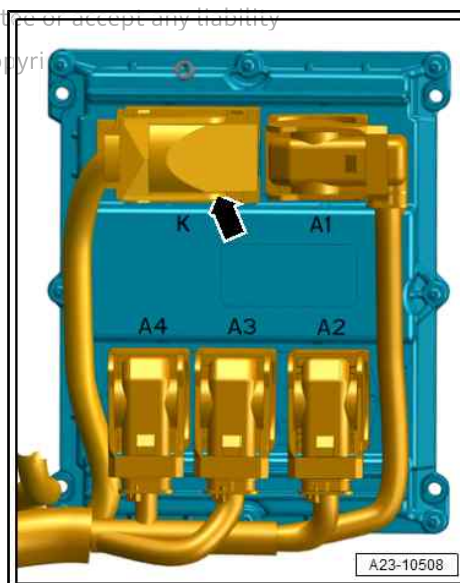
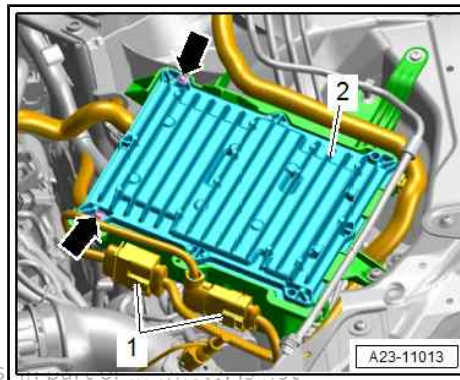


- Detach electrical connectors -1- from bracket, unplug and move electrical wiring clear.
- Remove bolts -arrows- and detach engine control unit - J623-
-item 2-.

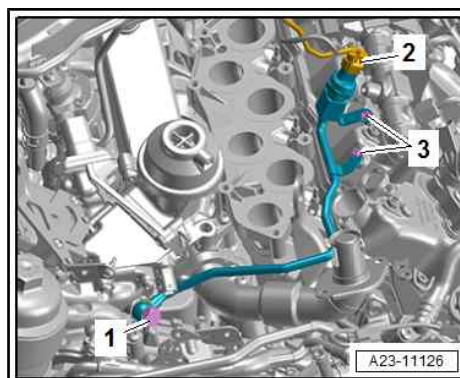
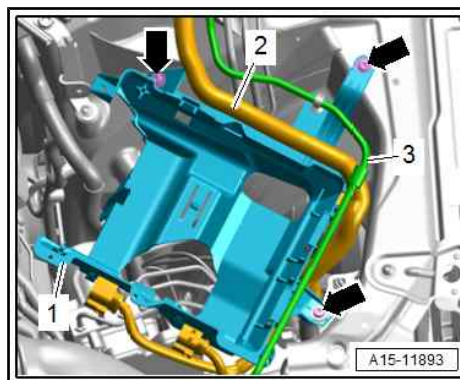


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- Unplug electrical connector "K" -arrow-.
- Place engine control unit - J623- on engine and secure to prevent it from dropping.



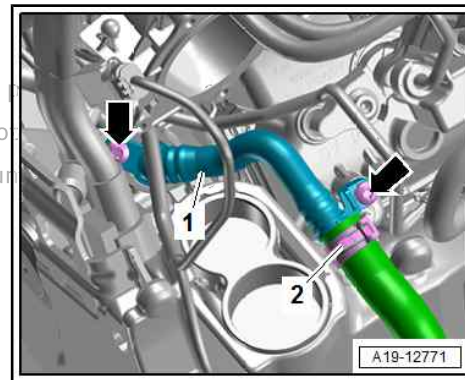
- Move coolant line -3- and electrical wiring harness -2- clear.
- Remove bolts -arrows- and detach bracket -1- for engine control unit.
- Remove poly V-belt from air conditioner compressor pulley ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- 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 intake manifold flap control unit - GX14-
⇒ [page 150](#) .
- Remove banjo bolt -1- and bolt -3-.
- Unplug electrical connector -2- and detach exhaust gas pressure sensor 1 - G450- .





- Remove bolts -arrows-, detach coolant line -2- from electric compressor and press it to one side.

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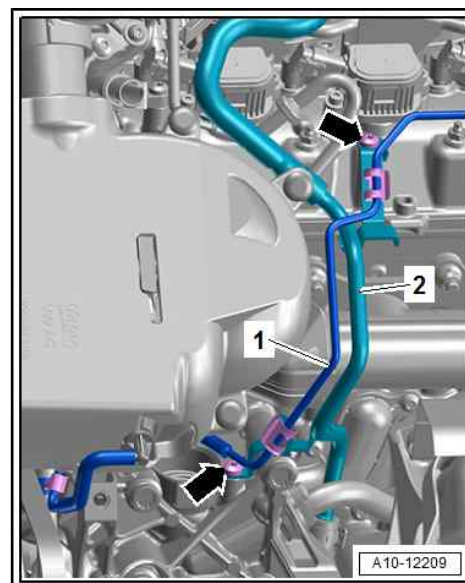
- Remove bolts -arrows- and press vacuum line -2- slightly to left side.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Removing and installing cylinder head .

Installing

Additional work:

- Install intake manifold flap control unit - GX14- ⇒ [page 150](#) .
- Install poly V-belt ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt ⇒ [page 43](#) .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ [“9.1 Exploded view - engine control unit”, page 173](#)
- ◆ ⇒ Brake system; Rep. gr. 47 ; Vacuum system; Exploded view - vacuum pump
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation
- ◆ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit

3.5 Removing and installing seals for injectors

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Removing and installing seals for injectors .

3.6 Checking compression

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Checking compression .



4 Valve gear

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Valve gear .



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5 Inlet and exhaust valves

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Inlet and exhaust valves .



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17 – Lubrication

1 Sump/oil pump

⇒ [“1.1 Exploded view - sump/oil pump”, page 62](#)

⇒ [“1.2 Engine oil”, page 62](#)

⇒ [“1.3 Removing and installing sump \(bottom section\)”, page 62](#)

⇒ [“1.4 Removing and installing sump \(top section\)”, page 63](#)

⇒ [“1.5 Removing and installing oil pump”, page 64](#)

⇒ [“1.6 Removing and installing oil level and oil temperature sender G266”, page 64](#)

1.1 Exploded view - sump/oil pump

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump .

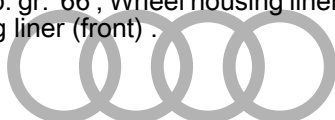
1.2 Engine oil

- ◆ 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
- ◆ Checking 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)

Removing

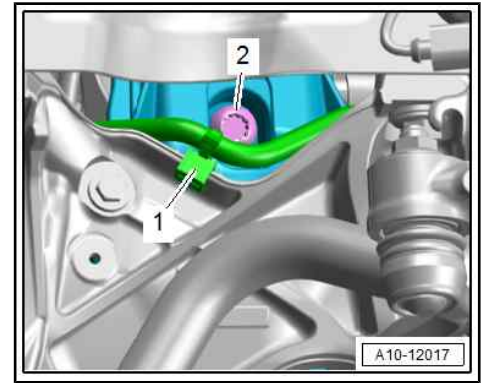
- Support engine in installation position ⇒ [page 35](#) .
- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove wheel spoilers (front) on both sides ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .



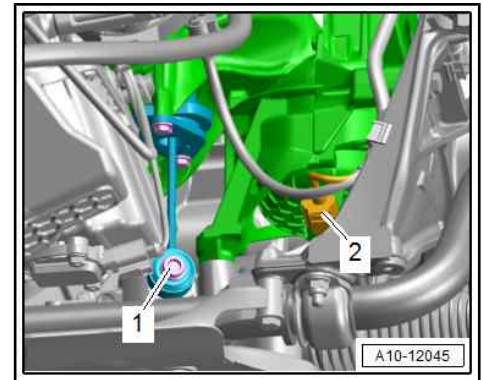
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- Remove bolt -2- on both sides.



- Remove bolt -1- for support mounting (both sides).



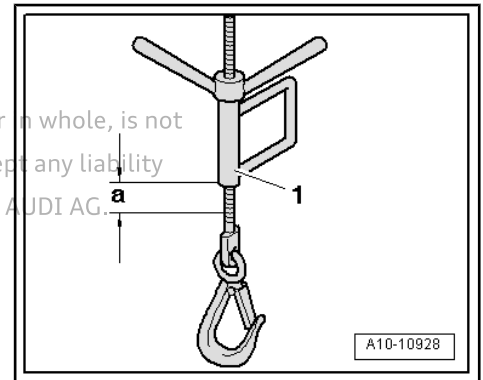
- Using spindle -10-222A/11- -item 1-, raise engine through distance -a-.

- Dimension -a- = 30 mm

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17; Sump/oil pump; Removing and installing sump (bottom section) .

Tightening torques

- ◆ ⇒ 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



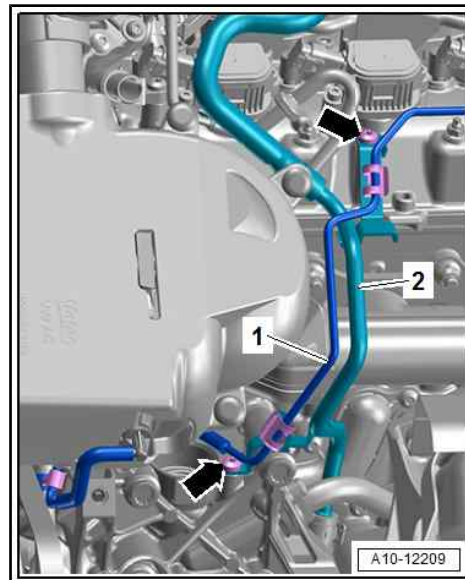
1.4 Removing and installing sump (top section)

Removing

- Engine secured to engine and gearbox support
⇒ ["1.3 Securing engine to engine and gearbox support", page 26](#)



- Remove bolts -arrows- and move vacuum line -2- clear.



- Remove bolts -arrows-.
- Move vacuum hose clear and detach dipstick guide tube -1-.

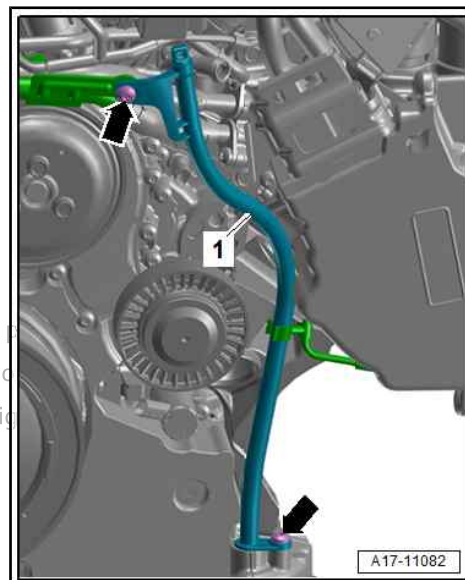
All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing sump (top section) .

Tightening torques

- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end)

- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

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1.5 Removing and installing oil pump

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil pump .

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

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil level and oil temperature sender - G266- .



2 Engine oil cooler

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Engine oil cooler .



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3 Crankcase breather

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail (EA 897 Gen II); Rep. gr. 17 ; Crankcase breather .

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4 Oil filter/oil pressure switches

⇒ ["4.1 Exploded view - oil filter", page 67](#)

⇒ ["4.2 Removing and installing oil filter housing", page 67](#)

⇒ ["4.3 Removing and installing oil pressure sender G10 ", page 68](#)

⇒ ["4.4 Checking oil pressure", page 68](#)

⇒ ["4.5 Removing and installing valve for oil pressure control N428 ", page 69](#)

⇒ ["4.6 Removing and installing oil temperature sender 2 G664 ", page 69](#)

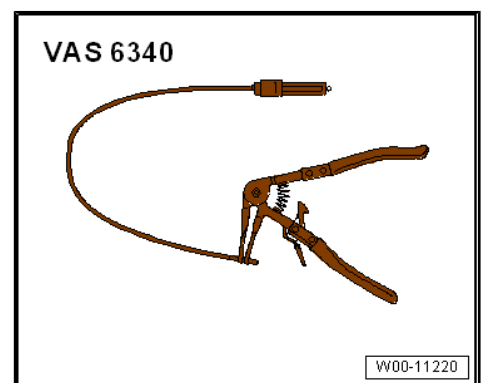
4.1 Exploded view - oil filter

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil filter .

4.2 Removing and installing oil filter housing

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6340-

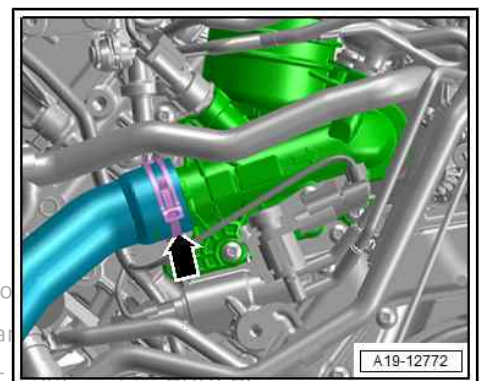


Removing

- Remove oil filter element ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter .
- Drain coolant ⇒ [page 75](#) .
- Remove oil pressure sender - G10- ⇒ [page 68](#) .
- Unbolt coolant pipe (front) and detach from thermostat ⇒ [page 95](#) .
- Release hose clip -arrow- and detach coolant hose.

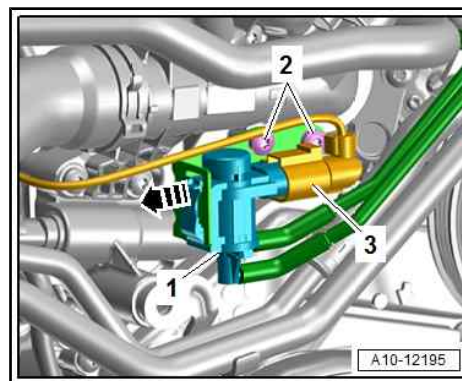


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- Unplug electrical connector -1- for exhaust gas recirculation cooler changeover valve - N345- .
- Remove bolts -2- and place changeover valve to one side together with bracket -1-.



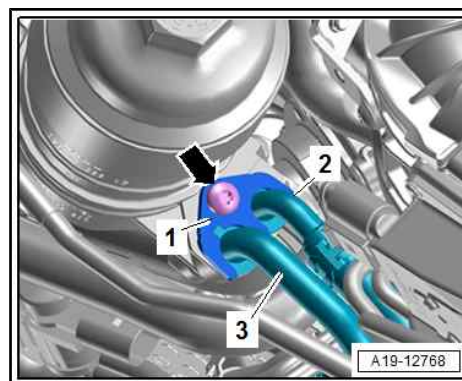
- Remove bolt -arrow-.
- Detach retaining plate -1-, pull off connections -2, 3- and press to side.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing oil filter housing .

Installing

Additional work:

- Install oil pressure sender - G10- ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches ; Removing and installing oil pressure sender - G10- .
- Install oil filter element ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter .



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)

4.3 Removing and installing oil pressure sender - G10-

Removing

- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
- Remove bolts -arrows- and detach air duct -2-.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches ; Removing and installing oil pressure sender - G10- .

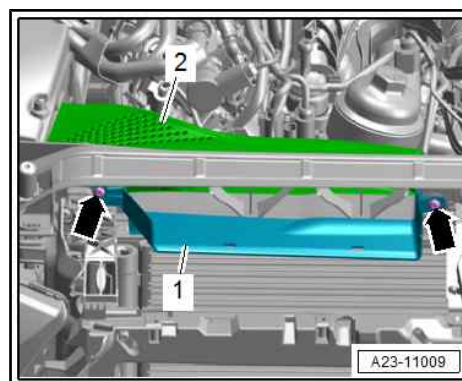
Installing

Additional work:

- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 143](#)



4.4 Checking oil pressure

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Checking oil pressure .

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

Removing

- Remove coolant pipe (bottom front)
⇒ [“3.2.3 Removing and installing coolant pipe \(bottom front\)”](#),
[page 98](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Removing and installing valve for oil pressure control - N428- .

Installing

Additional work:

- Install coolant pipe (bottom front)
⇒ [“3.2.3 Removing and installing coolant pipe \(bottom front\)”](#),
[page 98](#) .

4.6 Removing and installing oil temperature sender 2 - G664-

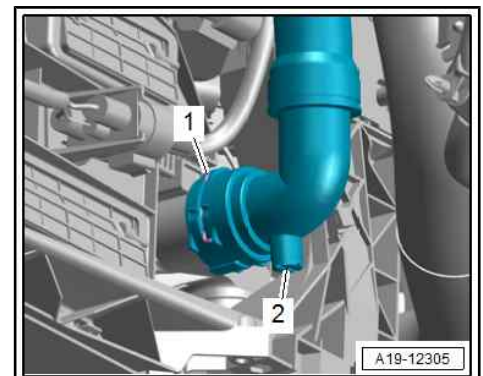
Special tools and workshop equipment required

- ◆ 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 .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Remove drain plug -2- at connection and drain off coolant.
- Remove air cleaner housing ⇒ [page 144](#) .





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

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches ; Removing and installing oil temperature sender 2 - G664- .

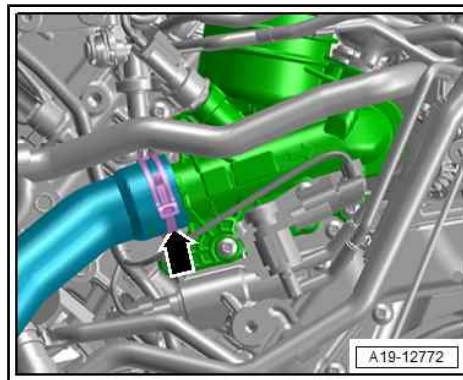
Installing

Additional work:

- Do not reuse coolant.
- Install air cleaner housing ⇒ [page 144](#) .
- Fill up with coolant ⇒ [page 75](#) .

Tightening torques

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



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19 – Cooling

1 Cooling system/coolant

⇒ [“1.1 Connection diagram - coolant hoses”, page 71](#)

⇒ [“1.2 Checking cooling system for leaks”, page 75](#)

⇒ [“1.3 Draining and filling cooling system”, page 75](#)

1.1 Connection diagram - coolant hoses

⇒ [“1.1.1 Connection diagram - coolant hoses, vehicles without auxiliary/supplementary heater”, page 71](#)

⇒ [“1.1.2 Connection diagram - coolant hoses, vehicles with auxiliary/supplementary heater”, page 73](#)

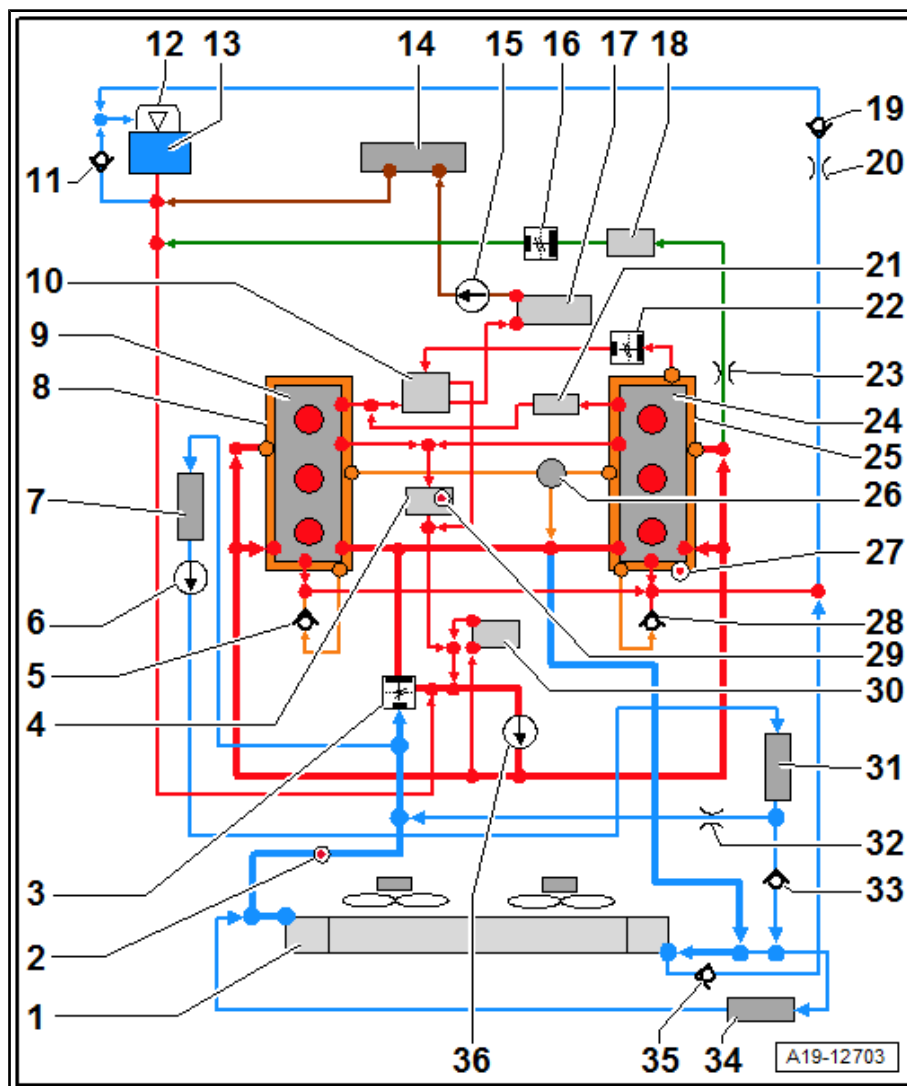
1.1.1 Connection diagram - coolant hoses, vehicles without auxiliary/supplementary heater

- ◆ 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

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- 1 - Radiator
- 2 - Coolant temperature sender 2 - G802-
- 3 - Thermostat
- 4 - Exhaust gas recirculation cooler
- 5 - Non-return valve
- 6 - Starter-alternator coolant pump - V621-
- 7 - Starter-alternator - C29-
- 8 - Cylinder block
- Cylinder bank 1 (right-side)
- 9 - Cylinder head
- Cylinder bank 1 (right-side)
- 10 - Turbocharger
- 11 - Non-return valve
- 12 - Filler cap
- Checking pressure relief valve ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks
- 13 - Coolant expansion tank
- 14 - Heat exchanger for heater
- 15 - Coolant circulation pump - V50-
- 16 - Thermostat
- For coolant circuit for gearbox
- 17 - Exhaust gas recirculation cooler
- Low pressure
- 18 - ATF cooler
- 19 - Non-return valve
- 20 - Restrictor
- 21 - Injector for reducing agent - N474-
- 22 - Thermostat
- For turbocharger coolant circuit
- 23 - Restrictor
- 24 - Cylinder head
- Cylinder bank 2 (left-side)
- 25 - Cylinder block
- Cylinder bank 2 (left-side)



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- 26 - Coolant shut-off valve
- 27 - Temperature sender for engine temperature regulation - G694-
- 28 - Non-return valve
- 29 - Coolant temperature sender - G62-
- 30 - Engine oil cooler
- 31 - Electric compressor
- 32 - Restrictor
- 33 - Non-return valve
- 34 - Auxiliary radiator
 - Depending on version
- 35 - Non-return valve
- 36 - Coolant pump

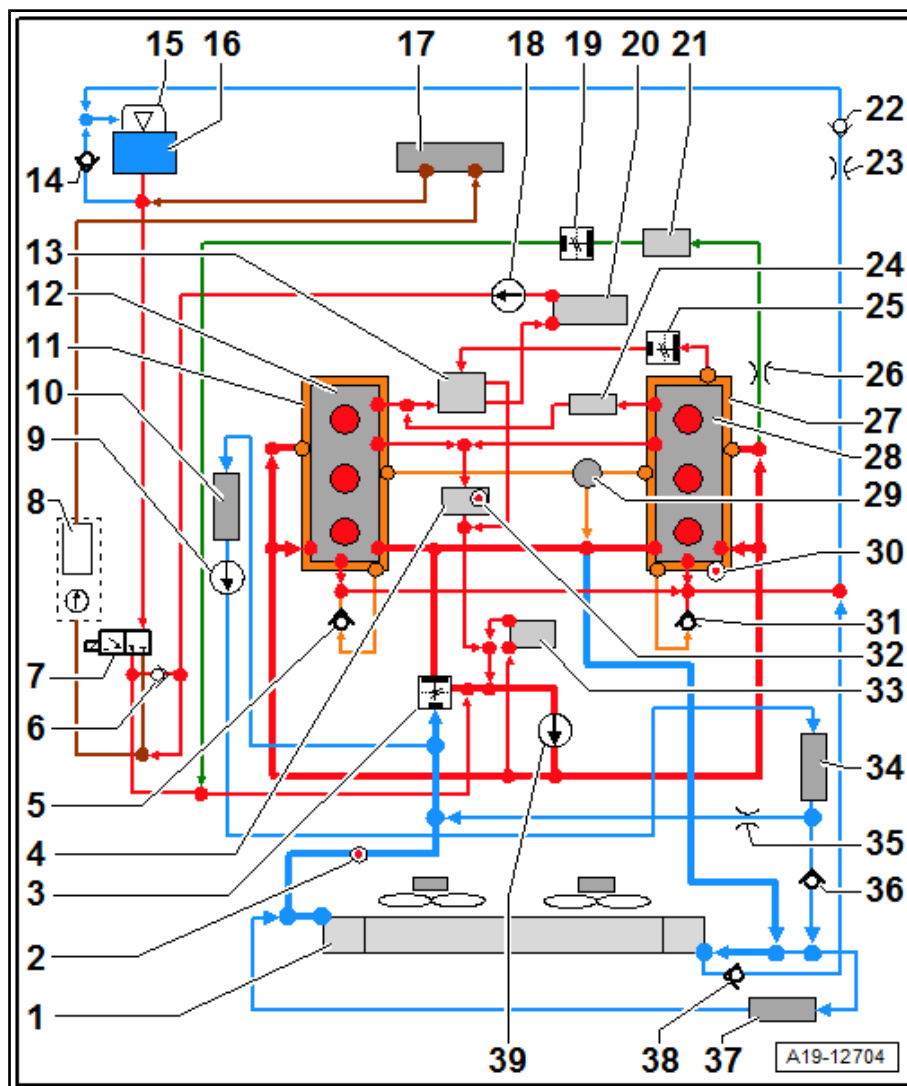
1.1.2 Connection diagram - coolant hoses, vehicles with auxiliary/supplementary heater

- ◆ 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

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- 1 - Radiator
 2 - Coolant temperature sender 2 - G802-
 3 - Thermostat
 4 - Exhaust gas recirculation cooler
 5 - Non-return valve
 6 - Non-return valve
 7 - Heater coolant shut-off valve - N279-
 8 - Auxiliary heater
 ☐ With circulation pump - V55-
 9 - Starter-alternator coolant pump - V621-
 10 - Starter-alternator - C29-
 11 - Cylinder block
 ☐ Cylinder bank 1 (right-side)
 12 - Cylinder head
 ☐ Cylinder bank 1 (right-side)
 13 - Turbocharger
 14 - Non-return valve
 15 - Filler cap
 ☐ Checking pressure relief valve ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks
 16 - Coolant expansion tank
 17 - Heat exchanger for heater
 18 - Coolant circulation pump - V50-
 19 - Thermostat
 ☐ For coolant circuit for gearbox
 20 - Exhaust gas recirculation cooler
 ☐ Low pressure
 21 - ATF cooler
 22 - Non-return valve
 23 - Restrictor
 24 - Injector for reducing agent - N474-
 25 - Thermostat
 ☐ For turbocharger coolant circuit
 26 - Restrictor
 27 - Cylinder block
 ☐ Cylinder bank 2 (left-side)



- 16 - Coolant expansion tank
 17 - Heat exchanger for heater
 18 - Coolant circulation pump - V50-
 19 - Thermostat
 ☐ For coolant circuit for gearbox
 20 - Exhaust gas recirculation cooler
 ☐ Low pressure
 21 - ATF cooler
 22 - Non-return valve
 23 - Restrictor
 24 - Injector for reducing agent - N474-
 25 - Thermostat
 ☐ For turbocharger coolant circuit
 26 - Restrictor
 27 - Cylinder block
 ☐ Cylinder bank 2 (left-side)



28 - Cylinder head

- ☐ Cylinder bank 2 (left-side)

29 - Coolant shut-off valve

30 - Temperature sender for engine temperature regulation - G694-

31 - Non-return valve

32 - Coolant temperature sender - G62-

33 - Engine oil cooler

34 - Electric compressor

35 - Restrictor

36 - Non-return valve

37 - Auxiliary radiator

- ☐ Depending on version

38 - Non-return valve

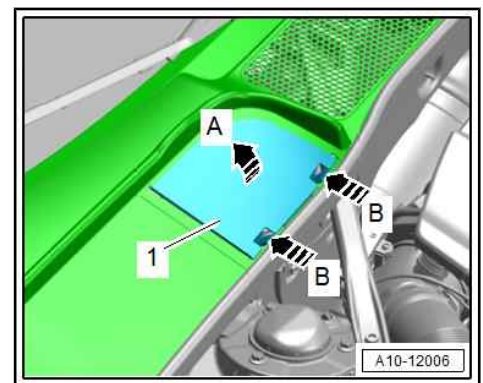
39 - Coolant pump

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 TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks .



1.3 Draining and filling cooling system

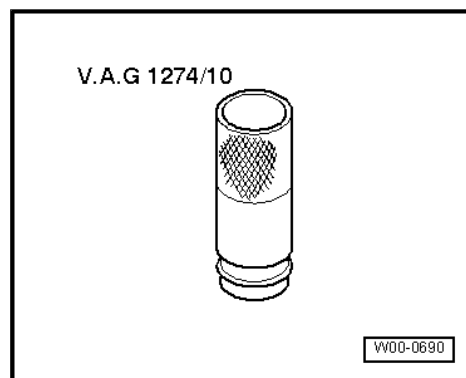
Special tools and workshop equipment required

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

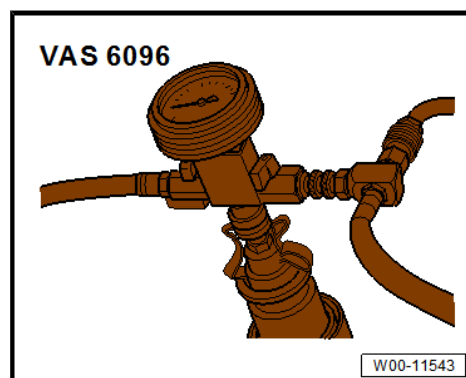




- ◆ Pipe for cooling system tester - V.A.G 1274/10-



- ◆ Cooling system charge unit - VAS 6096-



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



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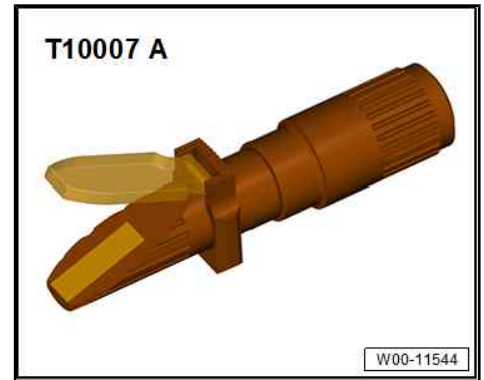


- ◆ Hose clip pliers - VAS 6362-





◆ Refractometer - T10007A-

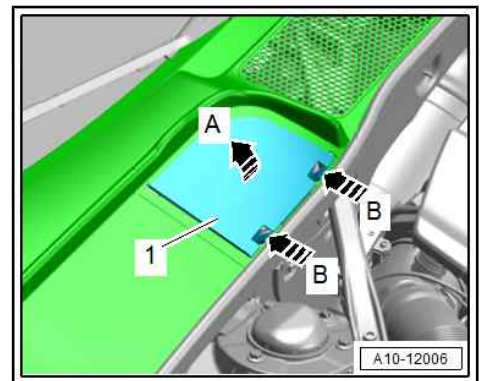


◆ Safety goggles

◆ Protective gloves

Draining coolant

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

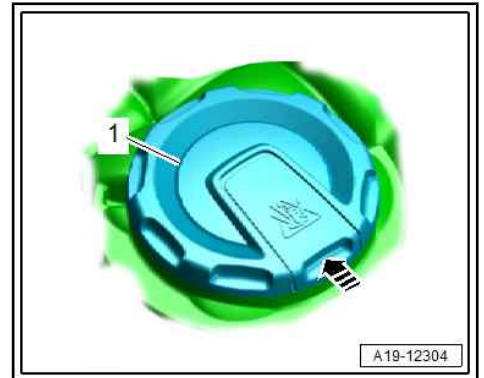


⚠ CAUTION

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

Danger of scalding skin and other parts of the body.

- Put on protective gloves.
 - Put on safety goggles.
 - Cover filler cap on expansion tank with a cloth and open carefully to release pressure.
-
- Release fastener -arrow- and open filler cap -1- on coolant expansion tank.
 - Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .



⚠ CAUTION

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

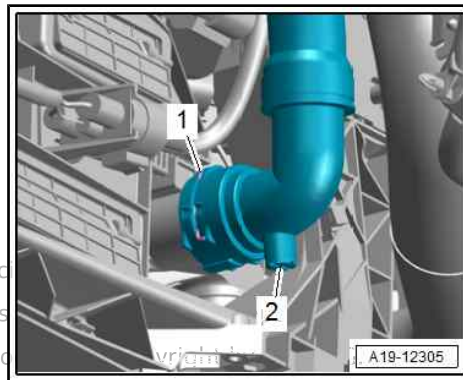
- When working in the vicinity of the radiator, keep a safe distance from the radiator fan.



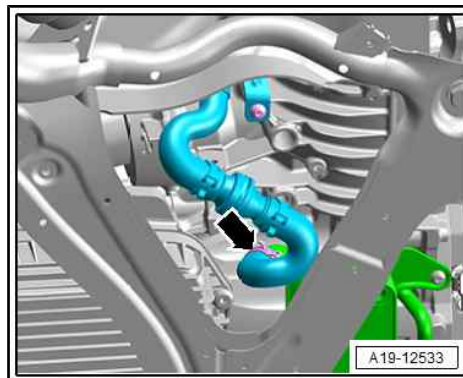
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Remove drain plug -2- at connection and drain off coolant.



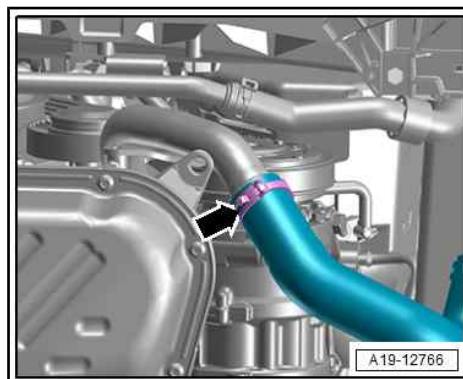
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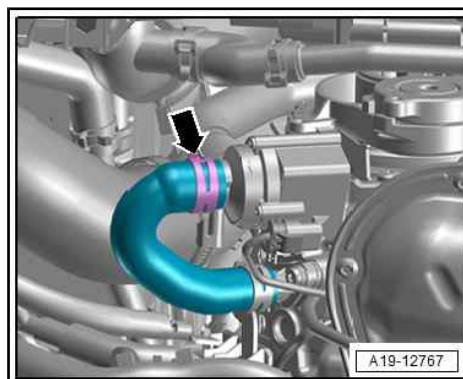
- Release hose clip -arrow-.
- Disconnect coolant hose from ATF cooler, hold end of hose downwards and drain off coolant.



- Release hose clip -arrow-, disconnect coolant hose and drain off coolant.



- Release hose clip -arrow-, disconnect coolant hose and drain off coolant.





- Release hose clip -arrow-.
- Disconnect coolant hose from exhaust gas recirculation cooler, hold end of hose downwards and drain off coolant.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Tighten drain plug and re-connect coolant hoses.

Coolant specifications

All information can be found in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .

Recommended mixture ratio for coolant



NOTICE

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

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

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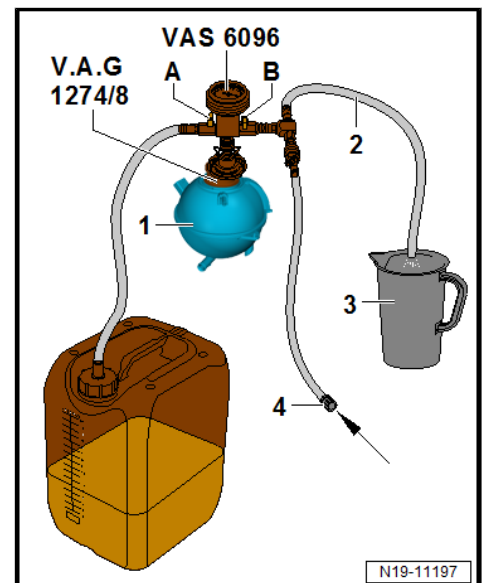
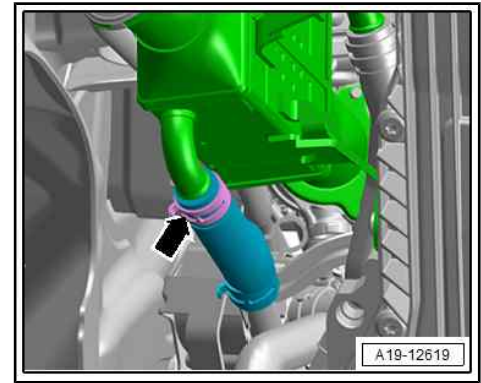
Filling cooling system

- 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 79](#)).
- 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 -1-.
- 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.

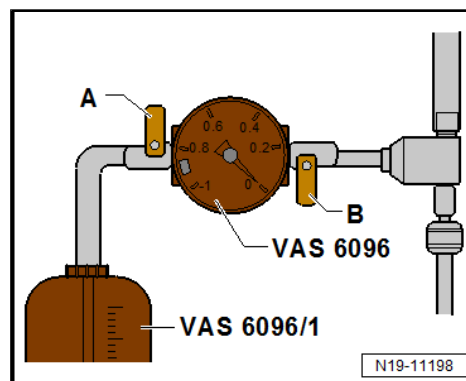




- Open valve -B- by setting lever in direction of flow.
- The suction jet pump generates a partial vacuum in the cooling system; the needle on the gauge should move into the green zone.
- Also briefly open valve -A- (turn lever in direction of flow) so that hose on reservoir of -VAS 6096- can fill with 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

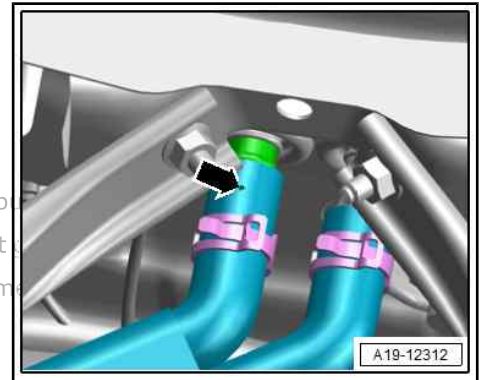
- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



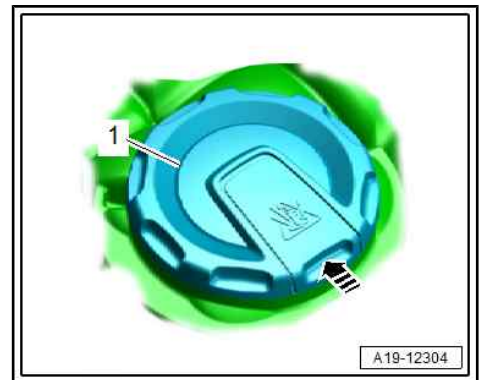


- Release hose clip on coolant hose going to heat exchanger for heater and pull back hose until bleeder hole -arrow- is no longer blocked by connection.
- Fill up with coolant until it flows out at bleeder hole in coolant hose.
- Push coolant hose back onto connection and secure with hose clip.

