

## Workshop Manual

Audi A6 2011 ➤

Audi A7 Sportback 2011 ➤

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

|           |          |          |          |          |          |          |          |          |      |
|-----------|----------|----------|----------|----------|----------|----------|----------|----------|------|
| Engine ID | CRT<br>D | CRT<br>F | CRT<br>E | CZV<br>D | CZV<br>B | CZV<br>E | CZV<br>A | CZV<br>C | CZVF |
|-----------|----------|----------|----------|----------|----------|----------|----------|----------|------|

Edition 02.2018



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## List of Workshop Manual Repair Groups

### Repair Group

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



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

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## Contents

|                                                         |           |
|---------------------------------------------------------|-----------|
| <b>00 - Technical data</b>                              | <b>1</b>  |
| 1 Identification                                        | 1         |
| 2 Safety precautions                                    | 2         |
| 3 Repair instructions                                   | 3         |
| <b>10 - Removing and installing engine</b>              | <b>4</b>  |
| 1 Removing and installing engine                        | 4         |
| 1.1 Removing engine                                     | 4         |
| 1.2 Separating engine and gearbox                       | 21        |
| 1.3 Securing engine to engine and gearbox support       | 29        |
| 1.4 Installing engine                                   | 33        |
| 2 Assembly mountings                                    | 42        |
| 2.1 Exploded view - assembly mountings                  | 42        |
| 2.2 Supporting engine in installation position          | 43        |
| 2.3 Removing and installing engine mountings            | 44        |
| 2.4 Removing and installing gearbox mounting            | 46        |
| 3 Engine cover panel                                    | 48        |
| 3.1 Removing and installing engine cover panel          | 48        |
| <b>13 - Crankshaft group</b>                            | <b>49</b> |
| 1 Cylinder block (pulley end)                           | 49        |
| 1.1 Exploded view - cylinder block (pulley end)         | 49        |
| 1.2 Exploded view - sealing flange (pulley end)         | 51        |
| 1.3 Removing and installing poly V-belt                 | 52        |
| 1.4 Removing and installing tensioner for poly V-belt   | 52        |
| 1.5 Removing and installing vibration damper            | 52        |
| 1.6 Removing and installing bracket for ancillaries     | 53        |
| 1.7 Renewing crankshaft oil seal (pulley end)           | 53        |
| 1.8 Removing and installing sealing flange (pulley end) | 53        |
| 2 Cylinder block (gearbox end)                          | 54        |
| 3 Crankshaft                                            | 55        |
| 4 Balance shaft                                         | 56        |
| 5 Pistons and conrods                                   | 57        |
| <b>15 - Cylinder head, valve gear</b>                   | <b>58</b> |
| 1 Timing chain cover                                    | 58        |
| 1.1 Exploded view - timing chain cover                  | 58        |
| 1.2 Removing and installing timing chain cover          | 60        |
| 2 Chain drive                                           | 61        |
| 3 Cylinder head                                         | 62        |
| 3.1 Exploded view - cylinder head                       | 62        |
| 3.2 Exploded view - cylinder head cover                 | 64        |
| 3.3 Removing and installing cylinder head               | 65        |
| 3.4 Removing and installing cylinder head cover         | 66        |
| 3.5 Removing and installing seals for injectors         | 69        |
| 3.6 Checking compression                                | 69        |
| 4 Valve gear                                            | 70        |
| 5 Inlet and exhaust valves                              | 71        |
| <b>17 - Lubrication</b>                                 | <b>72</b> |
| 1 Sump/oil pump                                         | 72        |



|           |                                                                                   |            |
|-----------|-----------------------------------------------------------------------------------|------------|
| 1.1       | Exploded view - sump/oil pump                                                     | 72         |
| 1.2       | Engine oil                                                                        | 75         |
| 1.3       | Removing and installing sump (bottom section)                                     | 76         |
| 1.4       | Removing and installing sump (top section)                                        | 76         |
| 1.5       | Removing and installing oil pump                                                  | 76         |
| 1.6       | Removing and installing oil level and oil temperature sender G266                 | 76         |
| <b>2</b>  | <b>Engine oil cooler</b>                                                          | <b>77</b>  |
| <b>3</b>  | <b>Oil filter/oil pressure switches</b>                                           | <b>78</b>  |
| 3.1       | Exploded view - oil filter                                                        | 78         |
| 3.2       | Removing and installing oil pressure sender G10                                   | 79         |
| 3.3       | Checking oil pressure                                                             | 80         |
| 3.4       | Removing and installing oil filter housing                                        | 80         |
| 3.5       | Removing and installing valve for oil pressure control N428                       | 80         |
| 3.6       | Removing and installing oil temperature sender 2 G664                             | 80         |
| <b>19</b> | <b>Cooling</b>                                                                    | <b>81</b>  |
| <b>1</b>  | <b>Cooling system/coolant</b>                                                     | <b>81</b>  |
| 1.1       | Connection diagram - coolant hoses                                                | 81         |
| 1.2       | Checking cooling system for leaks                                                 | 85         |
| 1.3       | Draining and filling cooling system                                               | 85         |
| <b>2</b>  | <b>Coolant pump/thermostat assembly</b>                                           | <b>89</b>  |
| 2.1       | Exploded view - coolant pump                                                      | 89         |
| 2.2       | Exploded view - thermostat                                                        | 90         |
| 2.3       | Exploded view - coolant temperature senders                                       | 92         |
| 2.4       | Removing and installing coolant pump                                              | 93         |
| 2.5       | Removing and installing thermostat housing                                        | 93         |
| 2.6       | Removing and installing map-controlled engine cooling system thermostat F265      | 93         |
| 2.7       | Removing and installing coolant temperature sender G62                            | 93         |
| 2.8       | Removing and installing temperature sender for engine temperature regulation G694 | 93         |
| 2.9       | Removing and installing coolant temperature sender 2 G802                         | 94         |
| 2.10      | Removing and installing coolant valves                                            | 94         |
| <b>3</b>  | <b>Coolant pipes</b>                                                              | <b>96</b>  |
| 3.1       | Exploded view - coolant pipes                                                     | 96         |
| 3.2       | Removing and installing coolant pipes                                             | 98         |
| <b>4</b>  | <b>Radiator/radiator fans</b>                                                     | <b>104</b> |
| 4.1       | Exploded view - radiator/radiator fans                                            | 104        |
| 4.2       | Removing and installing radiator                                                  | 106        |
| 4.3       | Removing and installing radiator cowl                                             | 109        |
| 4.4       | Removing and installing radiator fan V7                                           | 112        |
| <b>21</b> | <b>Turbocharging/supercharging</b>                                                | <b>113</b> |
| <b>1</b>  | <b>Turbocharger</b>                                                               | <b>113</b> |
| 1.1       | Exploded view - turbocharger                                                      | 113        |
| 1.2       | Removing and installing turbocharger                                              | 115        |
| <b>2</b>  | <b>Charge air system</b>                                                          | <b>116</b> |
| 2.1       | Exploded view - charge air system                                                 | 116        |
| 2.2       | Exploded view - hose connections for charge air system                            | 117        |
| 2.3       | Removing and installing charge air cooler                                         | 117        |
| 2.4       | Removing and installing charge pressure sender G31                                | 119        |
| 2.5       | Checking charge air system for leaks                                              | 119        |
| <b>23</b> | <b>Mixture preparation - injection</b>                                            | <b>121</b> |
| <b>1</b>  | <b>Injection system</b>                                                           | <b>121</b> |
| 1.1       | Overview - fuel system                                                            | 121        |
| 1.2       | Overview of fitting locations - injection system                                  | 122        |

|                            |                                                                    |            |
|----------------------------|--------------------------------------------------------------------|------------|
| 1.3                        | Filling and bleeding fuel system                                   | 126        |
| 1.4                        | Checking fuel system for leaks                                     | 126        |
| <b>2</b>                   | <b>Vacuum system</b>                                               | <b>127</b> |
| 2.1                        | Connection diagram - vacuum system                                 | 127        |
| 2.2                        | Checking vacuum system                                             | 127        |
| <b>3</b>                   | <b>Air cleaner</b>                                                 | <b>128</b> |
| 3.1                        | Exploded view - air cleaner housing                                | 128        |
| 3.2                        | Removing and installing air cleaner housing                        | 129        |
| <b>4</b>                   | <b>Intake manifold</b>                                             | <b>131</b> |
| 4.1                        | Exploded view - intake manifold                                    | 131        |
| 4.2                        | Removing and installing intake manifold (top section)              | 133        |
| 4.3                        | Removing and installing intake manifold (bottom section)           | 133        |
| 4.4                        | Removing and installing intake manifold flap motor V157            | 133        |
| 4.5                        | Removing and installing throttle valve module J338                 | 134        |
| <b>5</b>                   | <b>Injectors/high-pressure reservoir (rail)</b>                    | <b>135</b> |
| 5.1                        | Exploded view - injectors                                          | 135        |
| 5.2                        | Checking injectors                                                 | 137        |
| 5.3                        | Performing adaption of correction values for injectors             | 137        |
| 5.4                        | Checking for injectors sticking open                               | 137        |
| 5.5                        | Checking return flow rate of injectors with engine running         | 137        |
| 5.6                        | Checking return flow rate of injectors at starter cranking speed   | 138        |
| 5.7                        | Checking restrictor in fuel return line                            | 138        |
| 5.8                        | Removing and installing injectors                                  | 138        |
| 5.9                        | Removing and installing high-pressure pipes                        | 139        |
| 5.10                       | Removing and installing high-pressure reservoir (rail)             | 139        |
| <b>6</b>                   | <b>Senders and sensors</b>                                         | <b>140</b> |
| 6.1                        | Removing and installing intake air temperature sender G42          | 140        |
| 6.2                        | Removing and installing air mass meter G70                         | 140        |
| 6.3                        | Removing and installing fuel temperature sender G81                | 141        |
| 6.4                        | Removing and installing fuel pressure sender G247                  | 142        |
| 6.5                        | Removing and installing fuel pressure sender for low pressure G410 | 142        |
| 6.6                        | Removing and installing pressure differential sender G505          | 142        |
| 6.7                        | Checking fuel pressure regulating valve N276                       | 144        |
| 6.8                        | Removing and installing fuel pressure regulating valve N276        | 146        |
| <b>7</b>                   | <b>High-pressure pump</b>                                          | <b>147</b> |
| <b>8</b>                   | <b>Lambda probe</b>                                                | <b>148</b> |
| 8.1                        | Exploded view - Lambda probe                                       | 148        |
| 8.2                        | Removing and installing Lambda probe                               | 149        |
| 8.3                        | Removing and installing NOx sender                                 | 149        |
| <b>9</b>                   | <b>Engine control unit</b>                                         | <b>152</b> |
| 9.1                        | Removing and installing engine/motor control unit J623             | 152        |
| <b>26 - Exhaust system</b> |                                                                    | <b>153</b> |
| <b>1</b>                   | <b>Exhaust pipes/silencers</b>                                     | <b>153</b> |
| 1.1                        | Exploded view - silencers                                          | 153        |
| 1.2                        | Removing and installing front exhaust pipe                         | 155        |
| 1.3                        | Separating exhaust pipes/silencers                                 | 157        |
| 1.4                        | Removing and installing silencers                                  | 158        |
| 1.5                        | Stress-free alignment of exhaust system                            | 159        |
| 1.6                        | Checking exhaust system for leaks                                  | 160        |
| <b>2</b>                   | <b>Emission control system</b>                                     | <b>161</b> |
| 2.1                        | Exploded view - emission control system                            | 161        |
| 2.2                        | Removing and installing catalytic converter                        | 163        |
| 2.3                        | Removing and installing emission control module                    | 164        |



|           |                                                                              |            |
|-----------|------------------------------------------------------------------------------|------------|
| <b>3</b>  | <b>SCR (selective catalytic reduction) system</b>                            | <b>167</b> |
| 3.1       | Exploded view - reducing agent tank                                          | 167        |
| 3.2       | Exploded view - reducing agent supply line                                   | 168        |
| 3.3       | Exploded view - delivery unit for reducing agent                             | 168        |
| 3.4       | Exploded view - control unit for reducing agent metering system J880         | 169        |
| 3.5       | Draining reducing agent tank                                                 | 170        |
| 3.6       | Removing and installing reducing agent tank                                  | 171        |
| 3.7       | Removing and installing delivery unit for reducing agent                     | 173        |
| 3.8       | Removing and installing injector for reducing agent N474                     | 175        |
| 3.9       | Removing and installing control unit for reducing agent metering system J880 | 175        |
| <b>4</b>  | <b>Exhaust gas temperature control</b>                                       | <b>177</b> |
| 4.1       | Exploded view - exhaust gas temperature control                              | 177        |
| 4.2       | Removing and installing exhaust gas temperature senders                      | 178        |
| <b>5</b>  | <b>Exhaust gas recirculation</b>                                             | <b>180</b> |
| 5.1       | Exploded view - exhaust gas recirculation system                             | 180        |
| 5.2       | Removing and installing exhaust gas recirculation cooler                     | 181        |
| 5.3       | Removing and installing exhaust gas recirculation temperature sensor G98     | 181        |
| <b>6</b>  | <b>Exhaust manifolds</b>                                                     | <b>182</b> |
| 6.1       | Exploded view - exhaust manifold                                             | 182        |
| 6.2       | Removing and installing exhaust manifolds                                    | 183        |
| <b>28</b> | <b>Glow plug system</b>                                                      | <b>188</b> |
| <b>1</b>  | <b>Glow plug system</b>                                                      | <b>188</b> |
| 1.1       | Exploded view - glow plug system                                             | 188        |
| 1.2       | Removing and installing glow plug                                            | 189        |
| 1.3       | Removing and installing Hall sender G40                                      | 189        |
| 1.4       | Removing and installing engine speed sender G28                              | 189        |



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## 00 – Technical data

### 1 Identification

(ARL005666; Edition 02.2018)

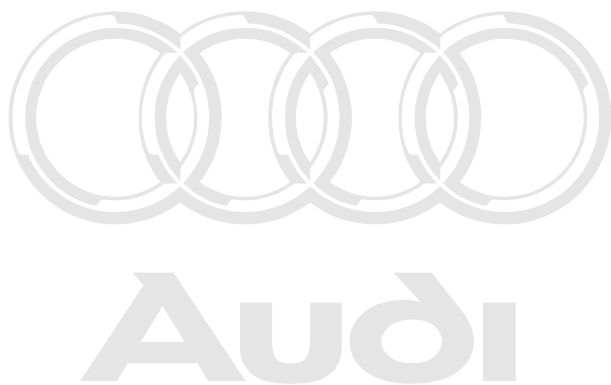
All information can be found in ⇒ Servicing 6-cylinder TDI engine,  
common rail; Rep. gr. 00 ; Identification .

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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,  
common rail; Rep. gr. 00 ; Repair instructions .



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## 10 – Removing and installing engine

### 1 Removing and installing engine

⇒ [“1.1 Removing engine”, page 4](#)

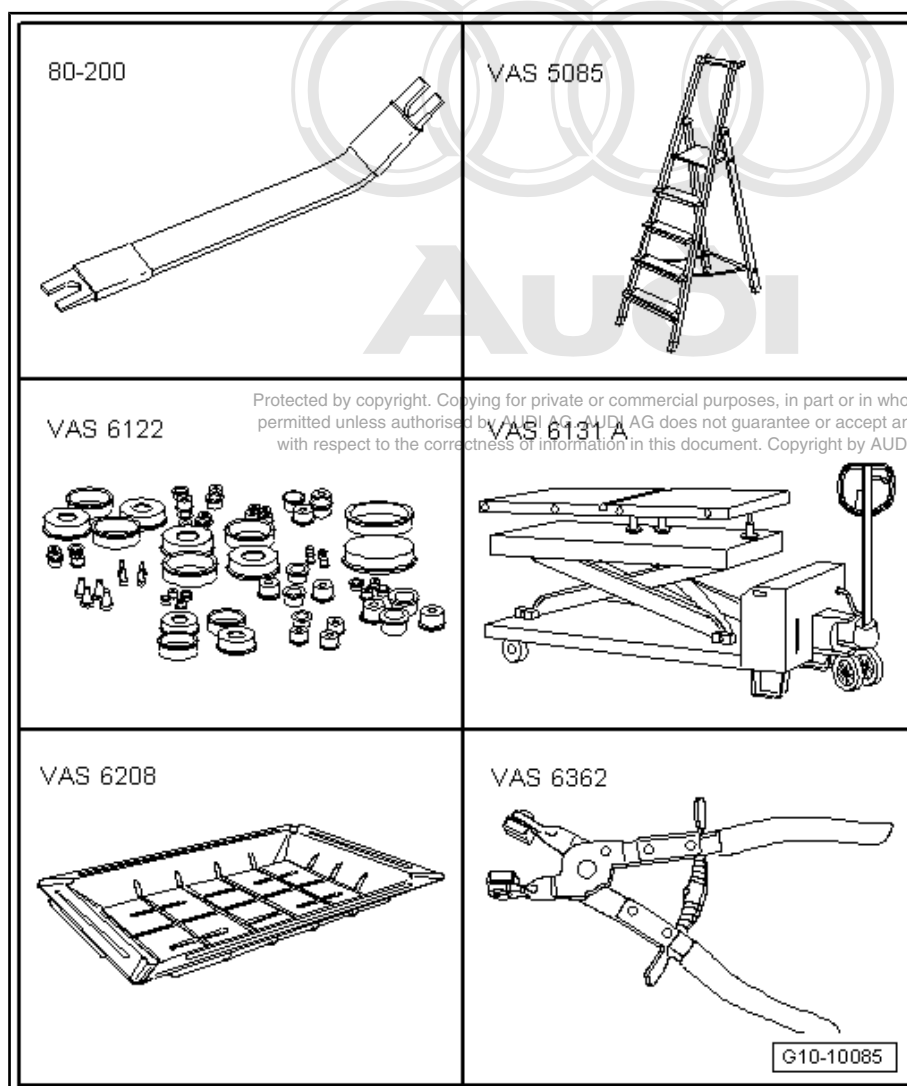
⇒ [“1.2 Separating engine and gearbox”, page 21](#)

⇒ [“1.3 Securing engine to engine and gearbox support”, page 29](#)

⇒ [“1.4 Installing engine”, page 33](#)

#### 1.1 Removing engine

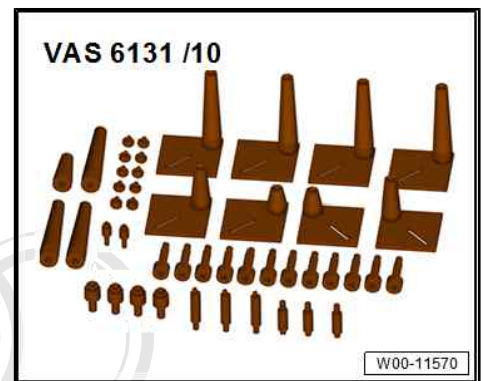
Special tools and workshop equipment required



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- ◆ Removal lever - 80 - 200-
- ◆ Stepladder - VAS 5085-
- ◆ Engine bung set - VAS 6122-
- ◆ Scissor-type assembly platform - VAS 6131 B-
- ◆ Drip tray for workshop hoist - VAS 6208-
- ◆ Hose clip pliers - VAS 6362-

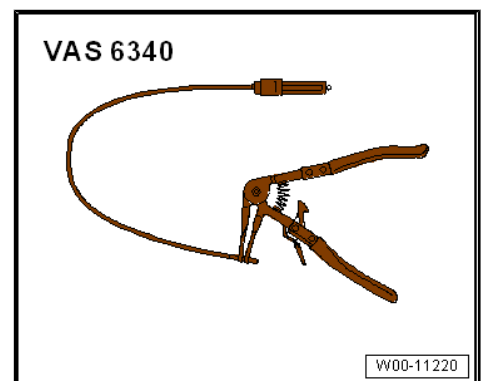
- ◆ Support set for Audi - VAS 6131/10-



- ◆ Supplementary set, Audi A8 >2002 - VAS 6131/11-
- ◆ Supplementary set, Audi Q7 >2005 - VAS 6131/13-



- ◆ Hose clip pliers - VAS 6340-



## Procedure



### WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*



## Note

- ◆ *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 notes; Rules for cleanliness .*
  - ◆ *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 notes; Lifting suspension to unladen position (vehicles with coil springs) or determine reference position ⇒ Running gear, axles, steering; Rep. gr. 00 ; Repair notes; Lifting suspension to unladen position (vehicles with air suspension) .



## WARNING

***Make sure the vehicle cannot tip over when the engine is removed.***

- ◆ ***Secure the vehicle, to do so, the luggage compartment must be empty.***

***The fuel system operates at extremely high pressure. This can cause injury.***

- ◆ ***The fuel pressure in the high-pressure section of the injection system must be reduced to a residual pressure prior to opening the system.***

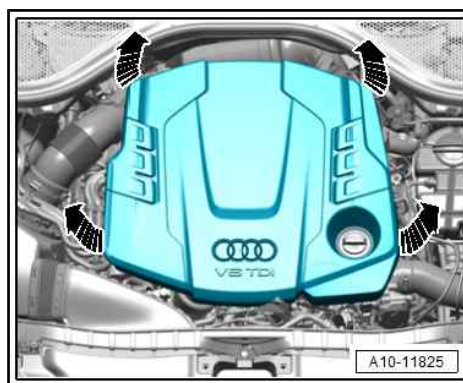
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- Bring front wheels into straight-ahead position.
- Carefully pull engine cover panel off retaining pins one after another -arrows-. Do not jerk engine cover panel away, and do not try to pull on one side only.