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- Close filler cap -1- on coolant expansion tank (make sure it engages).
- On vehicles with auxiliary/supplementary heater, switch heater on for about 30 seconds.
- Start engine.



Time period	Engine speed	Air conditioner/heater setting
2 minutes	2500 rpm	• Air conditioning system "OFF", LED in AC button not lit • Heating at "HI", select lowest possible blower speed (= 0)
3 minutes	Idle	• Air conditioning system "OFF" • Heating at "HI"
2 minutes	2500 rpm	
3 minutes	Idle	
2 minutes	2500 rpm	
3 minutes	Idle	
1 minutes	Switch off engine	
2 minutes	2500 rpm	
Until both large coolant hoses at radiator become warm	Idle	
1 minutes	2500 rpm	

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



Checking coolant level

CAUTION

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

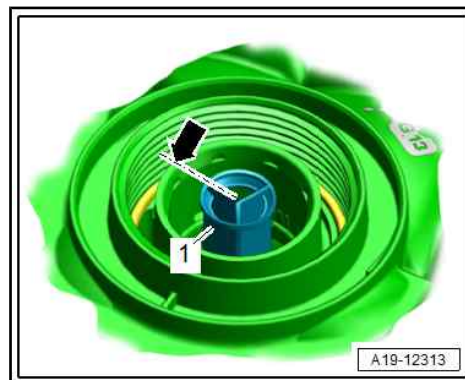
Danger of scalding skin and other parts of the body.

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

- 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

- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 111](#)
- ◆ ⇒ 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”, page 83](#)

⇒ [“2.2 Exploded view - electric coolant pump”, page 83](#)

⇒ [“2.3 Exploded view - thermostat”, page 85](#)

⇒ [“2.4 Exploded view - coolant temperature senders”,
page 85](#)

⇒ [“2.5 Removing and installing electric coolant pump”,
page 85](#)

⇒ [“2.6 Removing and installing coolant pump”, page 88](#)

⇒ [“2.7 Removing and installing thermostat”, page 89](#)

⇒ [“2.8 Removing and installing coolant temperature sender G62
”, page 89](#)

⇒ [“2.9 Removing and installing temperature sender for engine
temperature regulation G694 ”, page 90](#)

⇒ [“2.10 Removing and installing coolant valves”, page 90](#)

2.1 Exploded view - coolant pump

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump .

2.2 Exploded view - electric coolant pump

◆ Coolant circulation pump - V50- ⇒ [page 83](#)

◆ Starter-alternator coolant pump - V621- ⇒ [page 84](#)

Coolant circulation pump - V50-



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1 - Coolant pipes (rear)

- ❑ Removing and installing
⇒ [page 103](#)

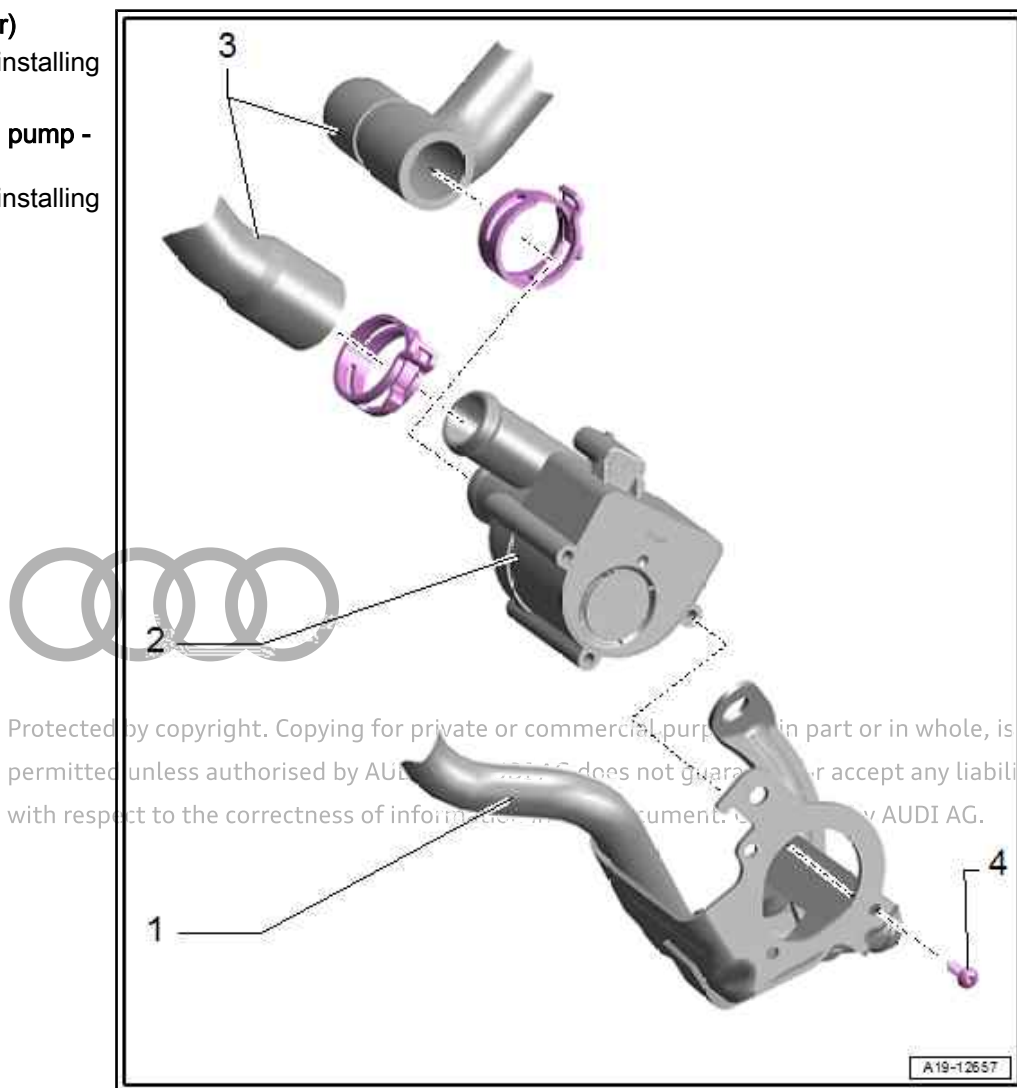
2 - Coolant circulation pump - V50-

- ❑ Removing and installing
⇒ [page 85](#)

3 - Coolant hoses

4 - Bolt

- ❑ 1.5 Nm



Starter-alternator coolant pump - V621-



1 - Coolant hose

2 - Starter-alternator coolant pump - V621-

- ☐ Removing and installing
⇒ ["2.5.2 Removing and installing starter-alternator coolant pump V621", page 87](#)

3 - Coolant hose

4 - Bolt

- ☐ 9 Nm

5 - Bracket

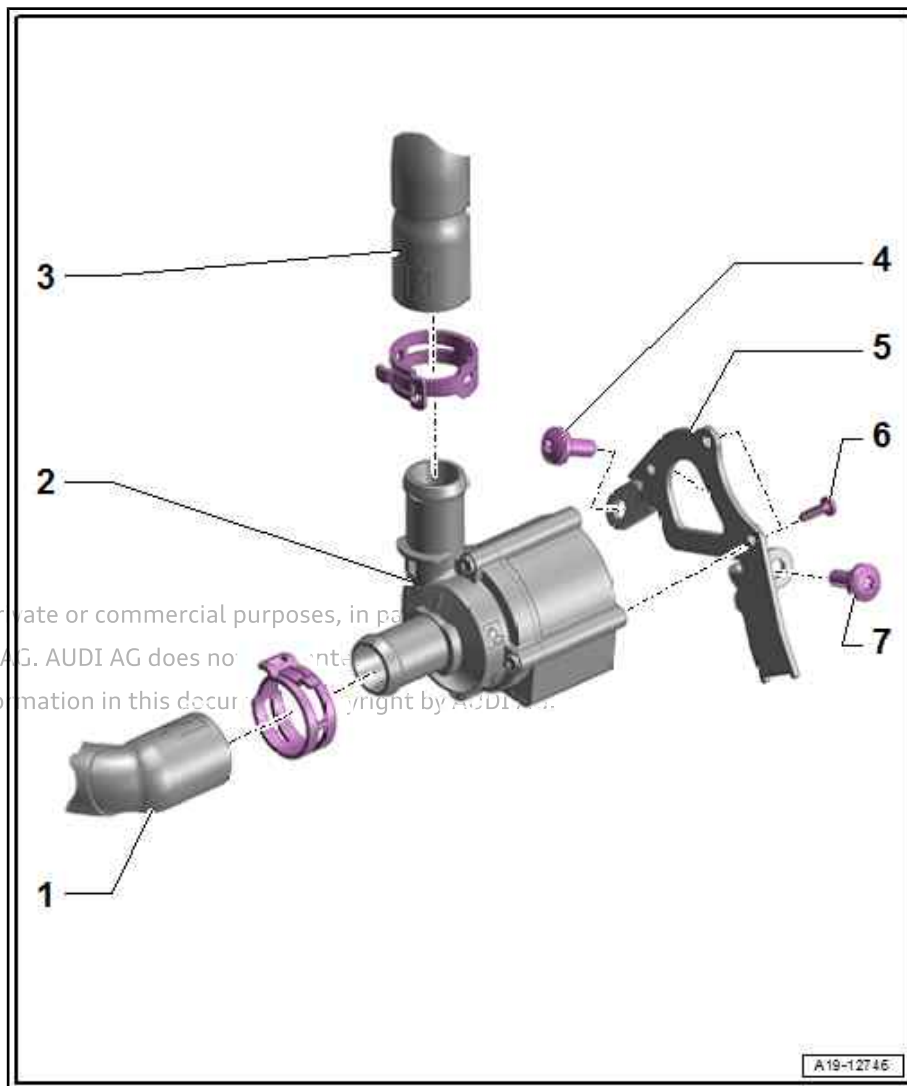
- ☐ For starter-alternator coolant pump - V621-

6 - Bolt

- ☐ 1.5 Nm

7 - Bolt

- ☐ 9 Nm



2.3 Exploded view - thermostat

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - thermostat .

2.4 Exploded view - coolant temperature senders

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature sender .

2.5 Removing and installing electric coolant pump

⇒ ["2.5.1 Removing and installing coolant circulation pump V50", page 85](#)

⇒ ["2.5.2 Removing and installing starter-alternator coolant pump V621", page 87](#)

2.5.1 Removing and installing coolant circulation pump - V50-

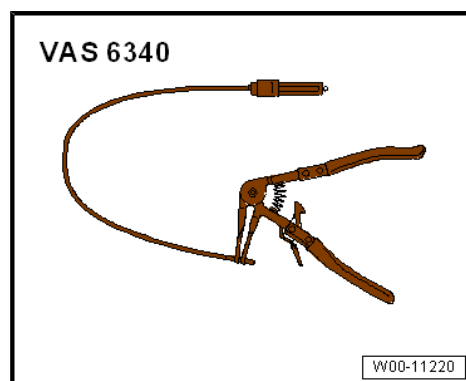
Special tools and workshop equipment required



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



- ◆ Hose clip pliers - VAS 6340-



Removing

- Remove subframe shield (left-side) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe shield .
- 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 steering column .



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- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Remove bolt -1- and push coolant hose to one side.
- Unplug electrical connector -3-.
- Remove bolts -2-.
- Release hose clips -arrows-, detach coolant circulation pump - V50- and remove 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.
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column .
- Fill up with coolant ⇒ [page 75](#) .

Tightening torques

- ◆ ⇒ [page 83](#)
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe

2.5.2 Removing and installing starter-alternator coolant pump - V621-

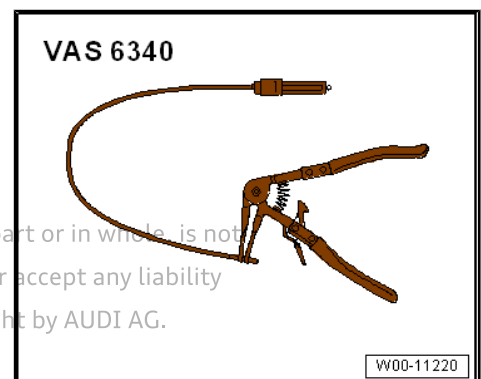
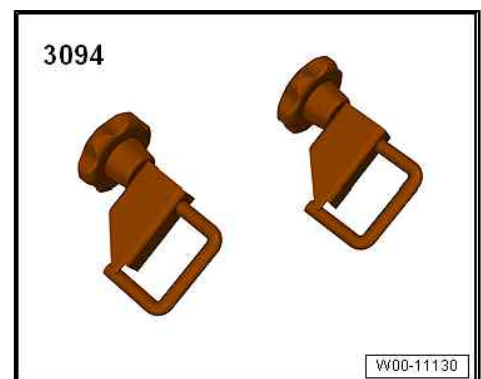
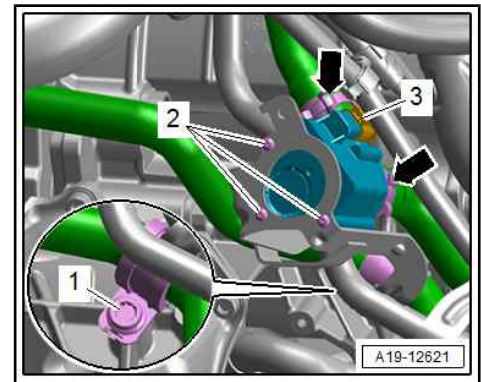
Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-

- ◆ Hose clip pliers - VAS 6340-



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Removing

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Unplug electrical connector -1-.
- Place a cloth underneath to catch escaping coolant.
- Clamp off coolant hoses using hose clamps up to 25 mm - 3094- , release hose clips -2- and disconnect hoses.
- Remove bolts -arrows- and detach starter-alternator coolant pump V621- with bracket.
- Unscrew bolts 3- and detach coolant pump from bracket.

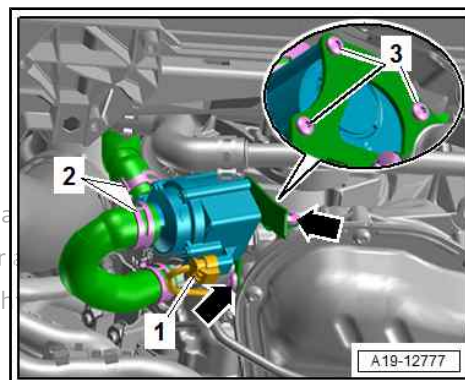
Installing

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.
- Fill up with coolant ⇒ [page 75](#) .

Tightening torques

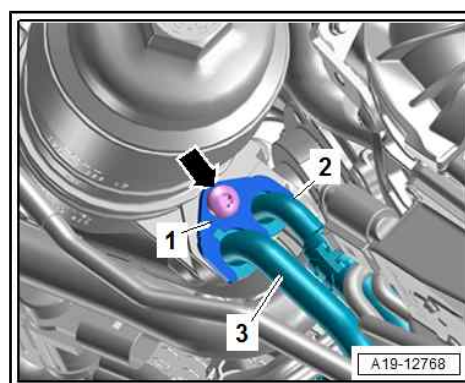
- ♦ ⇒ , [page 84](#)



2.6 Removing and installing coolant pump

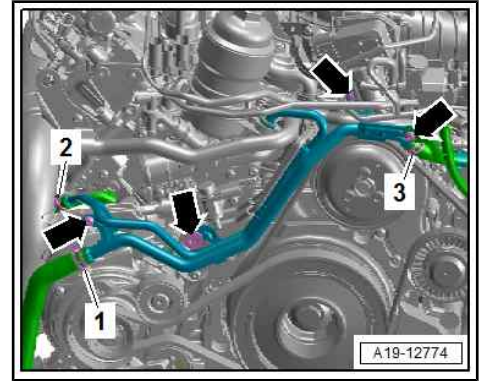
Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove radiator cowl ⇒ [page 117](#) .
- Remove poly V-belt tensioner for air conditioner compressor ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .
- Remove bolt -arrow- and detach retaining plate -1-.
- Detach connection -3- from oil filter housing.





- Remove bolts -arrows-.
- Release hose clip -3- and disconnect coolant hose.
- Press coolant hoses (front) to side.



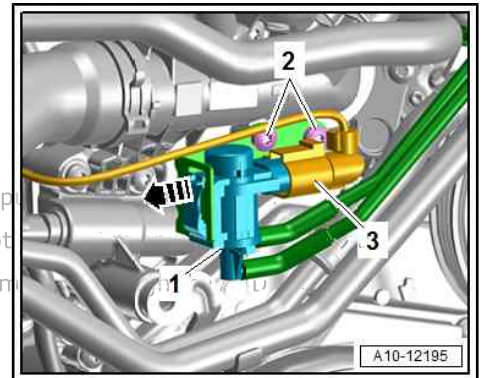
- Unplug electrical connector -1- for exhaust gas recirculation cooler changeover valve - N345- .
- Release fastener -arrow- and move changeover valve to one side.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant pump .

Installing

Additional work:

- Install radiator cowl ⇒ [page 117](#) .
- Install poly V-belt tensioner for air conditioner compressor ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)

2.7 Removing and installing thermostat

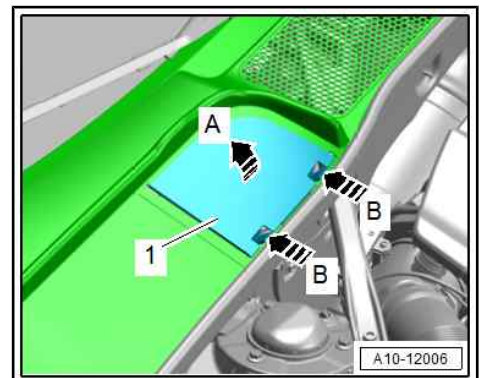
All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing thermostat .

2.8 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 TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant temperature sender - G62- .

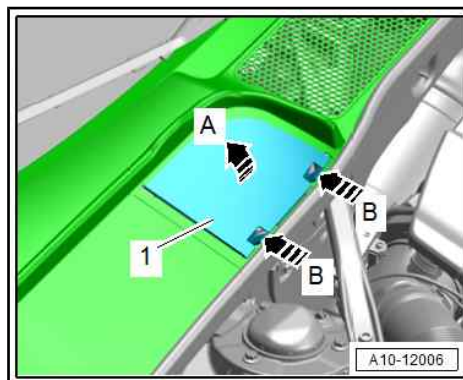




2.9 Removing and installing temperature sender for engine temperature regulation - G694-

Procedure

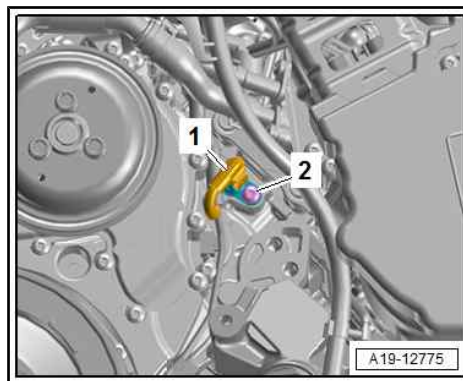
- Engine cold.
- Release catches -arrows B- and open cover -1- -arrow A-.



- Release fastener -arrow- (if necessary) and open filler cap -1- on coolant expansion tank.
- Remove poly V-belt tensioner for air conditioner compressor ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .



- Unplug electrical connector -1-.
- Place a cloth underneath to catch escaping coolant.
- Unscrew bolt -2- and detach temperature sender for engine temperature regulation - G694- .
- Renew O-rings after removing.
- To avoid loss of coolant, insert new temperature sender immediately.



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

- Install poly V-belt tensioner for air conditioner compressor ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing tensioner for poly V-belt .
- Check coolant level ➔ [page 75](#) .

Tightening torques

- ♦ ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders

2.10 Removing and installing coolant valves

All procedures are described in ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves .



3 Coolant pipes

⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)

⇒ [“3.2 Removing and installing coolant pipes”, page 95](#)

3.1 Exploded view - coolant pipes

◆ Part I ⇒ [page 91](#)

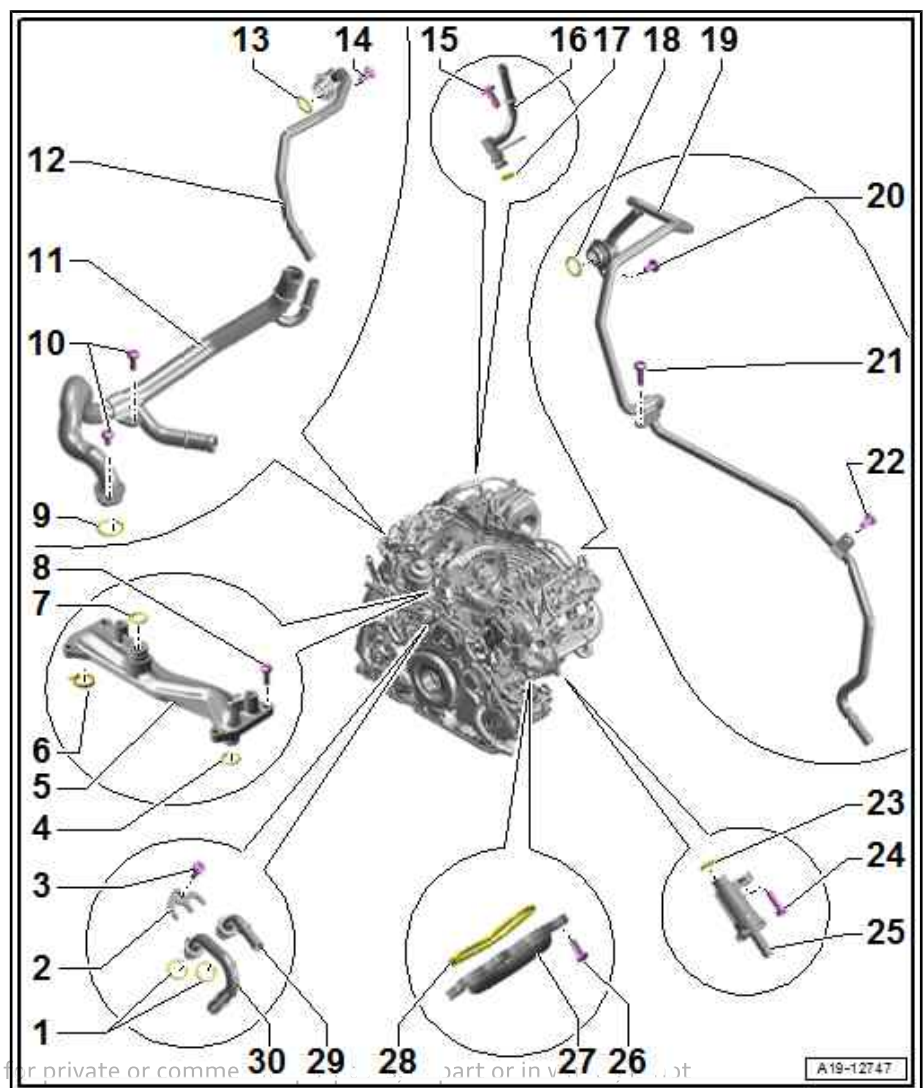
◆ Part II ⇒ [page 92](#)

◆ Part III ⇒ [page 93](#)

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

Part I

- 1 - O-rings
 - ☐ Renew after removing
- 2 - Retaining plate
- 3 - Bolt
 - ☐ 9 Nm
- 4 - O-ring
 - ☐ Renew after removing
- 5 - Coolant pipe (top)
 - ☐ Removing and installing
⇒ [page 101](#)
- 6 - Seal
 - ☐ Renew after removing
- 7 - O-ring
 - ☐ Renew after removing
- 8 - Bolt
 - ☐ 9 Nm
- 9 - O-ring
 - ☐ Renew after removing
- 10 - Bolts
 - ☐ 9 Nm
- 11 - Coolant pipe (top right)
 - ☐ Removing and installing
⇒ [page 101](#)
- 12 - Coolant pipe 4 for turbo-charger
 - ☐ Removing and installing
⇒ [page 107](#)
- 13 - O-ring
 - ☐ Renew after removing
- 14 - Bolt
 - ☐ 9 Nm
- 15 - Bolt
 - ☐ 9 Nm



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16 - Coolant connection

17 - O-ring

- ☐ Renew after removing

18 - O-ring

- ☐ Renew after removing

19 - Coolant pipe 5 for turbocharger

- ☐ Removing and installing ⇒ [“3.2.12 Removing and installing coolant pipe 5 for turbocharger”, page 108](#)

20 - Bolt

- ☐ 9 Nm

21 - Bolt

- ☐ 9 Nm

22 - Bolt

- ☐ 9 Nm

23 - O-ring

- ☐ Renew after removing

24 - Bolts

- ☐ 9 Nm

25 - Coolant connection

26 - Bolt

- ☐ 9 Nm

27 - Housing cover

- ☐ For cylinder block

28 - Gasket

- ☐ Renew after removing

29 - Coolant connection

30 - Coolant connection

Part II



1 - Bolt

- ☐ 9 Nm

2 - Coolant pipe (bottom front)

- ☐ Removing and installing
⇒ ["3.2.3 Removing and installing coolant pipe \(bottom front\)", page 98](#)

3 - Bolt

- ☐ 9 Nm

4 - O-ring

- ☐ Renew after removing

5 - Bracket

- ☐ For air conditioner compressor
- ☐ Removing and installing
⇒ [page 45](#)

6 - Bolt

- ☐ 9 Nm

7 - Coolant pipes (front)

- ☐ Removing and installing
⇒ ["3.2.2 Removing and installing coolant pipes \(front\)", page 97](#)

8 - Bolt

- ☐ 9 Nm

9 - Bolt

- ☐ 9 Nm

10 - Bolt

- ☐ 9 Nm

11 - Coolant pipe at electric compressor

- ☐ Removing and installing
⇒ ["3.2.13 Removing and installing coolant pipe at electric compressor", page 109](#)

12 - Bolt

- ☐ 9 Nm

13 - O-ring

- ☐ Renew after removing

14 - Bolt

- ☐ 20 Nm

15 - Coolant pipe (left-side)

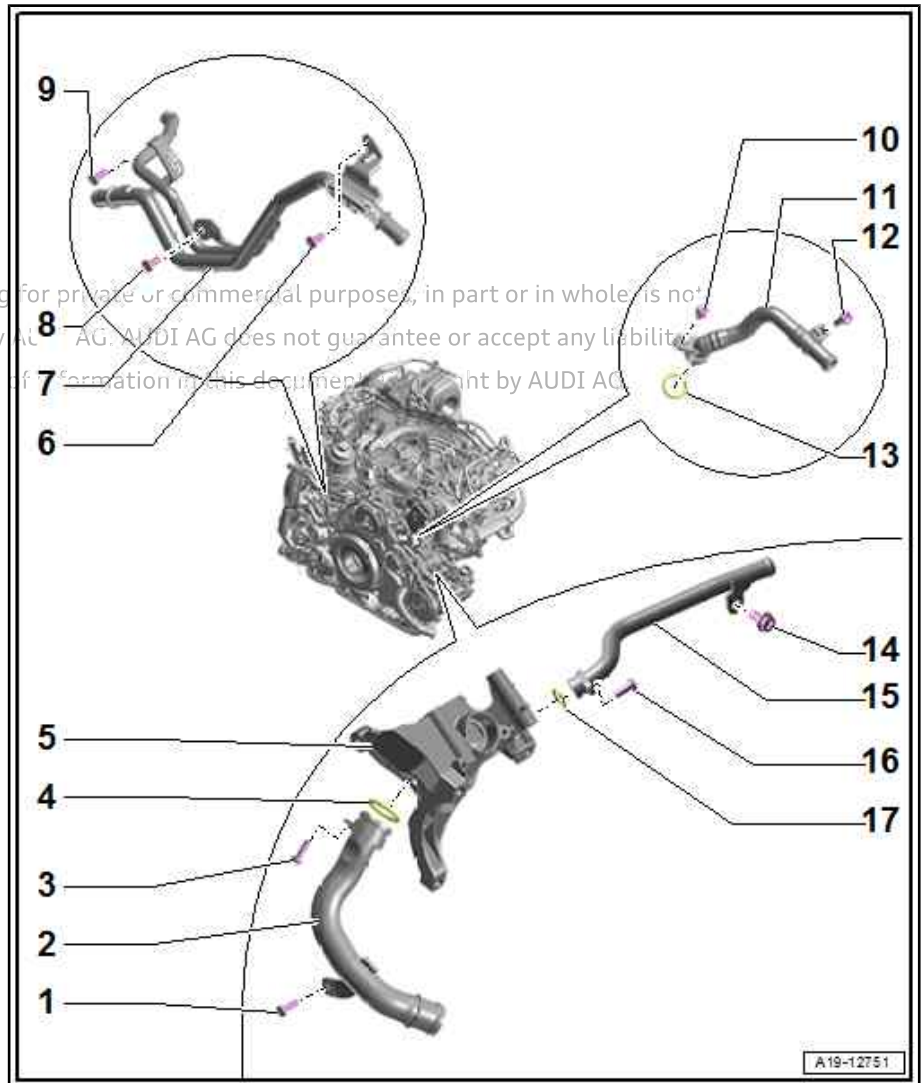
- ☐ Removing and installing ⇒ [page 99](#)

16 - Bolt

- ☐ 9 Nm

17 - O-ring

- ☐ Renew after removing



Part III



1 - Coolant pipes (rear)

- ☐ Removing and installing
⇒ [page 103](#)

2 - Bolt

- ☐ 9 Nm

3 - Coolant pipe 1 for turbo-charger

- ☐ Removing and installing
⇒ [page 105](#)

4 - O-ring

- ☐ Renew after removing

5 - Bolt

- ☐ 9 Nm

6 - O-ring

- ☐ Renew after removing

7 - Bolt

- ☐ 9 Nm

8 - Coolant pipe (front)

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

9 - Bolt

- ☐ 9 Nm

10 - Bolt

- ☐ 9 Nm

11 - Bolt

- ☐ 9 Nm

12 - Coolant pipe (right-side)

- ☐ Removing and installing
⇒ [“3.2.7 Removing and installing coolant pipe \(right-side\)”, page 101](#)

13 - Bolt

- ☐ 9 Nm

14 - Bolt

- ☐ 9 Nm

15 - Bolt

- ☐ 9 Nm

16 - O-ring

- ☐ Renew after removing

17 - Bolts

- ☐ 9 Nm

18 - O-ring

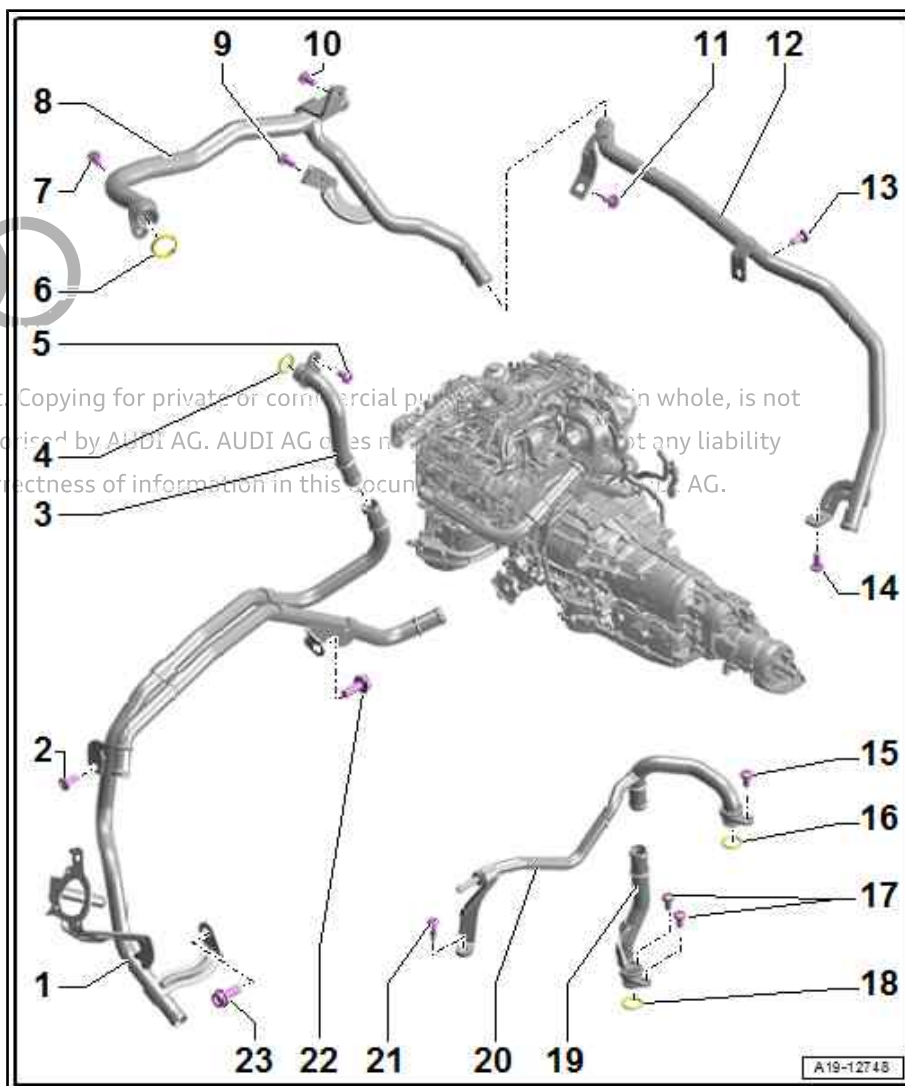
- ☐ Renew after removing

19 - Coolant pipe 3 for turbocharger

- ☐ Removing and installing ⇒ [page 106](#)

20 - Coolant pipe 2 for turbocharger

- ☐ Removing and installing ⇒ [page 106](#)





21 - Bolt

- 9 Nm

22 - Bolt

- 20 Nm

23 - Bolt

- 20 Nm

3.2 Removing and installing coolant pipes

⇒ [“3.2.1 Removing and installing coolant pipe \(front\)”, page 95](#)

⇒ [“3.2.2 Removing and installing coolant pipes \(front\)”, page 97](#)

⇒ [“3.2.3 Removing and installing coolant pipe \(bottom front\)”, page 98](#)

⇒ [“3.2.4 Removing and installing coolant pipe \(left-side\)”, page 99](#)

⇒ [“3.2.5 Removing and installing coolant pipe \(top\)”, page 101](#)

⇒ [“3.2.6 Removing and installing coolant pipe \(top right\)”, page 101](#)

⇒ [“3.2.7 Removing and installing coolant pipe \(right-side\)”, page 101](#)

⇒ [“3.2.8 Removing and installing coolant pipes \(rear\)”, page 103](#)

⇒ [“3.2.9 Removing and installing coolant pipe 1 for turbocharger”, page 105](#)

⇒ [“3.2.10 Removing and installing coolant pipes 2 and 3 for turbocharger”, page 106](#)

⇒ [“3.2.11 Removing and installing coolant pipe 4 for turbocharger”, page 107](#)

⇒ [“3.2.12 Removing and installing coolant pipe 5 for turbocharger”, page 108](#)

⇒ [“3.2.13 Removing and installing coolant pipe at electric compressor”, page 109](#)

3.2.1 Removing and installing coolant pipe (front)

Special tools and workshop equipment required

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

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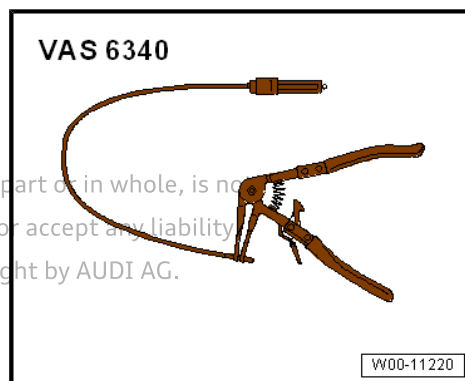




◆ Hose clip pliers - VAS 6340-



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Removing

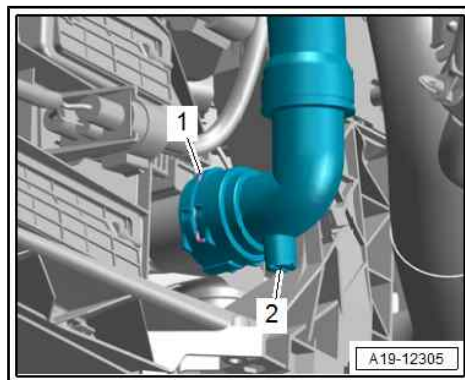
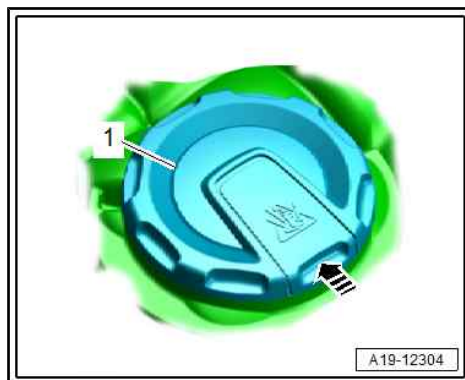
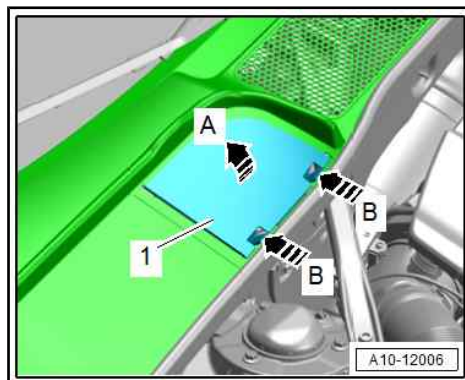
- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove air cleaner housing ⇒ [page 144](#) .
- Release catches -arrows B- and open cover -1- -arrow A-.

⚠ CAUTION

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

Danger of scalding skin and other parts of the body.

- Put on protective gloves.
 - Put on safety goggles.
 - Cover filler cap on expansion tank with a cloth and open carefully to release pressure.
-
- To relieve residual pressure in cooling system, release fastener -arrow- and briefly open filler cap -1- on coolant expansion tank.
 - Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
-
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
 - Remove drain plug -2- and drain off coolant.



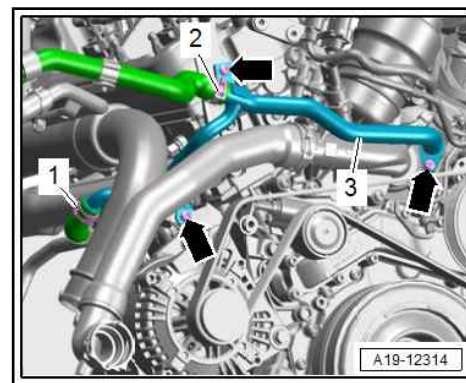


- Release hose clips -1, 2- and disconnect coolant hoses.
- Remove bolts -arrows- and detach coolant pipe (front) -3- from thermostat housing.

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.
- Clean and smoothen sealing surface for O-ring.
- Lubricate O-ring with coolant and slide onto coolant pipe.
- Install air cleaner housing ⇒ [page 144](#) .
- Fill up with coolant ⇒ [page 75](#) .
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



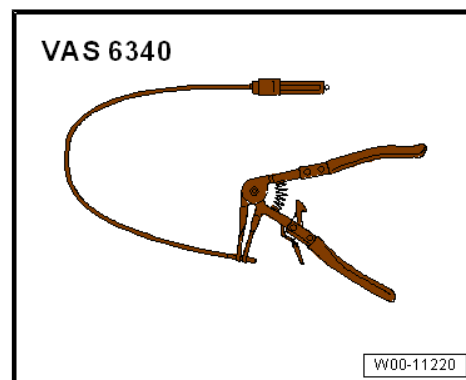
Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)
- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 111](#)
- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 143](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3.2.2 Removing and installing coolant pipes (front)

Special tools and workshop equipment required

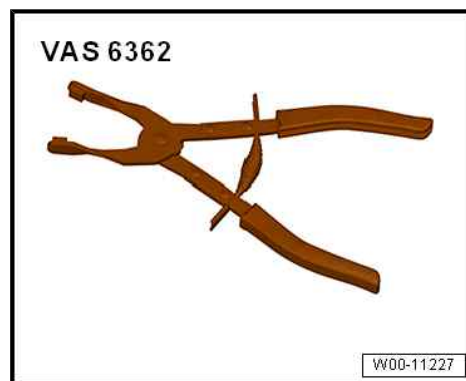
- ◆ Hose clip pliers - VAS 6340-



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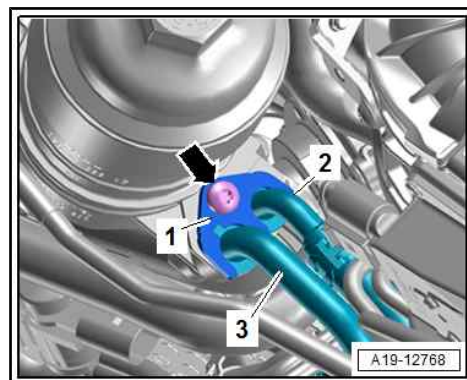


- ◆ Hose clip pliers - VAS 6362-



Removing

- Reinstall heat insulation sleeves in the same locations when installing.
- Remove radiator cowl ➔ [page 117](#) .
- Remove coolant pipe (front) ➔ [page 95](#) .
- Remove bolt -arrow-.
- Detach retaining plate -1- and pull connection -3- off oil filter housing.

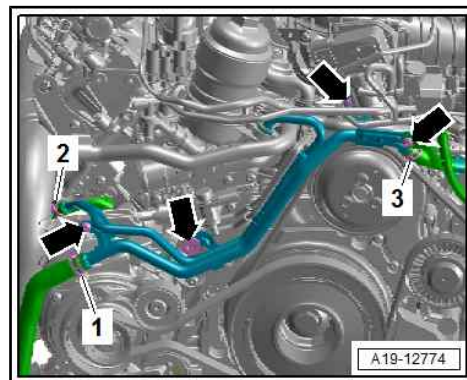


- Remove bolts -arrows-.
- Fold heat insulation sleeve to side.
- Release hose clips -1, 2, 3-, disconnect coolant hoses and detach coolant pipes.

Installing

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

- Secure all hose connections with correct type of hose clips (as original equipment) ➔ Electronic parts catalogue .
- Do not reuse coolant.
- Install coolant pipe (front) ➔ [page 95](#) .
- Install radiator cowl ➔ [page 117](#) .
- Fill up with coolant ➔ [page 75](#) .



Tightening torques

- ◆ ➔ [“3.1 Exploded view - coolant pipes”, page 91](#)

3.2.3 Removing and installing coolant pipe (bottom front)

Special tools and workshop equipment required

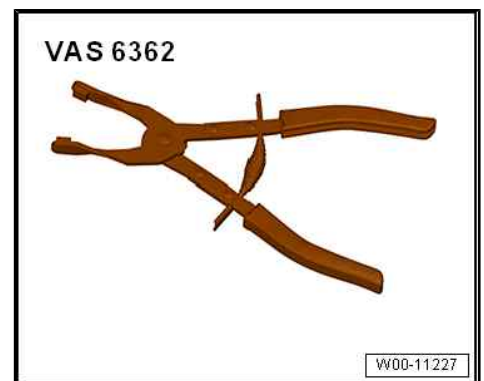
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- ◆ Coolant collecting system - VAS 5014- or drip tray for workshop hoist - VAS 6208-



- ◆ Hose clip pliers - VAS 6362-



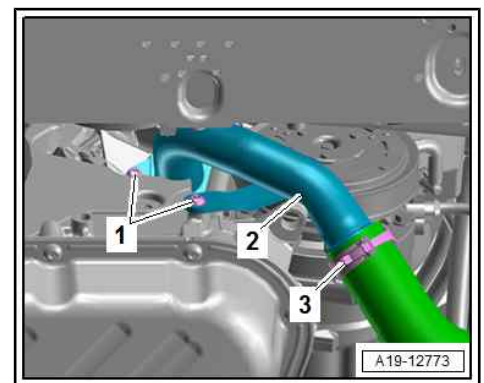
Removing

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.
- Release hose clip -3- and disconnect coolant hose.
- Remove bolts -1- and detach coolant pipe -2- from bracket for air conditioner compressor.

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.
- Fill up with coolant ⇒ [page 75](#)



Tightening torques

- ◆ ⇒ ["3.1 Exploded view - coolant pipes", page 91](#)

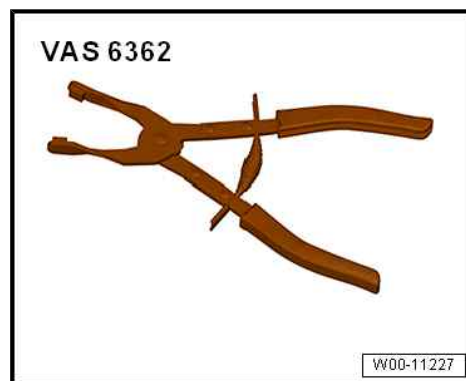
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3.2.4 Removing and installing coolant pipe (left-side)

Special tools and workshop equipment required



- ◆ Hose clip pliers - VAS 6362-



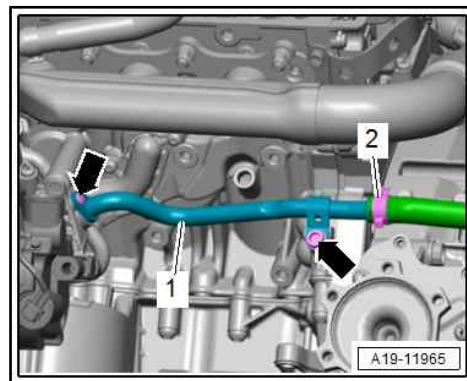
Removing

- Drain coolant ⇒ [page 75](#) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove poly V-belt from air conditioner compressor pulley ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- 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 drive shaft cover (left-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Release hose clip -2- and detach coolant hose from coolant pipe.
- Remove bolts -arrows-.
- Detach coolant pipe (left-side) -1-. (Shown with engine support removed.)

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 ⇒ [page 75](#) .



Tightening torques

- ◆ ⇒ ["3.1 Exploded view - coolant pipes" - page 91](#)
- ◆ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



3.2.5 Removing and installing coolant pipe (top)

Removing

- Remove exhaust gas recirculation cooler ⇒ [page 195](#) .
- Unscrew bolts -arrows- and remove coolant pipe (top) -1-.

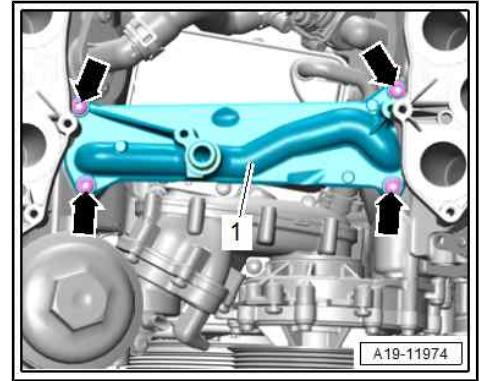
Installing

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

- Renew seal and O-ring after removing.
- Clean and smoothen sealing surface for O-ring.
- Lubricate O-ring with coolant and slide onto coolant pipe.
- Install exhaust gas recirculation cooler ⇒ [page 195](#) .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)



3.2.6 Removing and installing coolant pipe (top right)

Removing

- Remove coolant pipe 4 for turbocharger ⇒ [page 107](#) .
- Remove coolant pipe (top) ⇒ [page 101](#) .
- Remove oil filter element ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter .
- Loosen hose clip -2- and detach coolant hose.
- Release hose clip -3- and disconnect coolant hose.
- Detach coolant pipe (top right).

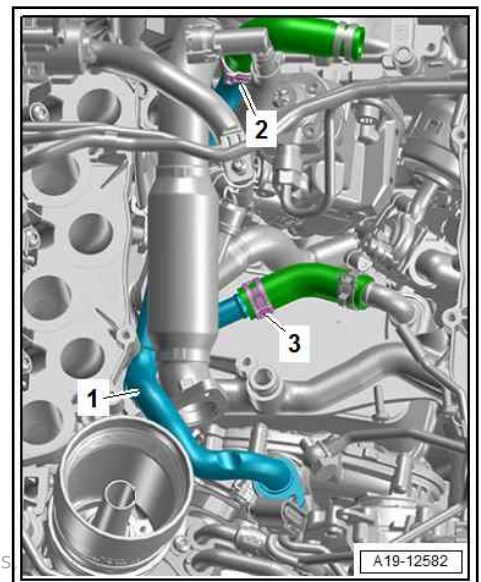
Installing

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 .
- Install oil filter element ⇒ Maintenance ; Booklet 830 ; Maintenance; Engine oil: renewing oil filter .
- Install coolant pipe (top) ⇒ [page 101](#) .
- Install coolant pipe 4 for turbocharger ⇒ [page 107](#) .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)



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-



- ◆ Socket Torx T30 - T10405-

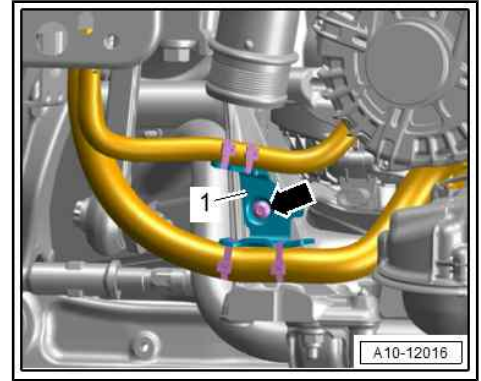


Removing

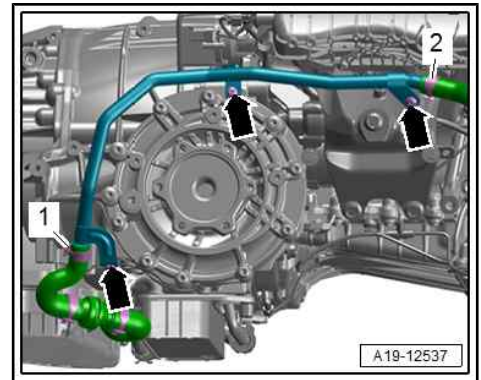
- Vehicles with auxiliary/supplementary heater: Remove exhaust system ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82 ; Auxiliary/supplementary heater; Removing and installing auxiliary/supplementary heater exhaust system .
- De-energise 48 V electrical system and disconnect battery ⇒ Electrical 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 .
- Remove wheel spoiler (front right) and drive shaft cover (right-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .



- Remove bolt -arrow- and press 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.
- Release hose clips -1, 2- and disconnect coolant hoses.
- Unscrew bolts -arrows- using socket Torx T30 - T10405- and detach coolant pipe (right-side).



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.
- Vehicles with auxiliary/supplementary heater: Install exhaust system ⇒ Auxiliary heater, supplementary heater; Rep. gr. 82 ; Auxiliary/supplementary heater; Removing and installing auxiliary/supplementary heater exhaust system .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Fill up with coolant ⇒ [page 75](#) .

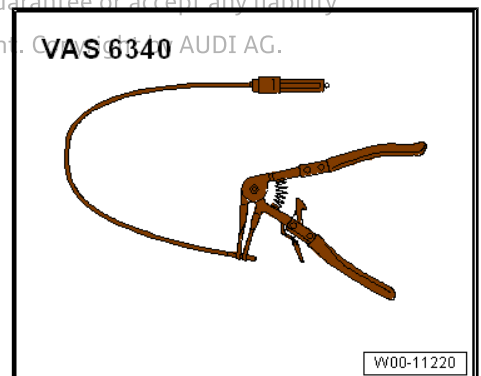
Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

3.2.8 Removing and installing coolant pipes (rear)

Special tools and workshop equipment required

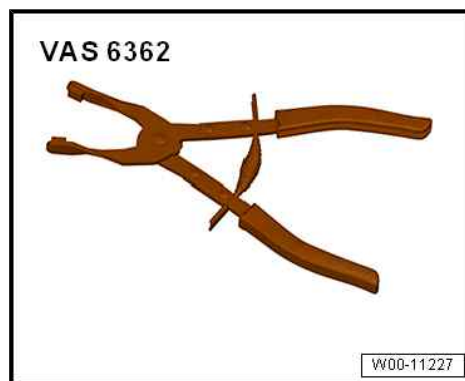
- ◆ Hose clip pliers - VAS 6340-



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- ◆ Hose clip pliers - VAS 6362-

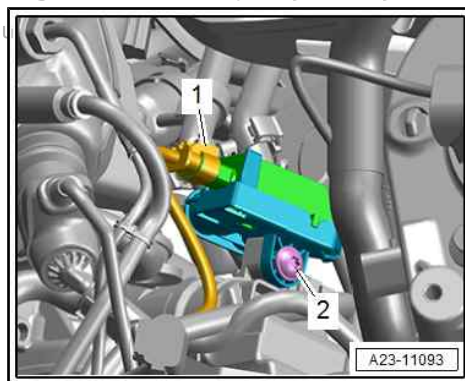


- ◆ Bit XZN 10 - T10501-



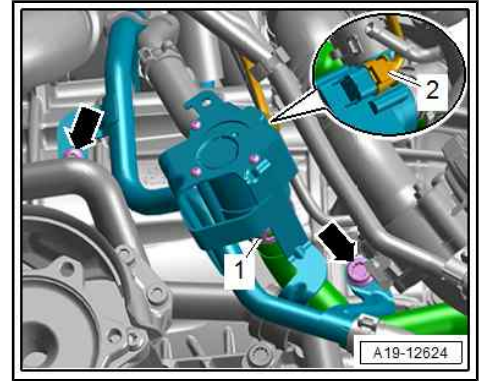
Removing

- Drain coolant ⇒ [page 75](#) .
- Remove emission control module ⇒ [page 182](#) .
- 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 steering column .
- Unplug electrical connector -1- .
- Remove bolt -2- and move pressure differential sender 2 - G524- clear.





- Unplug electrical connector -2- for coolant circulation pump - V50- .
- Remove bolts -arrows-.
- Release hose clip -1- and disconnect coolant hose.

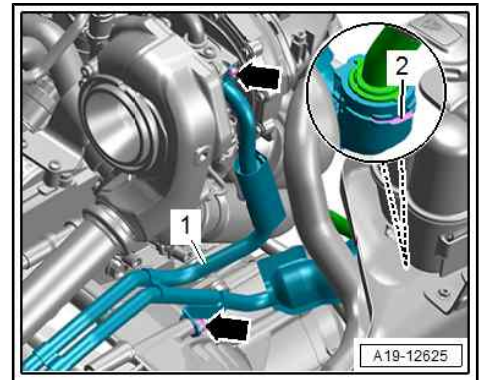


- Lift retaining clip -2- and disconnect coolant hose.
- Unscrew bolts -arrows- and detach coolant pipes -1-.

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.
- Install intermediate steering shaft ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing steering column



- Install emission control module ⇒ [page 182](#)
- Install pressure differential sender 2, G524, ⇒ [page 193](#)
- Connect coolant hose with plug-in connector ⇒ [page 112](#) .
- Fill up with coolant ⇒ [page 75](#) .

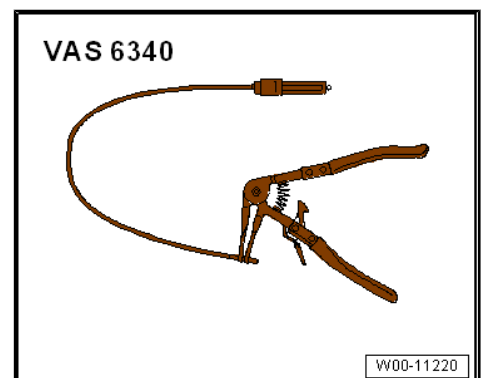
Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)

3.2.9 Removing and installing coolant pipe 1 for turbocharger

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6340-



Removing

- Reinstall heat insulation sleeves in the same locations when installing.
- Drain coolant ⇒ [page 75](#) .



- Remove emission control module ➔ [page 182](#) .
- Fold heat insulation sleeve back slightly.
- Unscrew bolt -arrow- and detach coolant pipe -1- from turbo-charger.
- Loosen hose clip -2- and detach coolant pipe.

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 emission control module ➔ [page 182](#) .
- Fill up with coolant ➔ [page 75](#) .

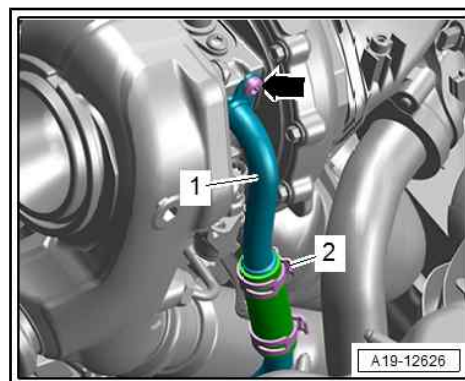
Tightening torques

- ◆ ➔ [“3.1 Exploded view - coolant pipes”, page 91](#)

3.2.10 Removing and installing coolant pipes 2 and 3 for turbocharger

Special tools and workshop equipment required

- ◆ Hose clip pliers VAS 6362



- ◆ Socket Torx T30 - T10405-

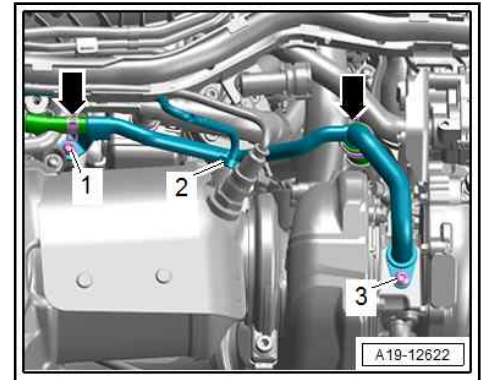


Removing coolant pipe 2 for turbocharger

- Remove engine cover panel ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Drain coolant ➔ [page 75](#) .



- Remove exhaust gas temperature sender 2 - G448- -item 2-
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender 2 - G448- .
- Remove bolts -1, 3-.
- Release hose clips -arrows-, pull coolant pipe 2 off turbo-charger and remove it.



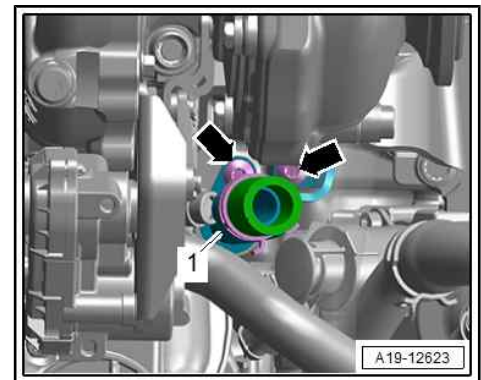
Removing coolant pipe 3 for turbocharger

- Coolant pipe 2 for turbocharger removed
- Remove bolts -arrows-.
- Pull coolant pipe -1- off cylinder block and detach it.

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 exhaust gas temperature sender 2 - G448- ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender 2 - G448- .
- Fill up with coolant ⇒ [page 75](#) .



- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel

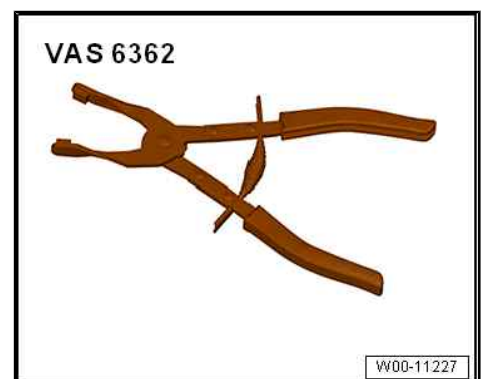
Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)

3.2.11 Removing and installing coolant pipe 4 for turbocharger

Special tools and workshop equipment required

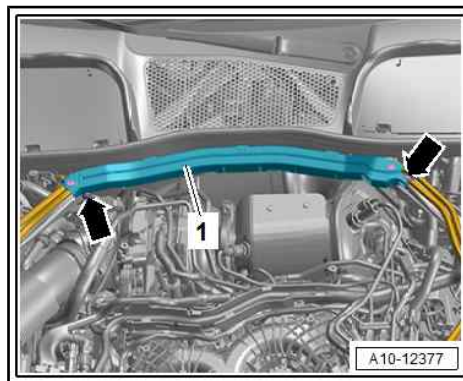
- ◆ Hose clip pliers - VAS 6362-



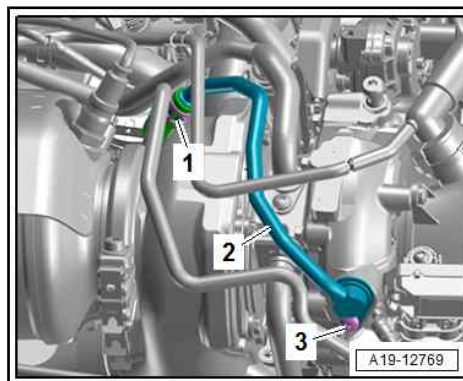


Removing

- Reinstall heat insulation sleeves in the same locations when installing.
- Drain coolant ➔ [page 75](#) .
- Remove engine cover panel ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove spreader rivets -arrows- and press wiring duct -1- to side.



- Unscrew bolt -3- and detach coolant pipe -2- from turbocharger.
- Push heat insulation sleeve slightly to side.
- Release hose clip -1- and detach coolant pipe.



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.
- Fill up with coolant ➔ [page 75](#) .

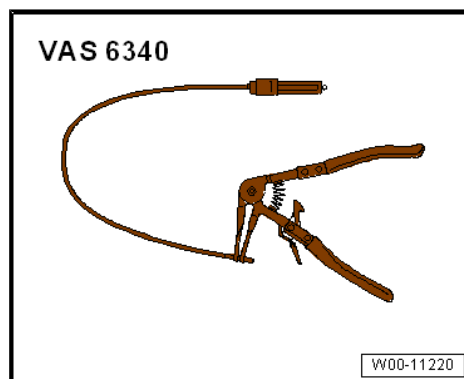
Tightening torques

- ♦ ➔ ["3.1 Exploded view - coolant pipes", page 91](#)

3.2.12 Removing and installing coolant pipe 5 for turbocharger

Special tools and workshop equipment required

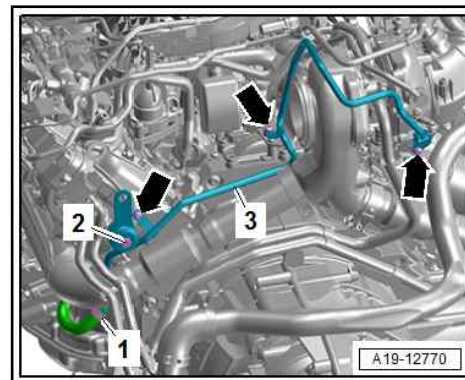
- ♦ Hose clip pliers - VAS 6340-





Removing

- Reinstall heat insulation sleeves in the same locations when installing.
- Remove emission control module ➔ [page 182](#) .
- Drain coolant ➔ [page 75](#) .
- Remove bolt -2- and detach bracket for emission control module.
- Unscrew bolt -arrow- and detach coolant pipe -3- from turbo-charger.
- Push heat insulation sleeve slightly to side.
- Loosen hose clip -1- and detach coolant pipe.



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 emission control module ➔ [page 182](#) .
- Fill up with coolant ➔ [page 75](#) .

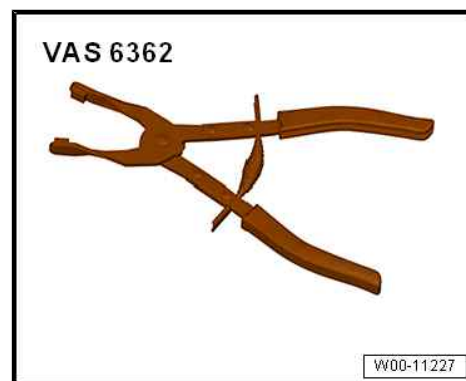
Tightening torques

- ◆ ➔ ["3.1 Exploded view - coolant pipes", page 91](#)

3.2.13 Removing and installing coolant pipe at electric compressor

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



Removing

- Drain coolant ➔ [page 75](#) .
- Remove throttle valve module ➔ [page 152](#) .

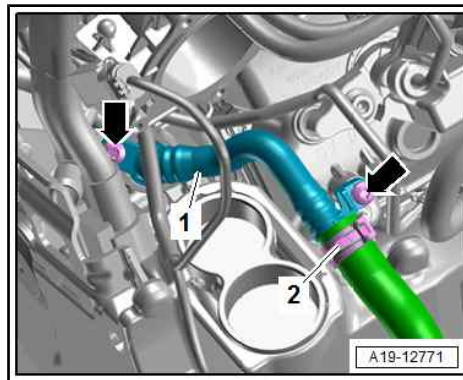


- Release hose clip -2- and disconnect coolant hose.
- Remove bolts -arrows- and pull coolant pipe -1- off electric compressor.

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 throttle valve module ⇒ [page 152](#) .
- Fill up with coolant ⇒ [page 75](#) .



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)



4 Radiators/radiator fans

⇒ ["4.1 Exploded view - radiator/radiator fans", page 111](#)

⇒ ["4.2 Removing and installing radiator", page 113](#)

⇒ ["4.3 Removing and installing radiator cowl", page 117](#)

⇒ ["4.4 Removing and installing radiator fan V7 ", page 119](#)

4.1 Exploded view - radiator/radiator fans

◆ Radiator ⇒ [page 111](#)

◆ Connecting coolant hose with plug-in connector ⇒ [page 112](#)

◆ Radiator cowl and radiator fan ⇒ [page 112](#)

Radiator

1 - Coolant hose

- ☐ Lift retaining clip to detach
- ☐ Connecting
⇒ [page 112](#)

2 - Radiator

- ☐ Removing and installing
⇒ [page 113](#)
- ☐ If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Installing radiators and condensers
- ☐ Radiator must be renewed if fasteners are damaged

3 - O-ring

- ☐ Renew after removing

4 - Plug

- ☐ Lift retaining clip to detach
- ☐ Connecting
⇒ [page 112](#)

5 - O-ring

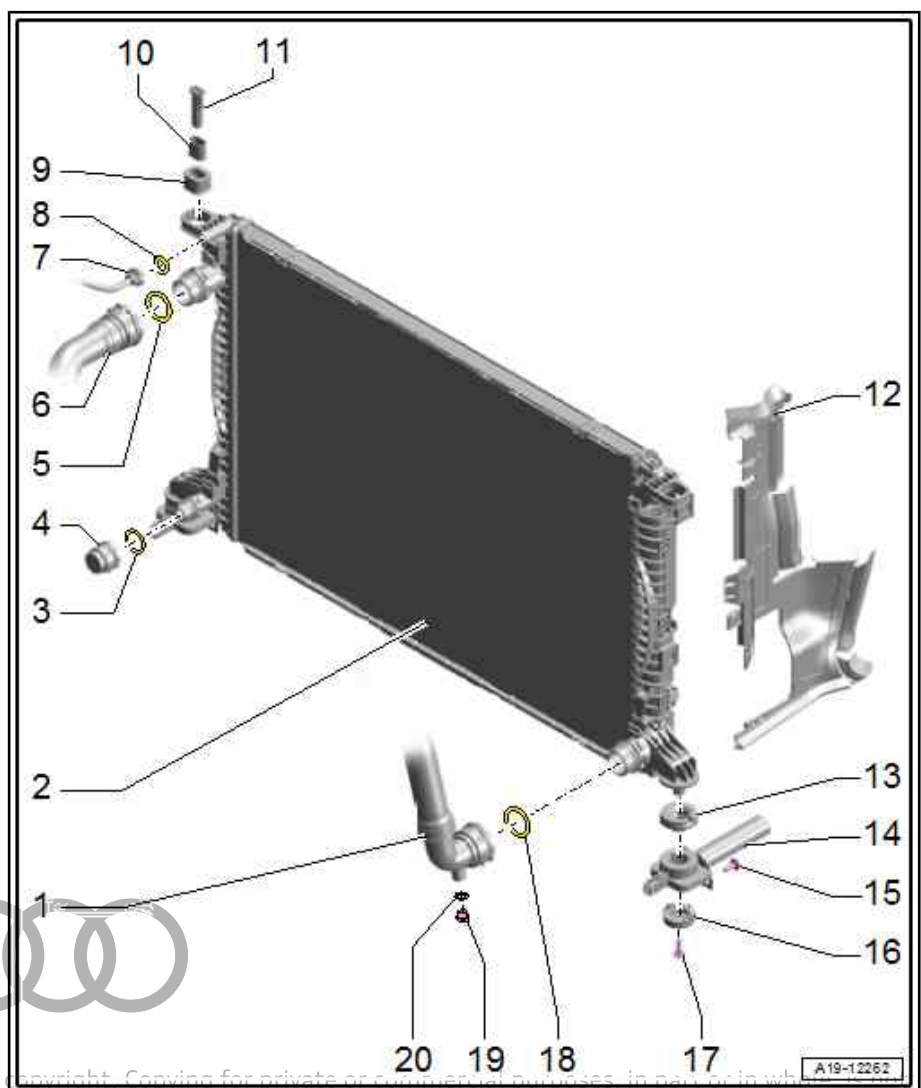
- ☐ Renew after removing

6 - Coolant hose

- ☐ Lift retaining clip to detach
- ☐ Connecting
⇒ [page 112](#)

7 - Coolant pipe

- ☐ To coolant expansion tank
- ☐ Lift retaining clip to detach
- ☐ Connecting ⇒ [page 112](#)



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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 - Drain plug

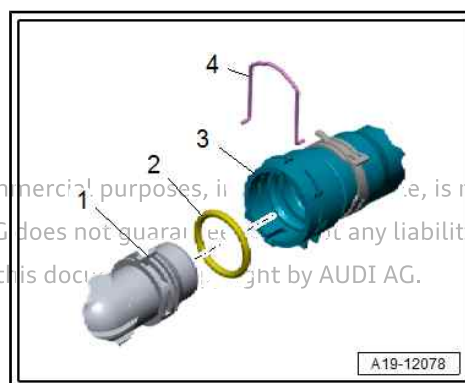
- ☐ 1.5 ... 3 Nm

20 - O-ring

- ☐ Renew after removing

Connecting coolant hose with plug-in connector

- If damaged, renew retaining clip -4-.
- Remove old O-ring -2- from coolant hose -3-.
- Lightly lubricate new O-ring with coolant and fit O-ring in coolant hose.
- Press coolant hose onto connection 1 until it engages audibly.
- Press coolant hose in again and then pull to check that plug-in connector is correctly engaged.



Radiator cowl and radiator fans



1 - Bolt

- ☐ 5 Nm

2 - Radiator cowl

- ☐ Removing and installing
⇒ [page 117](#)

3 - Bolt

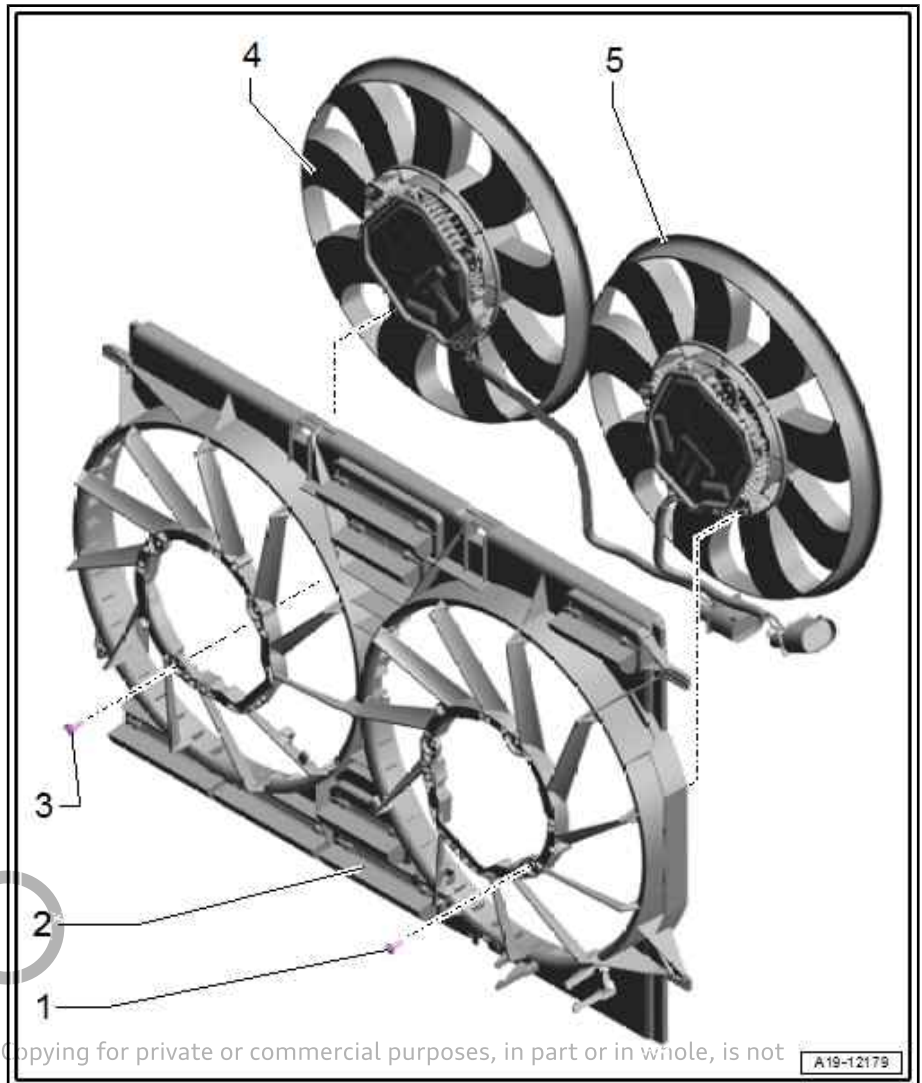
- ☐ 5 Nm

4 - Radiator fan - VX57-

- ☐ With radiator fan - V7-
and radiator fan control
unit - J293-
- ☐ Removing and installing
⇒ [page 119](#)

5 - Radiator fan 2 - V177-

- ☐ With radiator fan control
unit 2 - J671-
- ☐ Removing and installing
⇒ [page 119](#)



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A19-12179

4.2 Removing and installing radiator

- 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-

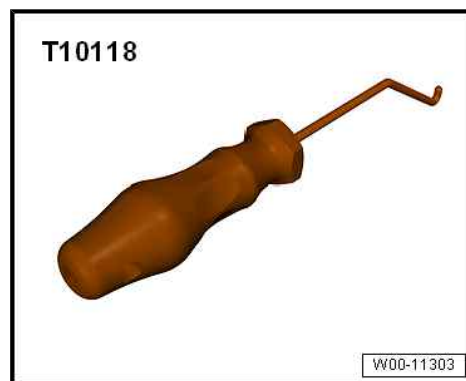
VAS 6208



W00-11209



- ◆ Assembly tool - T10118-



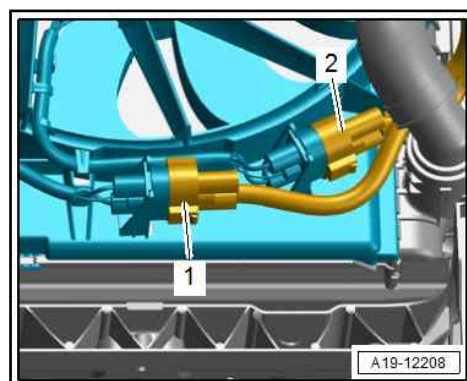
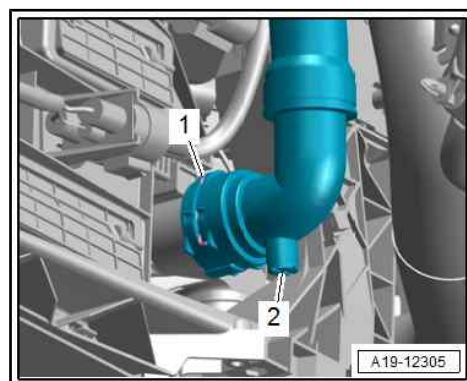
Removing

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

⚠ CAUTION

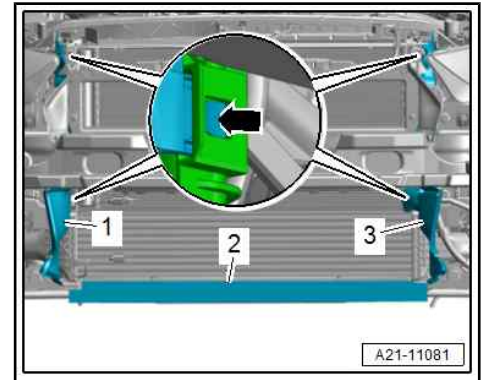
Risk of injury as the radiator fan may start up automatically.

- When working in the vicinity of the radiator, keep a safe distance from the radiator fan.
- Lift retaining clip -1- and disconnect coolant hose from radiator (bottom right).
- Unplug electrical connectors -1, 2- for radiator fan.