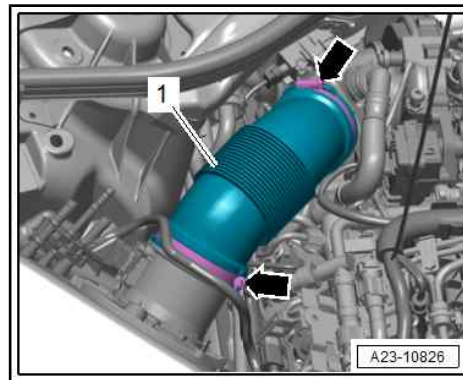
## Note

- ◆ *The electromechanical parking brake must be released before disconnecting the battery so that the propshaft can be turned during removal.*
- ◆ *If the turbocharger has to be removed for subsequent work, the turbocharger 1 control unit - J724- must be moved into the "closed" position.*

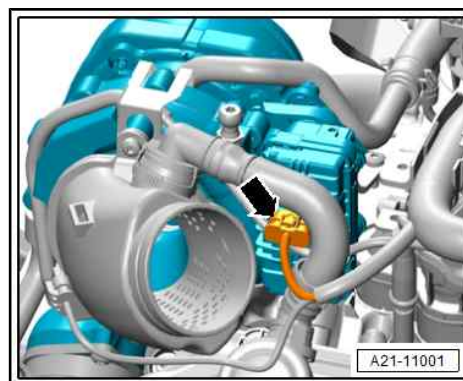


If performing repair work for turbocharger, move turbocharger 1 control unit - J724- into "closed" position:

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



- Select [01 Engine electronics], [Final control diagnosis] in "Guided Fault Finding" ⇒ Vehicle diagnostic tester.
- Unplug electrical connector -arrow- as soon as turbocharger 1 control unit - J724- is in closed position (held 10 seconds). This will cause an entry to be stored in the event memory of the engine control unit.
- The de-energised turbocharger 1 control unit - J724- remains in this position, allowing access to the bolts for the turbocharger.



#### Removing engine (continued):

- Switch off ignition.
- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .
- Discharge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Discharging refrigerant circuit .
- Remove body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .

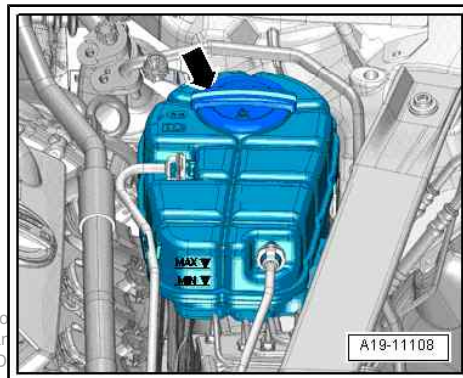
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# WARNING

*Risk of scalding due to hot steam and hot coolant.*

- ◆ *The cooling system is under pressure when the engine is hot.*
- ◆ *To allow pressure to dissipate, cover filler cap on coolant expansion tank with cloth and open carefully.*



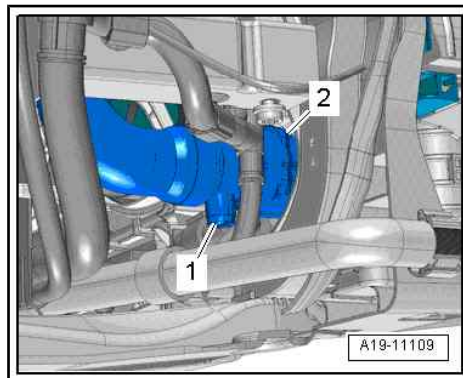
- Open filler cap ~~arrow~~ on coolant expansion tank.
- Remove both front wheels ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Remove wheel housing liners (front left and front right) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Remove wheel spoilers (front) on both sides ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .

## Vehicles with four-wheel drive:

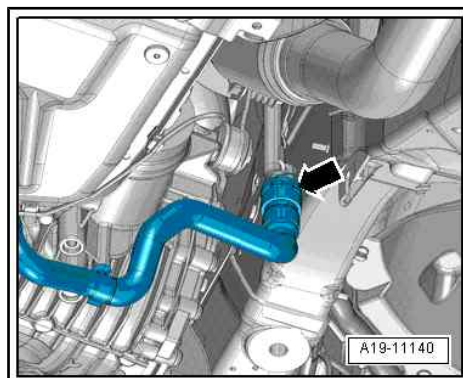
- Remove propshaft ⇒ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .

## All vehicles:

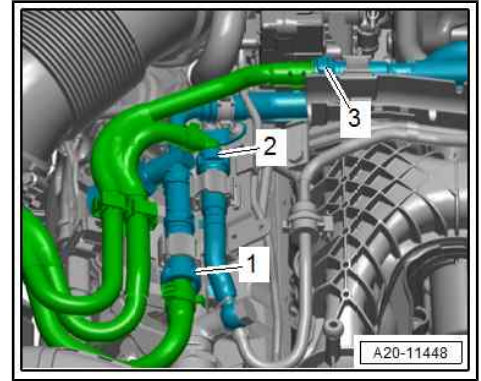
- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Remove drain plug -1- and drain off coolant.
- Lift retaining clip -2- and disconnect coolant hose from radiator.



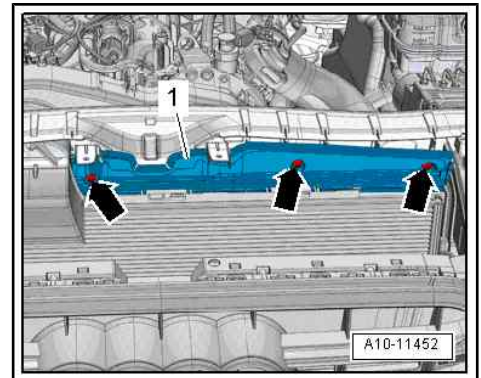
- Lift retaining clip -arrow- and disconnect coolant hose (rear right).
- Guide coolant hose downwards and drain off coolant.



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



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

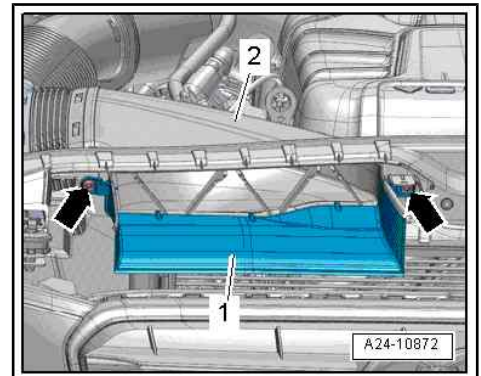


- Remove bolts -arrows- and detach air duct -2- from lock carrier.

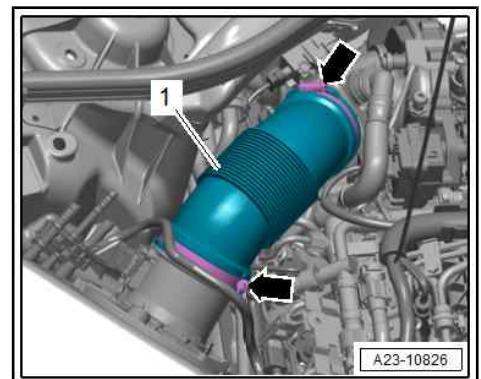
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 **Note**

*Disregard -item 1-.*



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



- Unplug electrical connector -2- at air mass meter - G70- and move clear.
- Lift off air cleaner housing -1-.



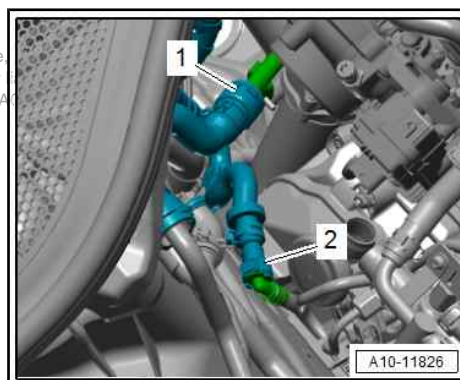
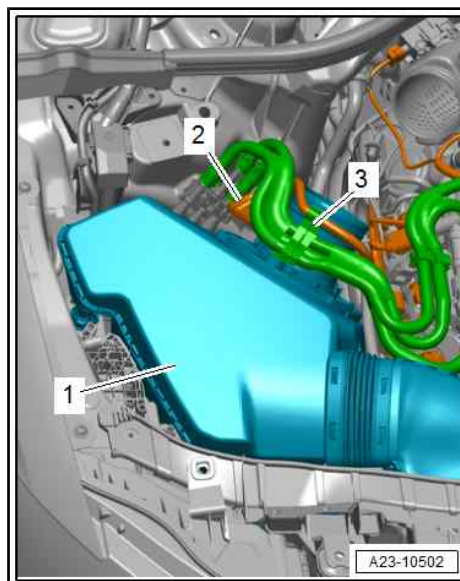
### Note

Disregard -item 3-.

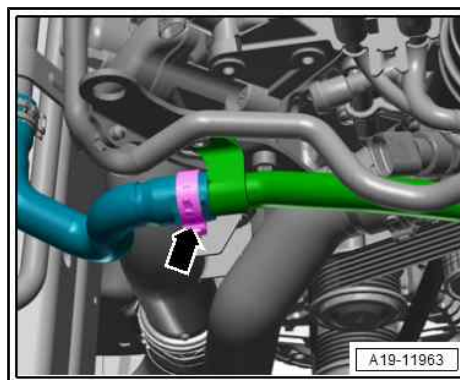


- Lift retaining clip -1- and disconnect coolant hose.
- Press release tabs on both sides and detach vacuum hose -2-.

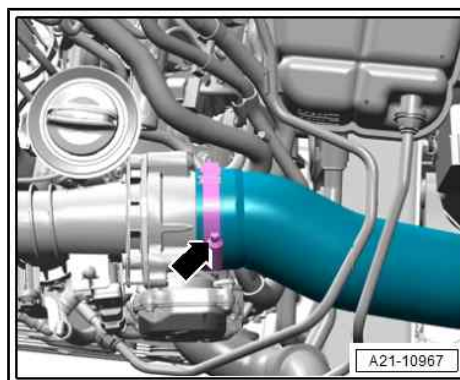
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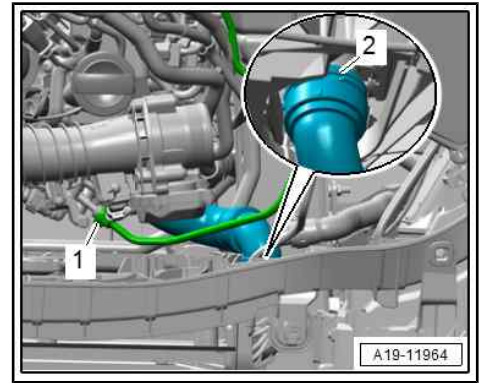
- Release hose clip -arrow- and disconnect coolant hose from coolant pipe (front).



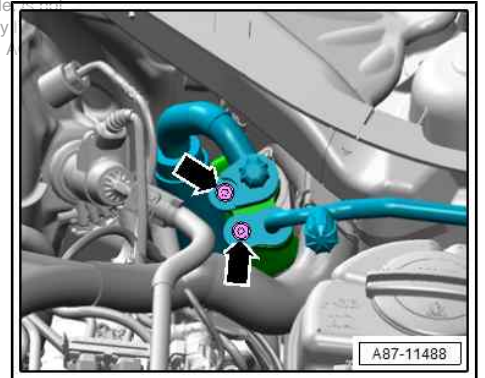
- Release hose clip -arrow- and detach air hose.



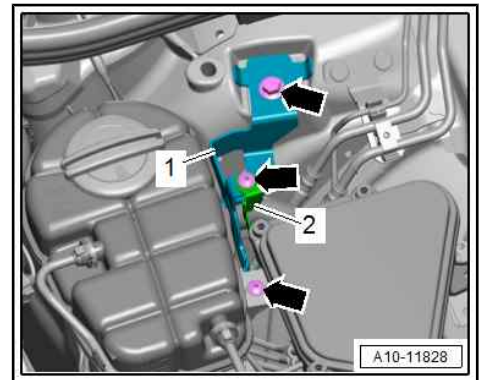
- Lift retaining clip -2- and disconnect coolant hose (top left) from radiator.
- Lift retaining clip -1- and disconnect coolant hose.



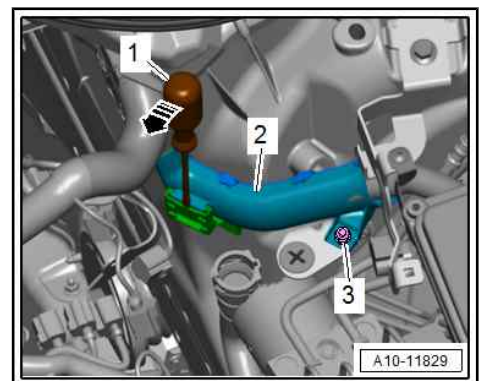
- Remove bolts -arrows- and disconnect refrigerant lines



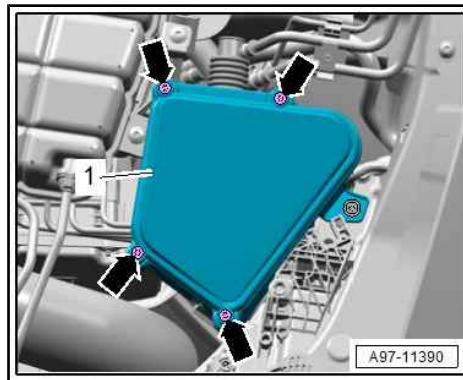
- Unscrew bolts -arrows- and detach brackets -1, 2-.
- Press coolant expansion tank slightly towards front.



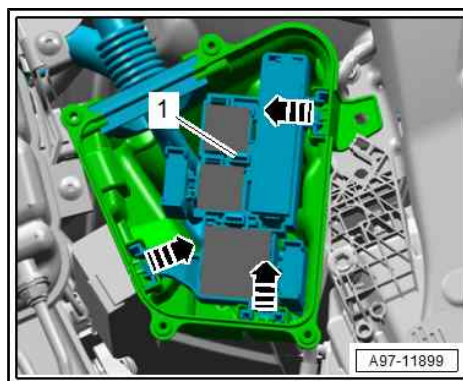
- Unscrew nut -3-.
- Use a screwdriver -1- to release catch -arrow- and move wiring duct -2- clear.



- Remove bolts -arrows- and detach cover -1- for electronics box.



- Release catches -arrows-, detach relay carrier with fuse holder -1-, move clear and place on engine.

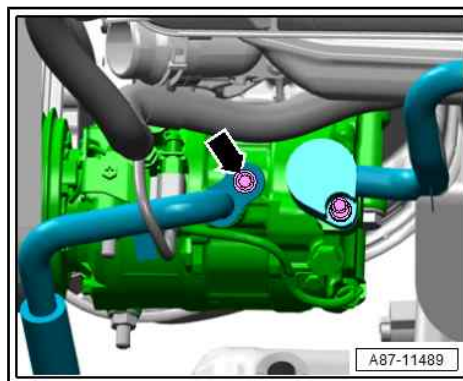


### Caution

***Danger of damage to refrigerant lines and hoses.***

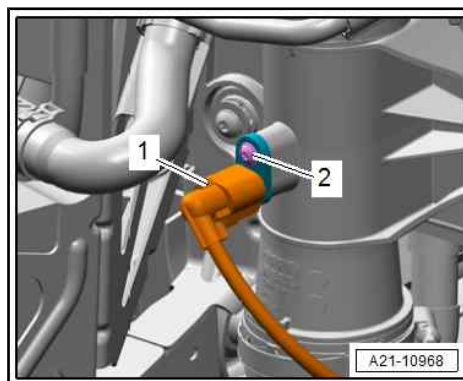
- ◆ ***Do NOT stretch, kink or bend refrigerant lines and hoses.***

- Remove bolt -arrow-, disconnect refrigerant line from air conditioner compressor and move to one side.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .
- Unplug electrical connector -1- for intake air temperature sender - G42- and move electrical wiring clear.

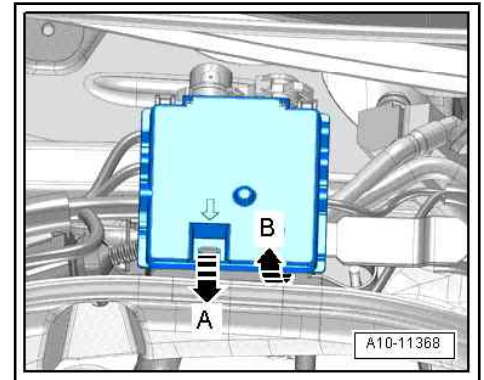


### Note

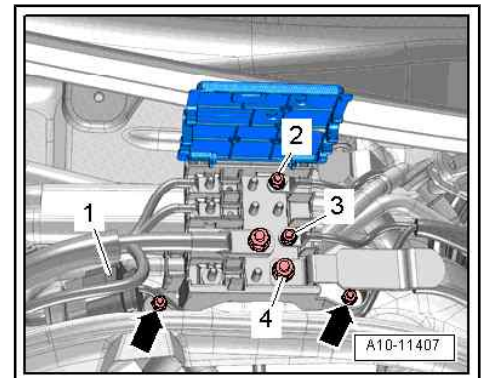
***Disregard -item 2-.***



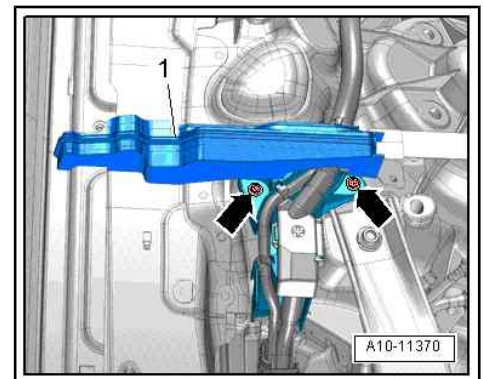
- Release retainer -arrow A- and open cover -arrow B-.



- Remove nuts -2, 3 and 4- and move electrical wiring clear.
- Detach electrical connector -1- from bracket and unplug.
- Remove bolts -arrows- and detach terminal 30 wiring junction 2 - TV22- from plenum chamber partition panel.

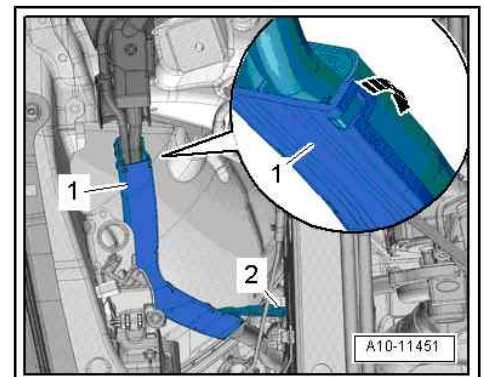


- Press foam wedge -1- to one side.
- Remove bolts -arrows-.

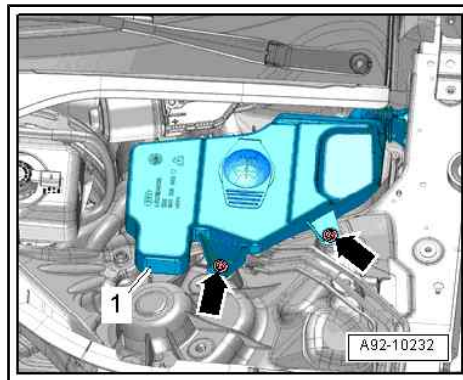


- Unscrew nut -2- on longitudinal member (right-side) and move earth cables clear.
- Release catch -arrow- to open wiring duct -1- and move electrical wiring harness clear.

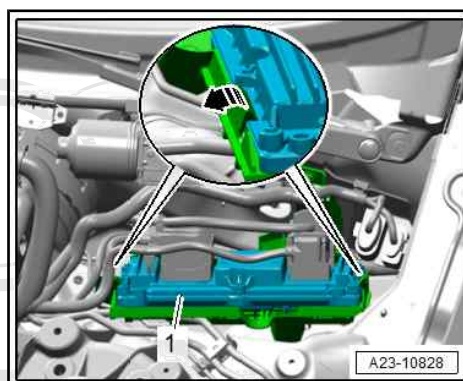
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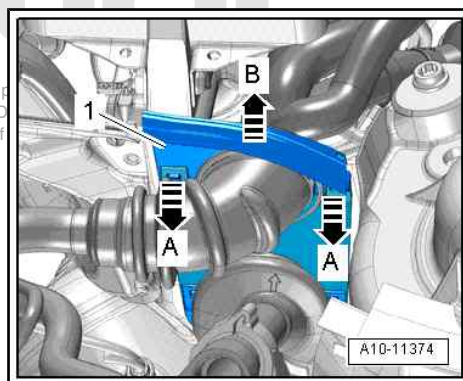
- Place drip tray for workshop hoist - VAS 6208- underneath.
- Unscrew bolts -arrows- and pull filler neck -1- out of washer fluid reservoir and through opening in body to right side.



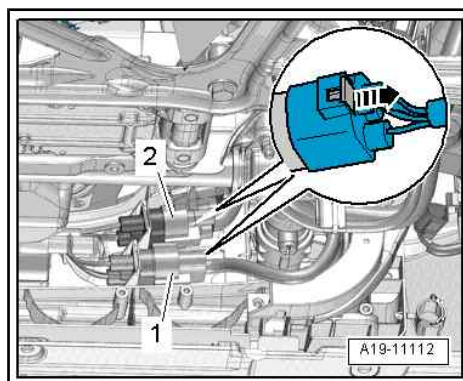
- Release catches -arrow- and detach engine/motor control unit - J623- -item 1- from bracket.