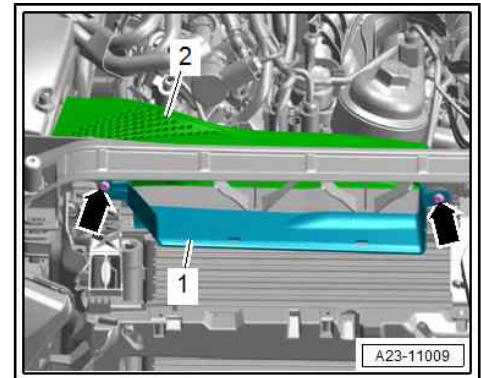




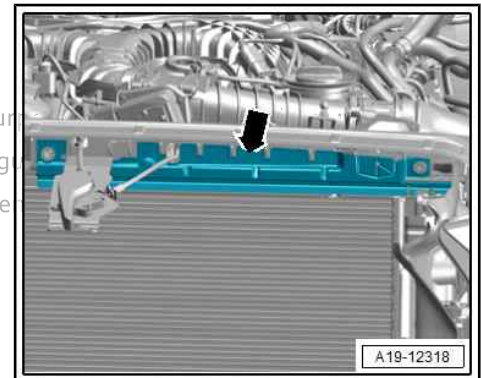
- Release catches -arrow- and detach air ducts -1, 3-.
- Unclip air duct -2-.



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



- Detach air duct (top) -arrow-.
- Remove charge air cooler ➔ [page 129](#) .



- Unplug electrical connector -2- for high-pressure sender - G65- .

! NOTICE

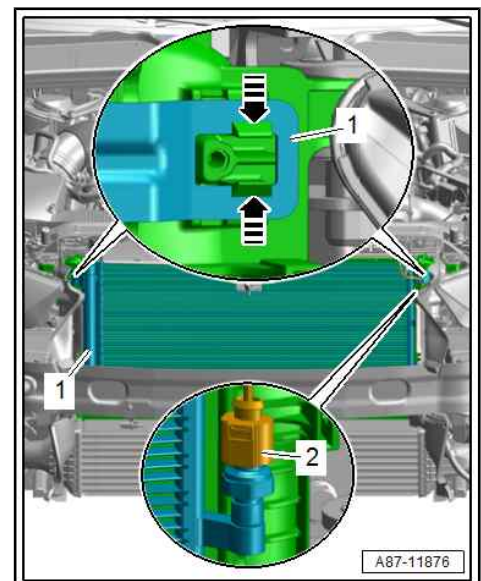
Danger of damage to refrigerant lines and hoses when detaching and pivoting condenser.

- Do NOT stretch, kink or bend refrigerant lines and hoses.

! NOTICE

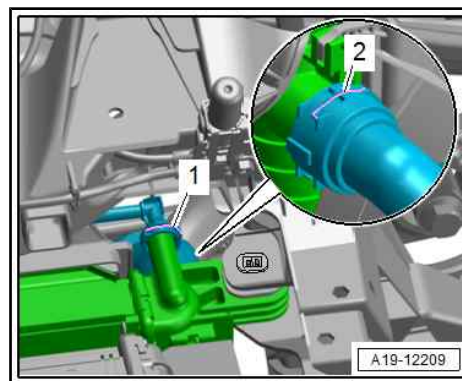
Risk of damage to fasteners if handled incorrectly.

- Release fasteners carefully.
- Release fasteners -arrows- on both sides, disengage condenser -1- from radiator and tie up to one side.

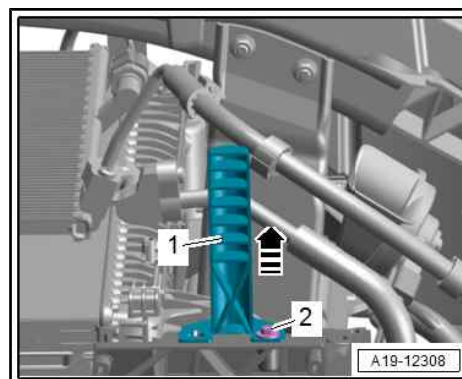




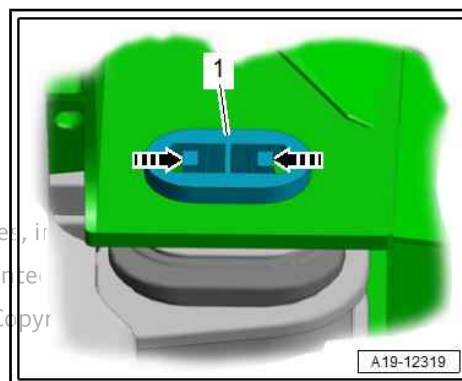
- Lift retaining clips -1, 2-, detach coolant connection from radiator and move connection clear.



- 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.



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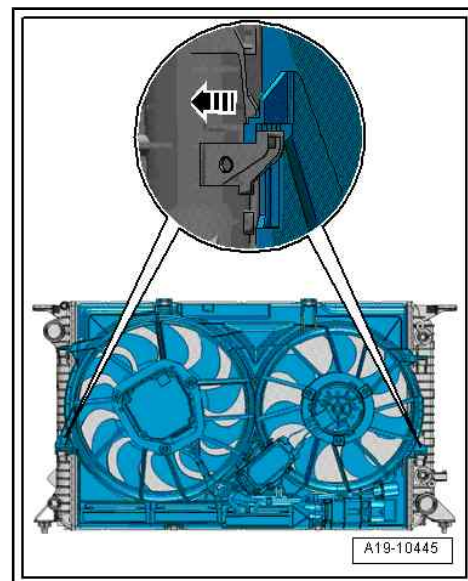


- Press locking tabs on left and right sides of radiator cowl together -arrow- and lift radiator cowl off radiator.

Installing

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

- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Installing radiators and condensers .
- Do not reuse coolant.
- Install charge air cooler ⇒ [page 129](#) .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Connect coolant hose with plug-in connector ⇒ [page 112](#) .
- Fill up with coolant ⇒ [page 75](#) .
- 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 111](#)
- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 143](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ General body repairs, exterior; Rep. gr. 50 ; Lock carrier; Exploded view - lock carrier
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

4.3 Removing and installing radiator cowl

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 ⇒ [page 129](#) .

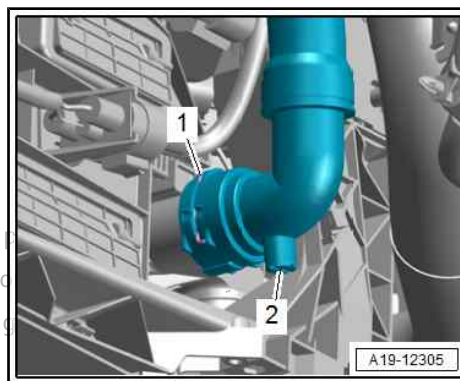


- Place collector tank from coolant collecting system -VAS 5014- or drip tray for workshop hoist - VAS 6208- underneath.

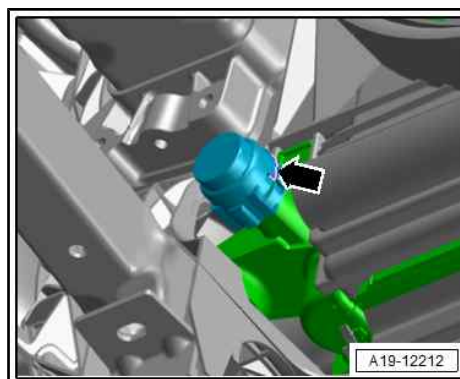
CAUTION

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

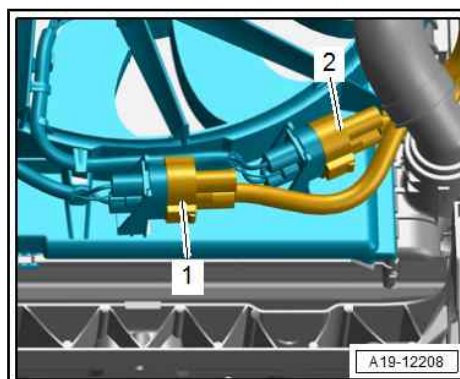
- When working in the vicinity of the radiator, keep a safe distance from the radiator fan.
- Lift retaining clip -1- and disconnect coolant hose from radiator (bottom right)



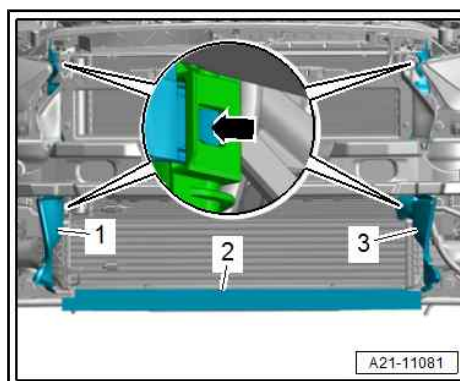
- Lift retaining clip -arrow- and remove sealing plug (bottom left) on radiator.



- Unplug electrical connectors -1, 2- for radiator fan.



- Unclip air duct -2-.

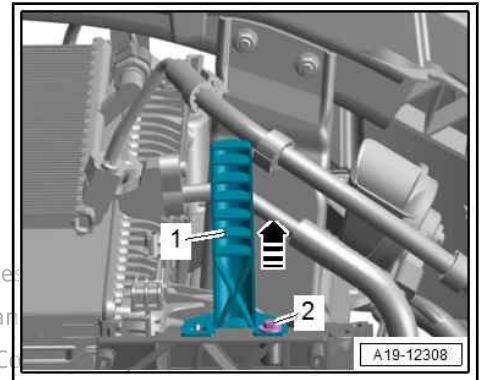




- Remove bolt -2- on both sides and press radiator bracket -1- with radiator towards front -arrow-.



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- Press locking tabs on left and right sides of radiator cowl simultaneously -arrow-, lift radiator cowl off radiator and remove from below.

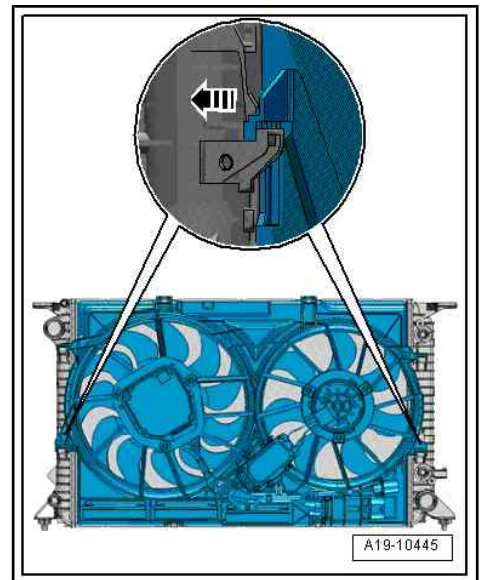
Installing

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 charge air cooler ⇒ [page 129](#) .
- Attach connection with plug-in connector ⇒ [page 112](#) .
- Fill up with coolant ⇒ [page 75](#) .

Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 111](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



4.4 Removing and installing radiator fan - V7-

Designation in current flow diagram: radiator fan - VX57-

Description applies to radiator fan - V7- and radiator fan 2 - V177- .

Removing

- Use correct type of fasteners for electrical wiring (as original equipment) ⇒ Electronic parts catalogue .
- Remove radiator cowl ⇒ [page 117](#) .
- Move electrical wiring harness clear.



- Unscrew bolts -1- or -2- and remove the corresponding radiator fan.

Note:

Do not remove balancing clamps from fan wheel. This can cause noise due to imbalance in fan wheel.

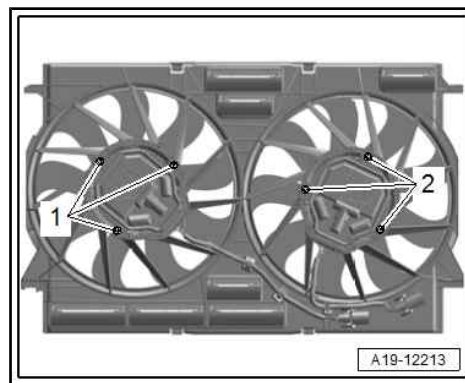
Installing

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

- Install radiator cowl ⇒ [page 117](#) .

Tightening torques

- ♦ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 111](#)



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21 – Turbocharging/supercharging

1 Turbocharger

⇒ [“1.1 Exploded view - turbocharger”, page 121](#)

⇒ [“1.2 Exploded view - electric compressor with control unit for electric compressor J1123”, page 121](#)

⇒ [“1.3 Removing and installing turbocharger”, page 122](#)

⇒ [“1.4 Removing and installing electric compressor with control unit for electric compressor J1123”, page 123](#)

⇒ [“1.5 Removing and installing sender 1 for turbocharger speed G688”, page 125](#)

1.1 Exploded view - turbocharger

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger .

1.2 Exploded view - electric compressor with control unit for electric compressor - J1123-

1 - Vacuum hose

2 - Electric compressor/ control unit for electric compressor - J1123-

- ☐ Removing and installing
⇒ [“1.4 Removing and installing electric compressor with control unit for electric compressor J1123”, page 123](#)

3 - Bolt

- ☐ 9 Nm

4 - Guard plate

- ☐ For electrical connectors

5 - Bolt

- ☐ 23 Nm

6 - Noise insulation

7 - Bolt

- ☐ 9 Nm

8 - Coolant connection

9 - Coolant connection

10 - Bolt

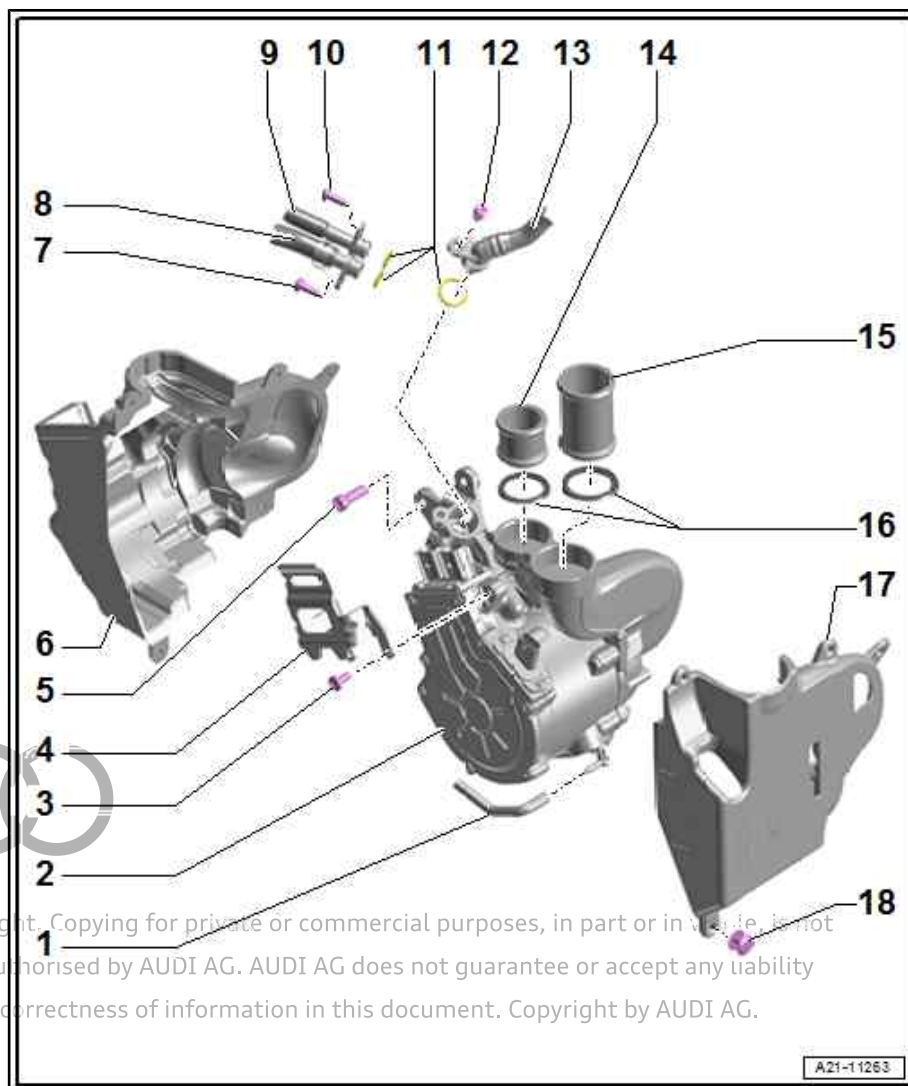
- ☐ 9 Nm

11 - O-rings

- ☐ Renew after removing

12 - Bolt

- ☐ Tightening torque
⇒ [Item 10 \(page 93\)](#)



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A21-11263



13 - Coolant pipe at electric compressor

- ❑ Removing and installing

⇒ ["3.2.13 Removing and installing coolant pipe at electric compressor", page 109](#)

14 - Connection

15 - Connection

16 - Not fitted

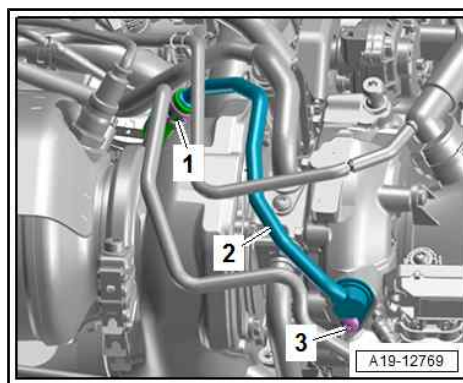
17 - Noise insulation

18 - Clip

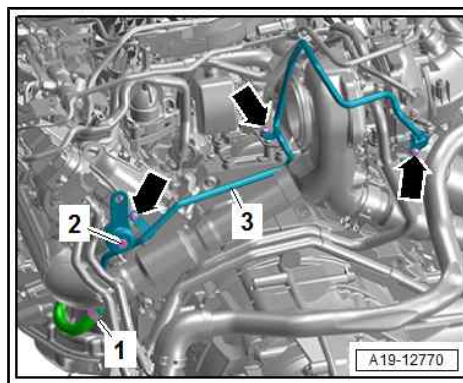
1.3 Removing and installing turbocharger

Removing

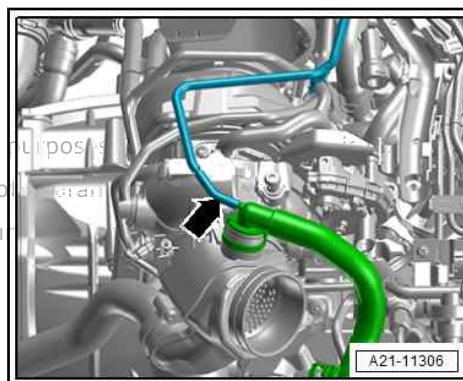
- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove emission control module ⇒ [page 182](#) .
- Unscrew bolt -3-, detach coolant pipe 4 from turbocharger and press to one side.



- Remove bolt -2- and detach bracket.
- Remove bolts -arrows-, detach coolant pipe 5 from turbocharger and press to one side.



- Disconnect vacuum hose -arrow-.



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- Unplug electrical connector -1-.
- Remove bolts -arrows-.
- Move sender 1 for turbocharger speed - G688- -item 2- clear.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Removing and installing turbocharger .

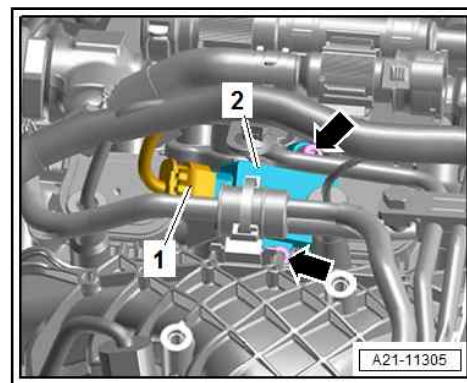
Installing

Additional work:

- Install coolant pipes
⇒ ["3.2 Removing and installing coolant pipes", page 95](#) .
- Install emission control module ⇒ [page 182](#) .

Tightening torques

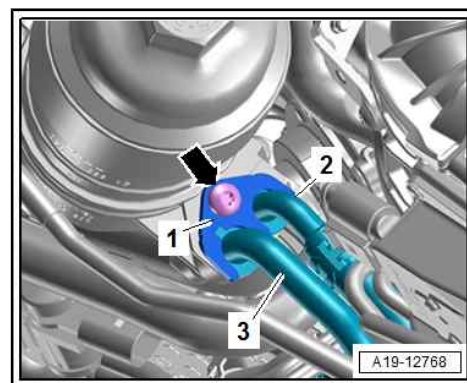
- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation



1.4 Removing and installing electric compressor with control unit for electric compressor - J1123-

Removing

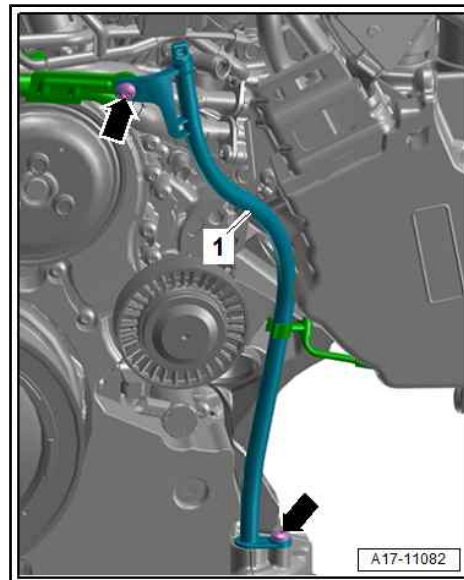
- De-energise 48 V electrical system ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Remove coolant pipe at electric compressor
⇒ ["3.2.13 Removing and installing coolant pipe at electric compressor", page 109](#) .
- Remove radiator cowl ⇒ [page 117](#) .
- Remove bracket for air conditioner compressor ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries .
- Remove bolt -arrow-.
- Detach retaining plate -1-, pull connection -2- off oil filter housing and press to side.



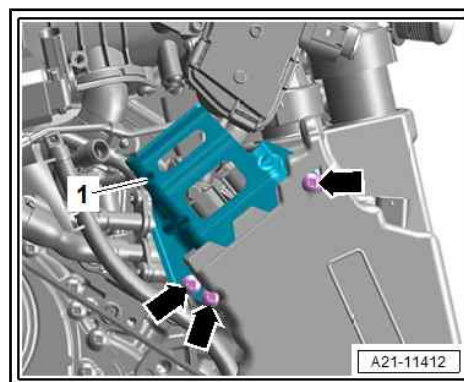
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- Remove bolts -arrows-.
- Move vacuum hose clear.
- Detach guide tube -1- for oil dipstick.



- Remove bolts -arrows- and detach guard plate -1-.



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- Unplug electrical connectors -2, 3-.
- Being careful not to damage it, detach vacuum hose -4-.
- Unscrew bolt -1- and detach coolant connection.
- Unscrew bolts -arrows- and detach electric compressor.

Installing

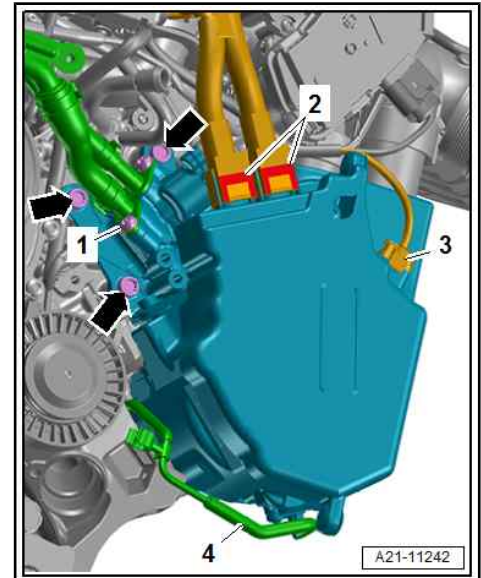
Installation is carried out in reverse order; note the following:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.

⚠ CAUTION

Risk of irreparable damage to electric compressor if vacuum hose is loose, damaged or blocked.

- Check for damage on vacuum hose to electric compressor, and ensure that it is routed correctly.



- Install bracket for air conditioner compressor ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries .
- Install radiator cowl ⇒ [page 117](#) .
- Install coolant pipe at electric compressor
⇒ [“3.2.13 Removing and installing coolant pipe at electric compressor”, page 109](#) .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

Tightening torques

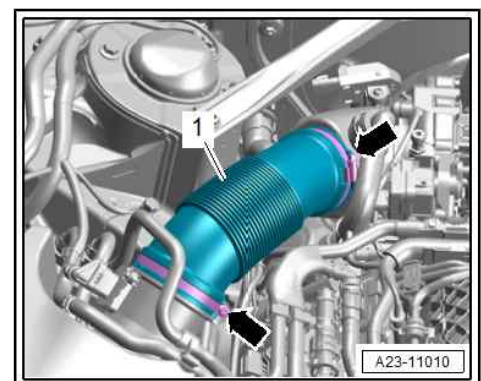
- ◆ ⇒ [“1.2 Exploded view - electric compressor with control unit for electric compressor J1123”, page 121](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

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1.5 Removing and installing sender 1 for turbocharger speed - G688-

Removing

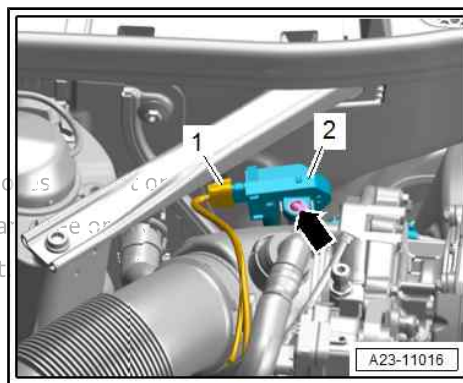
- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Release hose clips -arrows- and detach air pipe -1-.



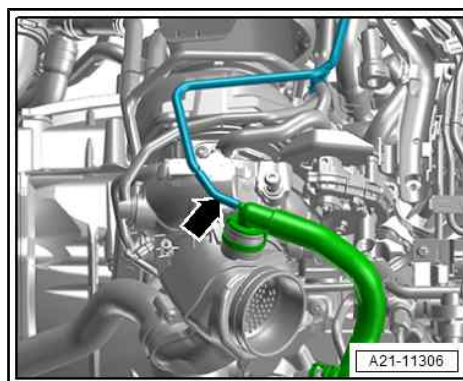


- Remove bolt -arrow-.
- Unplug electrical connector -1-.
- Move bracket -2- with pressure differential sender - G505- clear.

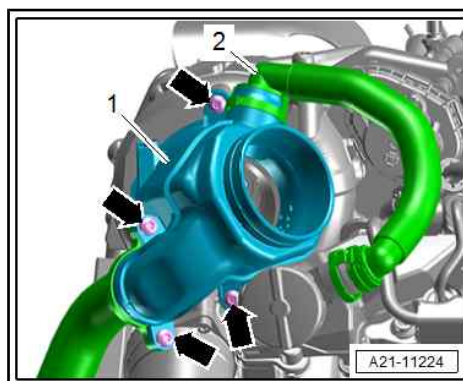
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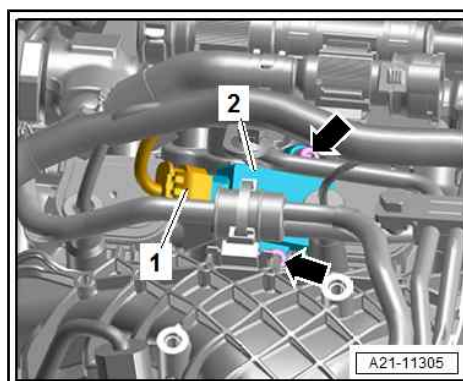
- Disconnect vacuum hose -arrow-, taking care not to damage it.



- Press release tabs on both sides and disconnect crankcase breather hose -2-.
- Remove bolts -arrows- and detach resonator -1-.



- Unplug electrical connector -1- and remove bolts -arrows-.
- Move sender 1 for turbocharger speed - G688- -item 2- clear.





- Remove bolt -arrow- and detach sender 1 for turbocharger speed - G688- -item 1-.

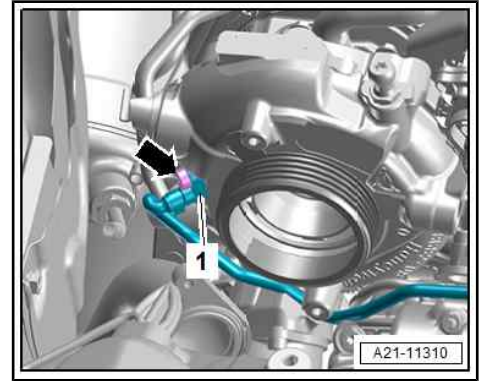
Installing

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 .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ Fig. ““Bracket with pressure differential sender -G505- - tightening torque”” , page 168



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2 Charge air system

⇒ ["2.1 Exploded view - charge air system", page 128](#)

⇒ ["2.2 Exploded view - hose connections for charge air system", page 129](#)

⇒ ["2.3 Removing and installing charge air cooler", page 129](#)

⇒ ["2.4 Removing and installing charge pressure sender G31 ", page 130](#)

⇒ ["2.5 Removing and installing charge air temperature sender before charge air cooler G810 ", page 131](#)

⇒ ["2.6 Removing and installing charge air temperature sender after charge air cooler G811 ", page 132](#)

⇒ ["2.7 Checking charge air system for leaks", page 132](#)

2.1 Exploded view - charge air system

1 - Charge air cooler

- ❑ Removing and installing
⇒ [page 129](#)

- ❑ If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Installing radiators and condensers

- ❑ Radiator must be renewed if fasteners are damaged

2 - Air hose

- ❑ Must be free of oil and grease when installing

3 - Bolt

- ❑ Tightening torque and sequence ⇒ [page 129](#)

4 - Spacer sleeve

5 - Rubber bush

6 - Air pipe

7 - Seal

- ❑ Renew after removing

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

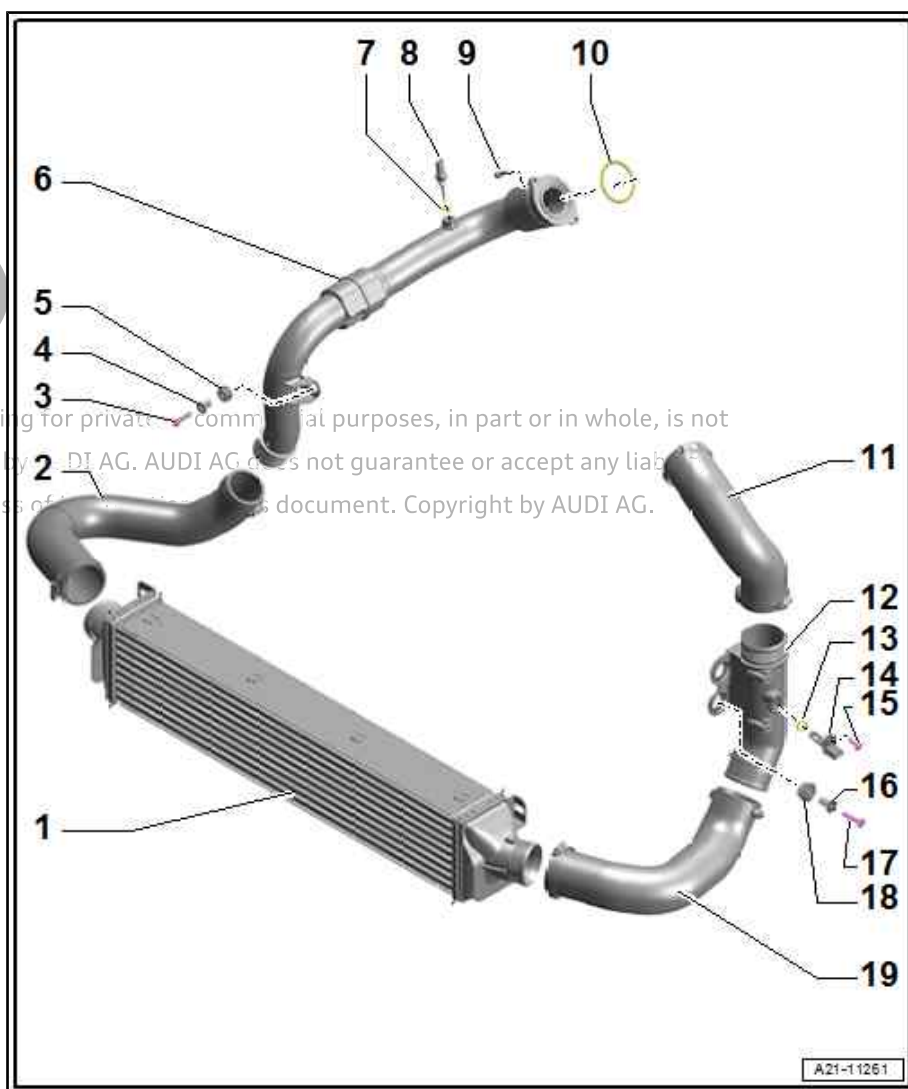
- ❑ Removing and installing
⇒ [page 131](#)
- ❑ 22 Nm

9 - Bolt

- ❑ Tightening torque and sequence ⇒ [page 129](#)

10 - Seal

- ❑ Renew after removing





11 - Air hose

- ☐ Must be free of oil and grease when installing

12 - Connection

- ☐ For air duct

13 - O-ring

- ☐ Renew after removing

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

- ☐ Removing and installing ⇒ [page 132](#)

15 - Bolt

- ☐ 5 Nm

16 - Spacer sleeve

17 - Bolt

- ☐ 9 Nm

18 - Rubber bush

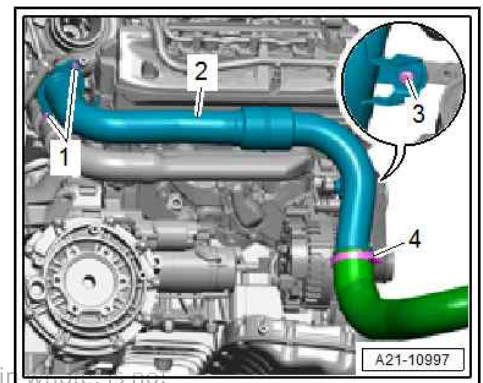
19 - Air hose

- ☐ Must be free of oil and grease when installing

Air pipe - tightening torque and sequence

- Tighten bolts in stages as follows:

Stage	Bolts	Tightening torque
1.	-1, 3-	Screw in by hand until contact is made
2.	-3-	8 Nm
3.	-1-	8 Nm



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2.2 Exploded view - hose connections for charge air system

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system .

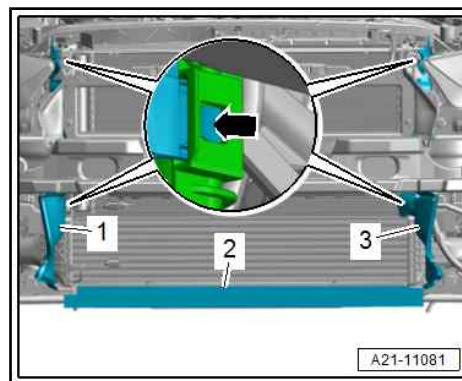
2.3 Removing and installing charge air cooler

Removing

- Observe rules for cleanliness ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; 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); Exploded view - bumper cover .



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

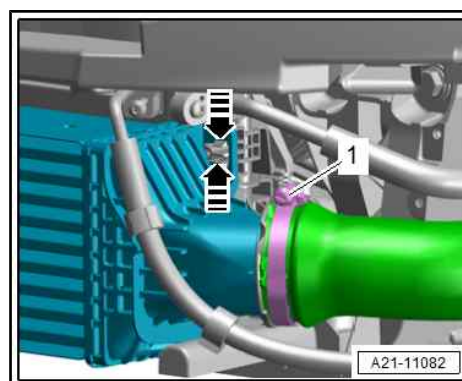


- Release hose clip -1- on both sides and detach air pipe from charge air cooler.

NOTICE

Risk of damage to fasteners if handled incorrectly.

- Release fasteners -arrows- on both sides and disengage charge air cooler from radiator.
- Take out charge air cooler from underneath.



Installing

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

- If there are slight impressions on the fins, refer to ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Installing radiators and condensers
- 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); Exploded view - bumper cover .

Tightening torques

- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

2.4 Removing and installing charge pressure sender - G31-

Removing

- Remove throttle valve module - J338- ⇒ [page 152](#) .



- Unplug electrical connector -2-.
- Unscrew bolt -1- and remove charge pressure sender - G31- .

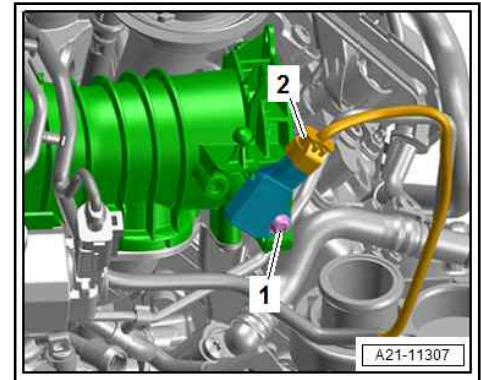
Installing

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

- Install throttle valve module - J338- ➔ [page 152](#) .

Tightening torques

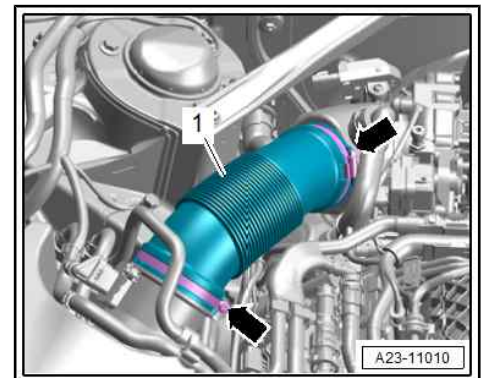
- ◆ ➔ [“4.1 Exploded view - intake manifold”, page 146](#)



2.5 Removing and installing charge air temperature sender before charge air cooler - G810-

Removing

- Remove engine cover panel ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Release hose clips -arrows- and detach air pipe -1-.



- Unplug electrical connector -arrow-.
- Unscrew charge air temperature sender before charge air cooler - G810- .

Installing

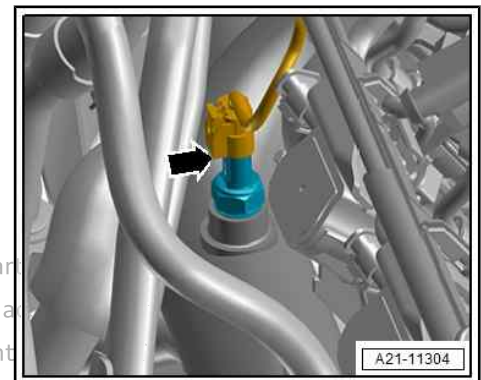
Installation is carried out in reverse order; note the following:

- Renew seal after removing.

- Install engine cover panel ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ➔ [“2.1 Exploded view - charge air system”, page 128](#)
- ◆ ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system





2.6 Removing and installing charge air temperature sender after charge air cooler - G811-

Removing

- Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Unplug electrical connector -2-.
- Remove bolt -1- and detach charge air temperature sender after charge air cooler - G811- .

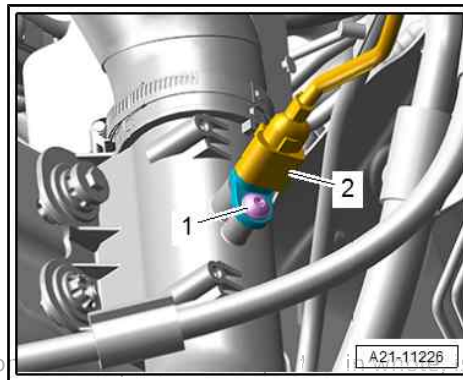
Installing

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

- Renew O-ring after removal.

Tightening torques

- ♦ ⇒ [“2.1 Exploded view - charge air system”, page 128](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)



2.7 Checking charge air system for leaks

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Checking charge air system for leaks .



23 – Mixture preparation - injection

1 Injection system

⇒ "1.1 Overview - fuel system", page 133

⇒ "1.2 Overview of fitting locations - injection system", page 134

⇒ "1.3 Filling and bleeding fuel system", page 141

⇒ "1.4 Checking fuel system for leaks", page 141

1.1 Overview - fuel system

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

1 - Injector

2 - High-pressure reservoir (rail)

- For cylinder bank 1 (right-side)

3 - Fuel temperature sender - G81-

4 - Fuel filter

5 - Fuel tank

- With fuel system pressurisation pump - G6-

6 - Fuel metering valve - N290-

7 - High-pressure pump

8 - Fuel pressure sender - G247-

9 - High-pressure reservoir (rail)

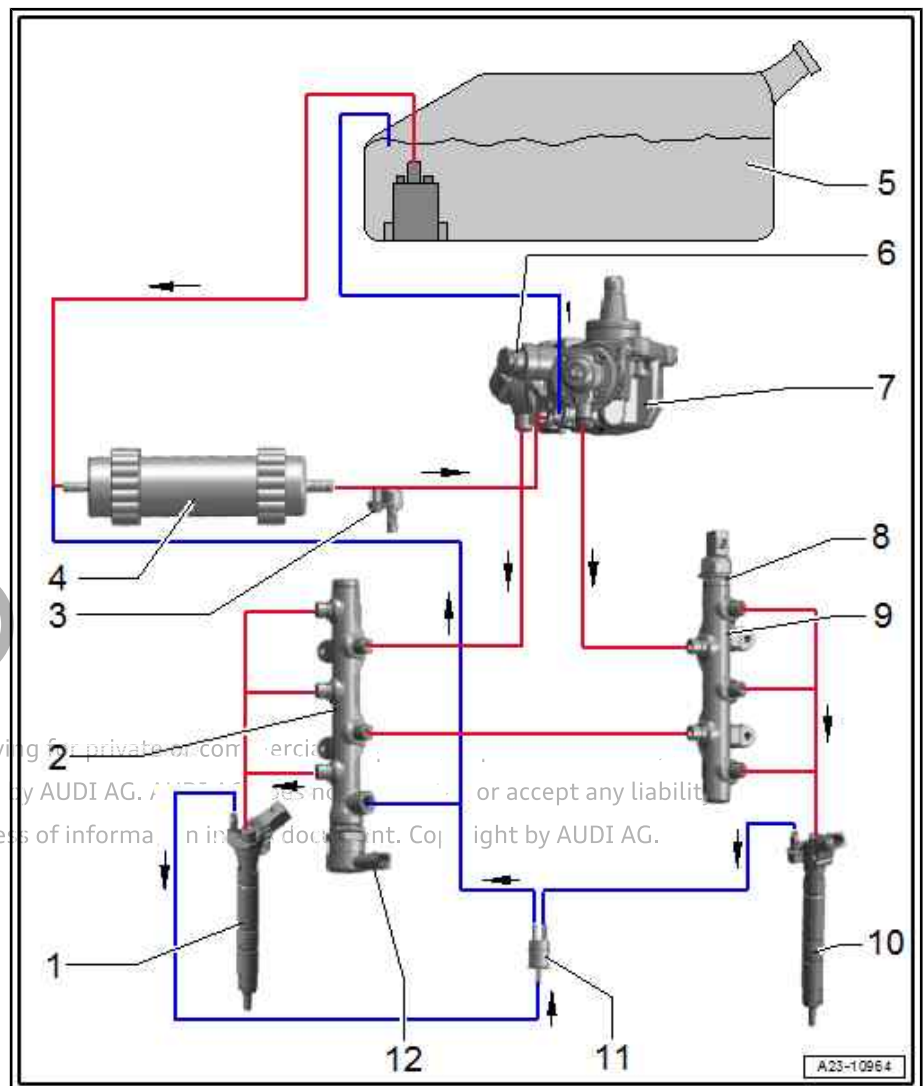
- For cylinder bank 2 (left-side)

10 - Injector

11 - Restrictor

- Maintains a residual pressure in fuel return hoses

12 - Fuel pressure regulating valve - N276-





1.2 Overview of fitting locations - injection system

- ◆ Overview of fitting locations - engine compartment
⇒ [page 134](#)
- ◆ Overview of fitting locations - engine (from above)
⇒ [page 136](#)
- ◆ Overview of fitting locations - engine (from front)
⇒ [page 138](#)
- ◆ Overview of fitting locations - engine (left-side) ⇒ [page 139](#)
- ◆ Overview of fitting locations - engine (right-side) ⇒ [page 140](#)

Overview of fitting locations - engine compartment

1 - Air mass meter - G70-

- Exploded view
⇒ ["3.1 Exploded view - air cleaner housing", page 143](#)

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

- Exploded view
⇒ ["2.1 Exploded view - charge air system", page 128](#)

3 - Pressure differential sender - G505-

- Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

4 - Exhaust flap control unit - J883-

- Fitting location
⇒ [page 136](#)

5 - Accelerator pedal module - GX2-

- With:

◆ Accelerator position sender - G79-

◆ Accelerator position sender 2 - G185-

- Fitting location
⇒ [page 135](#)

6 - Exhaust gas recirculation valve 2 - GX6-

- With:

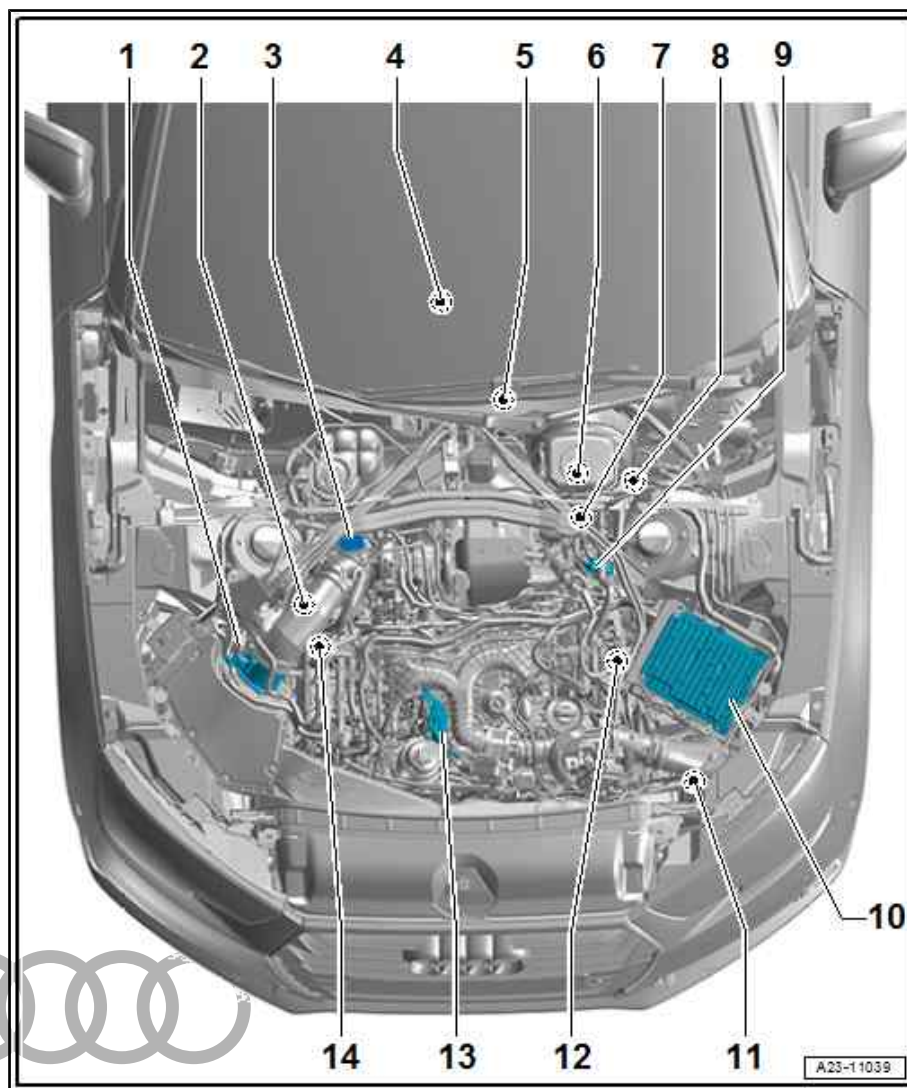
◆ Exhaust gas recirculation potentiometer 2 - G466-

◆ Exhaust gas recirculation control motor 2 - V339-

- Fitting location ⇒ [page 136](#)

7 - Coolant circulation pump - V50-

- Fitting location ⇒ [page 136](#)



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8 - Brake light switch - F-

- ❑ Fitting location ➔ [page 135](#)

9 - Pressure differential sender 2 - G524-

10 - Engine control unit - J623-

- ❑ Exploded view ➔ [page 173](#)

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

- ❑ Exploded view ➔ [“2.1 Exploded view - charge air system”, page 128](#)

12 - Left electrohydraulic engine mounting solenoid valve - N144-

- ❑ Fitting location ➔ [page 136](#)

13 - Automatic glow period control unit - J179-

- ❑ Exploded view ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

14 - Right electrohydraulic engine mounting solenoid valve - N145-

- ❑ Fitting location ➔ [page 136](#)

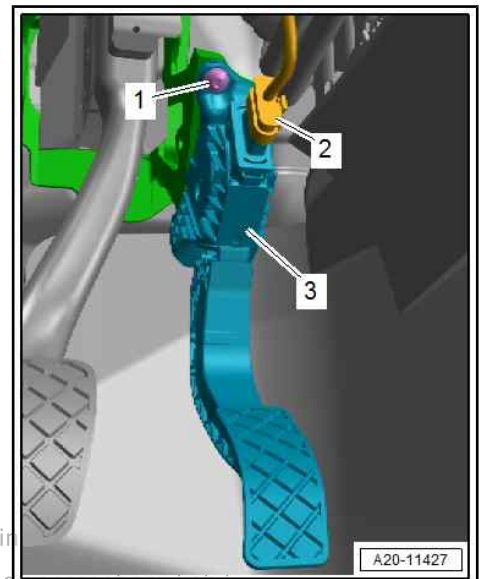
Fitting location of accelerator pedal module - GX2-

- ◆ 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



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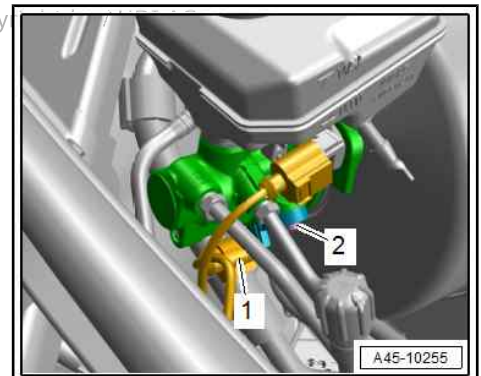


Fitting location of brake light switch - F-

- ◆ 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





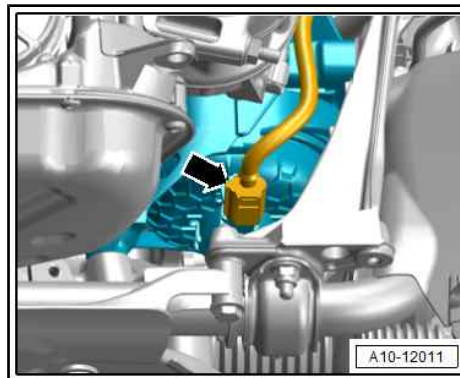
Fitting location of electrohydraulic engine mounting solenoid valves -N144- / -N145-

- ◆ 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 Removing and installing engine mounting", page 38](#)



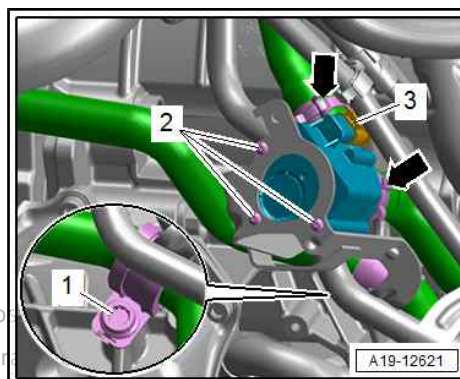
Fitting location of coolant circulation pump - V50-

- ◆ At coolant pipes (rear)

3 - Coolant circulation pump - V50-

Exploded view

⇒ ["2.2 Exploded view - electric coolant pump", page 83](#) .



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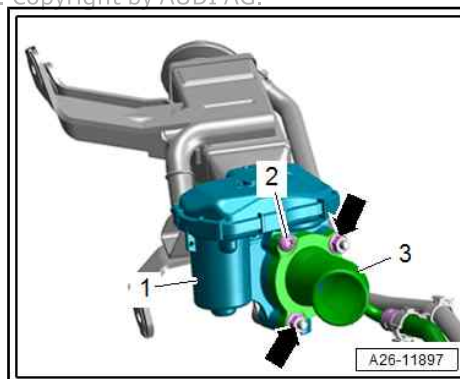
Fitting location of exhaust gas recirculation valve 2 - GX6-

- ◆ On left of gearbox

2 - Exhaust gas recirculation valve 2 - GX6-

Exploded view

⇒ ["5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side \(rear\)", page 193](#) .



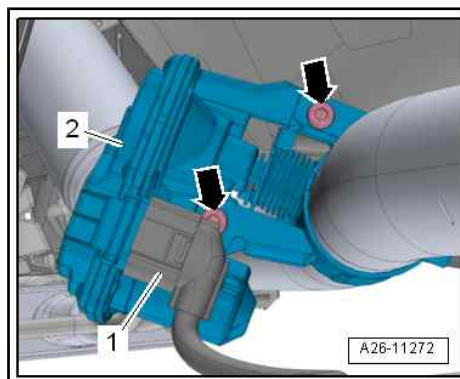
Fitting location of exhaust flap control unit - J883-

- ◆ At trap catalytic converter

2 - Exhaust flap control unit - J883-

Exploded view

⇒ ["2.1 Exploded view - emission control system", page 182](#) .



Overview of fitting locations - engine (from above)



1 - Fuel pressure regulating valve - N276-

- ☐ Removing and installing
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Removing and installing fuel pressure regulating valve - N276-
- ☐ Checking ⇒ [page 161](#)

2 - Glow plug 1 - Q10-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

3 - Sender 1 for turbocharger speed - G688-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger

4 - Glow plug 2 - Q11-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

5 - Glow plug 3 - Q12-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

6 - Control unit for turbocharger 1 - J724-

- ☐ On turbocharger
- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger

7 - Fuel metering valve - N290-

- ☐ Integrated in high-pressure pump

8 - Exhaust gas recirculation valve 1 - GX5-

- ☐ With:

◆ Exhaust gas recirculation potentiometer - G212-

◆ Exhaust gas recirculation control motor - V338-

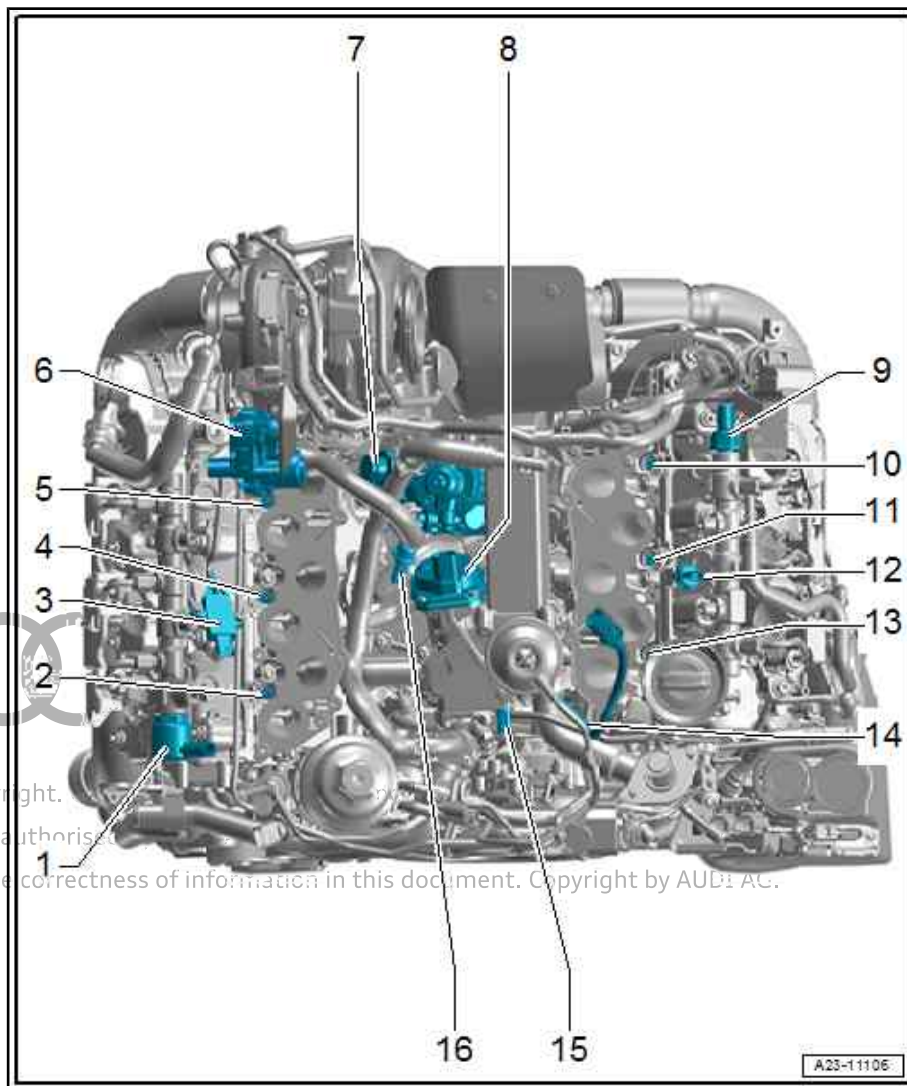
- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

9 - Fuel pressure sender - G247-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

10 - Glow plug 6 - Q15-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system



**11 - Glow plug 5 - Q14-**

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

12 - Pressure sender for exhaust gas recirculation - G691-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

13 - Glow plug 4 - Q13-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

14 - Exhaust gas recirculation temperature sensor - G98-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

15 - Coolant temperature sender - G62-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders

16 - Fuel temperature sender - G81-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; High-pressure pump; Exploded view - high-pressure pump

Overview of fitting locations - engine (from front)**1 - Starter-alternator coolant pump - V621-**

- ❑ Exploded view ⇒ ["2.2 Exploded view - electric coolant pump", page 83](#)

2 - Exhaust gas recirculation cooler change-over valve - N345-**3 - Oil temperature sender 2 - G664-**

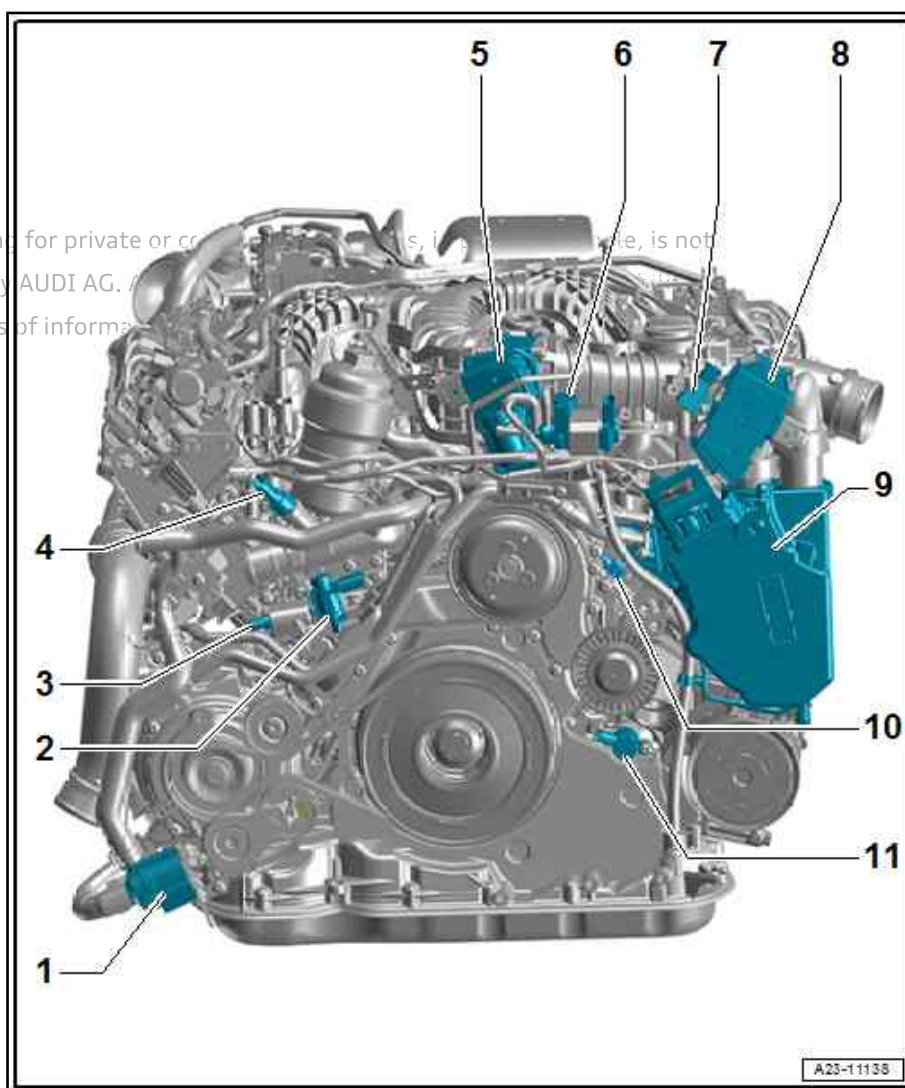
- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - sealing flange (pulley end)

4 - Oil pressure sender - G10-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switches; Exploded view - oil filter

5 - Intake manifold flap control unit - GX14-

- ❑ With intake manifold flap motor - V157-
- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold





6 - Coolant valve for cylinder head - N489-

7 - Charge pressure sender - G31-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold

8 - Throttle valve module - GX3-

- ☐ With:

◆ Throttle valve potentiometer - G69-

◆ Throttle valve module - J338-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold

9 - Electric compressor with control unit for electric compressor - J1123-

- ☐ Exploded view
⇒ ["1.2 Exploded view - electric compressor with control unit for electric compressor J1123 ", page 121](#)

10 - Temperature sender for engine temperature regulation - G694-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant temperature senders

11 - Valve for oil pressure control - N428-

- ☐ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

Overview of fitting locations - engine (left-side)



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1 - Oil level and oil temperature sender - G266-

- ❑ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

2 - Injector, cylinder 4 - N33-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

3 - Injector, cylinder 5 - N83-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

4 - Injector, cylinder 6 - N84-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors



Overview of fitting locations - engine (right-side)



1 - Engine speed sender - G28-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

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

- ❑ Exploded view ⇒ ["2.1 Exploded view - charge air system", page 128](#)

3 - Injector, cylinder 3 - N32-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

4 - Fuel pressure sender for low pressure - G410-

5 - Injector, cylinder 2 - N31-

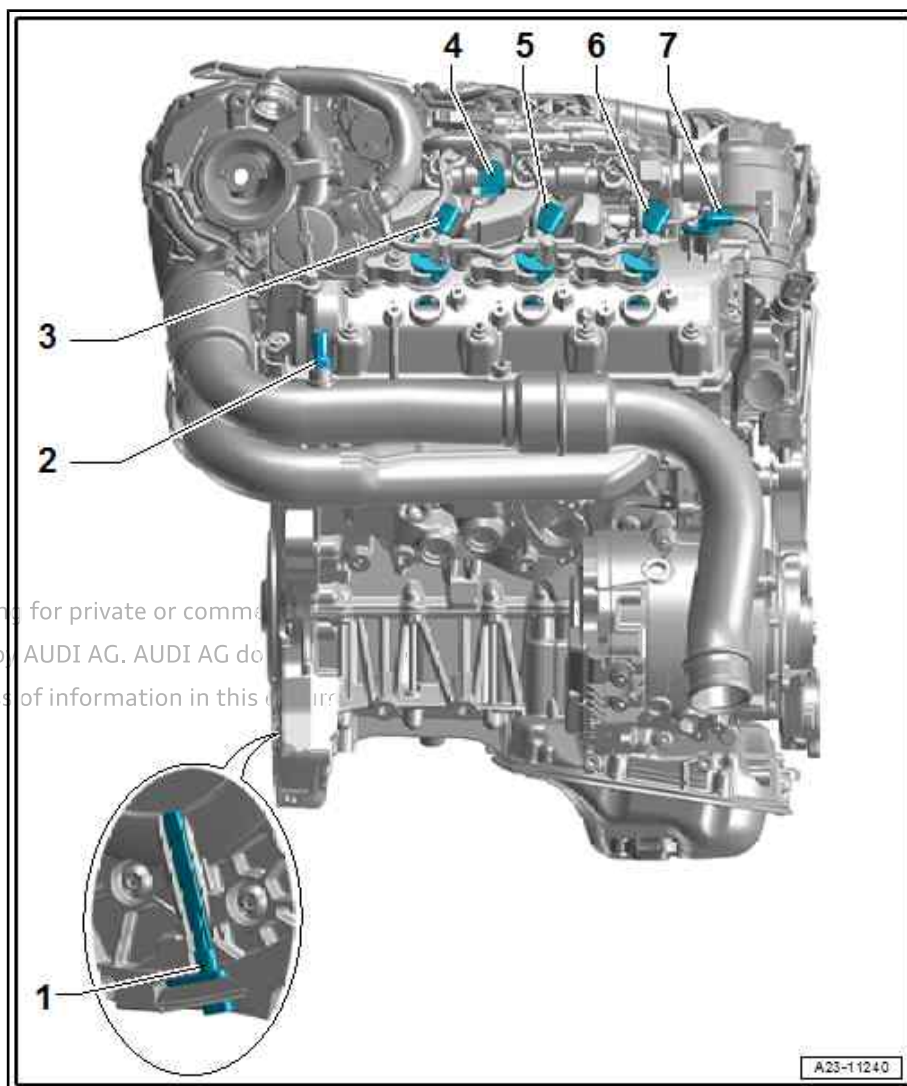
- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

6 - Injector, cylinder 1 - N30-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors

7 - Hall sender - G40-

- ❑ Exploded view ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system



1.3 Filling and bleeding fuel system

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injection system; Filling and bleeding fuel system .

1.4 Checking fuel system for leaks

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injection system; Checking fuel system for leaks .



2 Vacuum system

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Vacuum system .



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3 Air cleaner

⇒ ["3.1 Exploded view - air cleaner housing", page 143](#)

⇒ ["3.2 Removing and installing air cleaner housing", page 144](#)

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 144](#)

4 - Not fitted

5 - 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

6 - 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

7 - Bolt

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

8 - Air mass meter - G70-

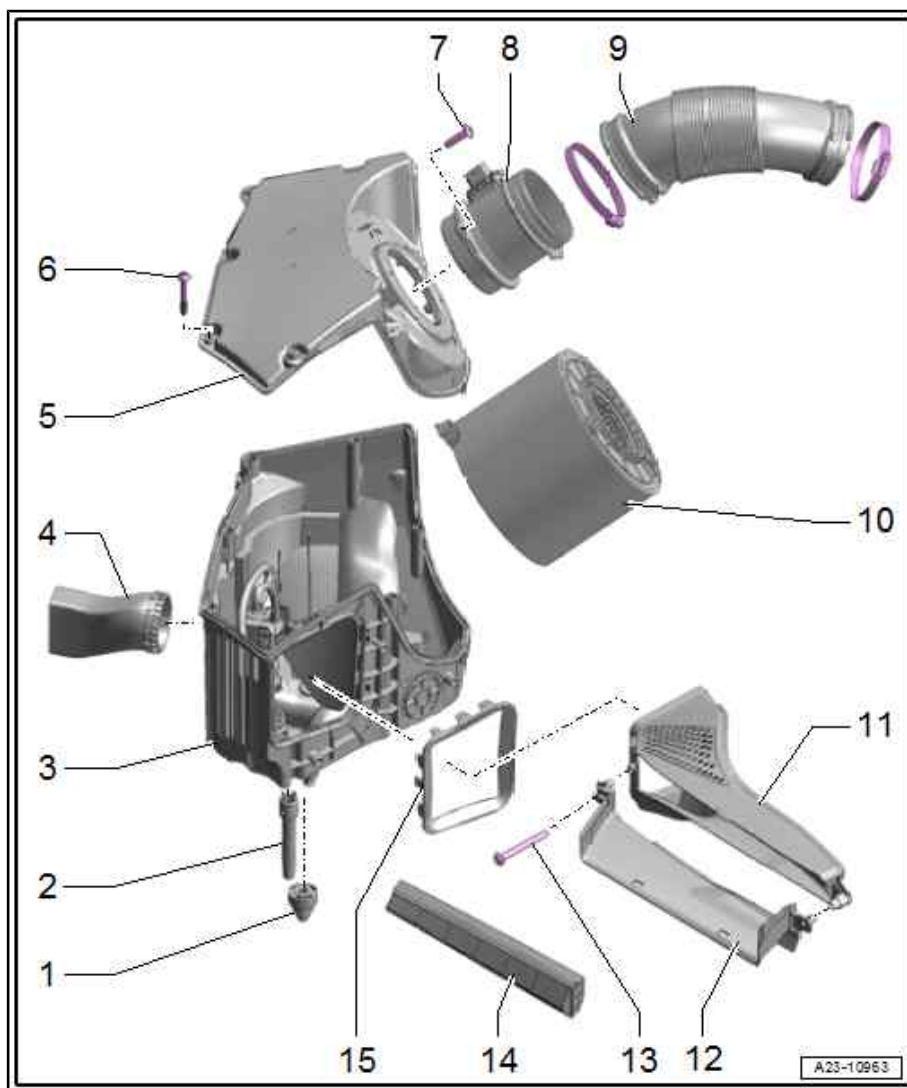
- ☐ Removing and installing ⇒ [page 159](#)

9 - Air pipe

- ☐ Observe installation markings
- ☐ Tightening torques for hose clips ⇒ [Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system](#)

10 - 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





11 - Air duct

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

12 - Air duct

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

13 - 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

14 - Snow screen

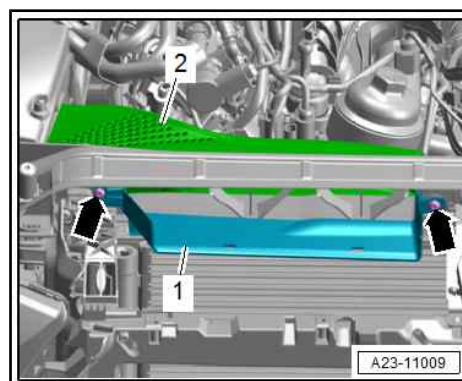
- ☐ Country-specific version

15 - Sealing element

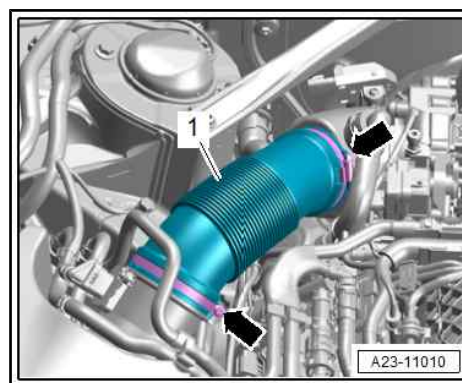
3.2 Removing and installing air cleaner housing

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - bumper cover .
- Remove bolts -arrows- and detach air duct -2-.



- Release hose clips -arrows- and detach air pipe -1-.



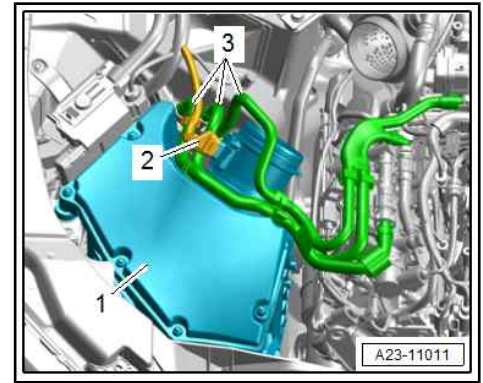


- Unplug electrical connector -2- for air mass meter - G70- .
- Move fuel hoses -3- clear and press to one side.
- Lift off air cleaner housing -1- and detach.

Installing

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

- The air cleaner housing must always be clean.
- To prevent malfunctions, cover critical parts of the engine air intake (air mass meter, air pipes, etc.) with a clean cloth when blowing out the air cleaner housing with compressed air.
- 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); Exploded view - bumper cover .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 143](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; 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 146](#)

⇒ ["4.2 Removing and installing intake manifold \(top section\)", page 146](#)

⇒ ["4.3 Removing and installing intake manifold \(bottom section\)", page 150](#)

⇒ ["4.4 Removing and installing intake manifold flap motor V157", page 150](#)

⇒ ["4.5 Removing and installing throttle valve module J338", page 152](#)

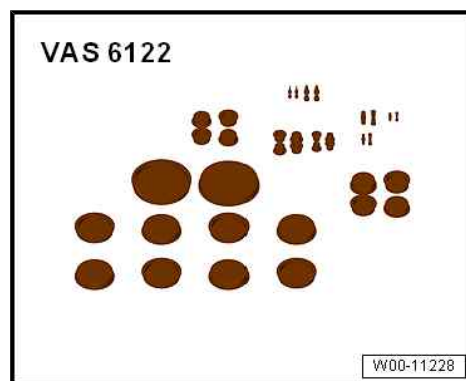
4.1 Exploded view - intake manifold

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold .

4.2 Removing and installing intake manifold (top section)

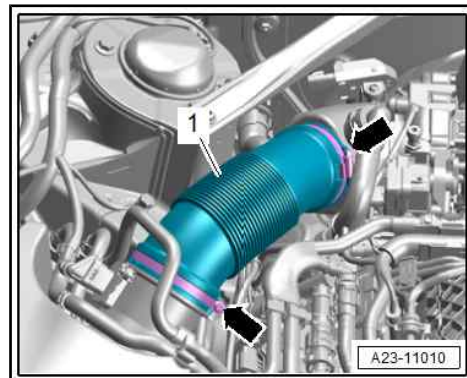
Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-



Removing

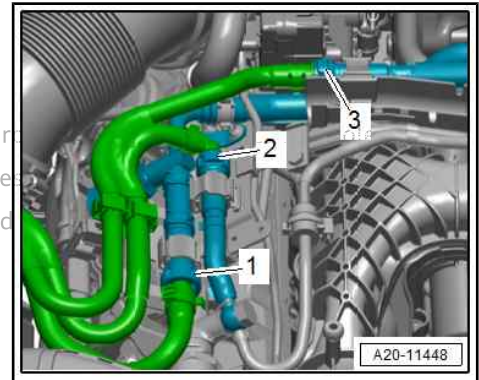
- Observe rules for cleanliness ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Rules for cleanliness .
- De-energise 48 V electrical system and disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Release hose clips -arrows- and detach air pipe -1-.
- Remove throttle valve module - GX3- ⇒ [page 152](#) .



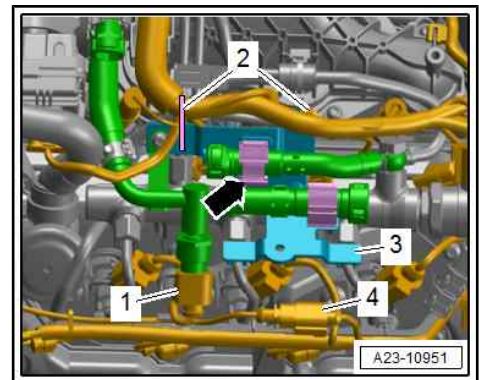


- Disconnect fuel hoses -1, 2, 3- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Remove coolant pipe 2 for turbocharger
⇒ "3.2.10 Removing and installing coolant pipes 2 and 3 for turbocharger", page 106

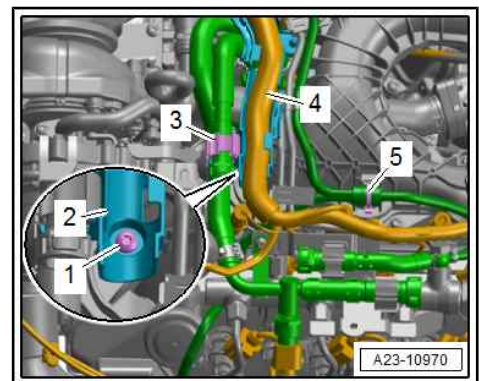
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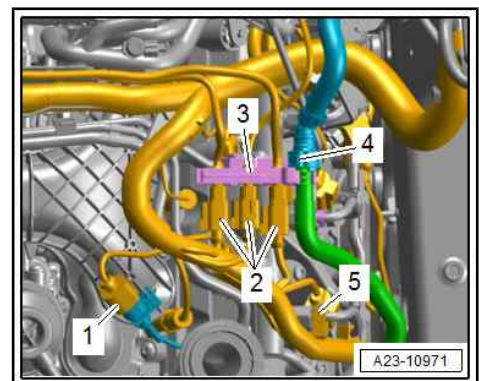
- Unplug electrical connector -1- for fuel pressure sender for low pressure - G410- .
- Move clear electrical connector -4- for exhaust gas temperature sender 4 - G648- .
- Move electrical wiring harnesses -2- and fuel hose -arrow- clear at bracket -3-.
- Unclip bracket from high-pressure lines and push to one side.
- Unplug electrical connectors on glow plugs.



- Move fuel hose -3- clear.
- Move electrical wiring harness -4- clear at wiring duct -2-.
- Unscrew bolt -1- (left and right) and detach wiring duct.
- Move fuel return hose -5- clear at intake manifold and high-pressure pipe.