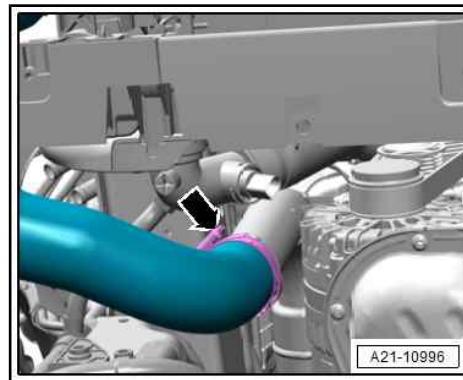
- Release catches -arrows A- and lift off wiring protector -1- -arrow B-.
- Place wiring harness on engine and secure engine/motor control unit - J623- to prevent it from dropping.



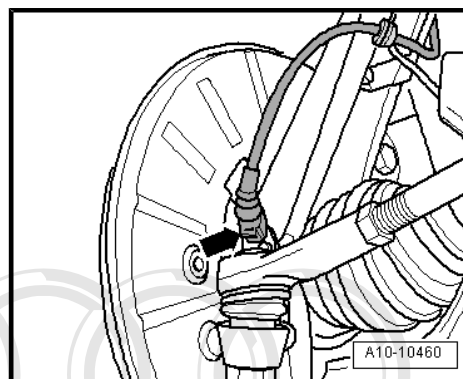
- Unplug electrical connector -1- and, if fitted, -2- for radiator fan (push retainer to the rear -arrow- and press down release catch).
- Move electrical wiring harness clear.



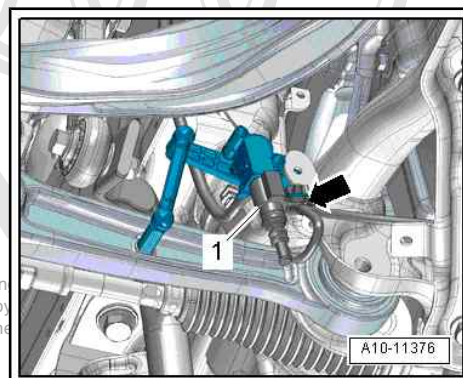
- Release hose clip -arrow- and detach air hose from air pipe.



- Unplug electrical connector -arrow- at front wheel speed sensor on both sides ( -G45- and -G47- ).

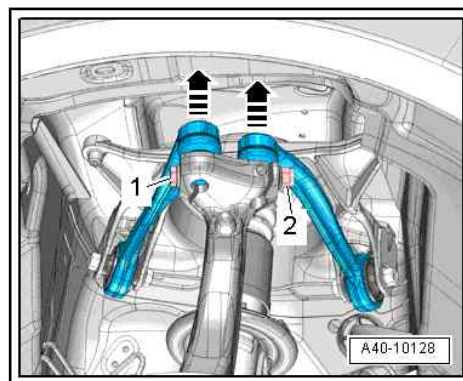


- If fitted, unplug electrical connector -1- at front vehicle level senders on both sides ( -G78- and -G289- ) and move electrical wiring clear -arrow-.
- Remove brake caliper and tie up in wheel housing with wire (brake hose remains attached) ⇒ Brake system; Rep. gr. 46 ; Front brakes; Removing and installing brake caliper .



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- Remove nut -2- and pull out bolt -1-.
- Pull upper suspension links upwards out of wheel bearing housing -arrows-.
- Repeat procedure on opposite side of vehicle.

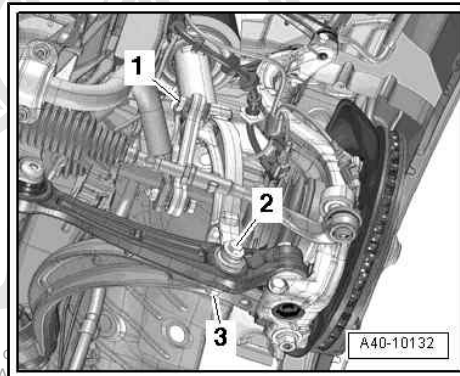


- Remove bolt -1- for anti-roll bar on both sides.
- Remove nut -3- on both sides.



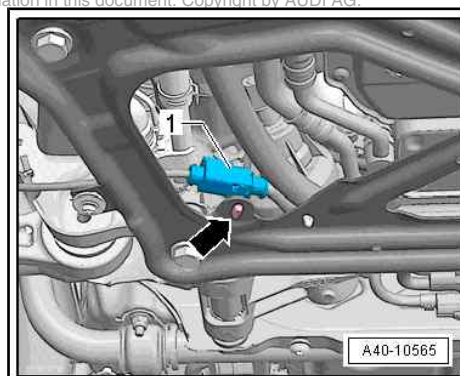
### Note

The bolts -2- are removed at a later stage.



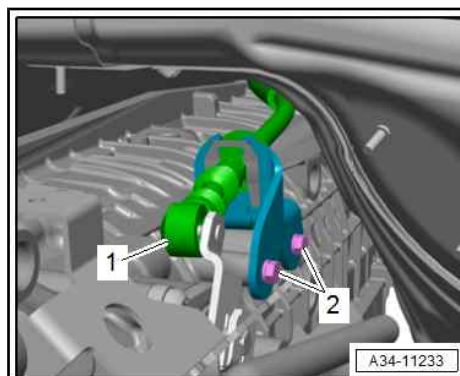
- Move clip clear -arrow-.
- Unplug electrical connector -1- and move wiring clear.
- Remove subframe cross brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Removing and installing subframe cross brace .

### Vehicles with front-wheel drive

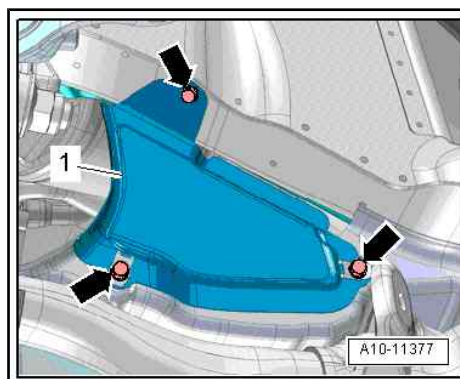


- Pry ball socket -1- of selector lever cable off gearbox selector lever using removal lever - 80 - 200- .
- Remove bolts -2-.

### All vehicles:



- Remove bolts -arrows- on both sides and detach heat shield -1- for longitudinal member.
- Detach intermediate steering shaft from steering rack and move clear by telescoping splines together ⇒ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .



- Unplug electrical connector -2- at power steering control unit - J500- (release retainer -arrow- and press down release catch).
- Unplug electrical connector -1- at power steering control unit - J500- .
- Move electrical wiring harness clear.

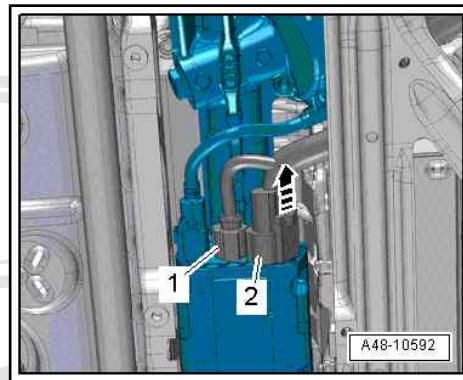


#### WARNING

*Reducing agent can cause skin irritation.*

- ◆ *Observe safety measures when handling reducing agent  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the SCR system .*
- ◆ *Put on safety goggles.*

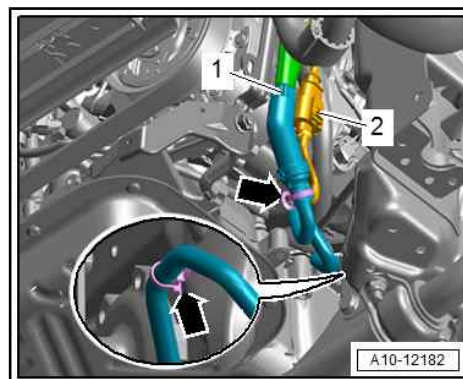
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#### Note

*Hold a clean cloth under the separating point to catch escaping reducing agent.*

- Unplug electrical connector -2-.
- Press release tabs and disconnect SCR metering line -1-.
- Unclip SCR metering line -arrows-.
- Unclip SCR metering line at subframe (rear left) and guide out metering line.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .

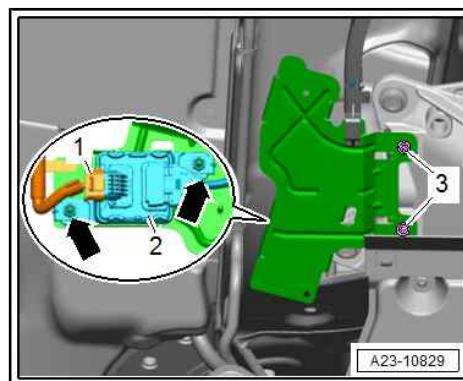


- Unplug electrical connector -1-.
- Unscrew bolts -3- and tie control unit for NOx sender 2 - J881- -2- with bracket to SCR catalytic converter.



#### Note

*Disregard -arrows-.*

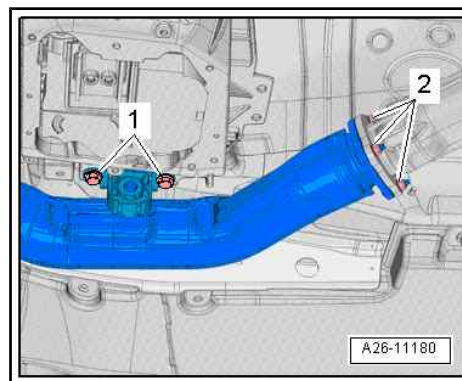


- Unscrew nuts -2- and detach SCR catalytic converter.



### Note

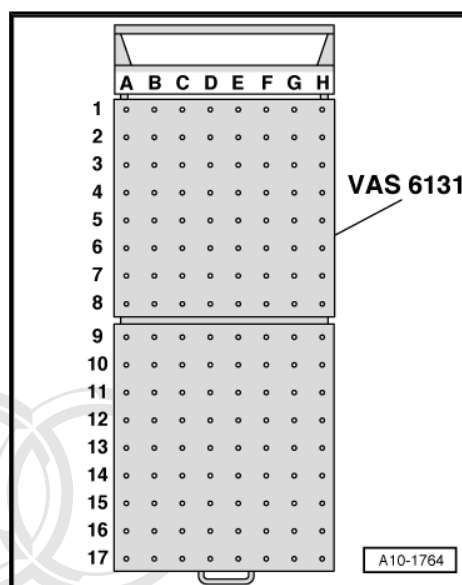
If separating the engine from the gearbox for subsequent work, unscrew the bolted connection securing the drive plate to the fly-wheel/torque converter ➔ [page 25](#).



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

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

| Platform coordinates | Parts of support set for Audi - VAS 6131/10- , support set -VAS 6131/11- and supplementary set -VAS 6131/13- |       |       |        |
|----------------------|--------------------------------------------------------------------------------------------------------------|-------|-------|--------|
| B4                   | /13-4                                                                                                        | /10-4 | /10-5 | /13-1  |
| G4                   | /13-4                                                                                                        | /10-4 | /10-5 | /13-1  |
| B6                   | /10-1                                                                                                        | /10-2 | /10-5 | /10-11 |
| G6                   | /10-1                                                                                                        | /10-2 | /10-5 | /10-11 |
| A8+C8                | /13-6                                                                                                        |       |       | /13-2  |
| F8+H8                | /13-5                                                                                                        |       |       | /13-2  |
| B14                  | /10-1                                                                                                        | /10-3 | /10-5 | /11-1  |
| G14                  | /10-1                                                                                                        | /10-4 | /10-5 | /11-1  |



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

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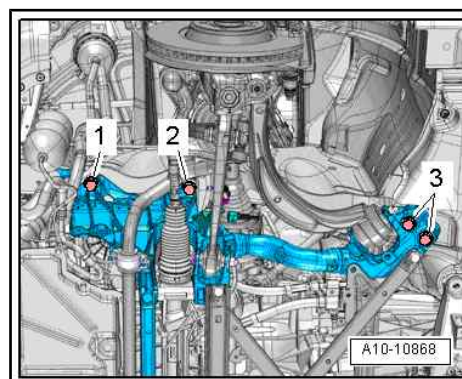


### WARNING

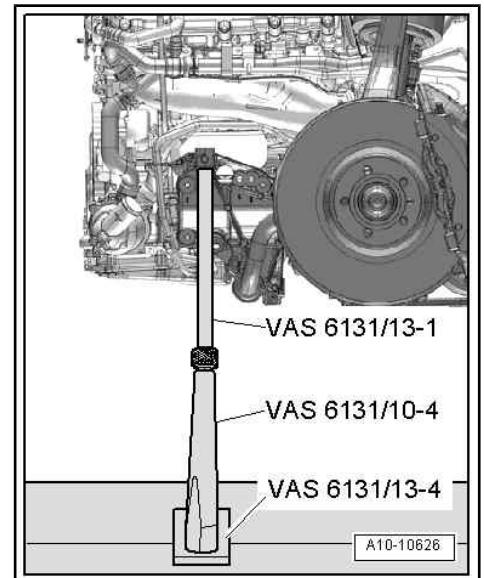
**Accident risk if subframe mountings are detached.**

♦ Subframe bolts -2- and -3- must not be loosened.

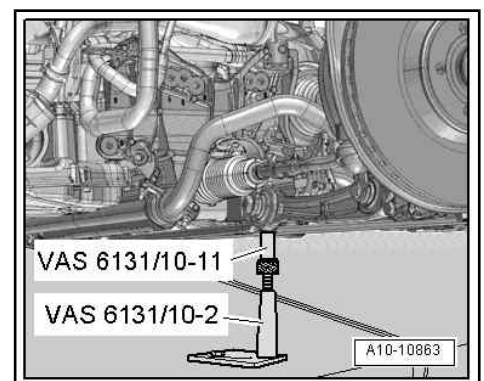
- Remove subframe bolts -1- on both sides.



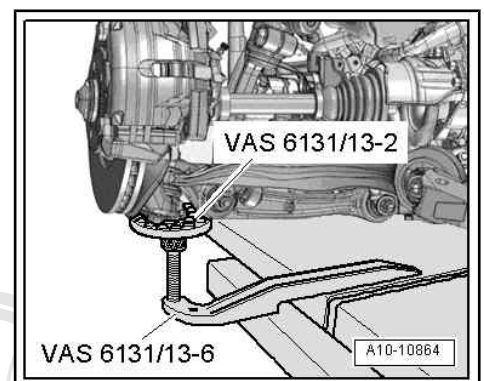
- Position support elements from -VAS 6131/10- and -VAS 6131/13- at front left and right of subframe as shown.
- Make sure that threaded spindles are screwed in completely.



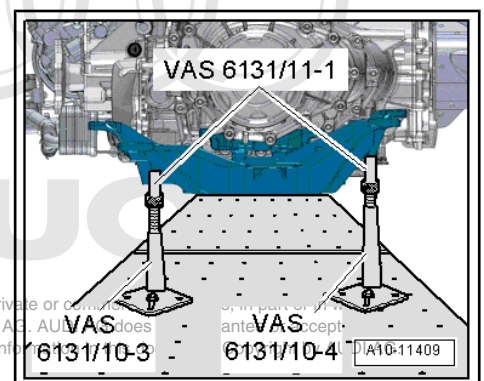
- Position support elements from -VAS 6131/10- (rear left and right) at front attachment points of subframe cross brace as shown.



- Position support elements from -VAS 6131/13- under left and right wheel bearing housings as shown.



- Position support elements from -VAS 6131/10- and -VAS 6131/11- (rear left and right) at tunnel cross member as shown.
- Turn all 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- .



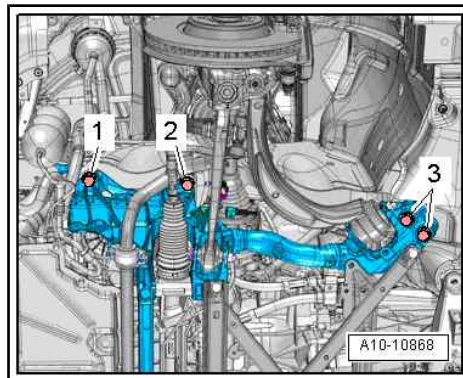
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- Mark installation position of subframe and tunnel cross member on longitudinal members with felt-tip pen.
- Unscrew subframe bolts -2- and -3- on both sides in several stages and in diagonal sequence.

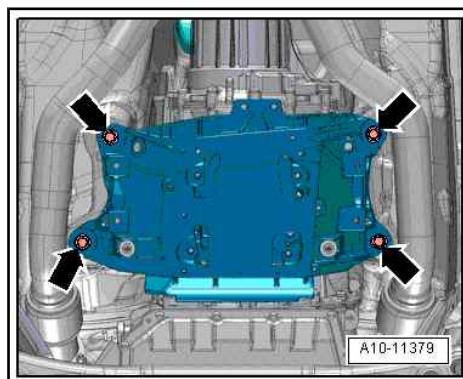


### Note

Bolts -1- are already removed.



- Remove bolts -arrows- on tunnel cross member.

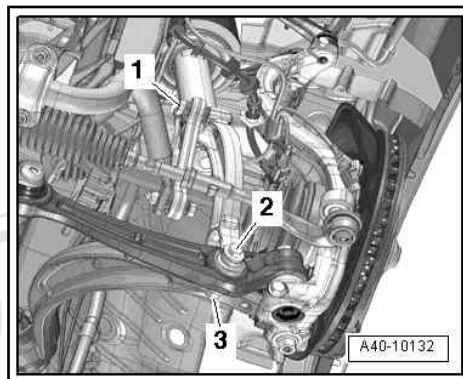


- Remove bolt -2- on both sides.



### Note

Bolts -1, 3- have already been removed.



### Caution

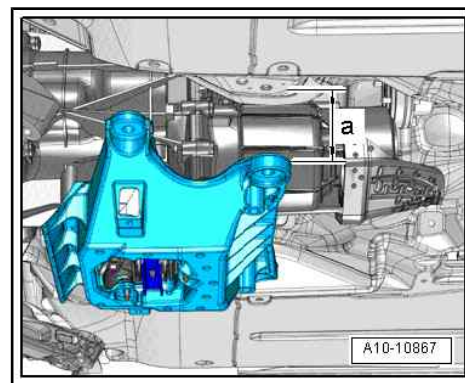
**Danger of damage to hoses, pipes and wiring connections and to engine compartment.**

- ◆ Check that all hoses and wiring connections between engine, gearbox, subframe and body have been detached.
- ◆ Carefully guide out engine/gearbox assembly with subframe from engine compartment when lowering.
- ◆ Carefully guide suspension struts past longitudinal members.

### Vehicles with four-wheel drive

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- Lower engine/gearbox assembly using scissor-type assembly platform - VAS 6131 B- initially only as far as distance -a-.
- Dimension -a- = 100 mm (maximum).



- Pry ball socket -2- of selector lever cable off gearbox selector lever using removal lever - 80 - 200- .
- Press off securing clip -1- / loosen nut, and remove selector lever cable from gearbox.

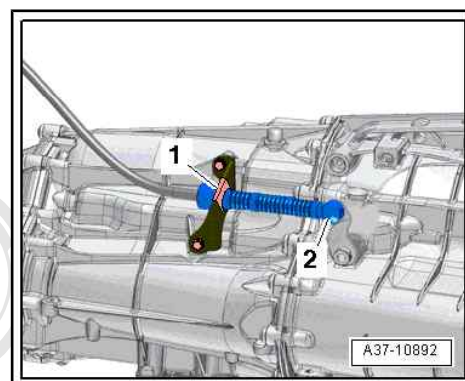


#### Note

*Take care not to bend or kink selector lever cable.*

#### All vehicles:

- Lower engine/gearbox assembly.
- Pull out scissor-type assembly platform - VAS 6131 B- with engine/gearbox assembly from underneath vehicle.

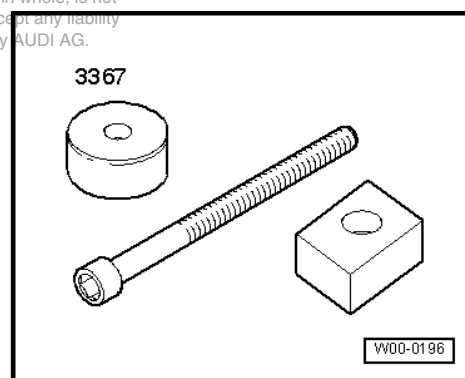


## 1.2 Separating engine and gearbox

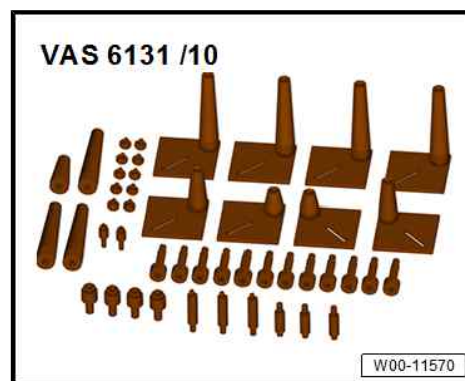
### Special tools and workshop equipment required

- ◆ Bolt -3367/3- from viscous fan fitting tool - 3367-

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



- ◆ Support - VAS 6131/11-4-



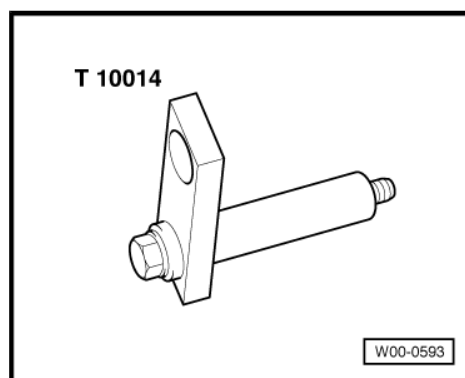
- ◆ Support -VAS 6131/13-7- from support set, Audi Q7 >2005 - VAS 6131/13-



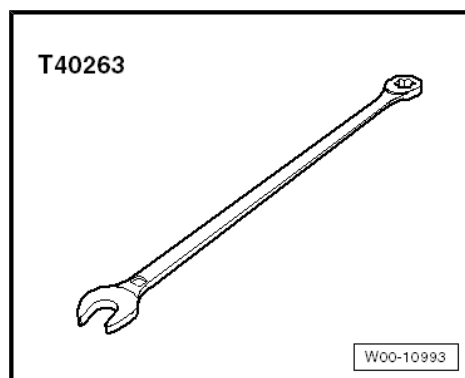
- ◆ Hose clip pliers - VAS 6362-



- ◆ Bracket - T10014-



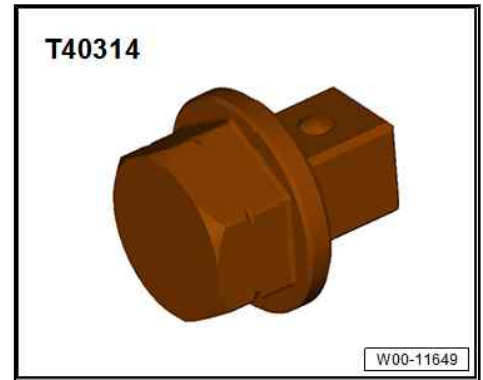
- ◆ Wrench, 21 mm - T40263-



**Audi**

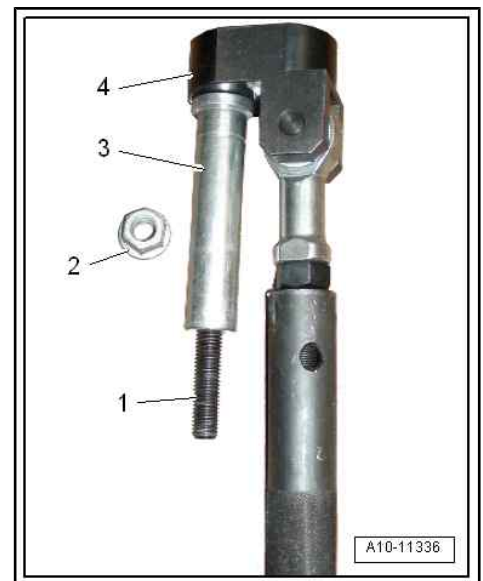
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◆ Adapter -T40314-



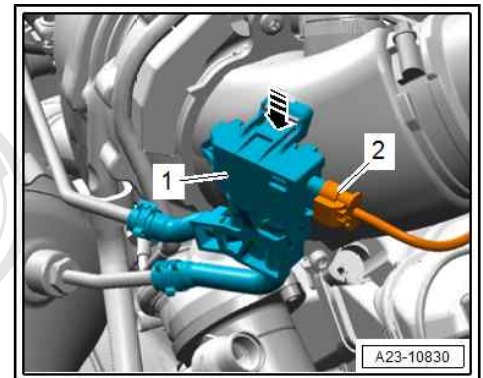
**Setting up support -VAS 6131/13-7- :**

- 1 - Bolt -3367/3- from viscous fan fitting tool - 3367-
- 2 - Nut M10
- 3 - Bracket - T10014-
- 4 - Support -VAS 6131/13-7-



**Procedure**

- Engine/gearbox assembly removed and secured to scissor-type assembly platform - VAS 6131 B-
- Unplug electrical connector -2-.
- Release catch -arrow- and detach bracket with pressure differential sender - G505- from connection.



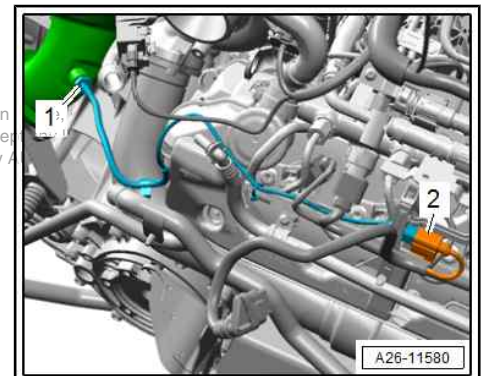
- Unplug electrical connector -2- at exhaust gas temperature sender 4 - G648- and move electrical wiring clear.



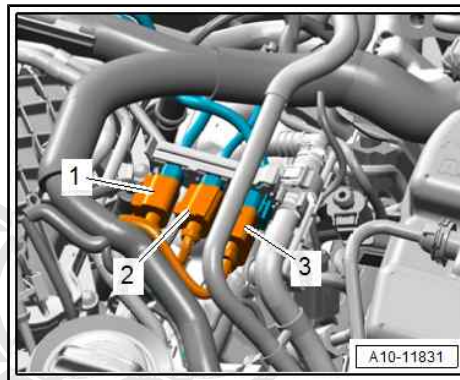
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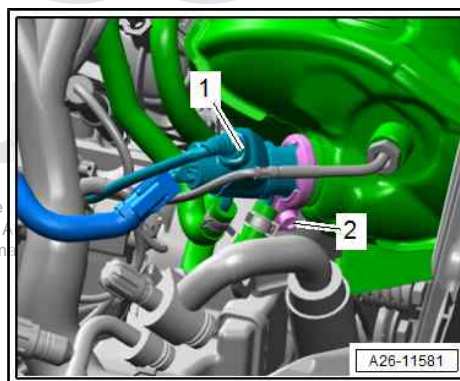
*Disregard -item 1-.*



- Unplug electrical connectors -1, 2, 3- 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.



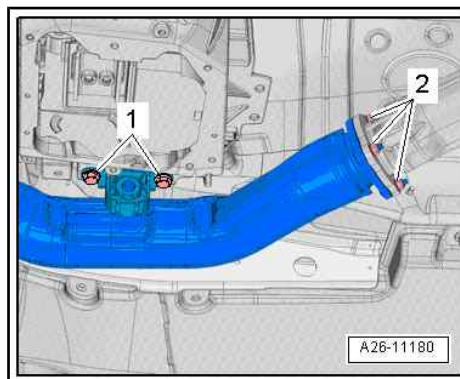
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- Remove bolts -1-.



#### Note

Disregard -item 2-.

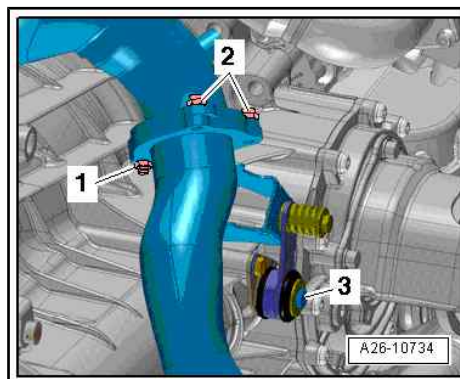


- Remove bolt -3-.

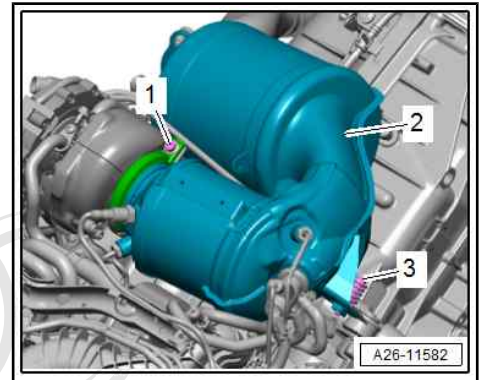


#### Note

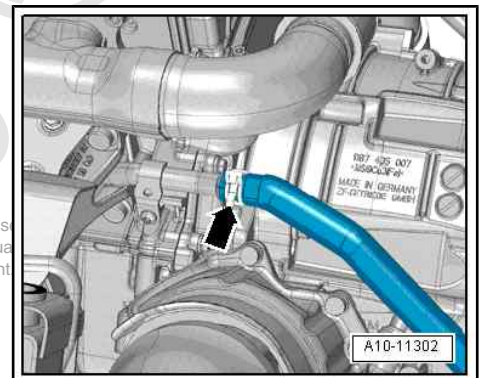
Disregard items -1 and 2-.



- Remove bolt -3- on retainer.
- Open screw-type clip -1- and place it on intake funnel of emission control module.
- Remove emission control module -2- with front exhaust pipe.
- Unbolt drive shaft (left and right) from gearbox flange shafts  
⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft;  
Removing and installing drive shaft .



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



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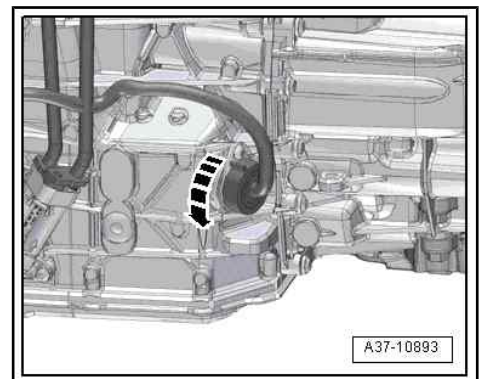
#### Vehicles with four-wheel drive



#### Caution

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

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



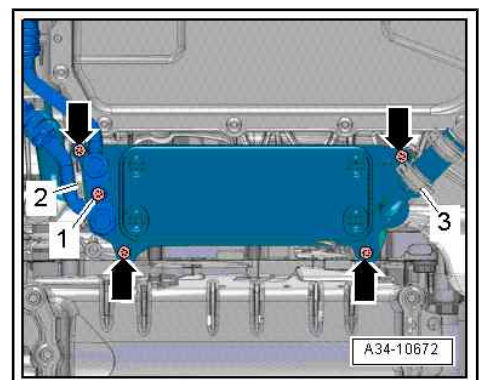
- Turn retainer catch anti-clockwise -arrow- and unplug electrical connector at gearbox.
- Move electrical wiring harness clear at gearbox.
- Release hose clip -3- and detach coolant hose.
- Remove bolts -arrows- and push ATF cooler to one side.



#### Note

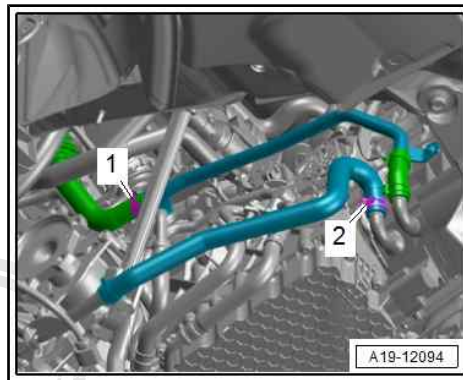
*Disregard items marked -1, 2-.*

#### Vehicles with front-wheel drive

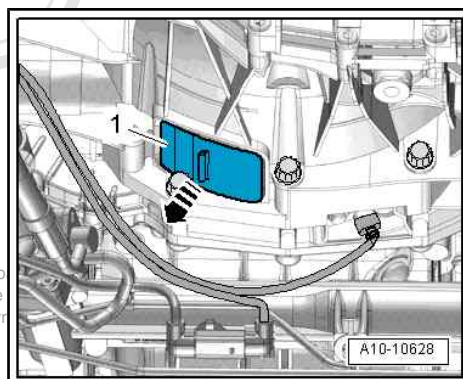


- Release hose clips -2- and detach coolant hoses -1-.

All vehicles:



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



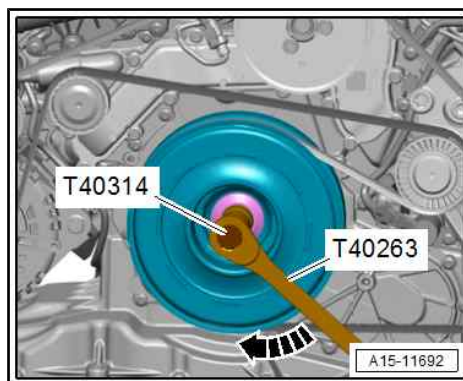
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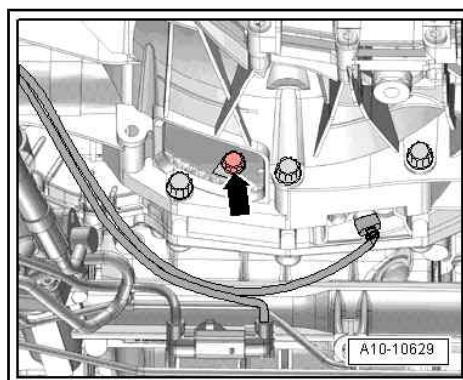
### Caution

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

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



- Counterhold crankshaft using wrench, 21 mm - T40263- and adapter -T40314- when slackening bolts for dual-mass fly-wheel.
- Remove 6 bolts -arrow- for dual-mass flywheel. Turn crankshaft 60° in direction of engine rotation each time.

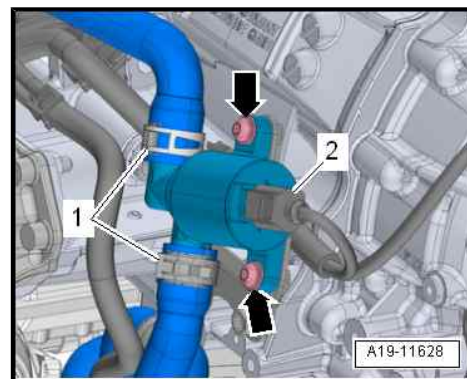


- Unplug electrical connector -2-.
- Remove bolts -arrows- and move gear oil cooling valve - N509- to one side.



**Note**

*Disregard -item 1-.*



- Set up scissor-type assembly platform - VAS 6131 B- with support set for Audi - VAS 6131/10- , supplementary set - VAS 6131/11- and support -VAS 6131/13-7- as follows:

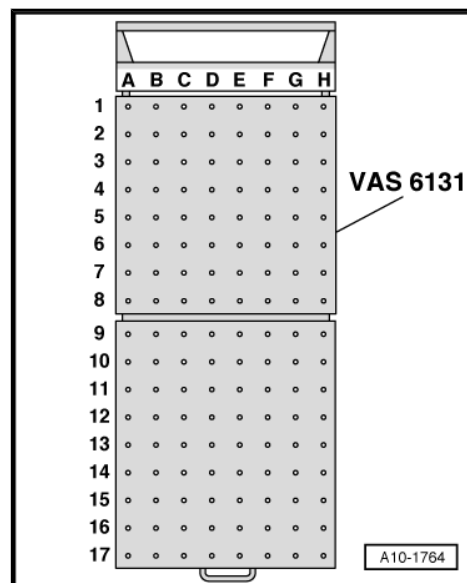


**Note**

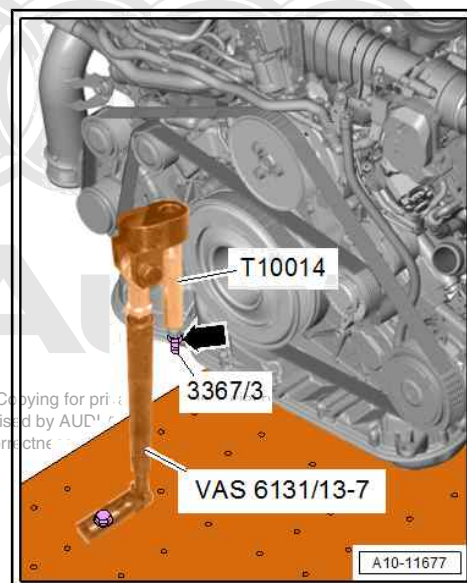
*The other support elements remain unchanged.*

**Vehicles with four-wheel drive**

| Platform coordinates | Parts from support set for Audi - VAS 6131/10- , supplementary set -VAS 6131/11- and support - VAS 6131/13-7- |       |       |       |
|----------------------|---------------------------------------------------------------------------------------------------------------|-------|-------|-------|
| F2                   | /13-7                                                                                                         |       |       |       |
| B10                  | /10-1                                                                                                         | /10-3 | /10-5 | /11-4 |
| G10                  | /10-1                                                                                                         | /10-3 | /10-5 | /11-4 |



- Secure support -VAS 6131/13-7- at front of engine (right-side) with M10 nut -arrow-, as illustrated.
- Secure support to scissor-type assembly platform - VAS 6131 B- and tighten to 20 Nm.

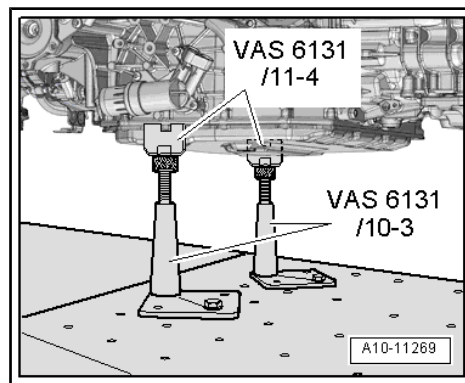


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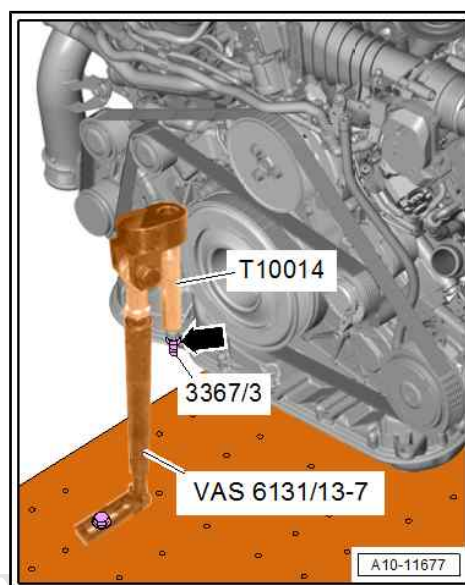
- Position support elements from -VAS 6131/10- and -VAS 6131/11- at front of gearbox, as shown in illustration.
- Screw spindles upwards on both sides until mountings -VAS 6131/11-4- make full contact with gearbox.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly platform - VAS 6131 B- .

#### Vehicles with front-wheel drive

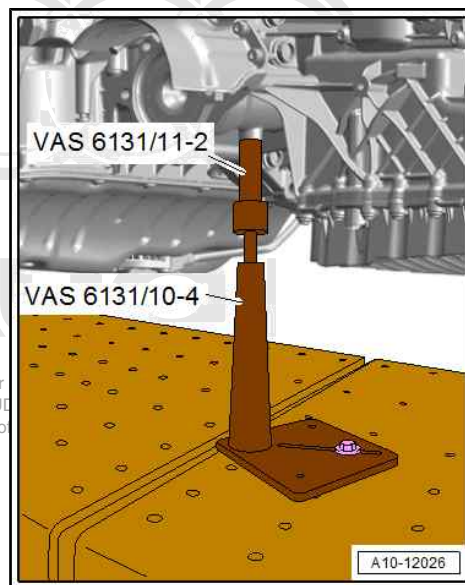
| Platform coordinates | Parts from support set for Audi - VAS 6131/10- , supplementary set -VAS 6131/11- and support -VAS 6131/13-7- |       |       |       |
|----------------------|--------------------------------------------------------------------------------------------------------------|-------|-------|-------|
| F2                   | /13-7                                                                                                        |       |       |       |
| C10                  | /10-1                                                                                                        | /10-4 | /10-5 | /11-2 |
| F10                  | /10-1                                                                                                        | /10-4 | /10-5 | /10-9 |



- Secure support -VAS 6131/13-7- at front of engine (right-side) with M10 nut -arrow-, as illustrated.
- Secure support to scissor-type assembly platform - VAS 6131 B- and tighten to 20 Nm.



- Position support elements from -VAS 6131/10- and adapter -VAS 6131/11-2- at left of gearbox, as shown.



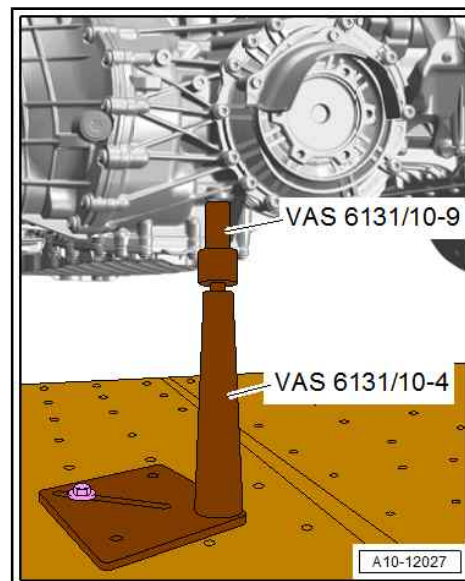
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- Position support elements from -VAS 6131/10- at right of gear-box, as shown.
- Turn spindles (left and right) upwards until all locating lugs make contact with mounting points.
- Tighten base plates for support elements to 20 Nm on scissor-type assembly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

**All vehicles:**



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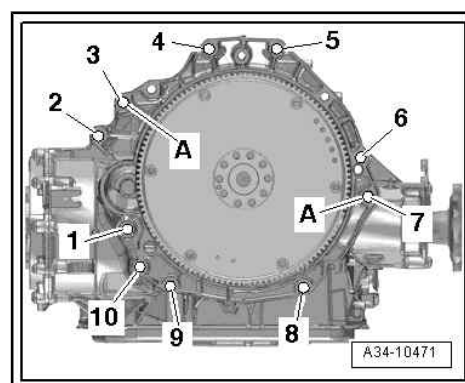


- Remove bolts -1- and -2- for starter.
- Separate starter from gearbox and leave in position.
- Unscrew remaining bolts -3 ... 10- securing engine to gearbox.