- If fitted, disconnect vacuum hose -4- and move hose clear at bracket.
- Detach electrical connectors -1 and 2- from bracket, unplug and move electrical wiring clear.
- Unclip bracket -3- from high-pressure lines and detach.
- Unclip bracket -5- from high-pressure pipes and move to one side together with SCR line.





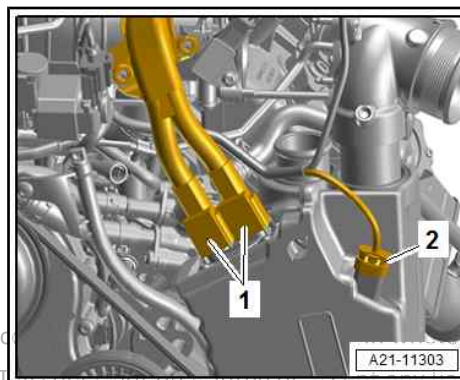
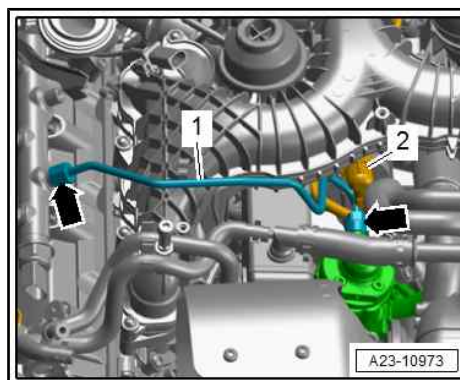
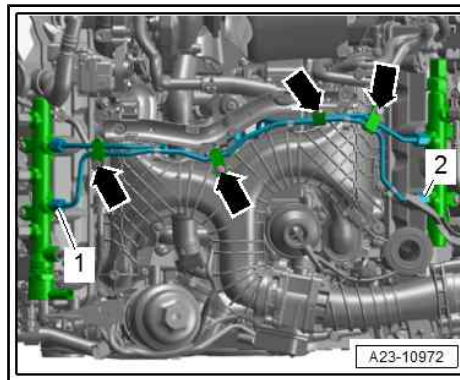
- Unscrew bolts -arrows- and remove retaining clips.

CAUTION

The fuel system is pressurised.

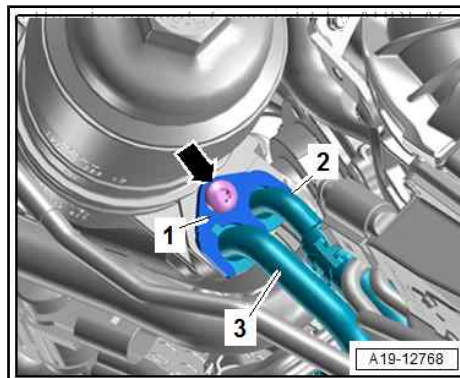
Risk of injury as fuel may spray out.

- Put on safety goggles.
 - Put on protective gloves.
 - Release pressure (wrap a clean cloth around connection and open connection carefully).
-
- Unscrew union nuts -1, 2- and detach high-pressure pipe.
-
- Unplug electrical connector -2- for exhaust gas recirculation valve 1 - GX5- .
-
- Unscrew union nuts -arrows- and detach high-pressure pipe -1-.
-
-
- Unplug electrical connectors -1- for electric compressor and move wiring clear.



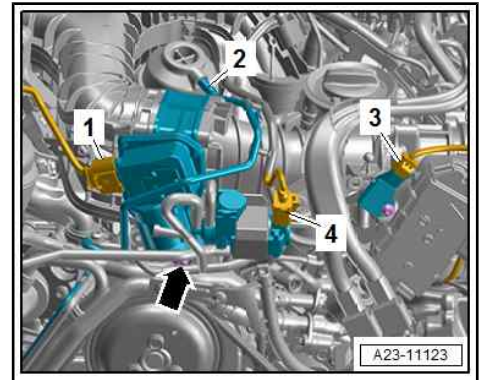
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- Remove bolt -arrow-. with respect to the correctness of information
- Detach retaining plate -1-, pull connection -2- off oil filter housing and press to side.
- Disconnect vacuum hose -2- from actuator for exhaust gas recirculation.



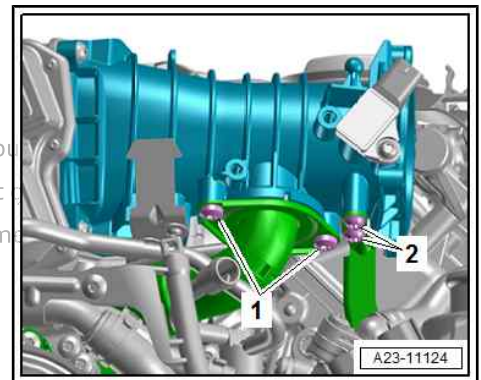


- Detach changeover valve -4- from bracket and move clear to side.
- Detach changeover valve -4- from bracket and move clear to side.
- Unplug electrical connectors:
 - 1 - For intake manifold flap control unit - GX14-
 - 3 - For charge pressure sender - G31-
- Remove bolt -arrow-.

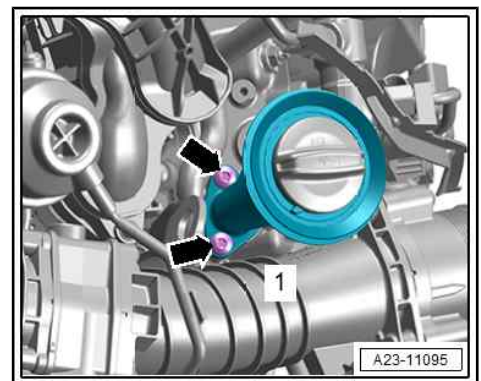


- Remove bolts -1- for exhaust gas recirculation pipe and bolts -2- on bracket for air pipe.

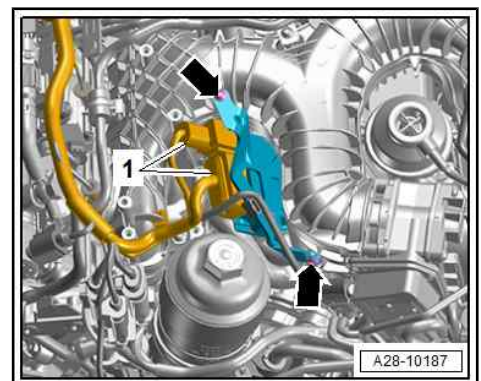
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- Remove bolts -arrows- and detach oil filler neck -1-.
- Seal off opening with plug from engine bung set - VAS 6122- (clean plug thoroughly).



- Move electrical wiring -1- clear.
- Remove bolts -arrows- and move bracket with automatic glow period control unit - J179- to one side.





- Move coolant hose leading to injector for reducing agent - N474- clear at intake manifold.
- If necessary, move electrical wiring clear.
- Loosen and remove bolts in the sequence -14 ... 1- and detach intake manifold (top section).

Installing

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

- Renew gaskets/seals **after removing**.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ **Electronic parts catalogue**.
- Install high-pressure pipes ⇒ [page 157](#) .
- Install throttle valve module - GX3- ⇒ [page 152](#) .
- Install coolant pipe 3 for turbocharger
⇒ [“3.2.10 Removing and installing coolant pipes 2 and 3 for turbocharger”, page 106](#) .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

4.3 Removing and installing intake manifold (bottom section)

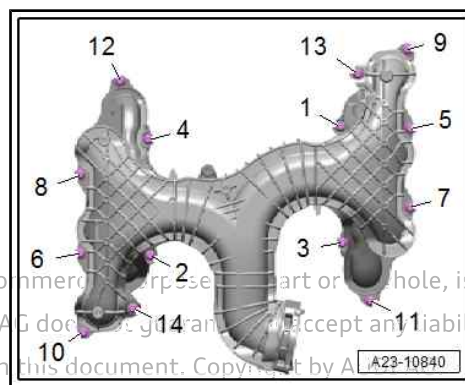
All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Removing and installing intake manifold (bottom section) .

4.4 Removing and installing intake manifold flap motor - V157-

Designation in current flow diagram: intake manifold flap control unit - GX14-

Special tools and workshop equipment required

- ◆ Socket Torx T30 - T10405-

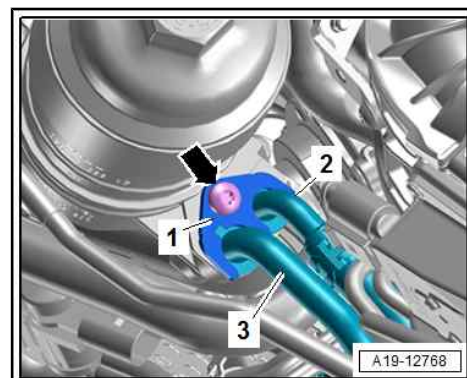


Removing

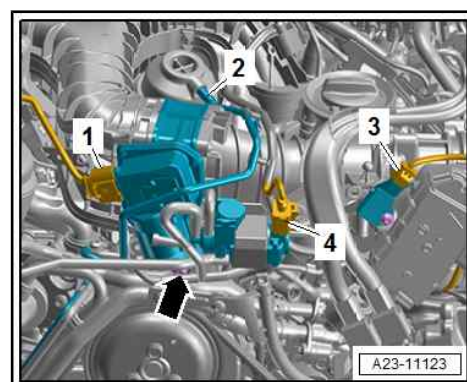
- Remove throttle valve module - GX3- ⇒ [page 152](#) .



- If necessary, release exhaust gas recirculation temperature sensor - G98- and rotate it to one side ➔ [page 198](#) .
- Drain coolant ➔ [page 75](#) .
- Remove bolt -arrow-.
- Detach retaining plate -1-, pull connection -2- off oil filter housing and press to side.

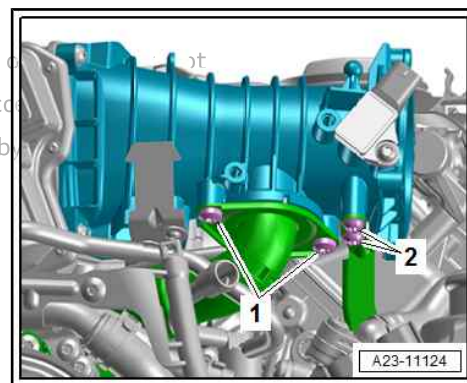


- Disconnect vacuum hose -2- from actuator for exhaust gas recirculation.
- Detach changeover valve -4- from bracket and move clear to side.
- Unplug electrical connectors:
1 - For intake manifold flap control unit - GX14-
3 - For charge pressure sender - G31-
- Remove bolt -arrow-.



- Remove bolts -1- for exhaust gas recirculation pipe and bolts -2- on bracket for air pipe.

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- Unscrew bolts -arrows- using socket Torx T30 - T10405- and detach air pipe -2- with intake manifold flap control unit - GX14- -item 1-.

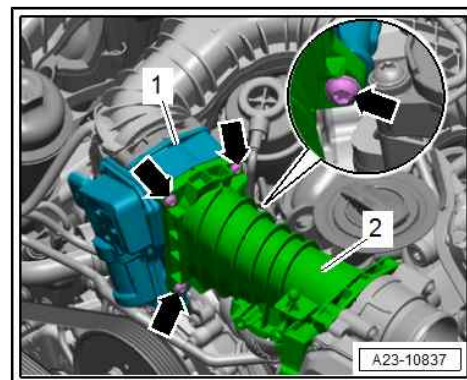
Installing

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

- Renew gaskets/seals after removing.
- Do not reuse coolant.
- Install throttle valve module - GX3- ➔ [page 152](#) .
- Fill up with coolant ➔ [page 75](#) .

Tightening torques

- ◆ ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold



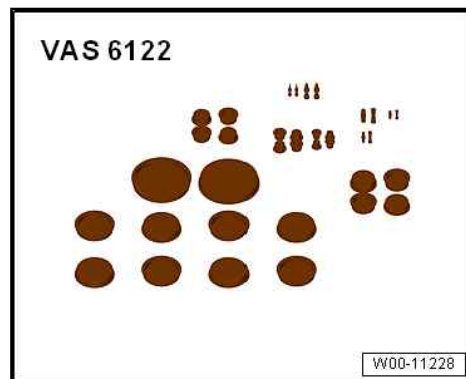


4.5 Removing and installing throttle valve module - J338-

Designation in current flow diagram: throttle valve module - GX3-

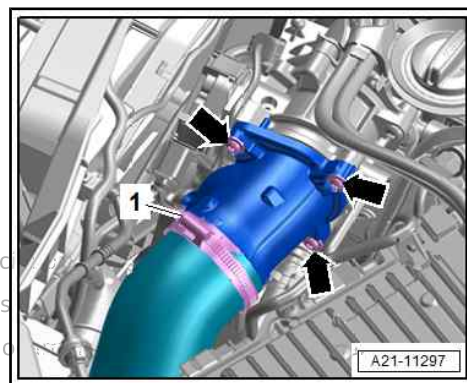
Special tools and workshop equipment required

- ♦ Engine bung set - VAS 6122-



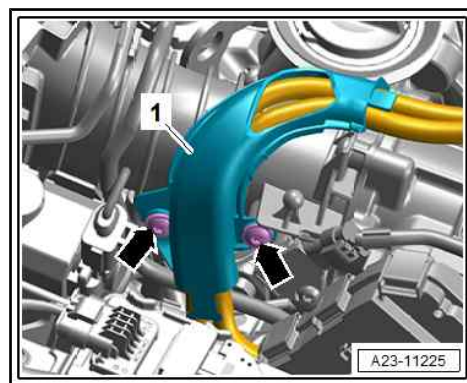
Removing

- Remove engine cover panel ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Unscrew bolts -arrows-, detach connection upwards and tie up to left side.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .



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- Remove bolts -arrows- and push wiring duct -1- to the side.



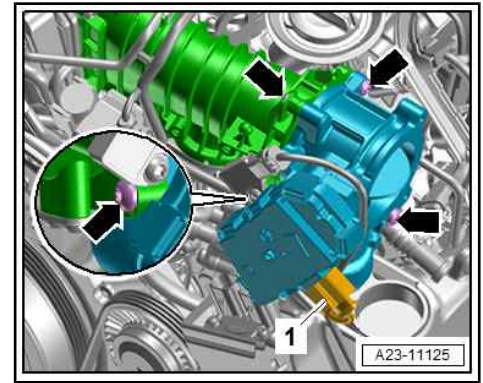


- Unplug electrical connector -1-.
- Remove bolts -arrows-, pull off throttle valve module upwards and remove it.

Installing

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

- Renew seal after removing.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



After renewing component, perform required adaptations using
⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Exploded view - intake manifold
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



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5 Injectors/high-pressure reservoir (rail)

⇒ [“5.1 Exploded view - injectors”, page 154](#)

⇒ [“5.2 Checking injectors”, page 154](#)

⇒ [“5.3 Performing adaption of correction values for injectors”, page 154](#)

⇒ [“5.4 Checking for injectors sticking open”, page 154](#)

⇒ [“5.5 Checking return flow rate of injectors with engine running”, page 155](#)

⇒ [“5.6 Checking return flow rate of injectors at starter cranking speed”, page 155](#)

⇒ [“5.7 Checking pressure retention valve in fuel return line”, page 156](#)

⇒ [“5.8 Removing and installing injectors”, page 156](#)

⇒ [“5.9 Removing and installing high-pressure pipes”, page 157](#)

⇒ [“5.10 Removing and installing high-pressure reservoir \(rail\)”, page 157](#)

5.1 Exploded view - injectors

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Exploded view - injectors .

5.2 Checking injectors

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Checking injectors .

5.3 Performing adaption of correction values for injectors

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Performing adaption of correction values for injectors .

5.4 Checking for injectors sticking open

Procedure

Cylinder bank 1 (right-side)

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



- Release hose clips -arrows- and detach air pipe -1-.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Checking for injectors sticking open .

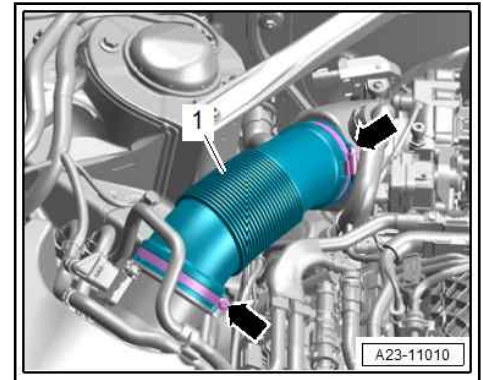
Assembling

Additional work:

- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



5.5 Checking return flow rate of injectors with engine running

Procedure

Cylinder bank 1 (right-side)

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Release hose clips -arrows- and detach air pipe -1-.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Checking return flow rate of injectors with engine running .

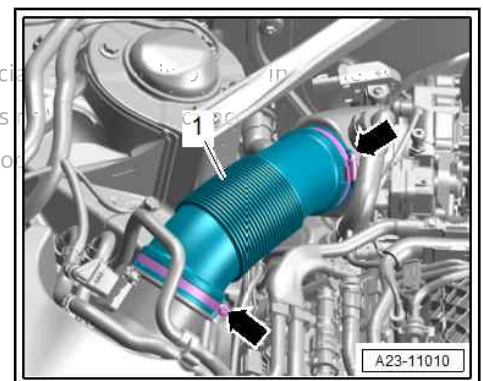
Assembling

Additional work:

- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



5.6 Checking return flow rate of injectors at starter cranking speed

Procedure

Cylinder bank 1 (right-side)

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



- Release hose clips -arrows- and detach air pipe -1-.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Checking return flow rate of injectors at starter cranking speed .

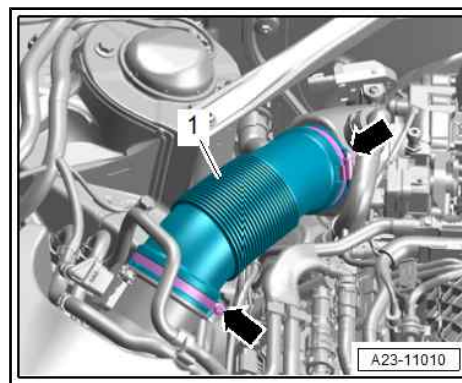
Assembling

Additional work:

- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



5.7 Checking pressure retention valve in fuel return line

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Checking pressure retention valve in fuel return line .

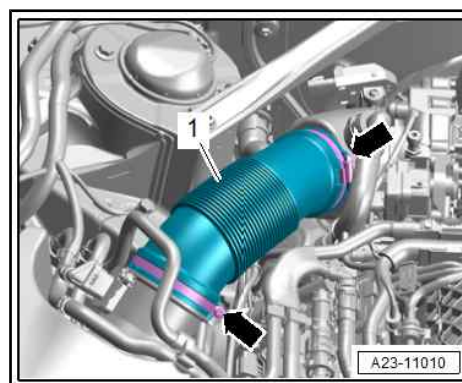
5.8 Removing and installing injectors

Removing

- All cable ties which are released or cut open when removing must be refitted in the same position when installing.
- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Cylinder bank 1 (right-side):

- Release hose clips -arrows- and detach air pipe -1-.

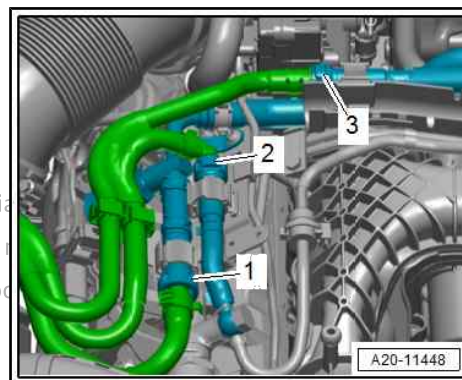


Cylinder bank 1 (right-side), injector for cylinders 1 and 2:

- Disconnect fuel hoses -1, 2, 3- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Remove air cleaner housing ⇒ [page 144](#) .

Cylinder bank 2 (left-side):

- Detach engine control unit - J623- from bracket and move aside ⇒ [page 173](#) .





Cylinder bank 2 (left-side), injector for cylinder 6:

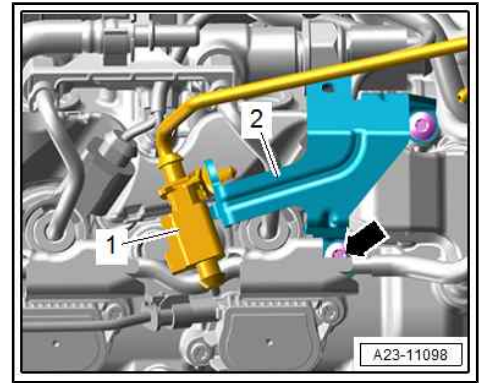
- Move electrical connector -1- for injector for reducing agent - N474- clear at bracket -2-.
- Unscrew bolts -arrows- and detach bracket.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Removing and installing injectors .

Installing

Additional work:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Connect fuel hoses ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Install air cleaner housing ⇒ [page 144](#) .
- Install engine control unit - J623- ⇒ [page 173](#) .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



Tightening torques

- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover
- ♦ ⇒ Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

5.9 Removing and installing high-pressure pipes

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Removing and installing high-pressure pipes .

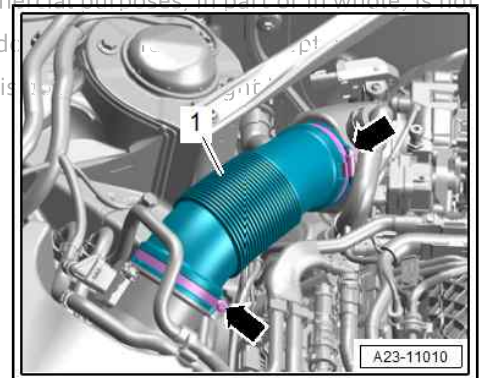
5.10 Removing and installing high-pressure reservoir (rail)

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Cylinder bank 1 (right-side):

- Release hose clips -arrows- and detach air pipe -1-.





- Disconnect fuel hoses -1, 2, 3- ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Removing and installing high-pressure reservoir (rail) .

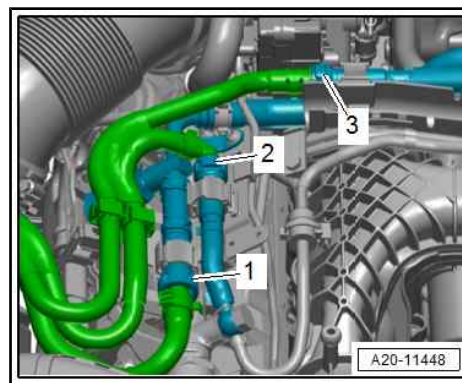
Installing

Additional work:

- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Connect fuel hoses ⇒ Fuel supply system, diesel engines; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



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6 Senders and sensors

⇒ [“6.1 Removing and installing actuator for engine sound generator”, page 159](#)

⇒ [“6.2 Removing and installing air mass meter G70 ”, page 159](#)

⇒ [“6.3 Removing and installing fuel temperature sender G81 ”, page 160](#)

⇒ [“6.4 Removing and installing fuel pressure sender G247 ”, page 160](#)

⇒ [“6.5 Removing and installing fuel pressure sender for low pressure G410 ”, page 160](#)

⇒ [“6.6 Checking fuel pressure regulating valve N276 ”, page 161](#)

⇒ [“6.7 Removing and installing fuel pressure regulating valve N276 ”, page 162](#)

⇒ [“6.8 Removing and installing pressure differential sender”, page 163](#)

6.1 Removing and installing actuator for engine sound generator

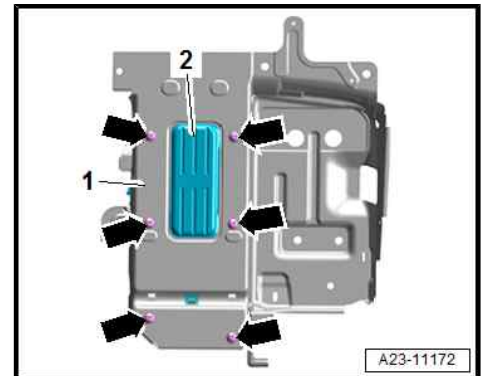
Removing

- Remove battery tray ⇒ Electrical system; Rep. gr. 27 ; Battery; Removing and installing battery tray .
- Remove bolts -arrows-.
- Detach battery tray -1- from actuator 1 for engine sound generator - R257- -item 2-.

Installing

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

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

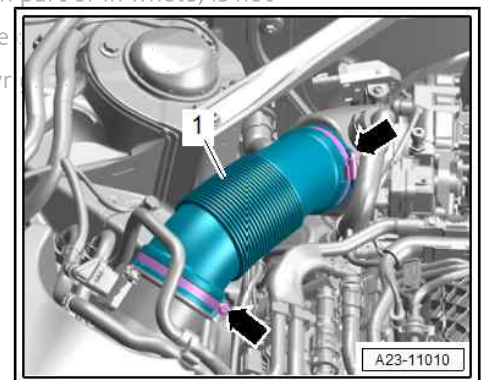


6.2 Removing and installing air mass meter - G70-

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Removing

- Release hose clips -arrows- and detach air pipe -1-.





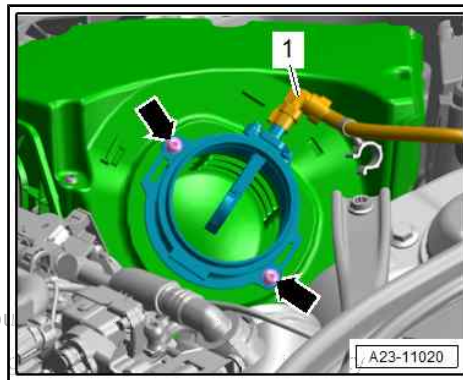
- Unplug electrical connector -1-.
- Unscrew bolts -arrows- and detach air mass meter - G70- .

Installing

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

To ensure that the air mass meter -G70- functions correctly, it is important to observe the following notes and procedures.

- If the air filter element is very dirty or wet, dirt particles or water can reach the air mass meter and falsify the detected air mass values. This will cause a loss of power as the calculated injection quantities will be too low.
- Check air filter element and inside of air cleaner housing for dirt; clean if necessary ⇒ Maintenance ; Booklet 830 ; Maintenance work; Air cleaner: renewing filter element and cleaning housing .
- 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 .



Tightening torques

- ♦ ⇒ [“3.1 Exploded view - air cleaner housing”, page 143](#)
- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

6.3 Removing and installing fuel temperature sender - G81-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors ; Removing and installing fuel temperature sender - G81- .

6.4 Removing and installing fuel pressure sender - G247-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Removing and installing fuel pressure sender - G247- .

6.5 Removing and installing fuel pressure sender for low pressure - G410-

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



- Release hose clips -arrows- and detach air pipe -1-.

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Removing and installing fuel pressure sender for low pressure - G410- .

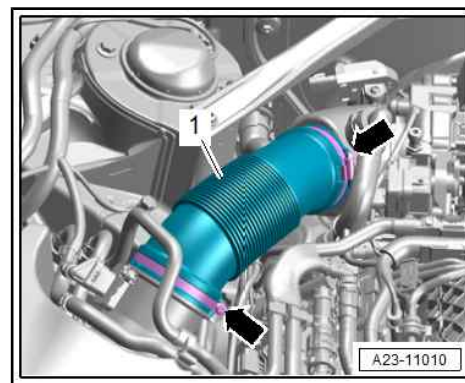
Installing

Additional work:

- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



6.6 Checking fuel pressure regulating valve - N276-

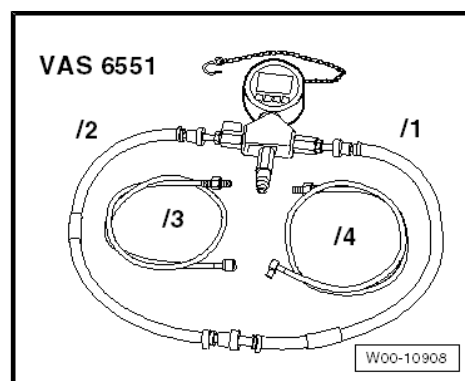
Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-

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- ◆ Test lead - VAS 6551/3- from pressure tester (diesel) - VAS 6551-



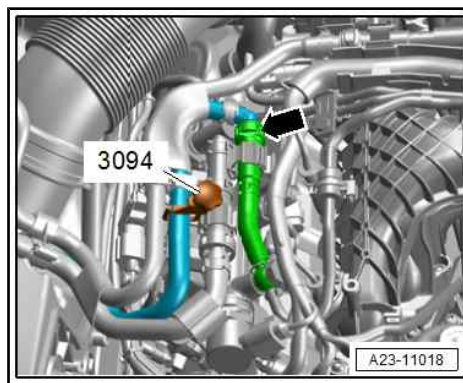
- ◆ Fuel-resistant measuring container
- ◆ Test hose for return line connection

Procedure

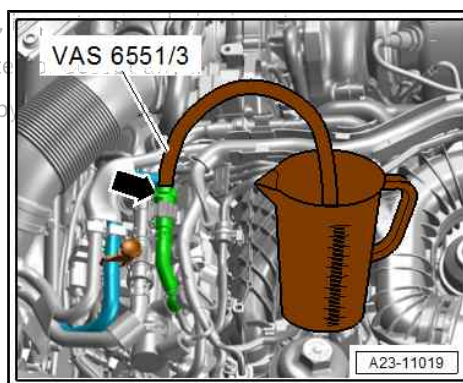
- Fuel temperature above 15 °C.
- Observe rules for cleanliness ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions; Rules for cleanliness .
- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .



- Seal fuel return hose -arrow- with hose clamp up to 25 mm -3094- and disconnect hose ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Move fuel return hose clear and place it on one side.



- Connect test lead VAS 6551/3 to return hose -arrow- and hold into measuring container, as shown in illustration.
- Start engine and run at idling speed for one minute.
- Return flow rate (engine start): 0 ml
- Leave engine running at idling speed.
- While engine is running, empty measuring container, or exchange it for an empty container and begin measurement.
- Leave engine running at idling speed for two minutes and measure return flow rate.
- Return flow rate after 2 minutes: 0 ... 60 ml



Note:

If specified values are obtained, fuel pressure regulating valve - N276- is OK.

If values do not match specifications:

- ◆ The fuel pressure regulating valve - N276- and injectors were checked during the preceding measuring process.
- ◆ To determine which component is defective, you must check the return flow rate of the injectors.
- Measure return flow rate of injectors with engine running
⇒ [page 155](#) .
- If return flow rate of injectors is OK, renew fuel pressure regulating valve - N276- .
- If return flow rate of injectors is not OK, renew defective injector.

Assembling

Assembly is performed in reverse sequence; note the following:

- Connect fuel hose ⇒ Fuel supply system, diesel engines; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

6.7 Removing and installing fuel pressure regulating valve - N276-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Senders and sensors; Removing and installing fuel pressure regulating valve - N276- .



6.8 Removing and installing pressure differential sender

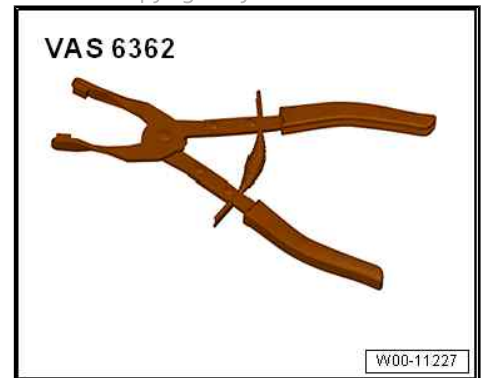
⇒ ["6.8.1 Removing and installing pressure differential sender G505", page 163](#)

⇒ ["6.8.2 Removing and installing pressure differential sender 2 G524", page 164](#)

6.8.1 Removing and installing pressure differential sender - G505-

Special tools and workshop equipment required

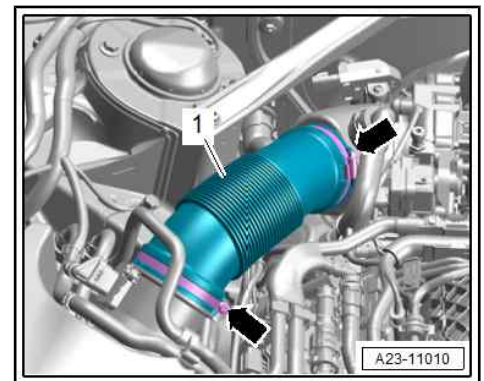
- ◆ Vehicle diagnostic tester
- ◆ Hose clip pliers - VAS 6362-



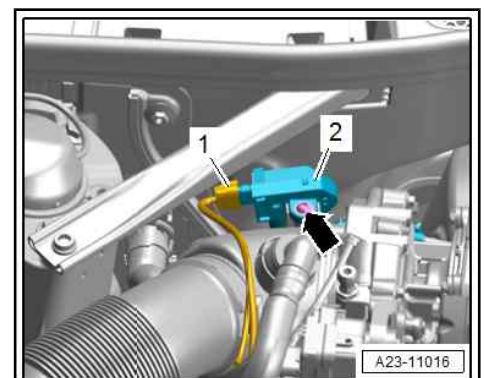
- ◆ Silicone-free lubricant (commercially available)

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Release hose clips -arrows- and detach air pipe -1-.

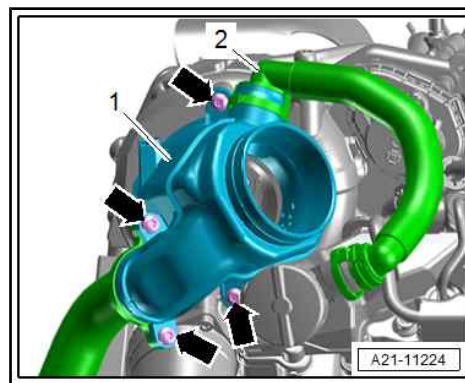


- Remove bolt -arrow-.
- Unplug electrical connector -1-.
- Move bracket -2- with pressure differential sender - G505- clear.

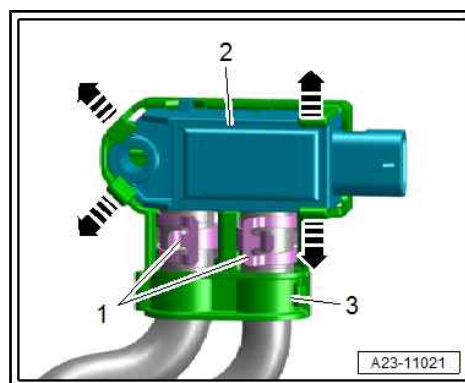




- Press release tabs on both sides and disconnect crankcase breather hose -2-.
- Remove bolts -arrows- and detach resonator -1-.



- Detach retaining clip -3-.
- Release catches -arrows- and detach bracket for pressure differential sender -2-.
- Release hose clips -1-.
- Spray hoses on pressure differential sender with silicone-free lubricant.
- To prevent hose connections from breaking off, carefully disconnect hoses and keep them straight when pulling them off.



Installing

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

- Blow through hose (towards emission control module) with compressed air to remove dirt or ice (frozen condensation).
- Make sure that hoses are securely fitted and seal properly.
- If pressure pipes have been detached from emission control module, tighten them to specified torque.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- After renewing component, perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions .

Tightening torques

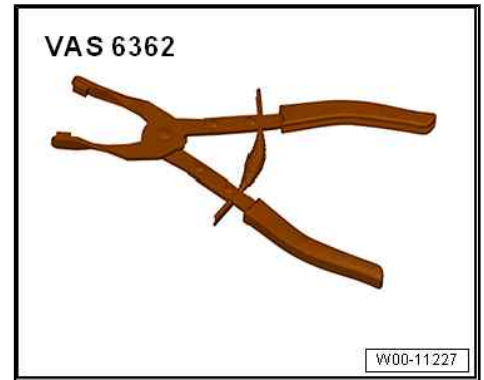
- ◆ ⇒ [Fig. “Bracket with pressure differential sender -G505- - tightening torque”](#), page 168
- ◆ ⇒ [“5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side \(rear\)”](#), page 193
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

6.8.2 Removing and installing pressure differential sender 2 - G524-

Special tools and workshop equipment required



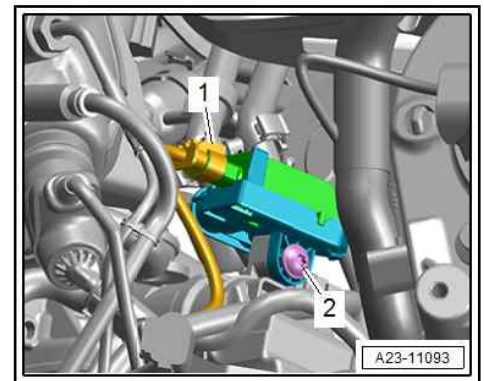
- ◆ Hose clip pliers - VAS 6362-



- ◆ Silicone-free lubricant (commercially available)

Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Remove body brace (left-side) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Unplug electrical connector -1-.
- Remove bolt -2- and move pressure differential sender 2 - G524- clear.



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- Detach retaining clip -3-.
- Release catches -arrows- and detach bracket for pressure differential sender -2-.
- Release hose clips -1-.
- Spray hoses on pressure differential sender with silicone-free lubricant.
- To prevent hose connections from breaking off, carefully disconnect hoses and keep them straight when pulling them off.

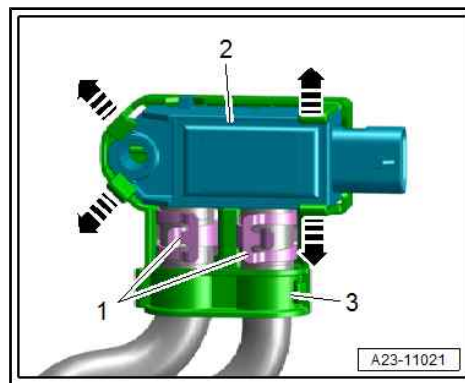
Installing

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

- Blow through hose (towards emission control module) with compressed air to remove dirt or ice (frozen condensation).
- Make sure that hoses are securely fitted and seal properly.
- If pressure pipes have been detached from emission control module, tighten them to specified torque.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

Tightening torques

- ◆ ⇒ [“5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side \(rear\)”, page 193](#)
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links



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7 High-pressure pump

⇒ [“7.1 Exploded view - high-pressure pump”, page 167](#)

⇒ [“7.2 Removing and installing high-pressure pump”, page 167](#)

7.1 Exploded view - high-pressure pump

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; High-pressure pump; Exploded view - high-pressure pump .

7.2 Removing and installing high-pressure pump

Removing

- Unbolt coolant pipe 5 from turbocharger and move clear to one side ⇒ [page 108](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; High-pressure pump; Removing and installing high-pressure pump .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 91](#)



8 Lambda probe

⇒ ["8.1 Exploded view - Lambda probe", page 168](#)

⇒ ["8.2 Removing and installing Lambda probe", page 168](#)

⇒ ["8.3 Removing and installing NOx senders", page 169](#)

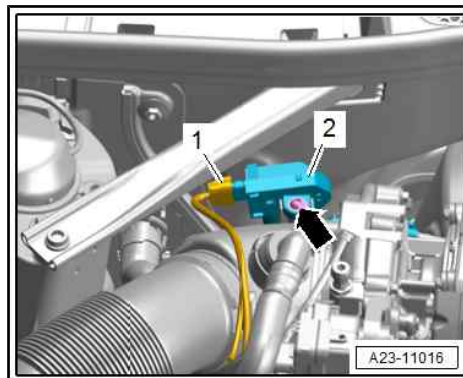
⇒ ["8.4 Removing and installing particulate sensor G784", page 171](#)

8.1 Exploded view - Lambda probe

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe .

Bracket with pressure differential sender - G505- - tightening torque

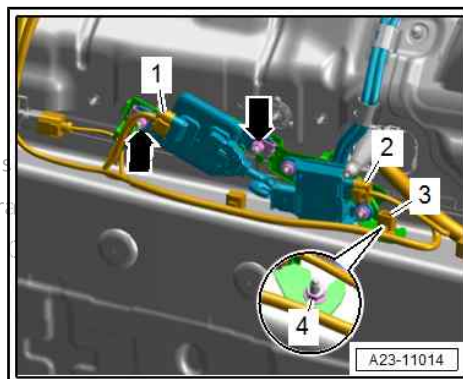
- Tighten bolt -arrow- to 4.5 Nm.



Bracket with NOx sender 2 - G687- / particulate sensor - G784- - tightening torque

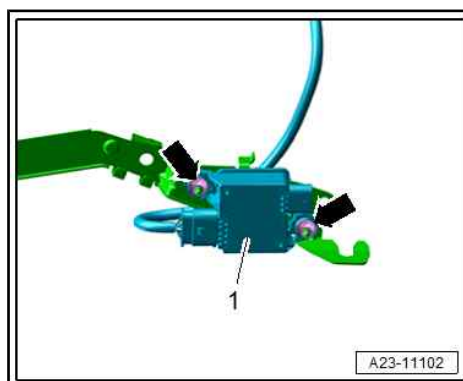
- Tighten nut -4- to 9 Nm.
- Fit nuts -arrows-.

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Particulate sensor - G784- - tightening torque

- Tighten nuts -arrows- to 9 Nm.



8.2 Removing and installing Lambda probe

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Removing and installing Lambda probe .



8.3 Removing and installing NOx senders

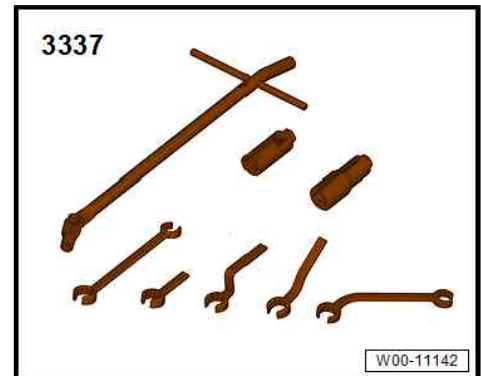
⇒ ["8.3.1 Removing and installing NOx sender G295", page 169](#)

⇒ ["8.3.2 Removing and installing NOx sender 2 G687", page 170](#)

8.3.1 Removing and installing NOx sender - G295-

Special tools and workshop equipment required

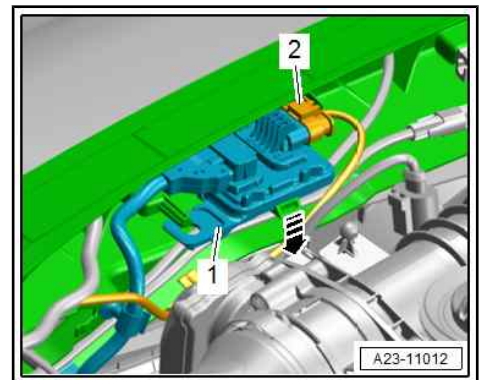
- ◆ Lambda probe open ring spanner set - 3337-



- ◆ High-temperature paste ⇒ Electronic parts catalogue

Removing

- Re-install all cable ties in original positions.
- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Unplug electrical connector -2-.
- Release fastener -arrow-, detach control unit for NOx sender - J583- -item 1- and move it clear.



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⚠ CAUTION

Risk of injury caused by soot particles in the air.

Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Unscrew NOx sender - G295 - arrow, using a tool from Lambda probe open ring spanner set - 3337-.

Installing

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

- Coat thread with high-temperature paste ⇒ Electronic parts catalogue .
- Move control unit for NOx sender - J583- into installation position and secure.
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

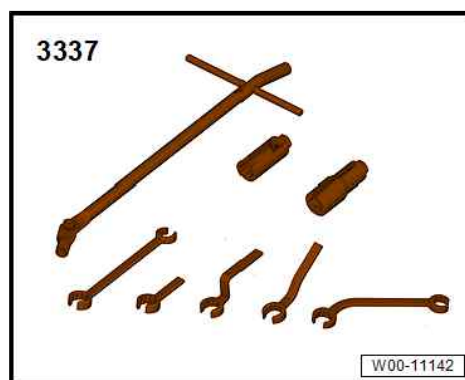
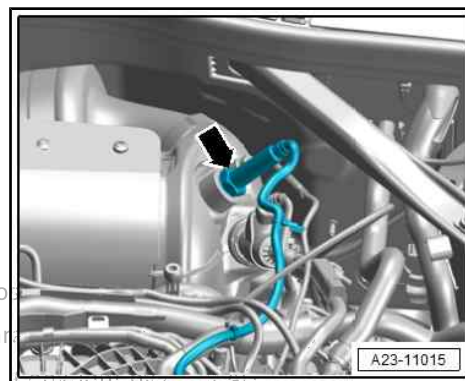
Tightening torques

- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

8.3.2 Removing and installing NOx sender 2 - G687-

Special tools and workshop equipment required

- ♦ Lambda probe open ring spanner set - 3337-



- ♦ High-temperature paste ⇒ Electronic parts catalogue

Removing

- Re-install all cable ties in original positions.
- Unfasten underbody trim (left-side) and lower it slightly ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing underbody trim .



- Unplug electrical connector -1-.
- Pull clip -3- off stud.
- Remove nuts -arrows- and loosen (do not remove) nut -4-.
- Detach bracket and move control unit for NOx sender 2 - J881-clear.



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⚠ CAUTION

Risk of injury caused by soot particles in the air.
Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Unscrew NOx sender 2 - G687- -item 2- using a tool from Lambda probe open ring spanner set - 3337- .

Installing

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

- When reusing probe, coat thread with high-temperature paste
⇒ Electronic parts catalogue .
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

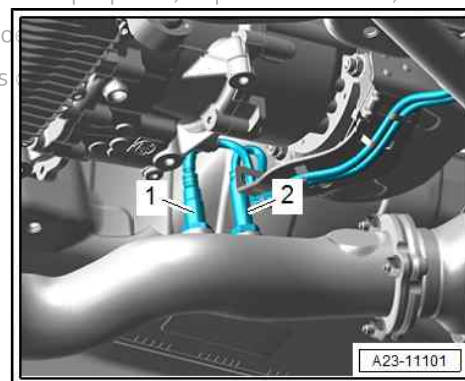
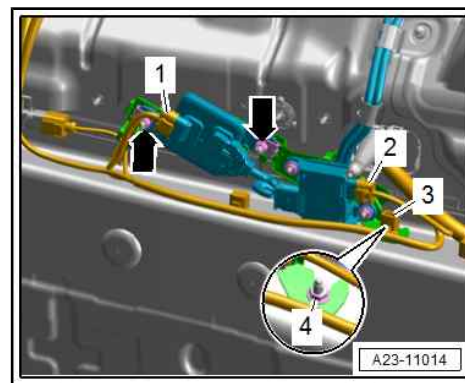
Tightening torques

- ◆ ⇒ Fig. [“Bracket with NOx sender 2 -G687- / particulate sensor -G784- - tightening torque”](#) , page 168
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim

8.4 Removing and installing particulate sensor - G784-

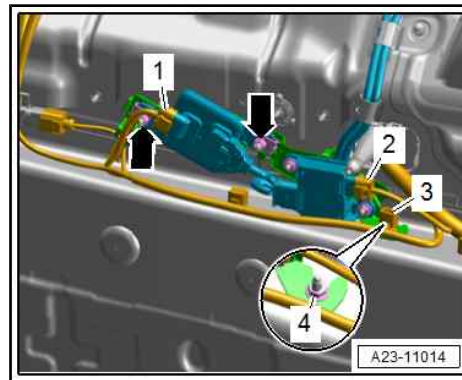
Removing

- Re-install all cable ties in original positions.
- Unfasten underbody trim (left-side) and lower it slightly ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing underbody trim .

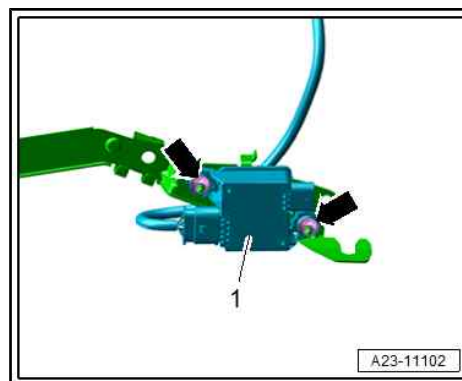




- Unplug electrical connectors -1, 2-.
- Pull clip -3- off stud.
- Remove nuts -arrows- and loosen (do not remove) nut -4-.
- Detach bracket.



- Remove nuts -arrows-, detach particulate sensor - G784- from bracket and move sensor clear.



CAUTION

Risk of injury caused by soot particles in the air.
Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

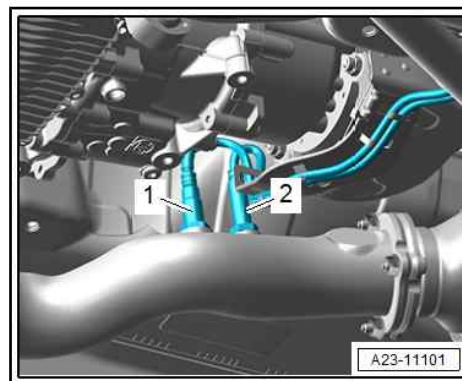
- Unscrew particulate sensor - G784- -item 1-.

Installing

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

Tightening torques

- ◆ ⇒ [Fig. "" Particulate sensor -G784- - tightening torque"" , page 168](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim



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9 Engine control unit

⇒ "9.1 Exploded view - engine control unit", page 173

⇒ "9.2 Removing and installing engine control unit J623 ",
page 173

9.1 Exploded view - engine control unit

1 - Suspension turret

2 - Mounting

- ❑ For engine control unit - J623-

3 - Engine control unit - J623-

- ❑ After renewing component, perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes
- ❑ Removing and installing ⇒ [page 173](#)

4 - Bolt

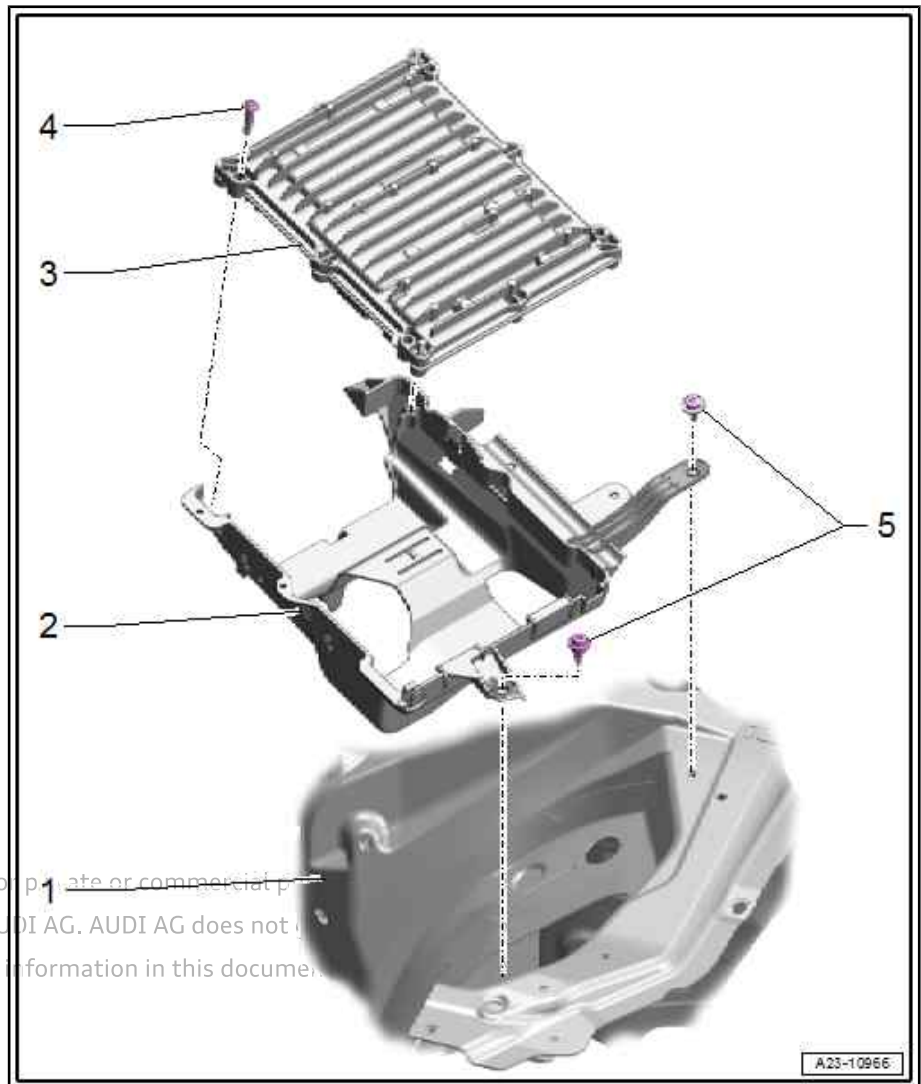
- ❑ 4.5 Nm

5 - Bolts

- ❑ 9 Nm



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9.2 Removing and installing engine control unit - J623-

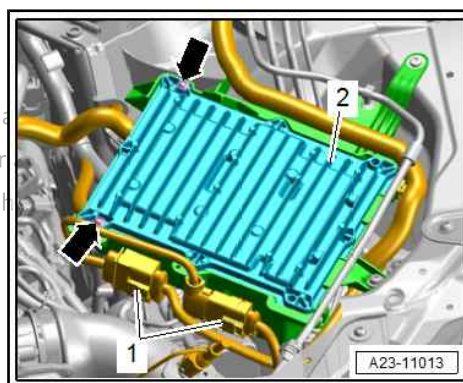
Removing

- If the engine control unit - J623- is renewed, the adaption values must be read out and stored before the engine control unit - J623- is removed.
- Connect ⇒ Vehicle diagnostic tester.
- Select **Diagnosis** mode and then **Start diagnosis**.
- Choose **Select own test** tab and select following options one after the other:



- ◆ Drive train
- ◆ Select engine code and engine
- ◆ 0001 - Self-diagnosis compatible systems
- ◆ 0001 - Engine electronics
- ◆ 0001 - Engine electronics, functions
- ◆ 0001 - Replace, further operations
- Switch off ignition and remove ignition key after storing electronic file containing adaption values.
- If the adaption values of the injectors cannot be read out of the old (defective) engine control unit, the adaption values must be entered into the new engine control unit manually and the adaption procedure must be performed accordingly.
- Remove bolts -arrows- and take out engine control unit - J623-
-item 2-.

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- Unplug electrical connectors -arrows- and remove engine control unit - J623- .

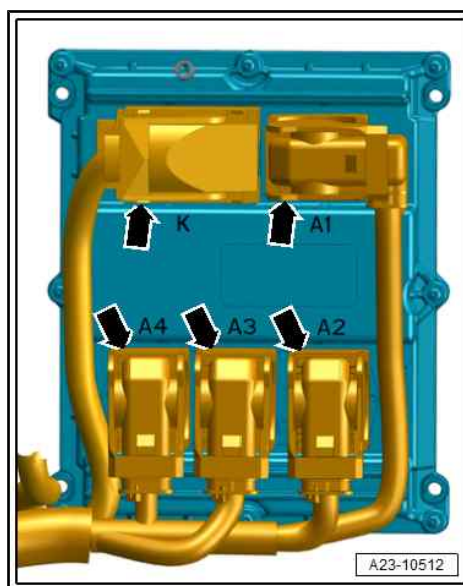
Installing

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

- If engine control unit has been renewed, perform function 0001 - Replace, further operations in Guided Functions mode of ⇒ Vehicle diagnostic tester.

Tightening torques

- ◆ ⇒ ["9.1 Exploded view - engine control unit", page 173](#)





26 – Exhaust system

1 Exhaust pipes/silencers

- ⇒ [“1.1 Exploded view - silencers”, page 175](#)
- ⇒ [“1.2 Removing and installing front exhaust pipe”, page 176](#)
- ⇒ [“1.3 Separating exhaust pipes/silencers”, page 178](#)
- ⇒ [“1.4 Removing and installing silencer”, page 179](#)
- ⇒ [“1.5 Stress-free alignment of exhaust system”, page 180](#)
- ⇒ [“1.6 Checking exhaust system for leaks”, page 181](#)

1.1 Exploded view - silencers

1 - Rear silencer

- ☐ Removing and installing
⇒ [page 179](#)

- ☐ Combined as one unit
with centre silencer as
original equipment

- ☐ Centre silencer and rear
silencer can be renewed
separately

- ☐ Cutting point
⇒ [page 178](#)

- ☐ Align exhaust system so
it is free of stress
⇒ [page 180](#)

2 - Clamp (front)

- ☐ Before tightening, align
exhaust system so it is
free of stress
⇒ [page 180](#)

- ☐ Installation position
⇒ [page 176](#)

- ☐ Tighten bolted connec-
tions evenly to 23 Nm

3 - Centre silencer

- ☐ Removing and installing
⇒ [page 179](#)

- ☐ Combined as one unit
with rear silencer as
original equipment

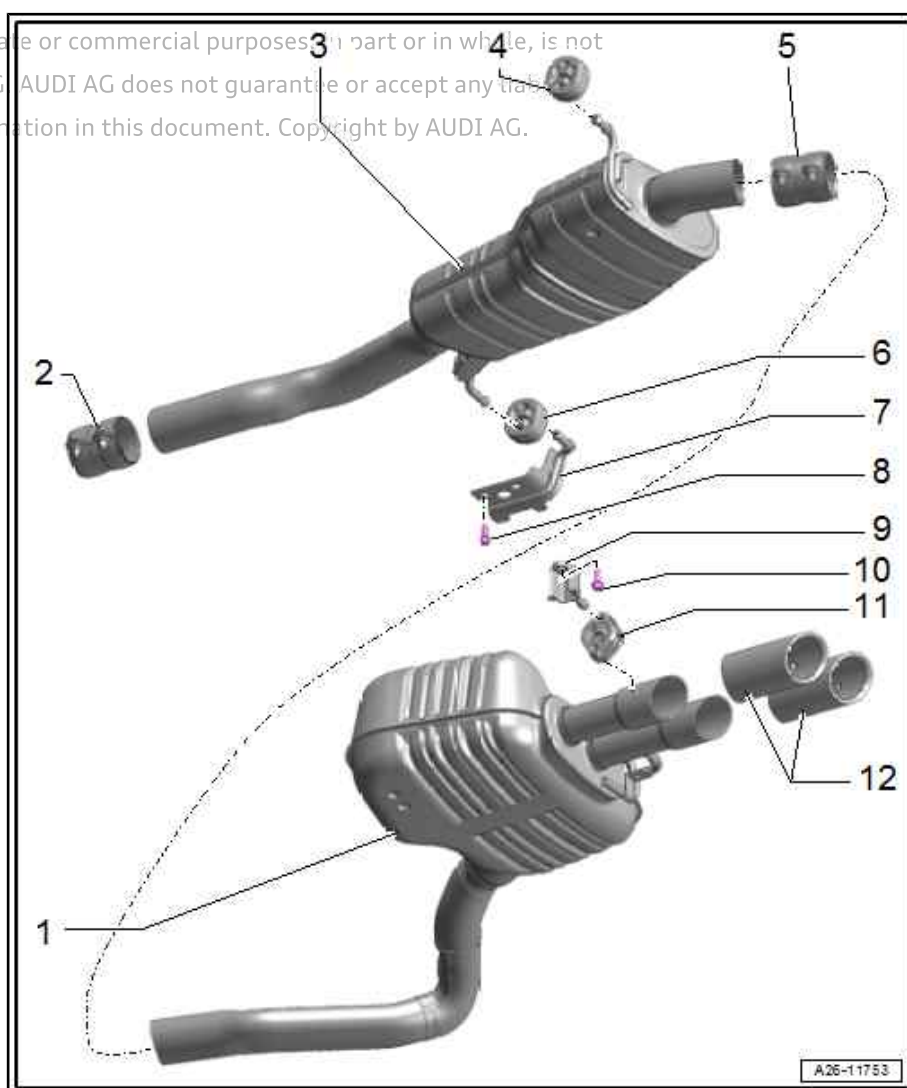
- ☐ Centre silencer and rear
silencer can be renewed
separately

- ☐ Cutting point
⇒ [page 178](#)

- ☐ Align exhaust system so
it is free of stress ⇒ [page 180](#)

4 - Mounting

- ☐ Renew if damaged
- ☐ Align exhaust system so it is free of stress ⇒ [page 180](#)





5 - Clamp (rear)

- ☐ For renewing centre and rear silencers separately
- ☐ Before tightening, align exhaust system so it is free of stress ⇒ [page 180](#)
- ☐ Installation position ⇒ [page 176](#)
- ☐ Tighten bolted connections evenly to 23 Nm

6 - Mounting

- ☐ Renew if damaged
- ☐ Align exhaust system so it is free of stress ⇒ [page 180](#)

7 - Bracket

- ☐ For rubber mounting

8 - Bolt

- ☐ 20 Nm

9 - Bracket

- ☐ For rubber mounting

10 - Bolt

- ☐ 20 Nm

11 - Mounting

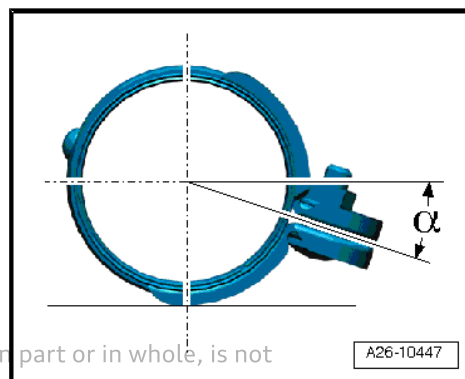
- ☐ Renew if damaged
- ☐ Align exhaust system so it is free of stress ⇒ [page 180](#)

12 - Trim

- ☐ For tailpipes

Clamps - installation position

- Fit clamp in position shown.
- Angle α = approx. 20°
- Bolted connections face outwards.

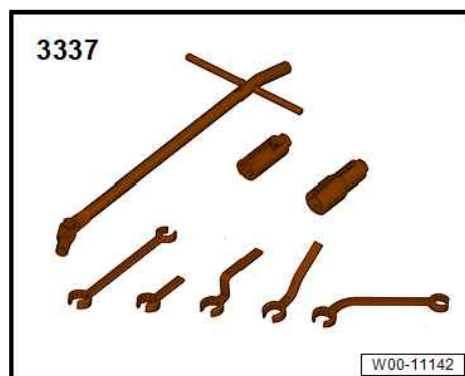


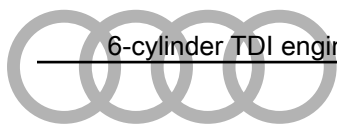
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1.2 Removing and installing front exhaust pipe

Special tools and workshop equipment required

- ♦ Lambda probe open ring spanner set - 3337-



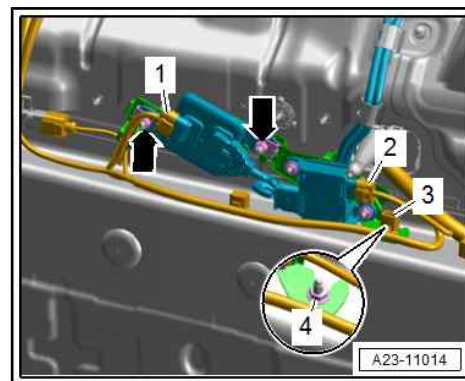


Removing

Remove noise insulation (rear) ➤ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

Unfasten underbody trim (left-side) and lower it slightly ➤ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing underbody trim .

- Unplug electrical connectors -1, 2- and move them clear.
- Pull clip -3- off stud.
- Remove nuts -arrows- and loosen (do not remove) nut -4-.
- Tie bracket with control unit for NOx sender 2 - J881- to front exhaust pipe.

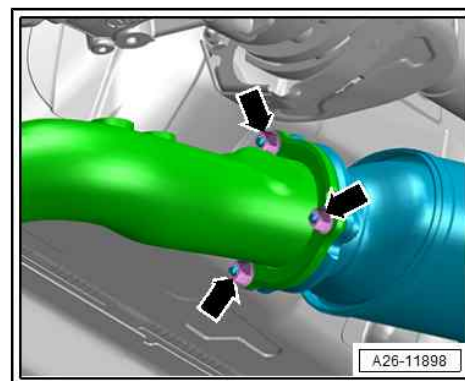


⚠ CAUTION

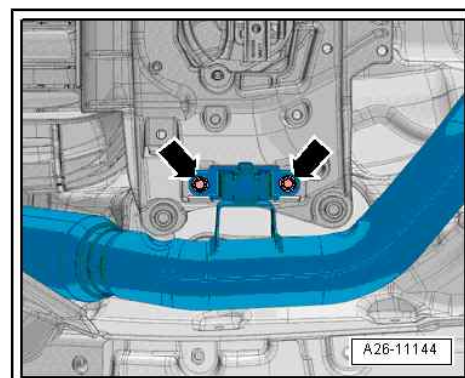
Risk of injury caused by soot particles in the air.
Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Remove nuts -arrows-.



- Remove bolts -arrows-.





NOTICE

Risk of damage to flexible joint if handled incorrectly.

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

– Remove bolt -2- and nuts -1-.

– Detach front exhaust pipe.

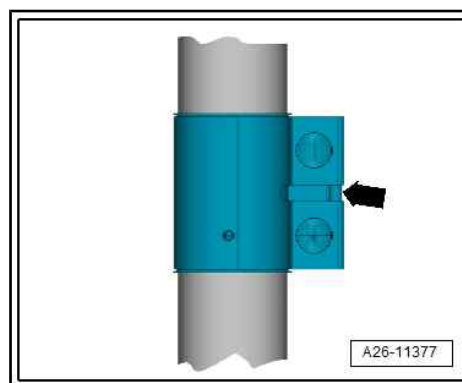
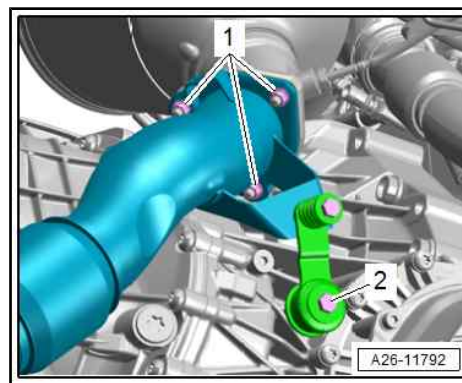
Installing

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 ⇒ [page 180](#) .
- Wrap tape around connection ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Exploded view - emission control system .
- Slide clamp -arrow- as far as possible onto trap catalytic converter and tighten, paying attention to aluminium foil/glass cloth tape.

Tightening torques

- ◆ ⇒ [“2.1 Exploded view - emission control system”, page 182](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim

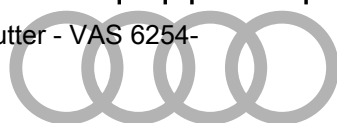


1.3 Separating exhaust pipes/silencers

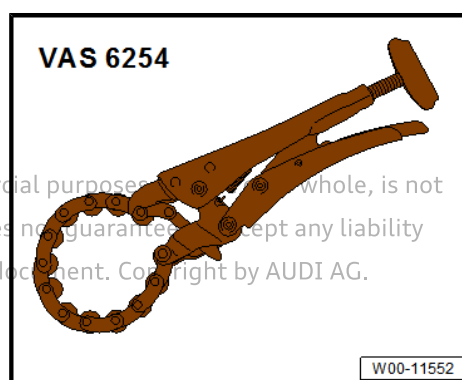
- ◆ The connecting pipe can be cut through at the cutting point in order to renew the centre or rear silencer separately.
- ◆ The cutting point is marked by an indentation on the circumference of the exhaust pipe.

Special tools and workshop equipment required

- ◆ Chain pipe cutter - VAS 6254-



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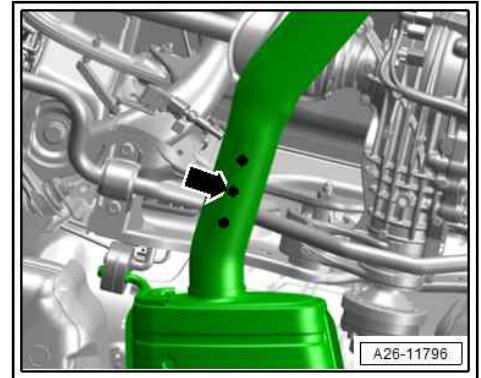
Procedure

⚠ CAUTION

Risk of injury caused by soot particles in the air.
Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

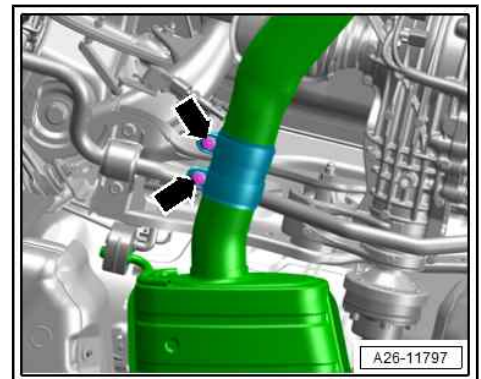
- Cut through exhaust pipes at a right angle at cutting point -arrow- using chain pipe cutter - VAS 6254- .



- Position centre of clamp over cutting point ⇒ [page 176](#) and tighten nuts -arrows-.
- Align the exhaust system so it is free of stress ⇒ [page 180](#) .

Tightening torques

- ◆ ⇒ ["1.1 Exploded view - silencers", page 175](#)



1.4 Removing and installing silencer

Removing

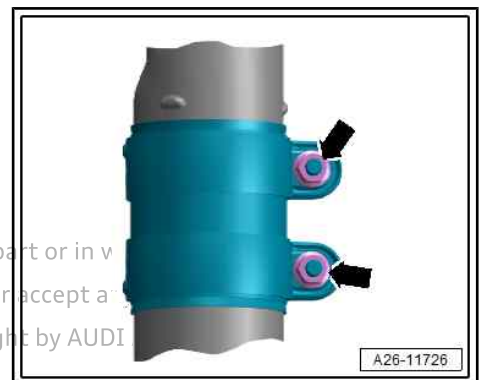
- Depending on equipment version: Remove diagonal strut (left-side) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing underbody trim .

⚠ CAUTION

Risk of injury caused by soot particles in the air.
Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Loosen clamp -arrows- and push towards rear.
- Lower front exhaust pipe slightly and detach clamp.
- Tie up front exhaust pipe.





⚠ CAUTION

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-.

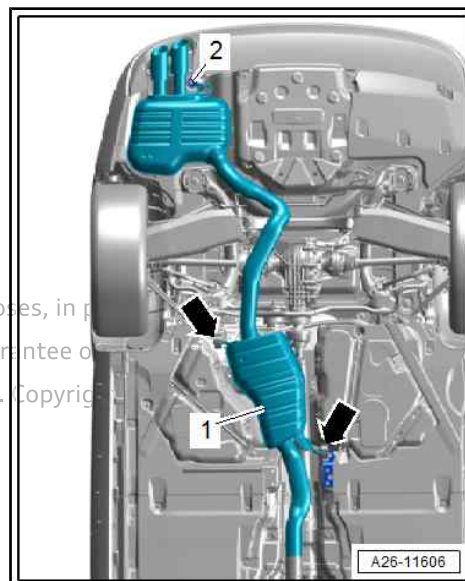
Installing

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

- Align the exhaust system so it is free of stress ⇒ [page 180](#) .

Tightening torques

- ♦ ⇒ “1.1 Exploded view - silencers”, [page 175](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim



1.5 Stress-free alignment of exhaust system

Procedure

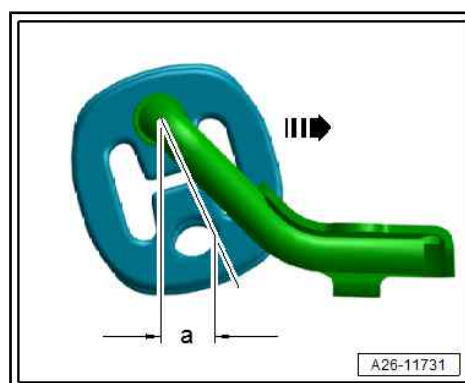
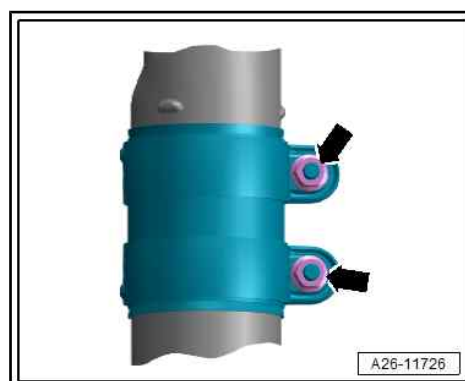
- The exhaust system must be aligned when it is cool.

⚠ CAUTION

Risk of injury caused by soot particles in the air.

Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.
- Loosen clamp -arrows- and push towards rear.
- 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 176](#) and tighten bolted connections evenly.

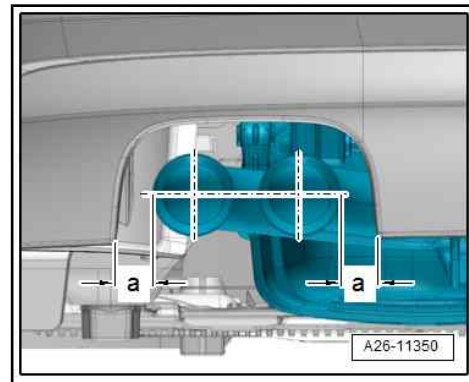




- Check clearance between tailpipes and bumper:
- Distance -a- is the same on both sides.

Tightening torques

- ◆ ⇒ [“1.1 Exploded view - silencers”, page 175](#)



1.6 Checking exhaust system for leaks

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; 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 182**

⇒ **"2.2 Removing and installing emission control module", page 182**

⇒ **"2.3 Removing and installing trap catalytic converter", page 185**

⇒ **"2.4 Removing and installing exhaust flap control unit J883 ", page 185**

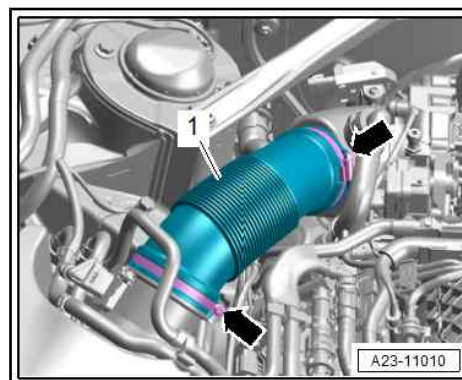
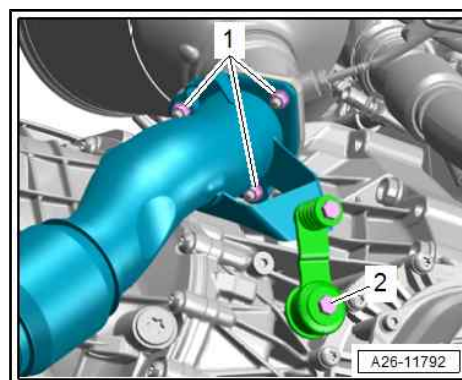
2.1 Exploded view - emission control system

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Exploded view - emission control system .

2.2 Removing and installing emission control module

Removing

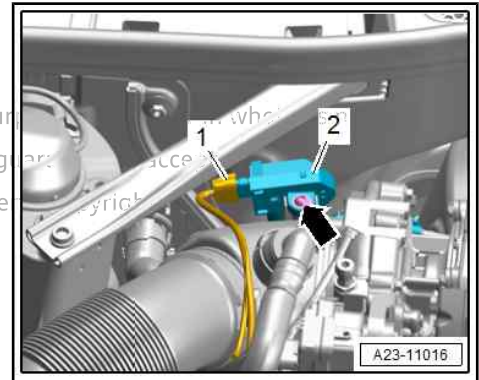
- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove nuts -1-.
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Release hose clips -arrows- and detach air pipe -1-.



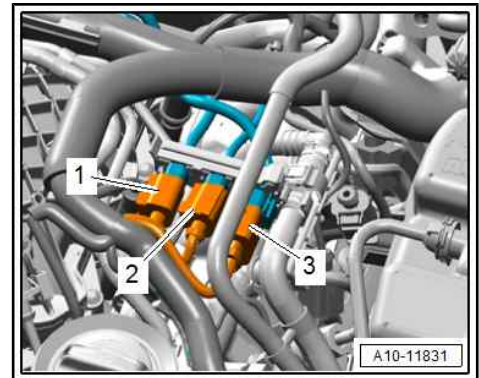


- Remove bolt -arrow-.
- Unplug electrical connector -1-.
- Move bracket -2- with pressure differential sender - G505- clear.

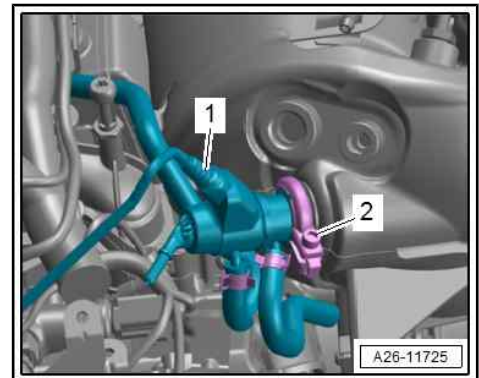
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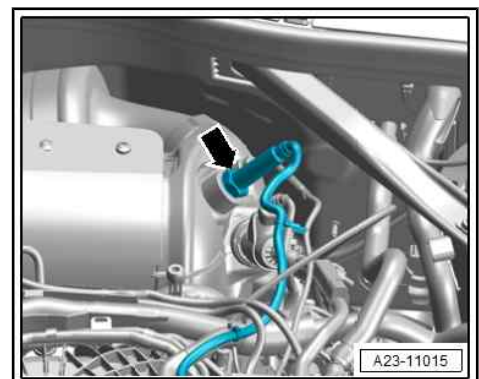
- Detach electrical connectors -1, 2, 3- from bracket, unplug connectors and move electrical wiring clear.



- Unscrew bolt -2- and loosen retaining clip.
- Detach injector for reducing agent - N474- -item 1- and place to one side.