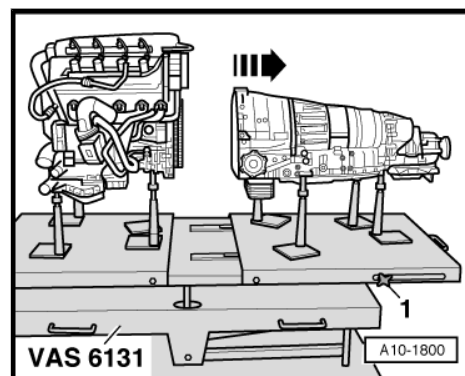


**Note**

*Disregard -item A-.*



- Loosen clamping bolts -1- on sides of scissor-type assembly platform - VAS 6131 B- and pull rear section of platform together with gearbox slightly towards rear -arrow-.



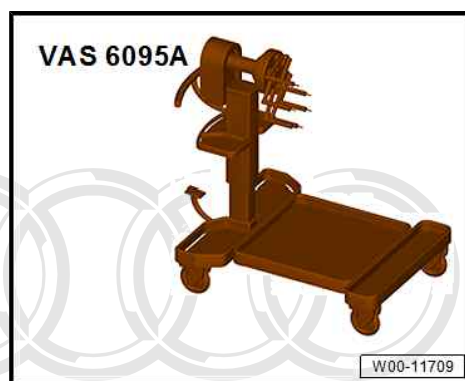
### 1.3 Securing engine to engine and gearbox support

Special tools and workshop equipment required

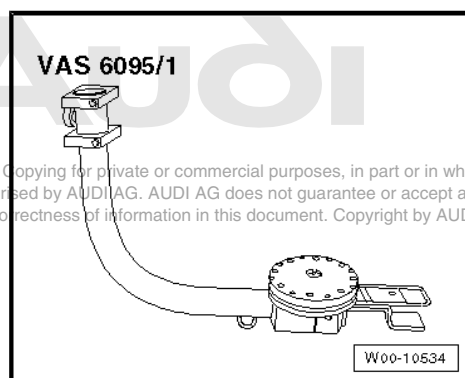
◆ Lifting tackle - 3033-



◆ Engine and gearbox support - VAS 6095A-



◆ Universal mounting - VAS 6095/1- with bracket for 3.0 ltr. TDI engine Gen2 Evo - VAS 6095/1-14-

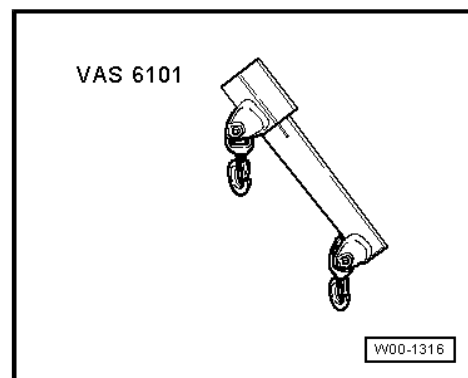


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◆ Workshop hoist - VAS 6100-

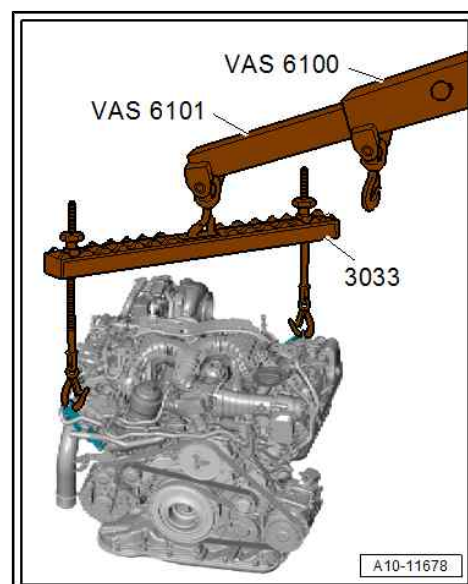


◆ Lift arm extension (workshop hoist) - VAS 6101-



**Procedure**

- Engine/gearbox assembly removed and secured to scissor-type assembly platform - VAS 6131- (with engine detached from gearbox)
- Engine secured with support -VAS 6131/13-7- .
- 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.

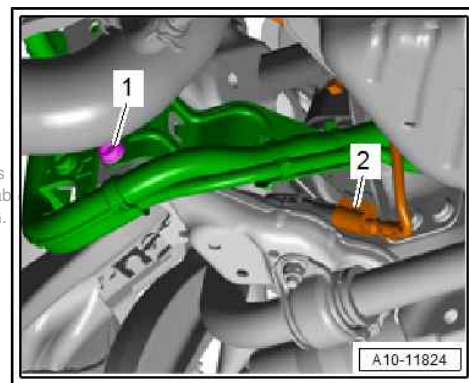


- Take electrical connectors -2- for electrohydraulic engine mounting solenoid valves -N144- / -N145- out of brackets and unplug (both sides).
- Unscrew bolt -1- and detach bracket with electrical wiring from subframe.



**Note**

*The illustration shows the installation position with the engine installed.*

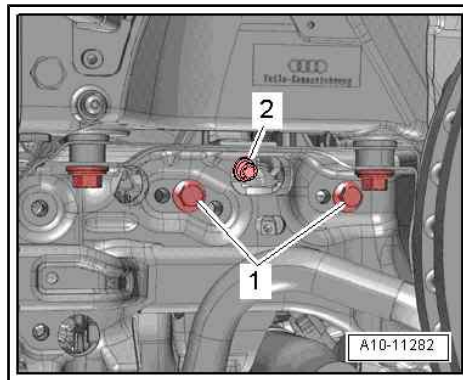


- Remove bolt -2- for engine mounting on both sides.

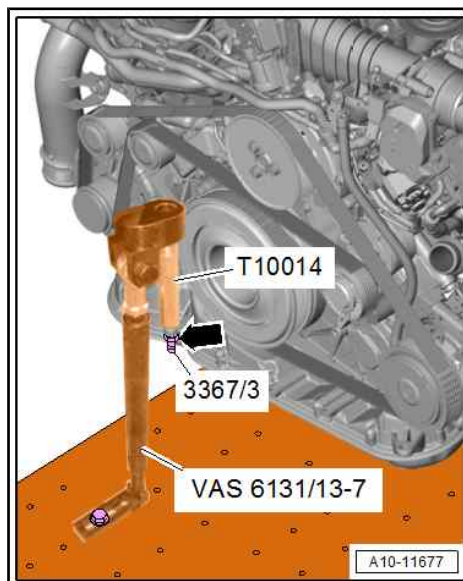


#### Note

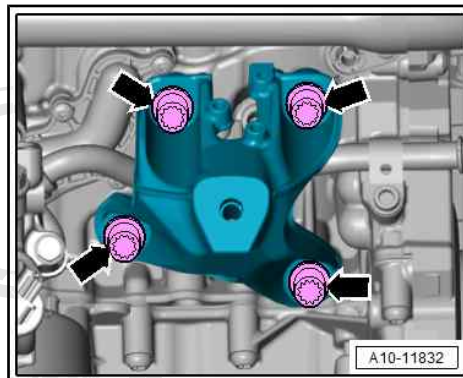
Disregard -item 1-.



- Remove support -VAS 6131/13-7- from engine.
- Lift engine off engine cross member.



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



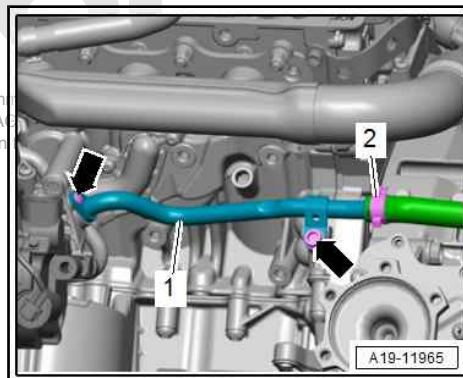
- Remove bolts -arrows-.
- Detach coolant pipe (left-side) -1- and move clear to side.



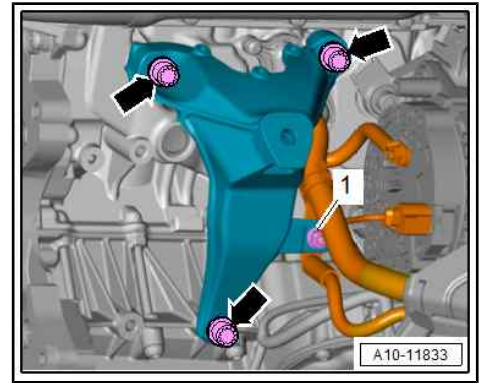
#### Note

Disregard -item 2-.

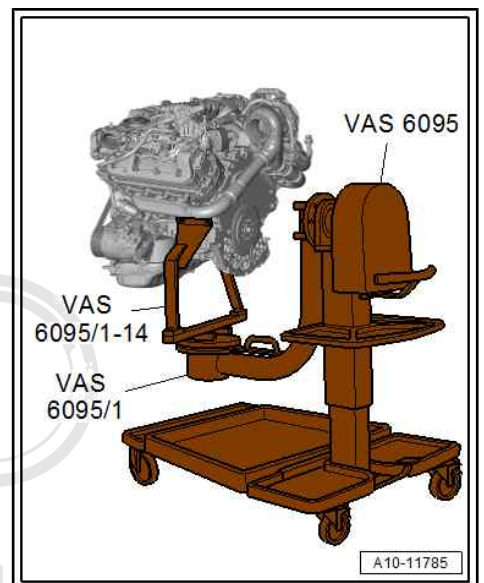
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- Remove nut -1- and bolts -arrows- and detach engine support (right-side).
- Tie up starter on engine.



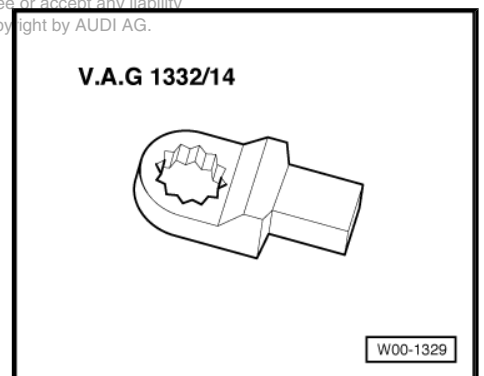
- Using universal mounting - VAS 6095/1- and bracket for TDI engine 3.0 ltr. Gen2 Evo - VAS 6095/1-14- , secure engine to engine and gearbox support - VAS 6095A- (40 Nm) as shown in illustration.



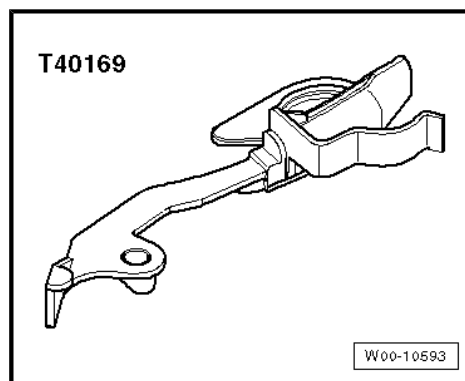
## 1.4 Installing engine

### Special tools and workshop equipment required

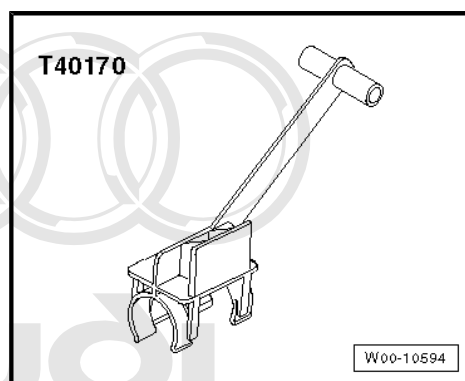
- ◆ Ring spanner insert AF 16 - V.A.G 1332/14-



# ◆ Assembly aid - T40169-



# ◆ Transport lock - T40170-



## Tightening torques

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### Note

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

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

- ◆ Assembly mountings  
⇒ ["2.1 Exploded view - assembly mountings", page 42](#)
- ◆ Bolts securing engine to gearbox ⇒ Gearbox; Rep. gr. 34 ;  
Removing and installing gearbox; Tightening torques for gearbox

## Procedure



### Note

- ◆ *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* .*
  - ◆ *Re-install all cable ties in the same locations when installing.*
- Engine with subframe positioned on scissor-type assembly platform - VAS 6131 B-
  - Engine secured with support -VAS 6131/13-7- .
  - Install coolant pipe (left-side) ⇒ [page 100](#) .
  - Install engine supports and engine mountings ⇒ [page 42](#) .
  - Before installing gearbox, remove residue from threaded holes for engine/gearbox bolts in cylinder block using a thread tap.
  - The following preparations are required before joining engine and gearbox:
  - Insert assembly aid - T40169- into gearbox housing and dual-mass flywheel from below, as illustrated.
  - The assembly aid must engage in the semi-circular recess -1- and in the inspection hole -2-.

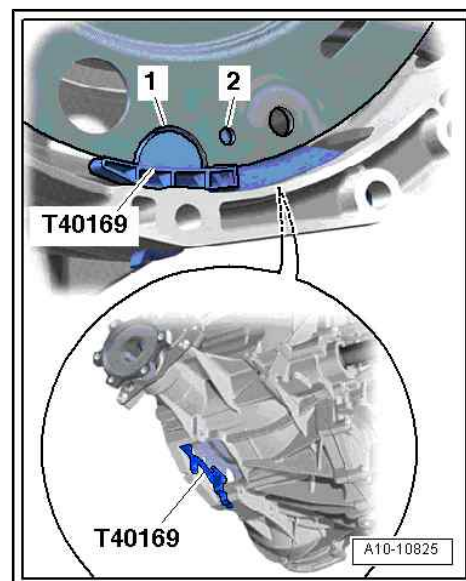


### Note

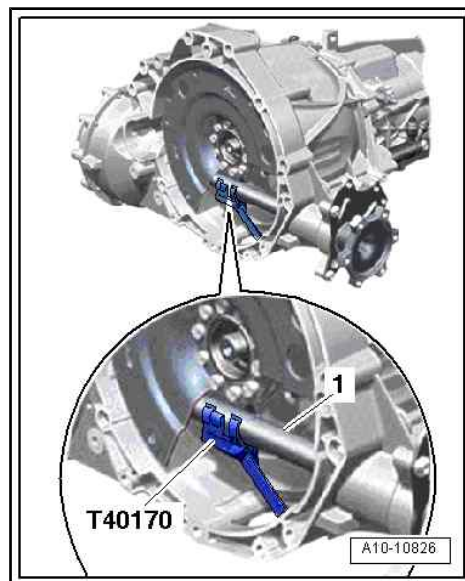
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*There is only one inspection hole on the circumference; turn the dual-mass flywheel accordingly.*

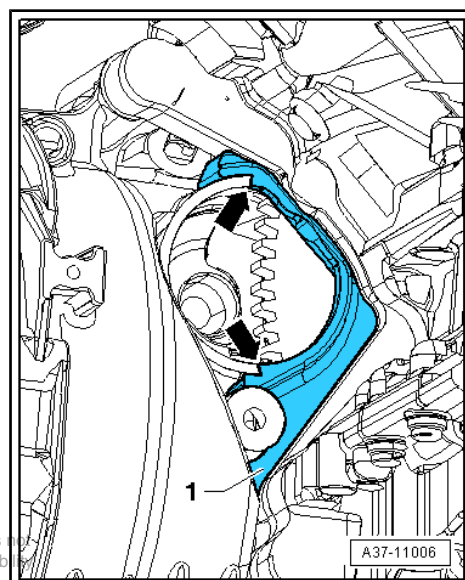
- Insert pin of assembly aid into hole on gearbox housing.



- Insert transport lock - T40170- into gearbox housing from below and clamp onto flange shaft -1-.

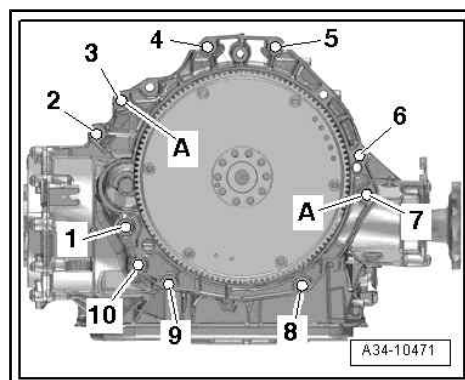


- Fit starter and end seal -1- (where present) in correct installation position -arrows-.



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- Check whether dowel sleeves -A- for centring engine and gearbox are fitted in cylinder block; install missing dowel sleeves.
- Check whether aluminium bolts securing engine to gearbox can be reused; if so, apply marking ⇒ Gearbox; Rep. gr. 34 ; Removing and installing gearbox; Tightening torques for gearbox .
- Bring gearbox into position on engine and tighten bolts -3 ... 10-.

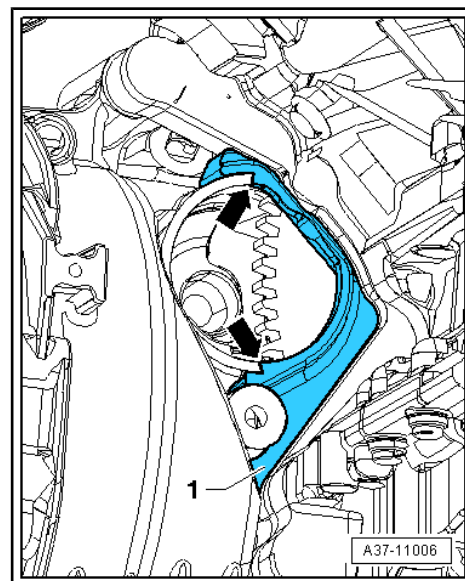


- End seal -1- must be correctly fitted -arrows- before installing starter.

 **Note**

*Apply a small amount of lubricant to the end seal if the starter cannot be installed easily.*

- Install starter ⇒ Electrical system; Rep. gr. 27 ; Starter; Exploded view - starter .
- Remove transport lock - T40170- and assembly aid - T40169- .

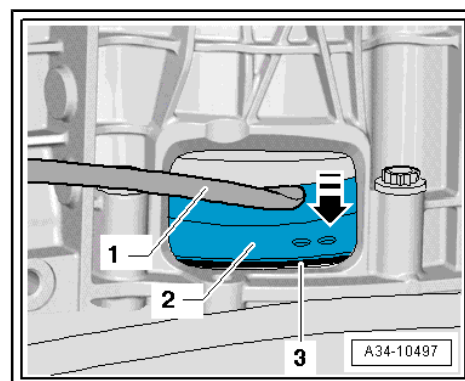


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*The following step is necessary to ensure that the dual-mass flywheel is straight and that it makes even contact with the drive plate.*

- Use assembly lever -1- to press dual-mass flywheel -2- slightly against drive plate -3- in direction of -arrow-.

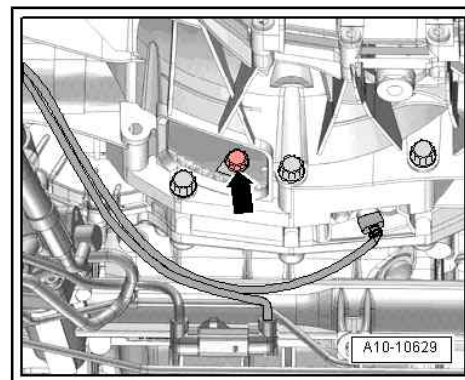


- Bolt dual-mass flywheel onto drive plate as follows:

 **Note**

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

- Screw in first bolt -arrow- hand-tight (2 Nm).



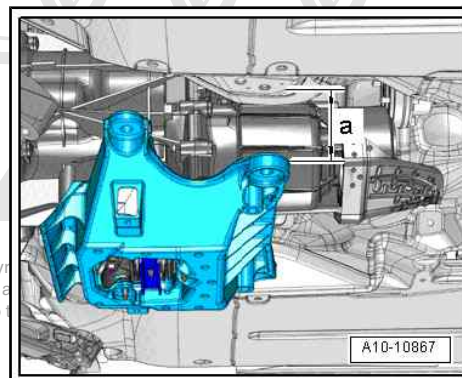
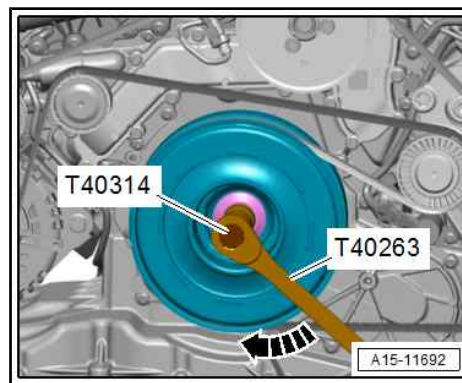


### Caution

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

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

- Turn crankshaft 180° further in normal direction of engine rotation with wrench, 21 mm - T40263- and adapter -T40314- .
- Tighten bolt accessible in this crankshaft position to specified torque ⇒ Gearbox; Rep. gr. 30 ; Clutch; Exploded view - flywheel and dual clutch .
- Turn crankshaft by 60° each time and tighten remaining 5 bolts to specified torque ⇒ Gearbox; Rep. gr. 30 ; Clutch; Exploded view - flywheel and dual clutch .
- Hold ATF lines in installation position when joining engine and subframe.
- Install gearbox oil cooling valve - N509- ⇒ [page 94](#) .
- Install ATF cooler ⇒ Gearbox; Rep. gr. 34 ; ATF circuit; Removing and installing ATF cooler .
- Secure drive shafts (left and right) to gearbox flange shafts ⇒ Running gear, axles, steering; Rep. gr. 40 ; Drive shaft; Exploded view - drive shaft .
- Install emission control module ⇒ [page 164](#) .
- Install injector for reducing agent - N474- ⇒ [page 175](#) .
- Raise engine/gearbox assembly using scissor-type assembly platform - VAS 6131 B- initially as far as distance -a-.
- Dimension -a- = 100 mm (maximum).



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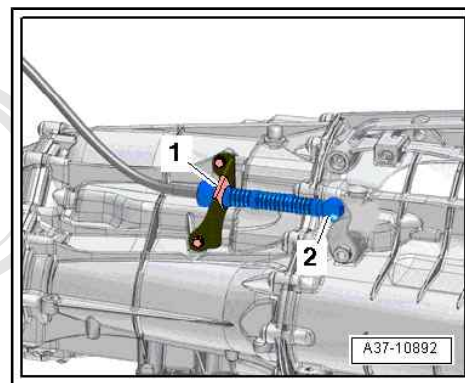
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- Carefully press ball socket -2- of selector lever cable in this position onto gearbox selector lever.

 **Note**

- ◆ *Take care not to bend gearbox selector lever when pressing on (counterhold if necessary).*
- ◆ *Take care not to bend or kink selector lever cable.*

- Secure selector lever cable with retaining clip -1-.
- Align subframe and tunnel cross member on longitudinal members according to markings made before removal.
- Tighten subframe bolts only to specified torque (do not turn further); the bolts should only be fully tightened after performing the wheel alignment check ➔ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view, subframe



**WARNING**

*Risk of accident if bolted connections are loose.*

- ◆ ***Do NOT drive the vehicle unless the subframe bolts have been tightened to their final torque.***

- Tighten bolts for tunnel cross-piece ➔ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings .

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

- Install propshaft ➔ Rear final drive; Rep. gr. 39 ; Propshaft; Removing and installing propshaft .
- Install SCR catalytic converter ➔ [page 163](#) .
- Install cover for reducing agent tank ➔ [page 167](#) .
- Install control unit for NOx sender 2 - J881- ➔ [page 148](#) .
- Remove underbody trim (centre, left-side) ➔ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Removing and installing underbody trim .
- Secure intermediate steering shaft to steering rack ➔ Running gear, axles, steering; Rep. gr. 48 ; Steering column; Removing and installing intermediate steering shaft .
- Install upper suspension links and suspension strut ➔ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links .
- Install subframe cross brace, anti-roll bar and heat shield ➔ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe .
- Install brake calipers ➔ Brake system; Rep. gr. 46 ; Front brakes; Removing and installing brake caliper .
- Install engine control unit ➔ [page 152](#) .
- Install filler neck for washer fluid reservoir ➔ Electrical system; Rep. gr. 92 ; Windscreen washer system; Exploded view - windscreen washer system .
- Electrical connections and routing ➔ Current flow diagrams, Electrical fault finding and Fitting locations.

- Install electrical wiring, terminal 30 wiring junction 2 - TV22- and cover for electronics box in plenum chamber ⇒ Electrical system; Rep. gr. 97 ; Relay carriers, fuse carriers, electronics boxes; Overview of fitting locations - relay carriers, fuse carriers, electronics boxes .
- Install hose connections for charge air system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system .
- Install body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links .
- Install refrigerant lines ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Exploded view - condenser .
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

**Caution**

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

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

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- Install air cleaner housing ⇒ [page 129](#) .
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Install engine cover panel ⇒ [page 48](#) .
- Fill with engine oil and check oil level ⇒ Maintenance ; Booklet 411 .
- Connect coolant hoses with plug-in connector ⇒ [page 105](#) .

**Note**

*Do not reuse coolant.*

- Fill up with coolant ⇒ [page 85](#) .
- Bleed fuel system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injection system; Filling and bleeding fuel system .
- Charge refrigerant circuit ⇒ Air conditioner with refrigerant R134a; Rep. gr. 87 ; Refrigerant circuit , or ⇒ Air conditioners with refrigerant R1234yf - General information; Rep. gr. 87 ; Working with the air conditioner service station; Discharging refrigerant circuit .
- Install wheel housing liners ⇒ 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 .
- Check wheel alignment ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheel alignment check; Wheel alignment procedure .



**WARNING**

*Risk of accident if bolted connections are loose.*

- ◆ *Tighten subframe bolts to final setting after performing wheel alignment check.*

- Check ATF level ⇒ Gearbox; Rep. gr. 34 ; ATF; Checking ATF level .
- Install noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .



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## 2 Assembly mountings

⇒ "2.1 Exploded view - assembly mountings", page 42

⇒ "2.2 Supporting engine in installation position", page 43

⇒ "2.3 Removing and installing engine mountings", page 44

⇒ "2.4 Removing and installing gearbox mounting", page 46

### 2.1 Exploded view - assembly mountings

#### Assembly mountings

#### 1 - Bolt

- ☐ 20 Nm

#### 2 - Bracket

- ☐ For engine mounting
- ☐ Renew retaining plate if engine mounting is defective
- ☐ Check retaining plate on opposite side; renew if necessary

#### 3 - Bolt

- ☐ 50 Nm

#### 4 - Engine support

#### 5 - Bolt

- ☐ 10 Nm

#### 6 - Heat shield

#### 7 - Bolt

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

#### 8 - Engine mounting

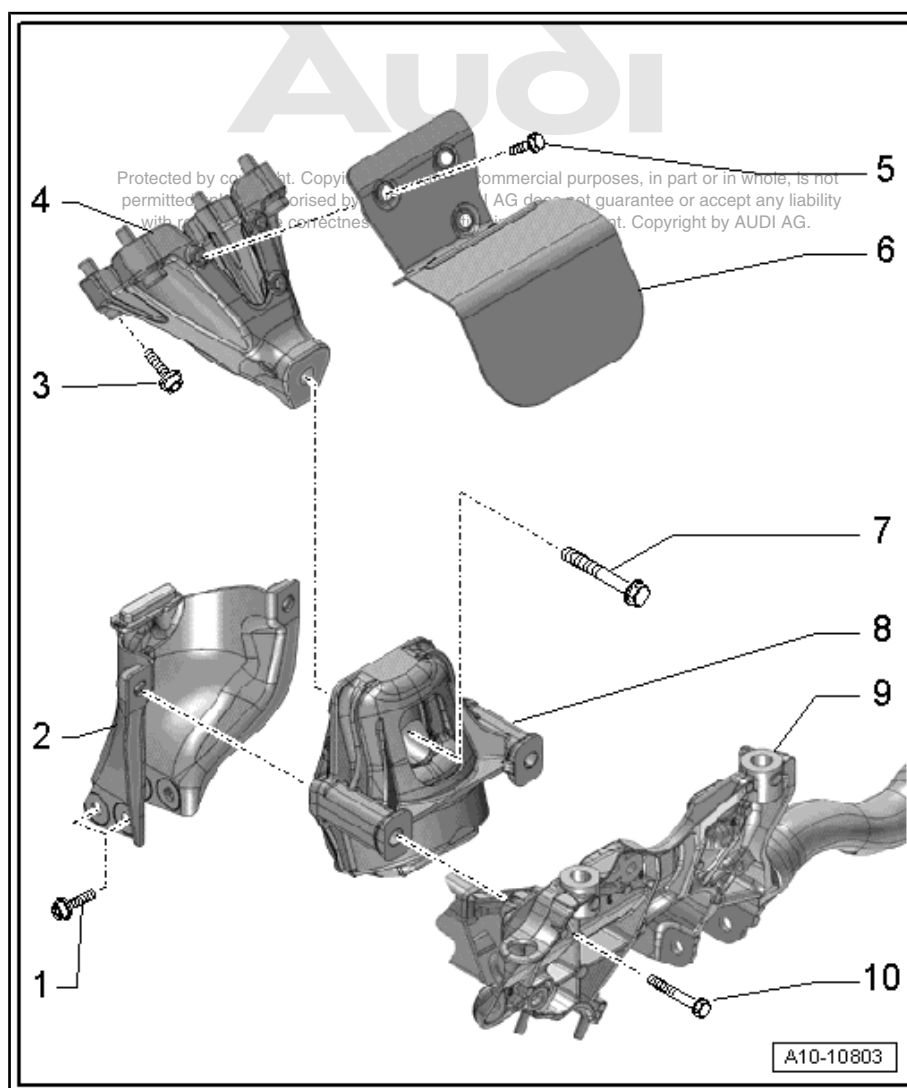
- ☐ Left side: with left electrohydraulic engine mounting solenoid valve - N144-
- ☐ Right side: with right electrohydraulic engine mounting solenoid valve - N145-
- ☐ Removing and installing  
⇒ [page 44](#)

#### 9 - Subframe

- ☐ Different versions available; for allocation refer to ⇒ Electronic parts catalogue

#### 10 - Bolt

- ☐ 55 Nm



Gearbox mounting for dual clutch gearbox 0B5

#### 1 - Bolt

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

#### 2 - Tunnel cross member

- ☐ Removing and installing ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

#### 3 - Stop plate

- ☐ For gearbox mounting

#### 4 - Gearbox mounting

- ☐ Removing and installing ⇒ [page 47](#)

#### 5 - Bolt

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

#### 6 - Nut

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

#### 7 - Bolt

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

#### 8 - Gearbox support

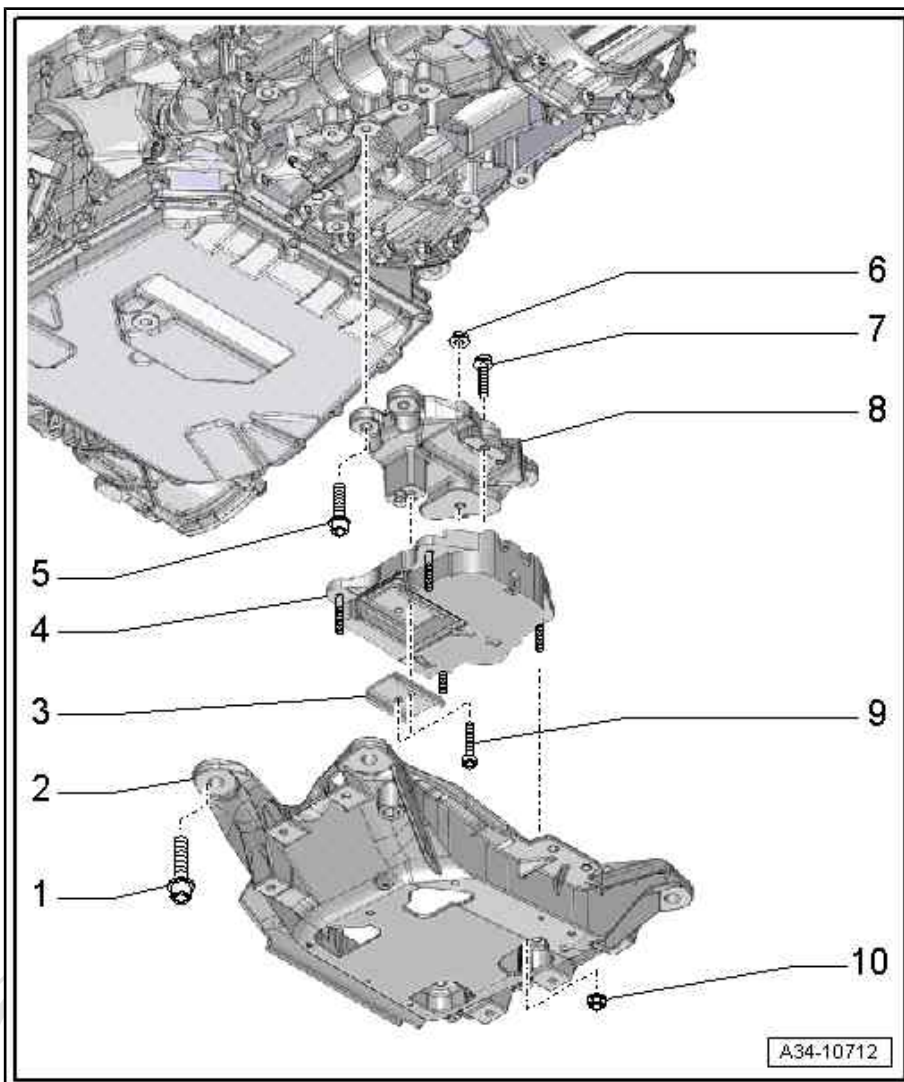
- ☐ Removing and installing ⇒ [page 46](#)

#### 9 - Bolt

- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings

#### 10 - Nut

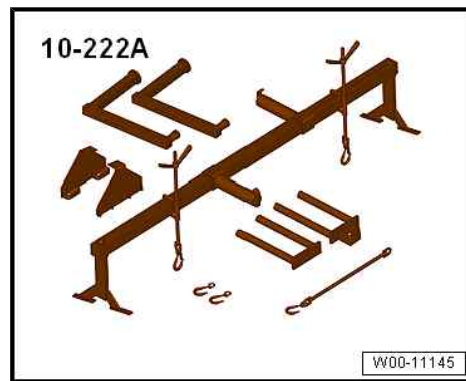
- ☐ Tightening torque ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings



## 2.2 Supporting engine in installation position

Special tools and workshop equipment required

# ◆ Support bracket - 10 - 222 A-



## Procedure



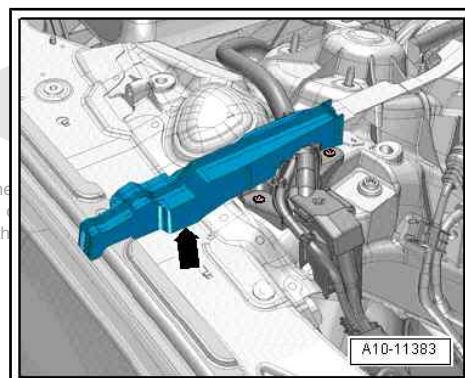
### WARNING

*Risk of accident when weight of engine is shifted.*

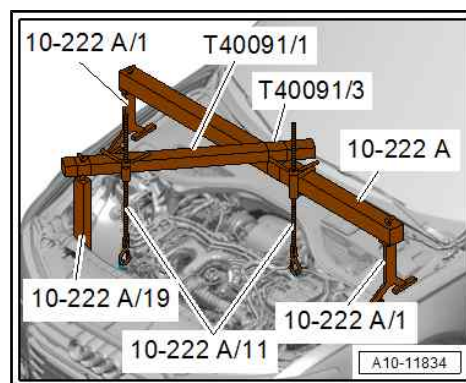
- ◆ *In order to support the engine as described below, the gearbox and tunnel cross members must be installed.*

- Remove engine cover panel ➤ [page 48](#) .
- Remove air cleaner housing ➤ [page 129](#) .
- Pull off foam wedge -arrow- (left and right) upwards.

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- Set up support bracket - 10 - 222 A- on suspension turrets (left and right) and longitudinal member (right-side) as illustrated.
- Unplug electrical connectors and move wiring clear.
- Engage spindles -10 - 222 A /11- at engine lifting eyes (left and right).
- Partly take up weight of engine with spindles.



## 2.3 Removing and installing engine mountings

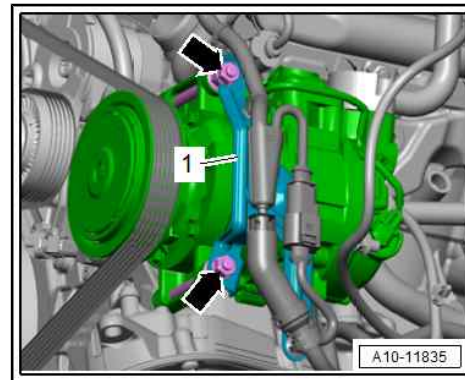
### Removing

- Support engine in installation position ➤ [page 43](#) .

- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove relevant front wheel spoiler ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .

#### Engine mounting (left-side):

- Remove poly V-belt ⇒ [page 52](#) .
- Remove nuts -arrows- and press bracket -1- to one side.
- Remove air conditioner compressor from bracket and tie up to front ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .

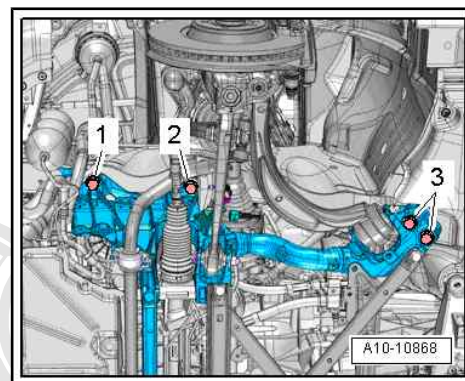


- Remove bolt -2- for subframe (left-side).



#### Note

*Bolts -1- and -3- on left side and all bolts for subframe on right side remain fitted.*



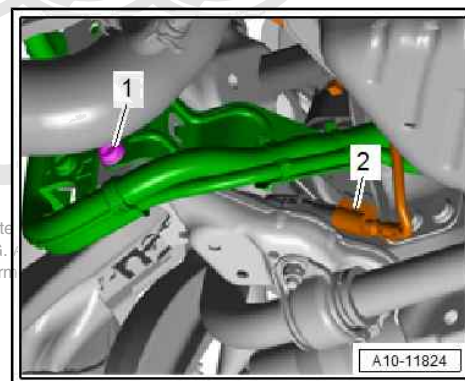
#### Engine mounting (right-side):

- Remove bolt -1-.

#### Both sides (continued):

- Move electrical connectors -2- (left and right) for electrohydraulic engine mounting solenoid valves -N144- / -N145- clear.

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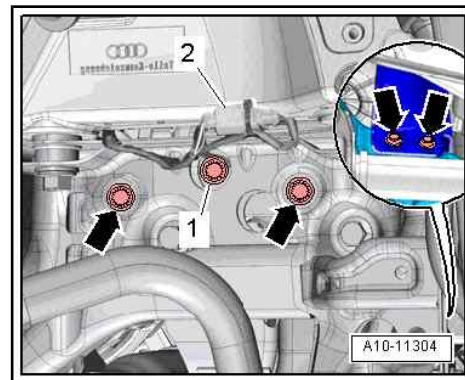


- Remove bolts (left and right) -1- and -arrows- and place retaining plate to one side.



#### Note

*Disregard -item 2-.*



- Using spindle - 10 - 222 A /11- -item 1-, raise engine through distance -a- on corresponding side.
- Distance -a- = approx. 20 mm.
- Detach engine mounting on relevant side.

### Installing

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



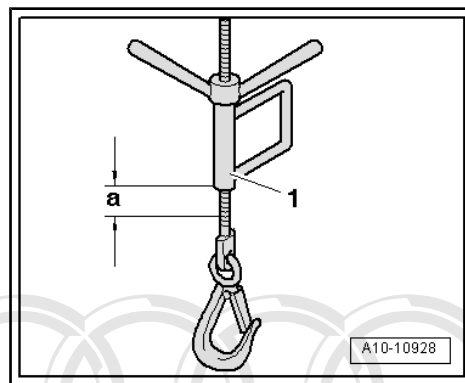
### Note

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 ⇒ [page 52](#) .

### Tightening torques

- ♦ ⇒ ["2.1 Exploded view - assembly mountings", page 42](#)
- ♦ ⇒ Running gear, axles, steering; Rep. gr. 40 ; Subframe; Exploded view - subframe
- ♦ ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Exploded view - air conditioner compressor drive unit
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation
- ♦ Wheel spoiler ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)



## 2.4 Removing and installing gearbox mounting

⇒ ["2.4.1 Removing and installing gearbox support with gearbox mounting", page 46](#)

⇒ ["2.4.2 Removing and installing gearbox mounting", page 47](#)

### 2.4.1 Removing and installing gearbox support with gearbox mounting

#### Removing

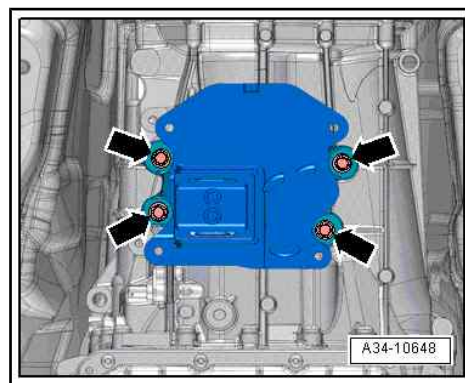
- Remove tunnel cross member ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings .
- Remove bolts -arrows- and detach gearbox support and gearbox mounting from gearbox.

#### Installing

Installation is carried out in reverse sequence.

#### Tightening torques

- ♦ ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view - assembly mountings



## 2.4.2 Removing and installing gearbox mounting

### Removing

- Remove gearbox support with gearbox mounting ⇒ [page 46](#) .
- Unscrew bolt -1- and detach stop -2- for gearbox mounting.
- Remove nut -5- and bolt -6- and detach gearbox mounting -3- from gearbox support -4-.

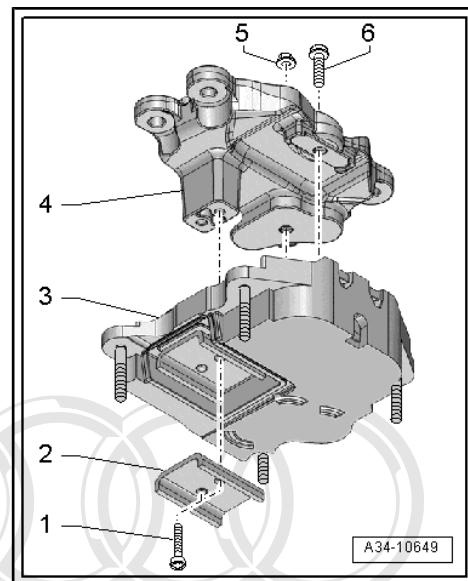
### Installing

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

- Position gearbox support -4- on gearbox mounting -3-.
- Hand-tighten nut -5- and bolt -6-.
- Tighten bolt -1- for stop -2-.
- Tighten nut -5- and bolt -6-.
- Install gearbox support with gearbox mounting ⇒ [page 46](#) .