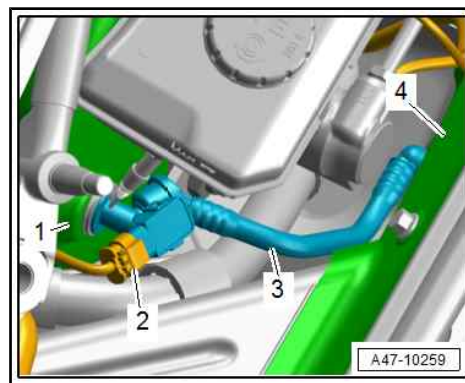


- Unscrew NOx sender - G295- -arrow- using a tool from Lambda probe open ring spanner set - 3337- .

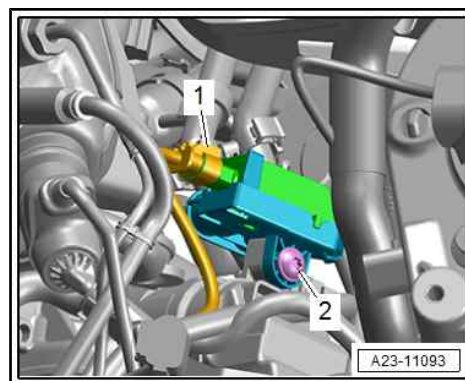




- Unplug electrical connector -2- for vacuum sender - G608- .
- Carefully pull vacuum line -3- off plenum chamber partition panel -4- and brake servo -1-.



- Unplug electrical connector -1-.
- Remove bolt -2- and move pressure differential sender 2 - G524- clear to one side.



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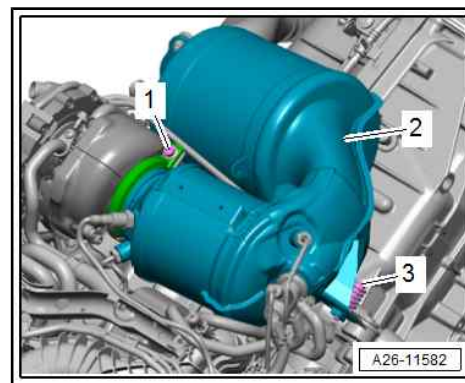


- Remove bolt -3- on bracket.
- Open screw-type clip -1- and place it on intake funnel of emission control module.
- Remove emission control module -2- (pay attention to brake servo pressure sensor - G294-).

Installing

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

- Renew gaskets and self-locking nuts after removal.
- Dirt screen ⇒ [Item 12 \(page 194\)](#) must be renewed if emission control module was renewed.
- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install injector for reducing agent - N474- ⇒ [page 190](#) .
- After renewing component, perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions .



Tightening torques

- ◆ ⇒ [“1.1 Exploded view - silencers”, page 175](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Exploded view - emission control system
- ◆ ⇒ [Fig. ““Bracket with pressure differential sender -G505- - tightening torque””, page 168](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

2.3 Removing and installing trap catalytic converter

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system ; Removing and installing trap catalytic converter.

2.4 Removing and installing exhaust flap control unit - J883-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Removing and installing exhaust flap control unit - J883- .



3 SCR (selective catalytic reduction) system

⇒ ["3.1 Exploded view - reducing agent tank", page 186](#)

⇒ ["3.2 Exploded view - reducing agent supply line", page 187](#)

⇒ ["3.3 Releasing pressure in SCR system", page 188](#)

⇒ ["3.4 Draining reducing agent tank", page 188](#)

⇒ ["3.5 Removing and installing reducing agent tank", page 188](#)

⇒ ["3.6 Removing and installing injector for reducing agent N474", page 190](#)

⇒ ["3.7 Removing and installing control unit for reducing agent metering system J880", page 190](#)

⇒ ["3.8 Removing and installing reducing agent quality sensor G849", page 191](#)

3.1 Exploded view - reducing agent tank

1 - Bolt

- 2 Nm

2 - Reducing agent quality sensor - G849-

- Depending on version
- Removing and installing ⇒ [page 191](#)
- After renewing component or draining reducing agent (opening a reducing agent line), perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions

3 - Seal

- Renew after removing

4 - Reducing agent tank

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

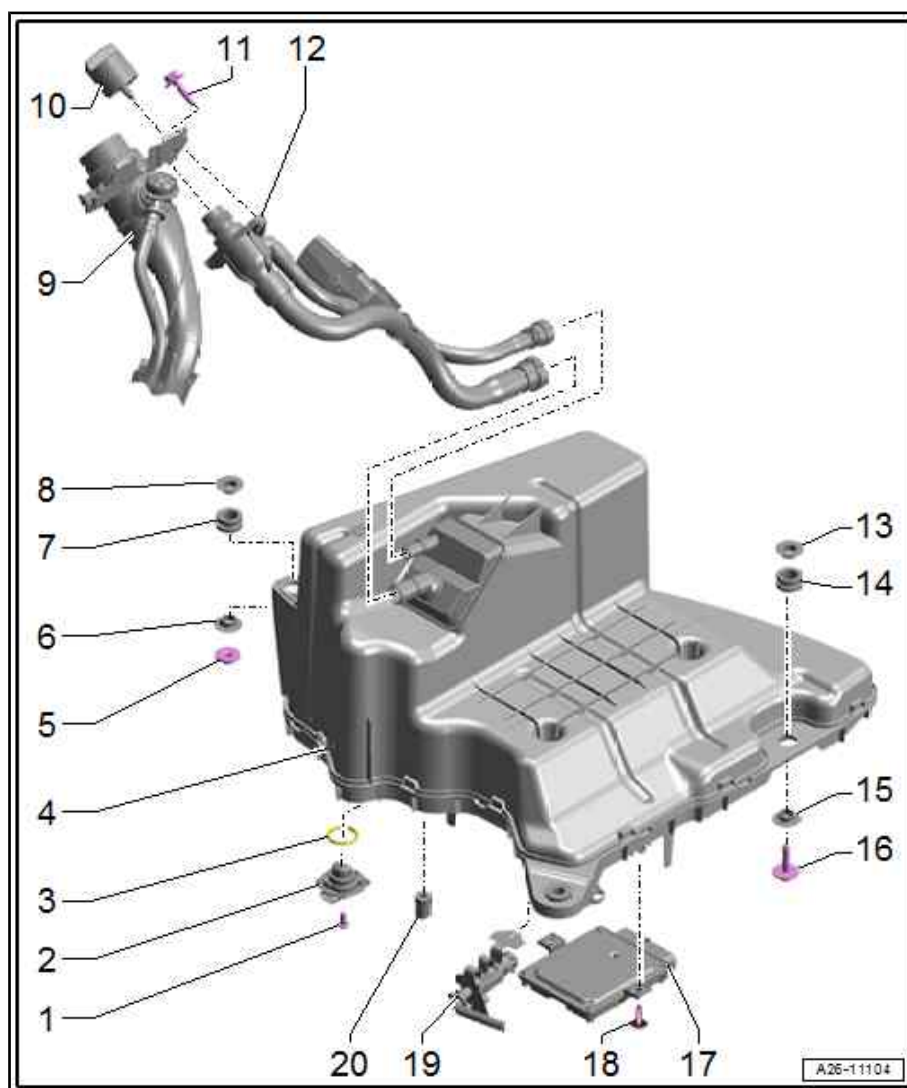
◆ Filter

◆ Tank sender for reducing agent - G684-

◆ Temperature sender for reducing agent - G685-

◆ Pressure sender for reducing agent metering system - G686-

◆ Pump for reducing agent - V437-





- ◆ Heater for reducing agent tank - Z102-
- ◆ Heater 2 for reducing agent tank (heater circuit 3) - Z167-
 - ☐ Fitting location: on rear right under underbody
 - ☐ Draining ⇒ [page 188](#)
 - ☐ Removing and installing ⇒ [page 188](#)
 - ☐ After renewing component or draining reducing agent (opening a reducing agent line), perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions

5 - Nut

- ☐ 20 Nm

6 - Spacer sleeve

7 - Grommet

8 - Spacer sleeve

9 - Filler neck

- ☐ For fuel tank

10 - Filler cap

- ☐ For filler neck for reducing agent tank

11 - Bolt

- ☐ 8 Nm

12 - Filler neck

- ☐ For reducing agent tank

13 - Spacer sleeve

14 - Grommet

15 - Spacer sleeve

16 - Bolt

- ☐ 20 Nm

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

- ☐ Checking ⇒ Vehicle diagnostic tester
- ☐ Removing and installing ⇒ [page 190](#)
- ☐ After renewing component or draining reducing agent (opening a reducing agent line), perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions

18 - Bolt

- ☐ 3 Nm

19 - SCR supply line

20 - Sealing plug

- ☐ For drain pipe



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3.2 Exploded view - reducing agent supply line

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .



3.3 Releasing pressure in SCR system

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Releasing pressure in SCR system .

3.4 Draining reducing agent tank

Procedure

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



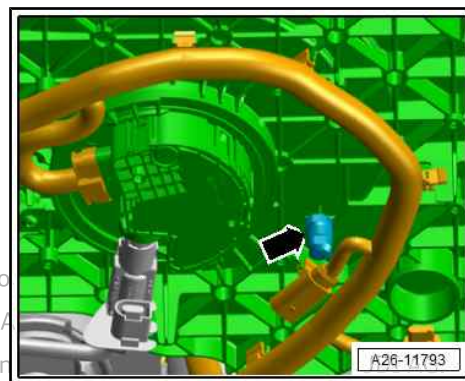
- Place drip tray underneath.
- Press release tab and remove sealing plug -arrow-.
- Allow reducing agent to drain off into drip tray.

Assembling

Assembly is performed in reverse sequence; note the following:

- Seal off drain pipe with sealing plug.

After renewing component or draining reducing agent (opening a reducing agent line), perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions .



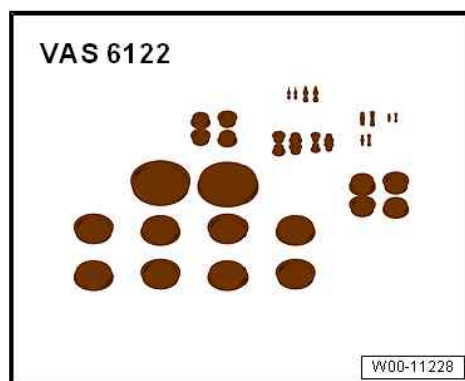
Tightening torques

- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim

3.5 Removing and installing reducing agent tank

Special tools and workshop equipment required

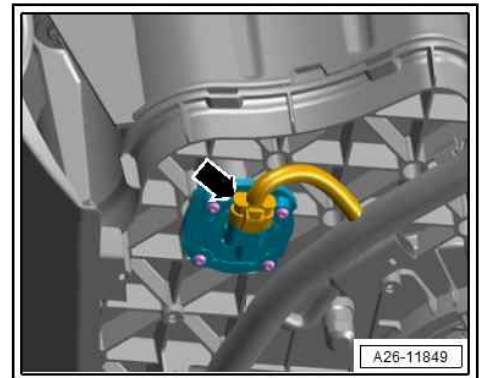
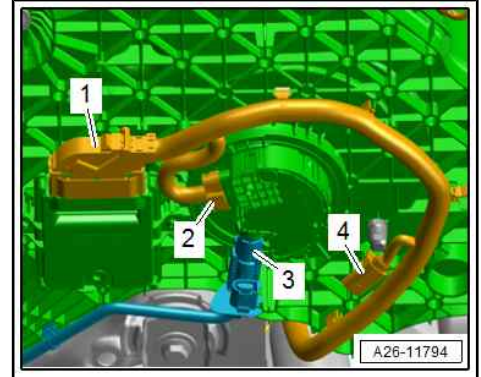
- ♦ Engine bung set - VAS 6122-





Removing

- Drain reducing agent tank ➔ [page 188](#) .
- Detach rear section of rear right wheel housing liner ➔ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (rear) .
- Disconnect SCR supply line -3- and move it clear ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .
- Detach electrical connector -4- from bracket.
- Unplug electrical connectors -1, 2- and move electrical wiring harness clear.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .
- Vehicles with reducing agent quality sensor - G849- : Unplug electrical connector -arrow-.

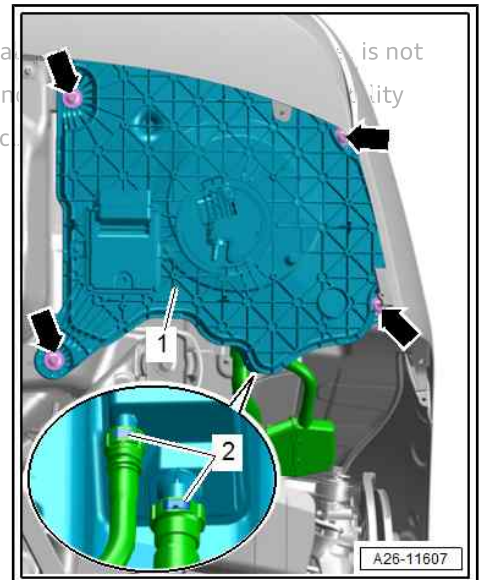


- Reducing agent tank must be empty when it is removed.
- Unscrew connections -arrows-.
- Lower reducing agent tank -1- slightly.
- Press release tabs on both sides and disconnect hoses -2-.
- Detach reducing agent tank.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine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

Installing

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

- Connect SCR supply line ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Exploded view - reducing agent supply line .
- Check that lines are clipped onto reducing agent tank.
- Electrical connections and routing ➔ Current flow diagrams, Electrical fault finding and Fitting locations.





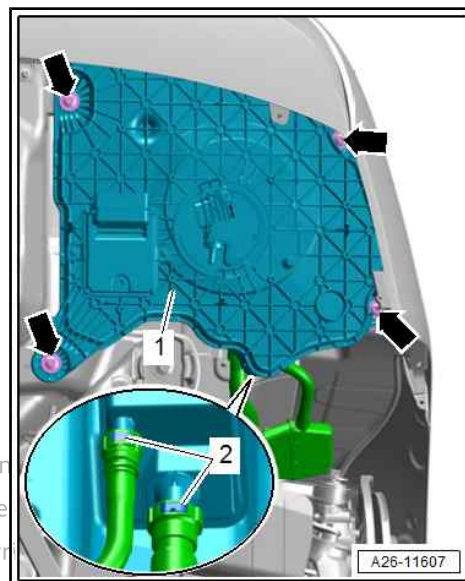
- Fit bolts -arrows-, then slide reducing agent tank towards rear of vehicle (with bolts in bolt holes) and finally tighten bolts.

After renewing component or draining reducing agent (opening a reducing agent line), perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - reducing agent tank”, page 186](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (rear)

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3.6 Removing and installing injector for reducing agent - N474-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; SCR (selective catalytic reduction) system; Removing and installing injector for reducing agent - N474- .

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

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

Removing

- Switch off ignition.
- Remove underbody trim (rear right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim .
- Remove bolts -arrows- and detach control unit for reducing agent metering system - J880- -item 1-.
- Unplug electrical connector -2-.

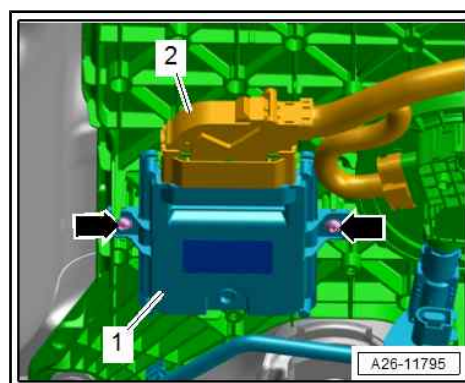
Installing

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

After renewing component or draining reducing agent (opening a reducing agent line), perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - reducing agent tank”, page 186](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Exploded view - underbody trim





3.8 Removing and installing reducing agent quality sensor - G849-

Removing

- Drain reducing agent tank ⇒ [page 188](#) .
- Unplug electrical connector -1-.
- Unscrew bolts -arrows- and detach reducing agent quality sensor - G849- .

Installing

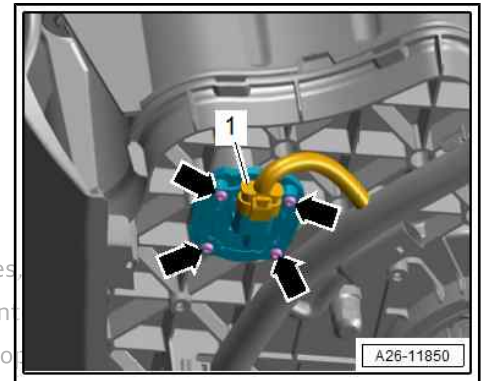
Installation is carried out in reverse order; note the following:

- Renew seal after removing.

After renewing component or draining reducing agent (opening a reducing agent line), perform required adaptations using ⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair instructions .

Tightening torques

- ◆ ⇒ [“3.1 Exploded view - reducing agent tank”, page 186](#)





4 Exhaust gas temperature control

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control .



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5 Exhaust gas recirculation

⇒ [“5.1 Exploded view - exhaust gas recirculation system”, page 193](#)

⇒ [“5.2 Removing and installing exhaust gas recirculation cooler”, page 195](#)

⇒ [“5.3 Removing and installing exhaust gas recirculation control motor 2 V339”, page 197](#)

⇒ [“5.4 Removing and installing exhaust gas recirculation temperature sensor G98”, page 198](#)

5.1 Exploded view - exhaust gas recirculation system

⇒ [“5.1.1 Exploded view - exhaust gas recirculation system, engine side \(front\)”, page 193](#)

⇒ [“5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side \(rear\)”, page 193](#)

5.1.1 Exploded view - exhaust gas recirculation system, engine side (front)

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation system .

5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side (rear)



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1 - Hoses

- ☐ To pressure differential sender 2 - G524-

2 - Pressure differential sender 2 - G524-

- ☐ Removing and installing
⇒ [page 164](#)

3 - Bracket

- ☐ For pressure differential sender 2 - G524-

4 - Bolt

- ☐ 9 Nm

5 - Nut

- ☐ 9 Nm

6 - Connection

7 - Hose

- ☐ For exhaust gas recirculation

8 - Bolt

- ☐ 9 Nm

9 - Seal

- ☐ Renew after removing

10 - Exhaust gas recirculation valve 2 - GX6-

- ☐ Removing and installing
⇒ [page 197](#)

11 - Seal

- ☐ Renew after removing
- ☐ On some vehicle versions, seal and dirt screen -12- are a single component

12 - Dirt screen

- ☐ Renew after removing
- ☐ On some vehicle versions, seal -11- and dirt screen are a single component
- ☐ Dirt screen must be renewed if emission control module was renewed

13 - Exhaust gas recirculation cooler (rear)

- ☐ Removing and installing ⇒ [page 195](#)

14 - Bolt

- ☐ 20 Nm

15 - Resonator

16 - Bolt

- ☐ 9 Nm

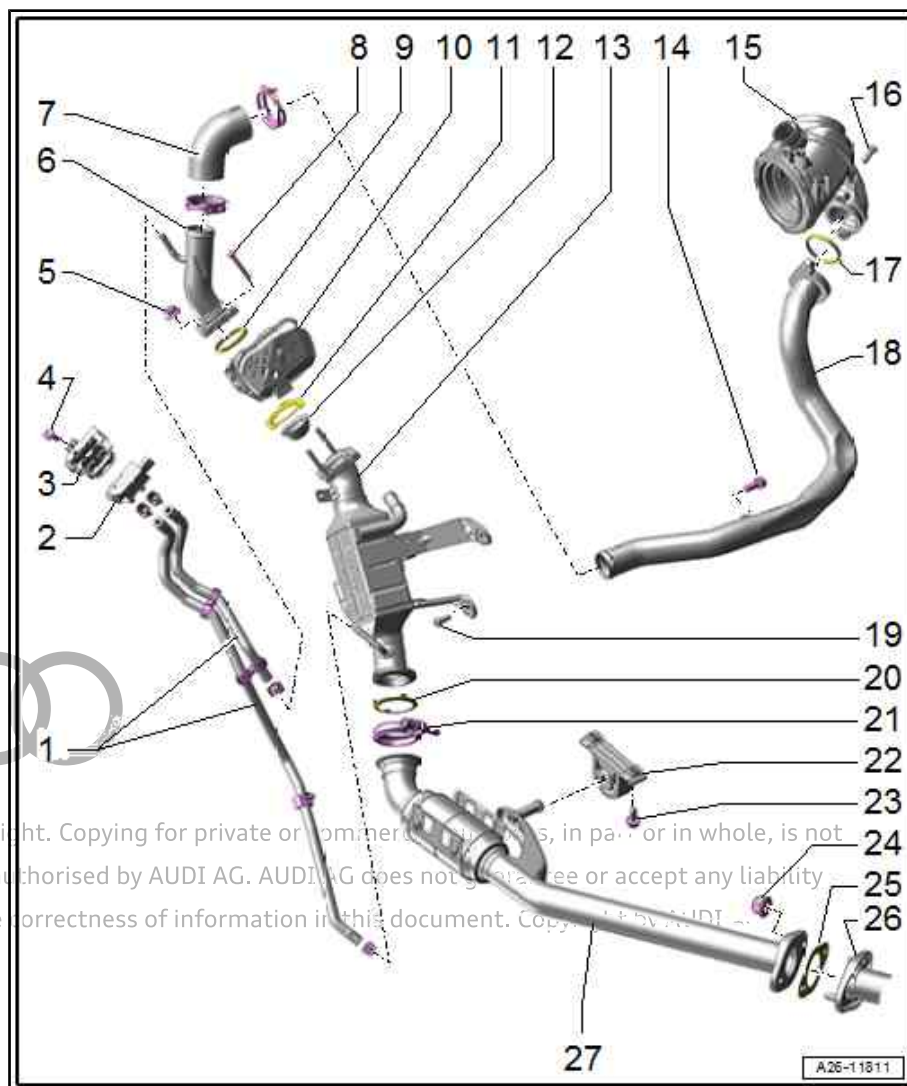
17 - Seal

- ☐ Renew after removing

18 - Exhaust gas recirculation pipe

19 - Bolt

- ☐ 9 Nm





20 - Seal

- ☐ Renew after removing

21 - Screw-type clip

- ☐ Renew after removing
- ☐ 15 Nm

22 - Mounting

- ☐ Renew if damaged

23 - Bolt

- ☐ 23 Nm

24 - Nut

- ☐ Renew after removing
- ☐ 25 Nm

25 - Gasket

- ☐ Renew after removing

26 - Trap catalytic converter

- ☐ Removing and installing ⇒ [page 185](#)

27 - Exhaust gas recirculation pipe

- ☐ With flexible joint

5.2 Removing and installing exhaust gas recirculation cooler

⇒ ["5.2.1 Removing and installing exhaust gas recirculation cooler \(front\)", page 195](#)

⇒ ["5.2.2 Removing and installing exhaust gas recirculation cooler \(rear\)", page 195](#)

5.2.1 Removing and installing exhaust gas recirculation cooler (front)

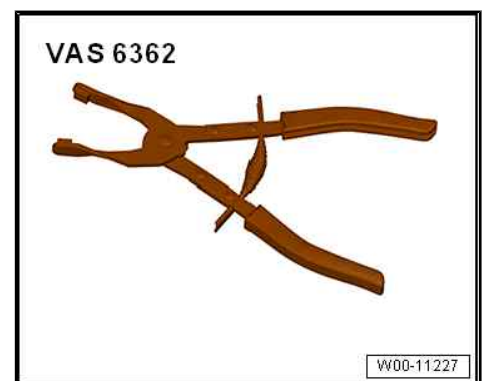
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All procedures are described in ⇒ Servicing 6-cylinder TDI engine common rail; Rep. gr. 26 : Exhaust gas recirculation: Removing and installing exhaust gas recirculation cooler .

5.2.2 Removing and installing exhaust gas recirculation cooler (rear)

Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



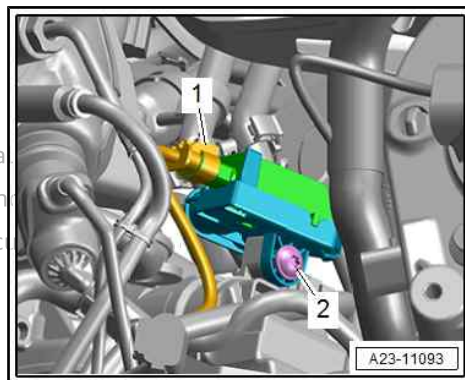


- ◆ Socket Torx T30 - T10405-



Removing

- Remove engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Unplug electrical connector -1-.
- Remove bolt -2- and move pressure differential sender 2 - G524- clear.
- Drain coolant ⇒ [page 75](#) .
- Remove subframe shield (left-side) ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe shield

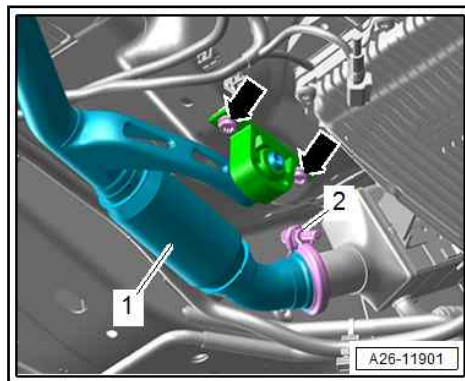
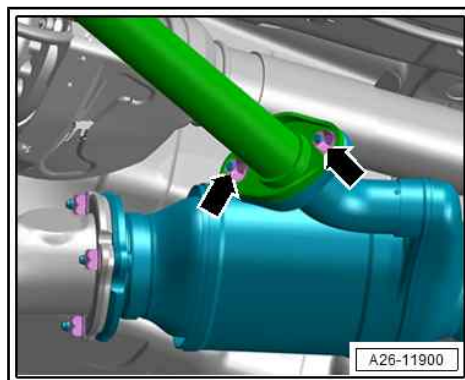


⚠ CAUTION

Risk of injury caused by soot particles in the air.
Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Remove nuts -arrows-.
- Loosen screw-type clip -2-.
- Remove bolts -arrows- and detach exhaust pipe -1-.
- Remove tunnel cross member and lower gearbox ⇒ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings .



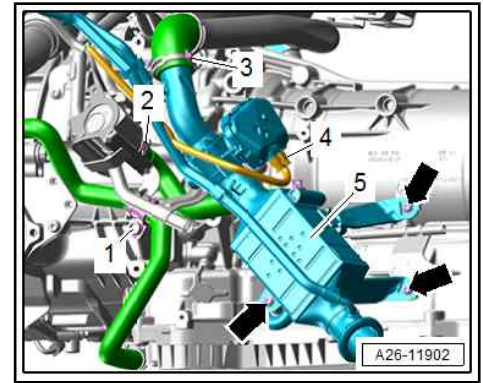


- Release hose clip -3- at hose for exhaust gas recirculation.
- Remove bolt -1- from retaining clip.
- Release hose clip -2- and detach coolant hose from coolant circulation pump - V50- .
- Unplug electrical connector -4- and move electrical wire clear.
- Remove bolts -arrows- and detach exhaust gas recirculation cooler (rear) -5-.

Installing

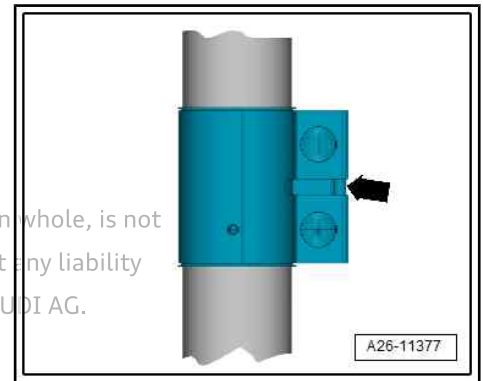
Installation is carried out in reverse order; note the following:

- Renew seals and O-rings after removal.
- Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .
- Do not reuse coolant.
- Wrap tape around connection ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Emission control system; Exploded view - emission control system .
- Slide clamp -arrow- as far as possible onto trap catalytic converter and tighten, paying attention to aluminium foil/glass cloth tape.
- Fill up with coolant ⇒ [page 75](#) .
- Install engine cover panel ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel



Tightening torques

- ◆ ⇒ [“5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side \(rear\)”, page 193](#)
- ◆ ⇒ [“1.1 Exploded view - turbocharger”, page 121](#)
- ◆ ⇒ Gearbox; Rep. gr. 37 ; Assembly mountings; Exploded view - assembly mountings
- ◆ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe



5.3 Removing and installing exhaust gas recirculation control motor 2 - V339-

Designation in current flow diagram: exhaust gas recirculation valve 2 - GX6-

Removing

- Remove exhaust gas recirculation cooler (rear) ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Removing and installing exhaust gas recirculation cooler .



⚠ CAUTION

Risk of injury caused by soot particles in the air.

Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Unscrew bolt -2- and nuts -arrows- and detach exhaust gas recirculation valve 2 - GX6- -item 1-.

Installing

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

- Renew seals and O-rings after removal.
- Clean and insert dirt screen ⇒ [Item 12 \(page 194\)](#) .
- Install exhaust gas recirculation cooler (rear) ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Removing and installing exhaust gas recirculation cooler .

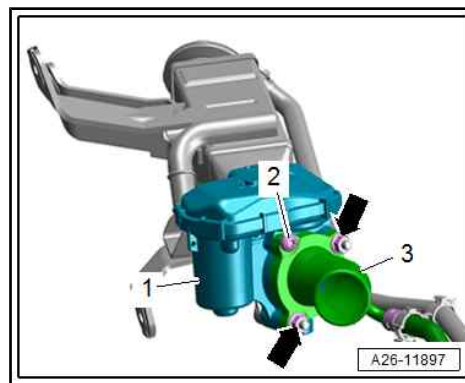
After renewing component, perform required adaptations using
⇒ Vehicle diagnostic tester ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes .

Tightening torques

- ♦ ⇒ [“5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side \(rear\)”](#), page 193

5.4 Removing and installing exhaust gas recirculation temperature sensor - G98-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Removing and installing exhaust gas recirculation temperature sensor - G98- .



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6 Exhaust manifolds

⇒ [“6.1 Exploded view - exhaust manifold”, page 199](#)

⇒ [“6.2 Removing and installing exhaust manifolds”, page 199](#)

6.1 Exploded view - exhaust manifold

All components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifolds; Exploded view - exhaust manifold .

6.2 Removing and installing exhaust manifolds

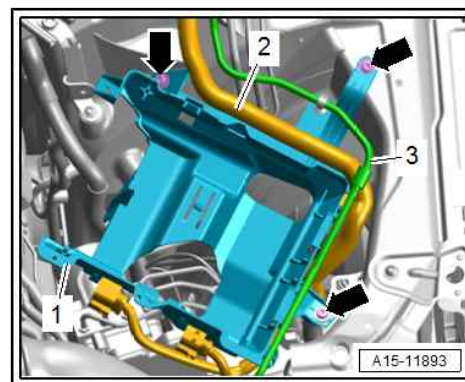
⇒ [“6.2.1 Removing and installing exhaust manifold \(left-side\)”, page 199](#)

⇒ [“6.2.2 Removing and installing exhaust manifold \(right-side\)”, page 201](#)

6.2.1 Removing and installing exhaust manifold (left-side)

Removing

- Remove front wheel (left-side) ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove emission control module ⇒ [page 182](#) .
- Remove poly V-belt from air conditioner compressor pulley ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .
- 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 .
- Unbolt electric compressor, move it towards front and secure it (bracket for air conditioner compressor remains installed) ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger ; Removing and installing electric compressor.
- Detach engine control unit - J623- from bracket and move aside ⇒ [page 173](#) .
- Move coolant line -3- and electrical wiring harness clear.
- Remove bolts -arrows- and detach bracket -1- for engine control unit.

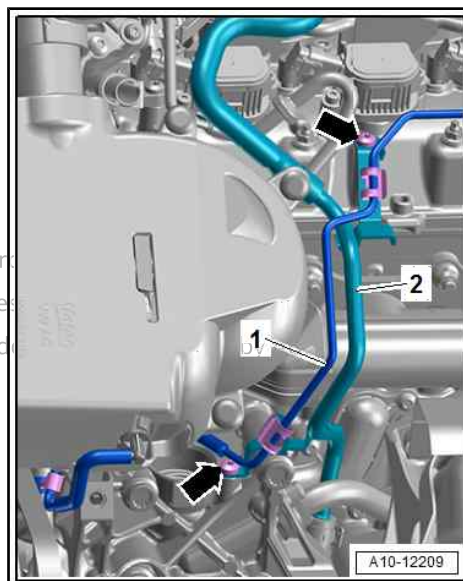




- Remove bolts -arrows- for vacuum line -2-.



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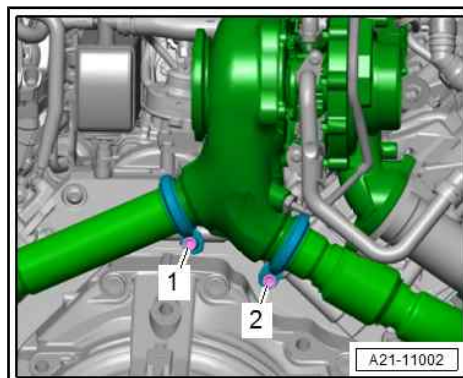
CAUTION

Risk of injury caused by soot particles in the air.

Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Release clip -1- and slide it onto intake funnel of turbocharger.

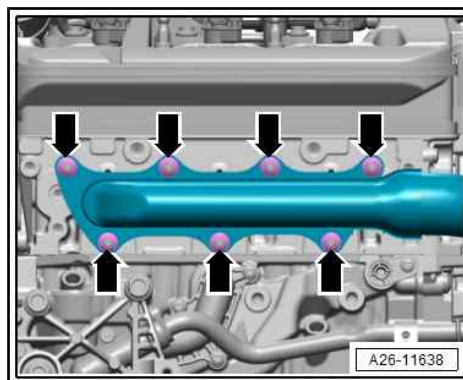


- Remove nuts -arrows- and detach exhaust manifold towards rear.

Installing

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

- Renew gaskets, seals, self-locking nuts and screw-type clip after removal.
- Install electric compressor ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger ; Removing and installing electric compressor.
- Install emission control module ⇒ [page 182](#) .
- Install poly V-belt ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing poly V-belt .



Tightening torques

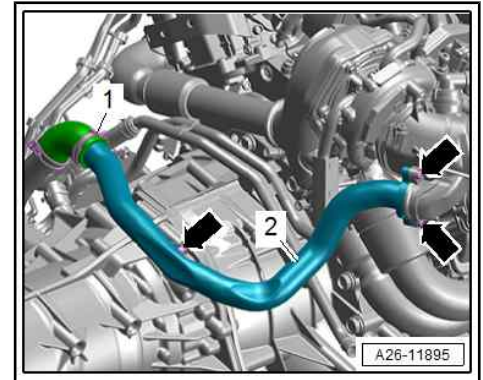
- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifolds; Exploded view - exhaust manifold
- ♦ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit
- ♦ ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres



6.2.2 Removing and installing exhaust manifold (right-side)

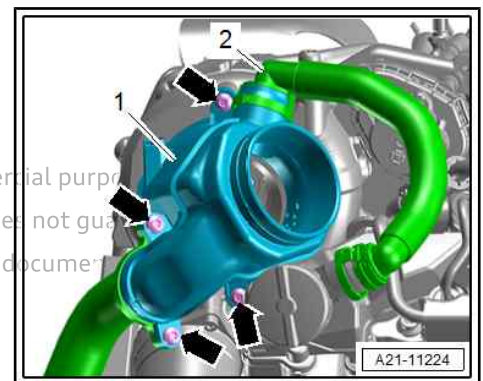
Removing

- Remove air cleaner housing ➔ [page 144](#) .
- Remove coolant pipes (rear) ➔ [page 103](#) .
- Remove coolant pipes (front) ➔ [page 97](#) .
- Remove bolts -arrows-.
- Release screw-type clip -1- and detach exhaust gas recirculation pipe -2-.

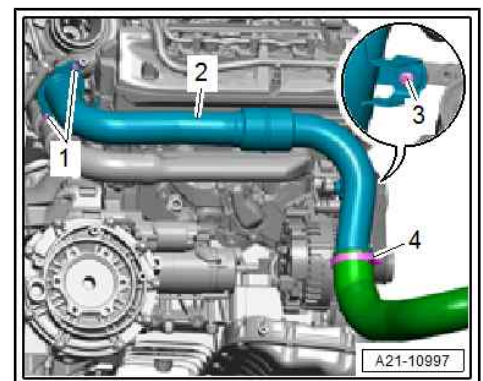


- Press release tabs on both sides and disconnect crankcase breather hose -2-.
- Remove bolts -arrows- and detach resonator -1-.

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- Remove bolts -1, 3- and press air pipe -2- to one side.





⚠ CAUTION

Risk of injury caused by soot particles in the air.

Eyes and skin can suffer irritation or injuries.

- Put on safety goggles.
- Put on protective gloves.

- Release clip -2- and slide it onto intake funnel of turbocharger.
- Remove engine support (right-side) ⇒ [page 47](#) .

- Remove nuts -arrows- and detach exhaust manifold towards rear.

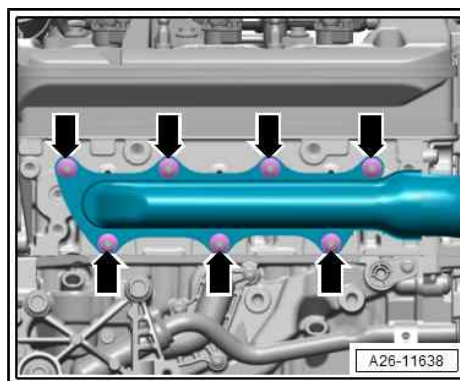
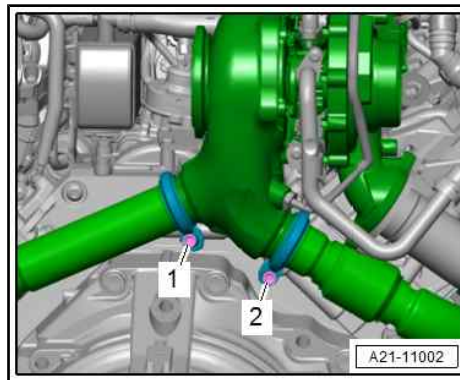
Installing

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

- Renew O-ring, bolts and screw-type clips after removal.
- Install engine support ⇒ [page 47](#) .
- Install coolant pipes (rear) ⇒ [page 103](#) .
- Install coolant pipe (front) ⇒ [page 95](#) .
- Install air cleaner housing ⇒ [page 144](#) .

Tightening torques

- ♦ ⇒ [“2.1 Exploded view - charge air system”, page 128](#)
- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger
- ♦ ⇒ [“5.1.2 Exploded view - exhaust gas recirculation system, low-pressure side \(rear\)”, page 193](#)
- ♦ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifolds; Exploded view - exhaust manifold



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28 – Glow plug system

1 Glow plug system

All procedures and components are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system .



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