### Tightening torques

- ◆ ⇒ Gearbox; Rep. gr. 34 ; Assembly mountings; Exploded view  
- assembly mountings



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### 3 Engine cover panel

⇒ ["3.1 Removing and installing engine cover panel", page 48](#)

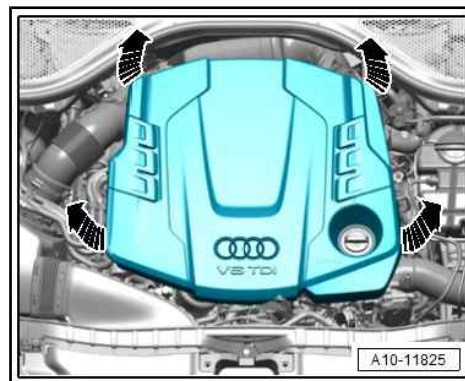
#### 3.1 Removing and installing engine cover panel

##### Removing

- 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.

##### Installing

- To avoid damage, do not strike the engine cover panel with your fist or with any kind of tool.
- When fitting engine cover panel, take care not to damage oil filler neck.
- First press engine cover panel onto rear retaining pins and then onto front retaining pins with both hands.



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## 13 – Crankshaft group

### 1 Cylinder block (pulley end)

⇒ [“1.1 Exploded view - cylinder block \(pulley end\)”, page 49](#)

⇒ [“1.2 Exploded view - sealing flange \(pulley end\)”, page 51](#)

⇒ [“1.3 Removing and installing poly V-belt”, page 52](#)

⇒ [“1.4 Removing and installing tensioner for poly V-belt”, page 52](#)

⇒ [“1.5 Removing and installing vibration damper”, page 52](#)

⇒ [“1.6 Removing and installing bracket for ancillaries”, page 53](#)

⇒ [“1.7 Renewing crankshaft oil seal \(pulley end\)”, page 53](#)

⇒ [“1.8 Removing and installing sealing flange \(pulley end\)”, page 53](#)

#### 1.1 Exploded view - cylinder block (pulley end)

##### 1 - Poly V-belt

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

##### 2 - Vibration damper

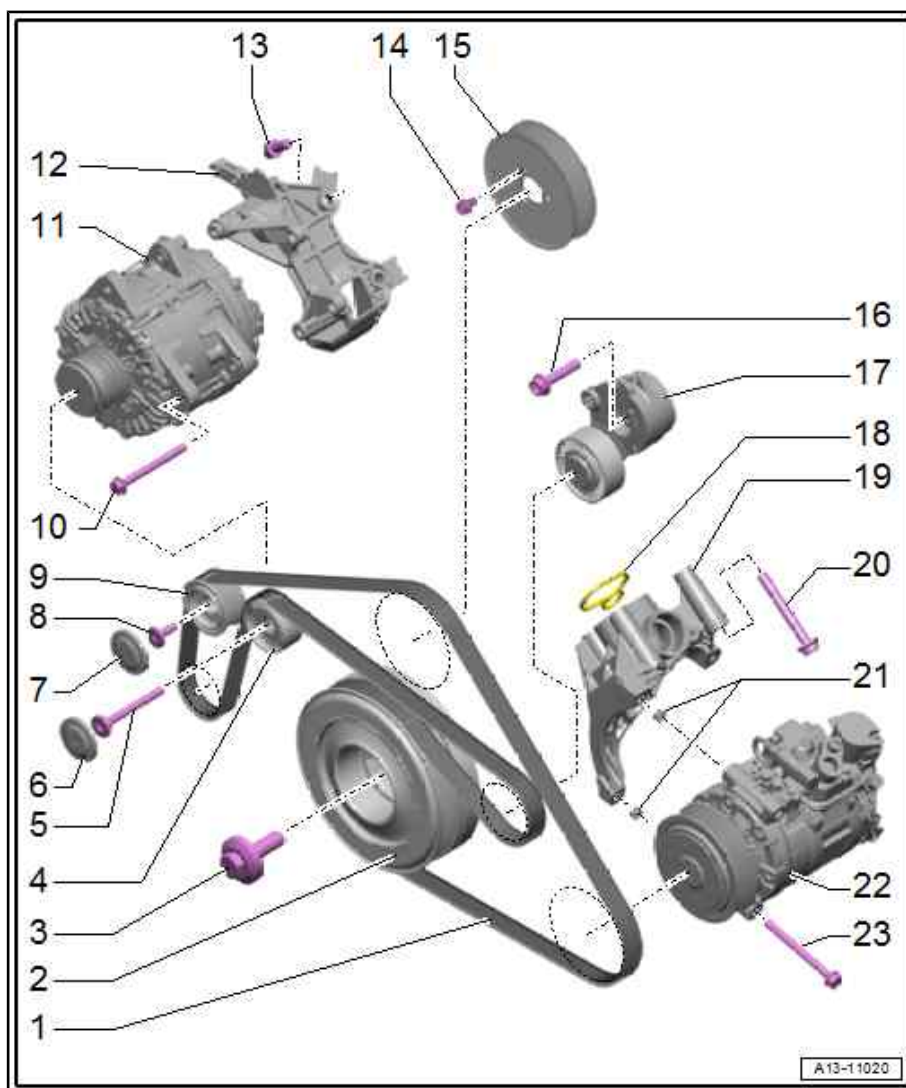
- ☐ With poly V-belt pulley
- ☐ Removing and installing  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing vibration damper

##### 3 - Bolt

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

##### 4 - Idler roller

- ☐ For poly V-belt



**5 - Bolt**

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

**6 - Cover**

- ☐ For idler roller

**7 - Cover**

- ☐ For idler roller

**8 - Bolt**

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

**9 - Idler roller**

- ☐ For poly V-belt

**10 - Bolt**

- ☐ Tightening torques ⇒ Electrical system; Rep. gr. 27 ; Alternator; Exploded view - alternator

**11 - Alternator**

- ☐ Removing and installing ⇒ Electrical system; Rep. gr. 27 ; Alternator; Removing and installing alternator

**12 - Bracket**

- ☐ For alternator
- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

**13 - Bolt**

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

**14 - Bolt**

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

**15 - Pulley**

- ☐ For coolant pump

**16 - Bolt**

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

**17 - Tensioner**

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

**18 - Gasket**

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

**19 - Bracket**

- ☐ For air conditioner compressor
- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries

**20 - Bolt**

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

## 21 - Dowel sleeves

## 22 - Air conditioner compressor

- ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket

## 23 - Bolt

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

## 1.2 Exploded view - sealing flange (pulley end)

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### 1 - Oil seal

- ☐ For crankshaft (pulley end)
- ☐ Renewing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Renewing crankshaft oil seal (pulley end)

### 2 - Sealing flange (pulley end)

- ☐ Removing and installing ⇒ [page 53](#)

### 3 - Bracket

- ☐ For intake manifold flap motor - V157-

### 4 - Bolt

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

### 5 - O-rings

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

### 6 - Oil temperature sender 2 - G664-

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch

### 7 - Bolt

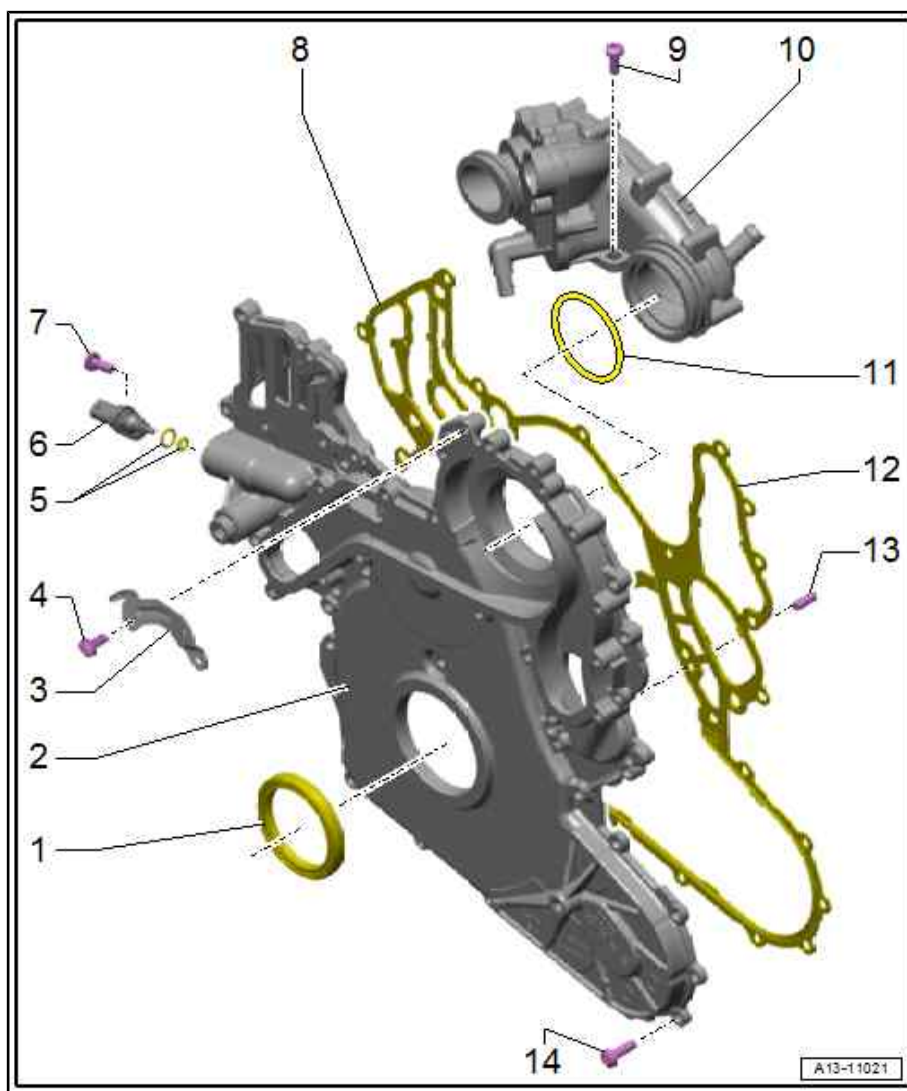
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - sealing flange (pulley end)

### 8 - Gasket

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

### 9 - Bolt

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





## 10 - Thermostat housing

- ❑ Exploded view ⇒ [page 90](#)

## 11 - O-ring

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

## 12 - Gasket

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

## 13 - Dowel pin

- ❑ 2x

## 14 - Bolt

- ❑ Tightening torques ⇒ 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-belt

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 noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove radiator cowl ⇒ [page 109](#) .

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 radiator cowl ⇒ [page 109](#) .

### Tightening torques

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

## 1.6 Removing and installing bracket for ancillaries

⇒ **"1.6.1 Removing and installing bracket for air conditioner compressor", page 53**

⇒ **"1.6.2 Removing and installing bracket for alternator", page 53**

### 1.6.1 Removing and installing bracket for air conditioner compressor

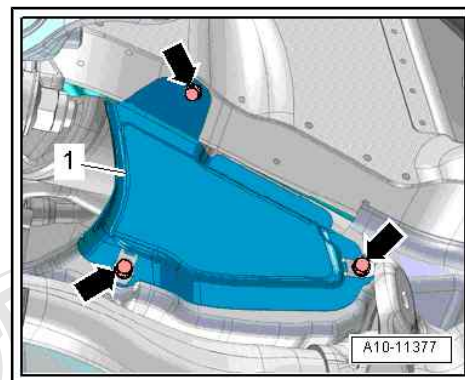
#### Removing

- Remove bolts -arrows- and detach heat shield (left-side) -1- for longitudinal member.

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

#### Tightening torques

- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Strips / trim panels / extensions; Exploded view - heat shield



### 1.6.2 Removing and installing bracket for alternator

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

## 1.7 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) .

## 1.8 Removing and installing sealing flange (pulley end)

#### Removing

- Drain off engine oil ⇒ Maintenance ; Booklet 411 .
- Remove oil filter element ⇒ Maintenance ; Booklet 411 .

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 oil filter element and fill up with engine oil ⇒ Maintenance ; Booklet 411 .

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## 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 58

⇒ "1.2 Removing and installing timing chain cover", page 60

### 1.1 Exploded view - timing chain cover

#### 1 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

#### 2 - Sender wheel

- ❑ For engine speed sender - G28-
- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Crankshaft; Removing and installing sender wheel

#### 3 - Oil seal

- ❑ For crankshaft (gearbox end)
- ❑ Renewing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Cylinder block (gearbox end); Renewing crankshaft oil seal (gearbox end)

#### 4 - Timing chain cover (bottom)

- ❑ Removing and installing ⇒ page 60

#### 5 - Dowel sleeve

- ❑ 2x

#### 6 - Gasket

- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

#### 7 - Bolt

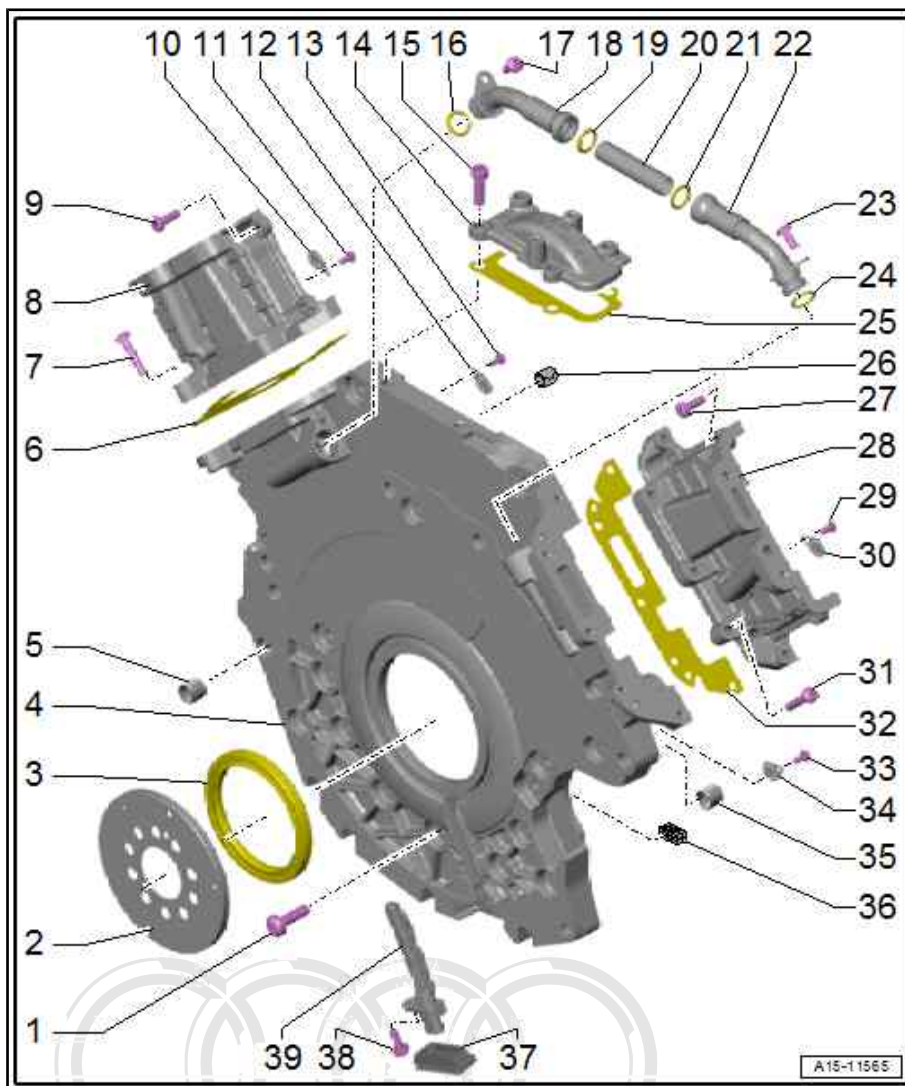
- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

#### 8 - Timing chain cover (left-side)

- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Removing and installing timing chain cover

#### 9 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover



#### 10 - Reed valve

- ☐ For crankcase breather

#### 11 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 12 - Reed valve

- ☐ For crankcase breather

#### 13 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 14 - Cover

#### 15 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 16 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 17 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 18 - Line

- ☐ For crankcase breather

#### 19 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 20 - Pipe

- ☐ For crankcase breather

#### 21 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 22 - Pipe

- ☐ For crankcase breather

#### 23 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 24 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 25 - Gasket

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 26 - Clamping sleeve

- ☐ 3x

#### 27 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Exploded view - timing chain cover

#### 28 - Timing chain cover (right-side)

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover;  
Removing and installing timing chain cover

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## 29 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

## 30 - Reed valve

- ❑ For crankcase breather

## 31 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

## 32 - Gasket

- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

## 33 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

## 34 - Reed valve

- ❑ For crankcase breather

## 35 - Dowel sleeve

- ❑ 2x

## 36 - Sealing element

- ❑ 2x

## 37 - Cover

## 38 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Timing chain cover; Exploded view - timing chain cover

## 39 - Engine speed sender - G28-

- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Removing and installing engine speed sender - G28-

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## 1.2 Removing and installing timing chain cover

⇒ **"1.2.1 Removing and installing timing chain cover (top)",**  
**page 60**

⇒ **"1.2.2 Removing and installing timing chain cover (bottom)",**  
**page 60**

### 1.2.1 Removing and installing timing chain cover (top)

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

### 1.2.2 Removing and installing timing chain cover (bottom)

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

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 62](#)

⇒ ["3.2 Exploded view - cylinder head cover", page 64](#)

⇒ ["3.3 Removing and installing cylinder head", page 65](#)

⇒ ["3.4 Removing and installing cylinder head cover", page 66](#)

⇒ ["3.5 Removing and installing seals for injectors", page 69](#)

⇒ ["3.6 Checking compression", page 69](#)

#### 3.1 Exploded view - cylinder head

##### 1 - Cylinder head gasket

- ☐ Renewing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Removing and installing cylinder head .
- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

##### 2 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

##### 3 - Bracket

##### 4 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

##### 5 - Coolant pipe

##### 6 - Bolt

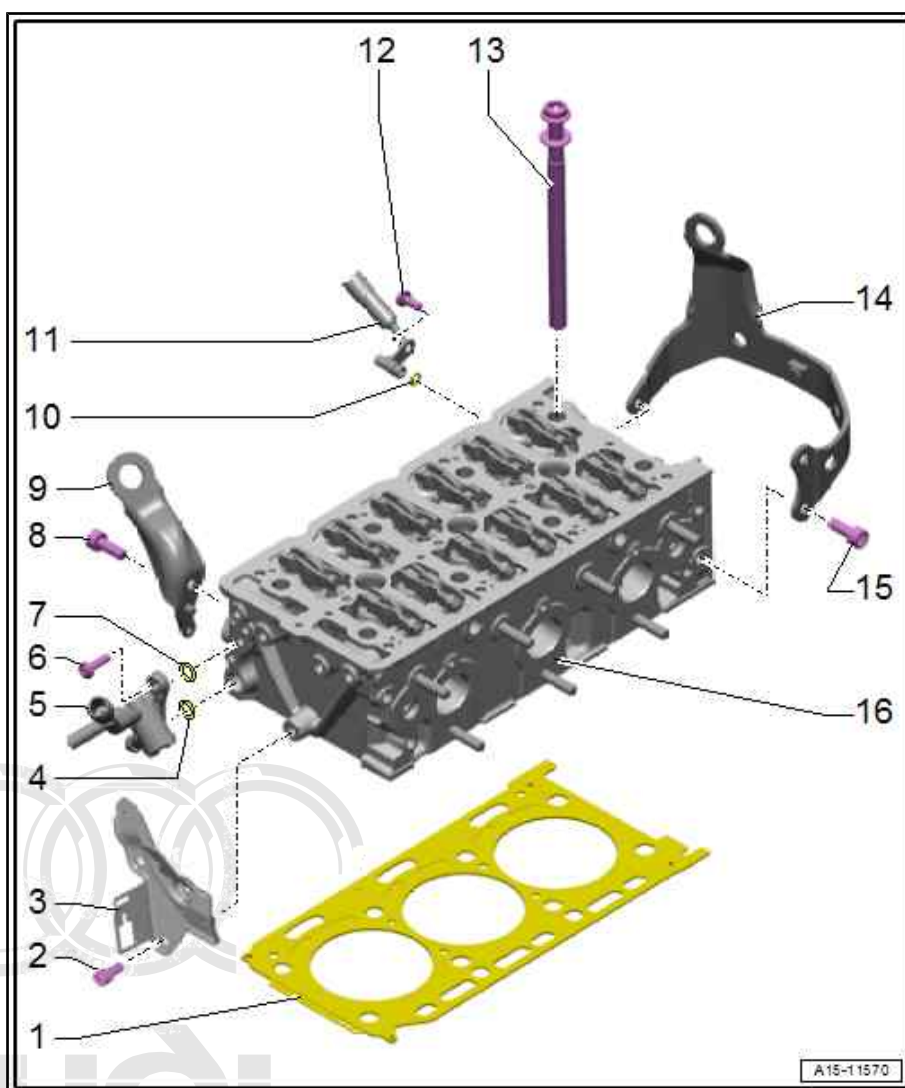
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

##### 7 - Seal

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

##### 8 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head



## 9 - Engine lifting eye

## 10 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

## 11 - Coolant pipe

## 12 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

## 13 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

## 14 - Engine lifting eye

## 15 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head

## 16 - Cylinder head

- ☐ Shown for cylinder bank 2 (left-side)
- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Removing and installing cylinder head
- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head



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## 3.2 Exploded view - cylinder head cover

### 1 - Gasket

- ❑ Installation instructions  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 2 - O-ring

- ❑ Installation instructions  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 3 - Cylinder head cover

- ❑ Shown for cylinder bank 2 (left-side)
- ❑ Removing and installing  
⇒ [page 66](#)

### 4 - O-ring

- ❑ Installation instructions  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 5 - Oil filler neck

### 6 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 7 - Grommet

### 8 - Seal

- ❑ For filler cap
- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 9 - Filler cap

### 10 - Nut

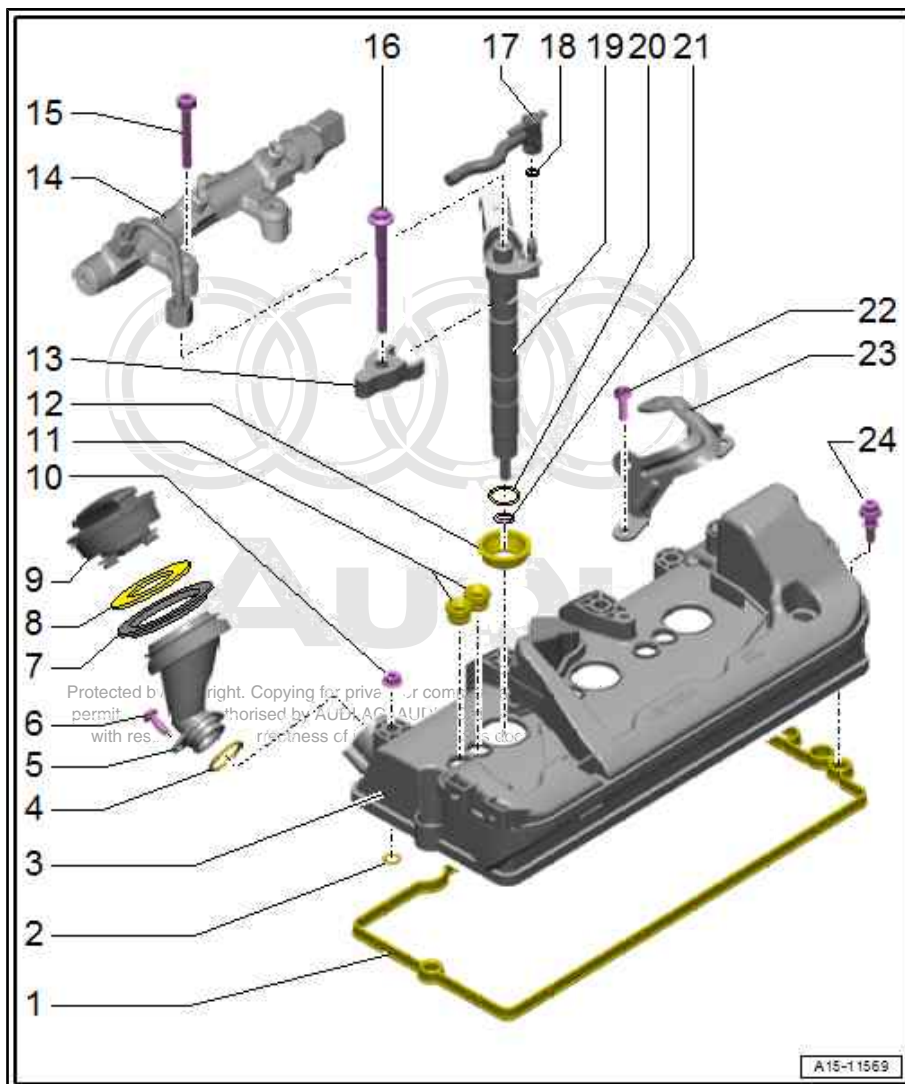
- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 11 - Grommets

- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 12 - Seal

- ❑ For injector
- ❑ Renewing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Removing and installing seals for injectors



### 13 - Clamping piece

- ☐ Removing and installing ⇒ [“5.8 Removing and installing injectors”, page 138](#)

### 14 - High-pressure reservoir (rail)

- ☐ Do not attempt to bend high-pressure pipes to a different shape
- ☐ Installing high-pressure pipes ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Removing and installing high-pressure pipes

### 15 - Bolt

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

### 16 - Bolt

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

### 17 - Fuel return hose

### 18 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 19 - Injector

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Injectors/high-pressure reservoir (rail); Removing and installing injectors ⇒ [page 138](#)

### 20 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 21 - Copper seal

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 22 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

### 23 - Bracket

### 24 - Bolt

- ☐ With seal
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 15 ; Cylinder head; Exploded view - cylinder head cover

## 3.3 Removing and installing cylinder head

### Removing

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

### Installing

Additional work:

- Change engine oil ⇒ Maintenance ; Booklet 411 .

## 3.4 Removing and installing cylinder head cover

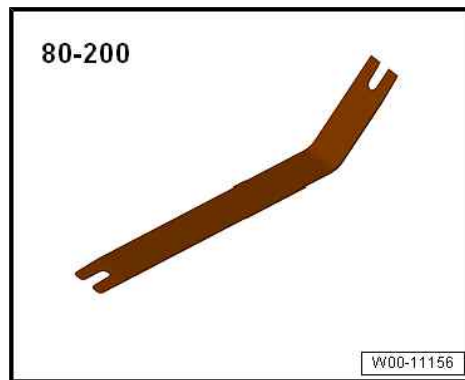
⇒ ["3.4.1 Removing and installing cylinder head cover - bank 1 \(right-side\)", page 66](#)

⇒ ["3.4.2 Removing and installing cylinder head cover - bank 2 \(left-side\)", page 67](#)

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

Special tools and workshop equipment required

◆ Removal lever - 80 - 200-



◆ Hose clamps, up to 25 mm - 3094-



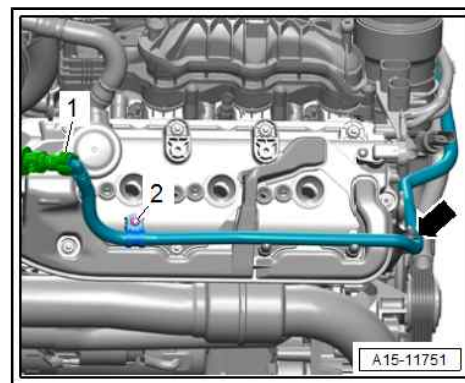
◆ Hose clip pliers - VAS 6362-



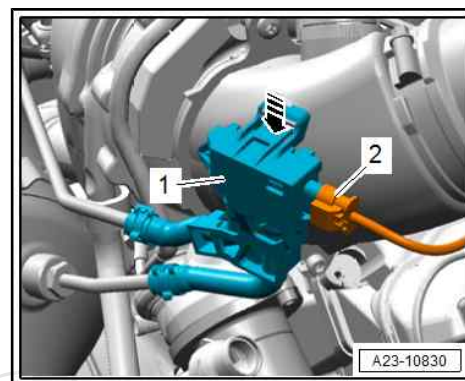
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## Removing

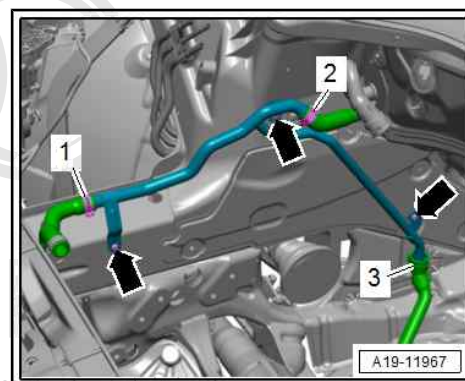
- Remove engine cover panel ➔ [page 48](#) .
- Press release tabs on both sides and detach vacuum hose -1-.
- Remove bolt -2-.
- Move vacuum hose -arrow- clear and move to one side.



- Unplug electrical connector -2-.
- Release catch -arrow- and detach bracket with pressure differential sender - G505- -item 1- from connection.



- Clamp off coolant hoses with hose clamps up to 25 mm - 3094- .
- Lift retaining clip -3-, release hose clips -1 and 2- and detach coolant hoses.
- Unscrew bolts -arrows- and coolant pipe (right-side) from longitudinal member.



## Note

*For illustration purposes, the installation position is shown with the engine removed.*

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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 engine cover panel ➔ [page 48](#) .

## Tightening torques

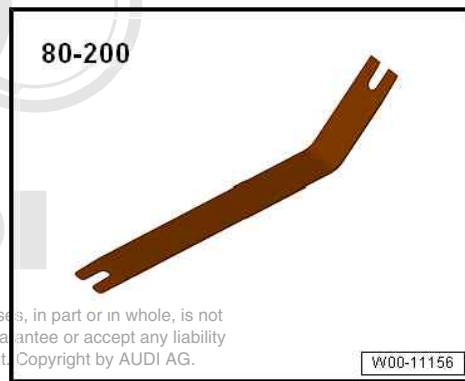
- ◆ ➔ [Fig. ""Coolant pipe \(right-side\) - tightening torque""](#), [page 98](#)

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

Special tools and workshop equipment required



◆ Removal lever - 80 - 200-

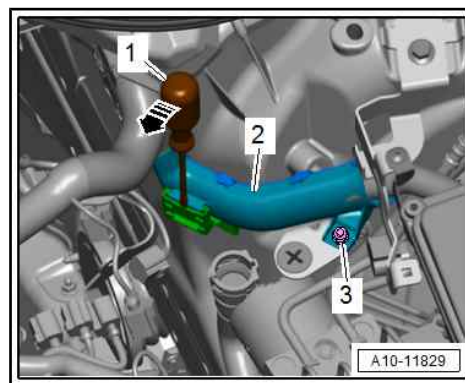


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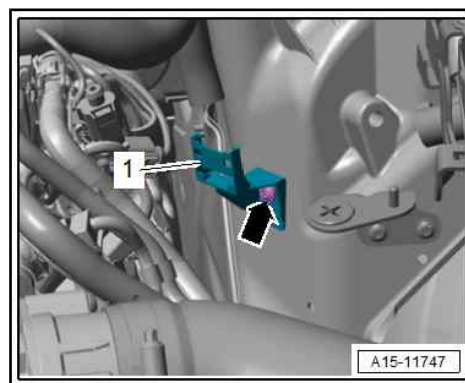
◆ Sealant ➔ Electronic parts catalogue

**Removing**

- Remove engine cover panel ➔ [page 48](#) .
- Remove body brace ➔ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Unscrew nut -3-.
- Use a screwdriver -1- to release catch -arrow- and move wiring duct -2- clear.



- Remove bolt -arrow- and detach bracket -1- for wiring channel.



- Release catches -arrows A- and lift off wiring protector -1- -arrow B-.
- Push wiring harness slightly to right.

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

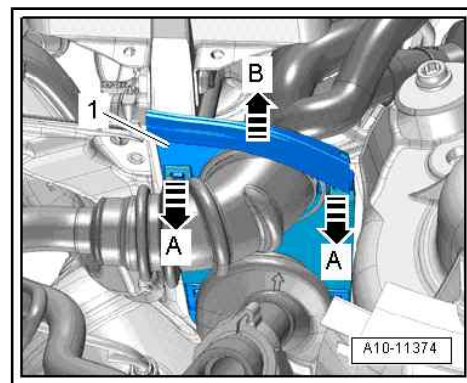
### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

### Tightening torques

- ◆ Body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links



## 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 .

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## 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 and components 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 72](#)

⇒ [“1.2 Engine oil”, page 75](#)

⇒ [“1.3 Removing and installing sump \(bottom section\)”, page 76](#)

⇒ [“1.4 Removing and installing sump \(top section\)”, page 76](#)

⇒ [“1.5 Removing and installing oil pump”, page 76](#)

⇒ [“1.6 Removing and installing oil level and oil temperature sender G266”, page 76](#)

#### 1.1 Exploded view - sump/oil pump

Exploded view - sump (bottom section)/oil pump ⇒ [page 72](#)

Exploded view - sump (top section) ⇒ [page 74](#)



#### Note

*Oil spray jet for piston cooling ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13 ; Pistons and conrods; Exploded view - pistons and conrods*

Sump (bottom section)/oil pump

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# 1 - Oil level and oil temperature sender - G266-

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

# 2 - Seal

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

# 3 - Bolt

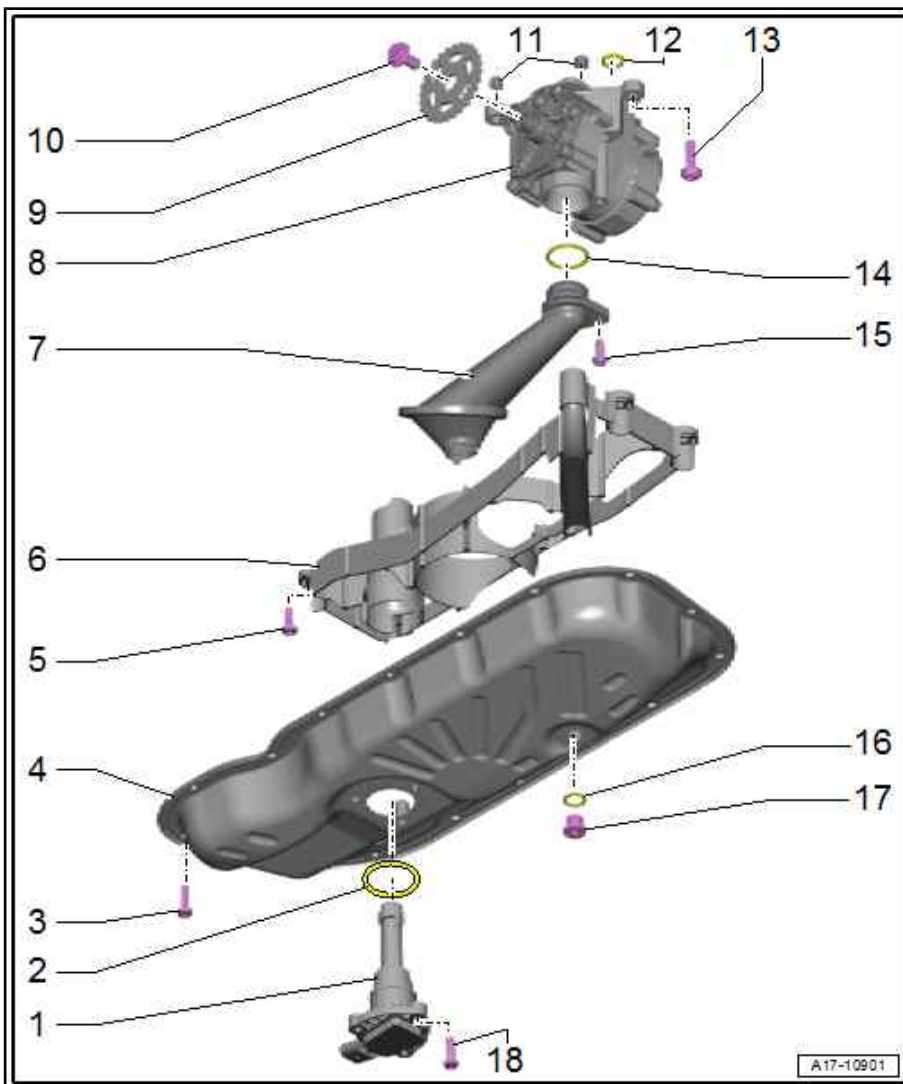
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

# 4 - Sump (bottom section)

- ☐ Removing and installing  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing sump (bottom section)

# 5 - Bolt

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



# 6 - Baffle plate

# 7 - Suction pipe

# 8 - Oil pump

- ☐ With vacuum pump for brake servo
- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil pump

# 9 - Chain sprocket

- ☐ For oil pump

# 10 - Bolt

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

# 11 - Dowel sleeves

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# 12 - Seal

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

# 13 - Bolt

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

#### 14 - O-ring

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

#### 15 - Bolt

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

#### 16 - Seal

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

#### 17 - Oil drain plug

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

#### 18 - Bolt

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

### Sump (top section)

#### 1 - Bolt

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

#### 2 - Valve for oil pressure control - N428-

- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Removing and installing valve for oil pressure control - N428-

#### 3 - O-ring

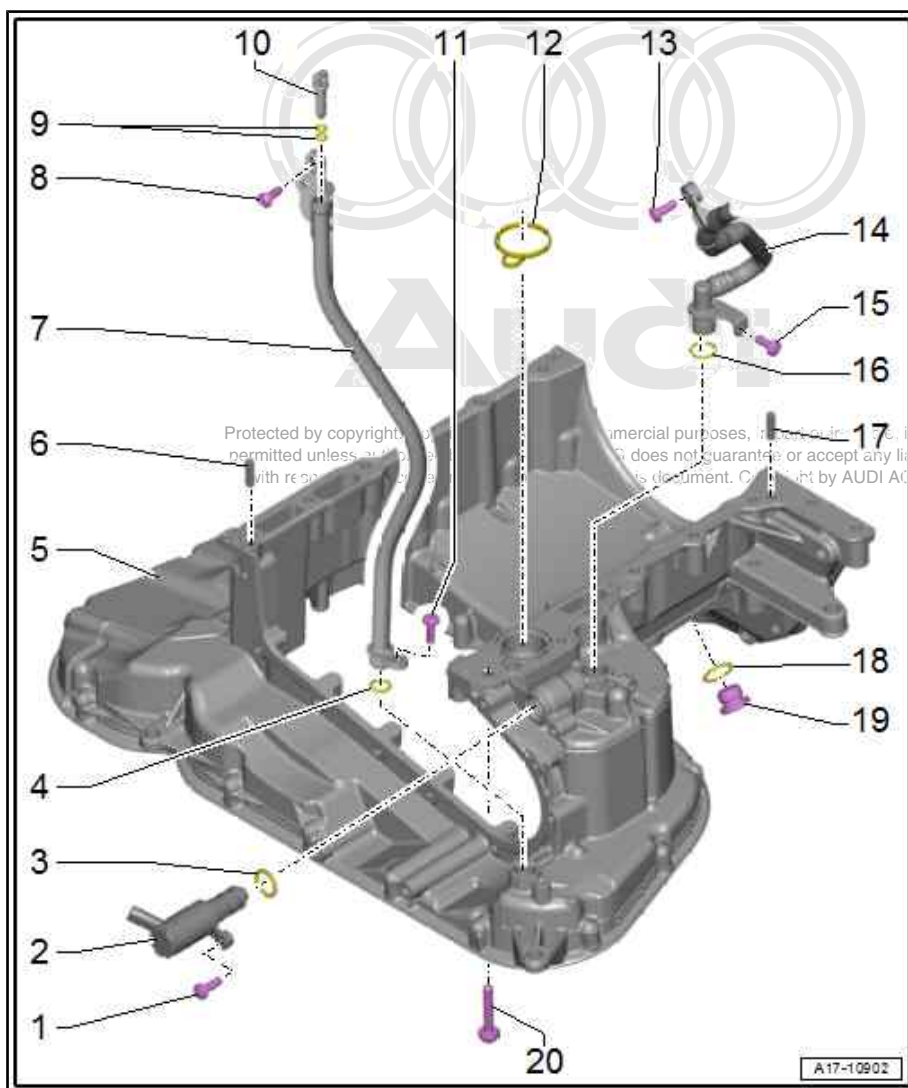
- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

#### 4 - O-ring

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

#### 5 - Sump (top section)

- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing sump (top section)



## 6 - Dowel sleeve

## 7 - Guide tube

- ☐ For oil dipstick

## 8 - Bolt

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

## 9 - O-rings

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

## 10 - Sealing plug

## 11 - Bolt

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

## 12 - Seal

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

## 13 - Bolt

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

## 14 - Vacuum line

- ☐ Leading from vacuum pump

## 15 - Bolt

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

## 16 - O-ring

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

## 17 - Dowel sleeve

## 18 - Seal

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

## 19 - Plug

- ☐ For "TDC" marking
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump

## 20 - Bolt

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

## 1.2 Engine oil

- ◆ Refer to ⇒ Maintenance ; Booklet 411 for instructions on draining and filling up engine oil, checking oil level, removing and installing oil filter element.
- ◆ Oil capacities, oil specifications and viscosity grades ⇒ Maintenance tables .



### **1.3 Removing and installing sump (bottom section)**

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

### **1.4 Removing and installing sump (top section)**

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

### **1.5 Removing and installing oil pump**

All procedures are described in ⇒ Servicing 6-cylinder 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-**

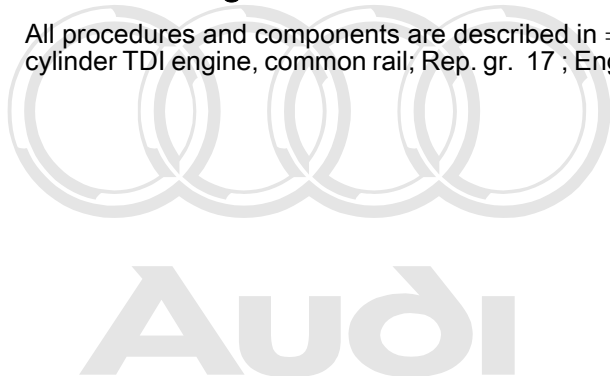
All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Sump/oil pump; Removing and installing oil level and oil temperature sender - G266- .



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## 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 Oil filter/oil pressure switches

⇒ ["3.1 Exploded view - oil filter", page 78](#)

⇒ ["3.2 Removing and installing oil pressure sender G10 ", page 79](#)

⇒ ["3.3 Checking oil pressure", page 80](#)

⇒ ["3.4 Removing and installing oil filter housing", page 80](#)

⇒ ["3.5 Removing and installing valve for oil pressure control N428 ", page 80](#)

⇒ ["3.6 Removing and installing oil temperature sender 2 G664 ", page 80](#)

#### 3.1 Exploded view - oil filter

##### 1 - Bolt

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

##### 2 - Oil filter housing

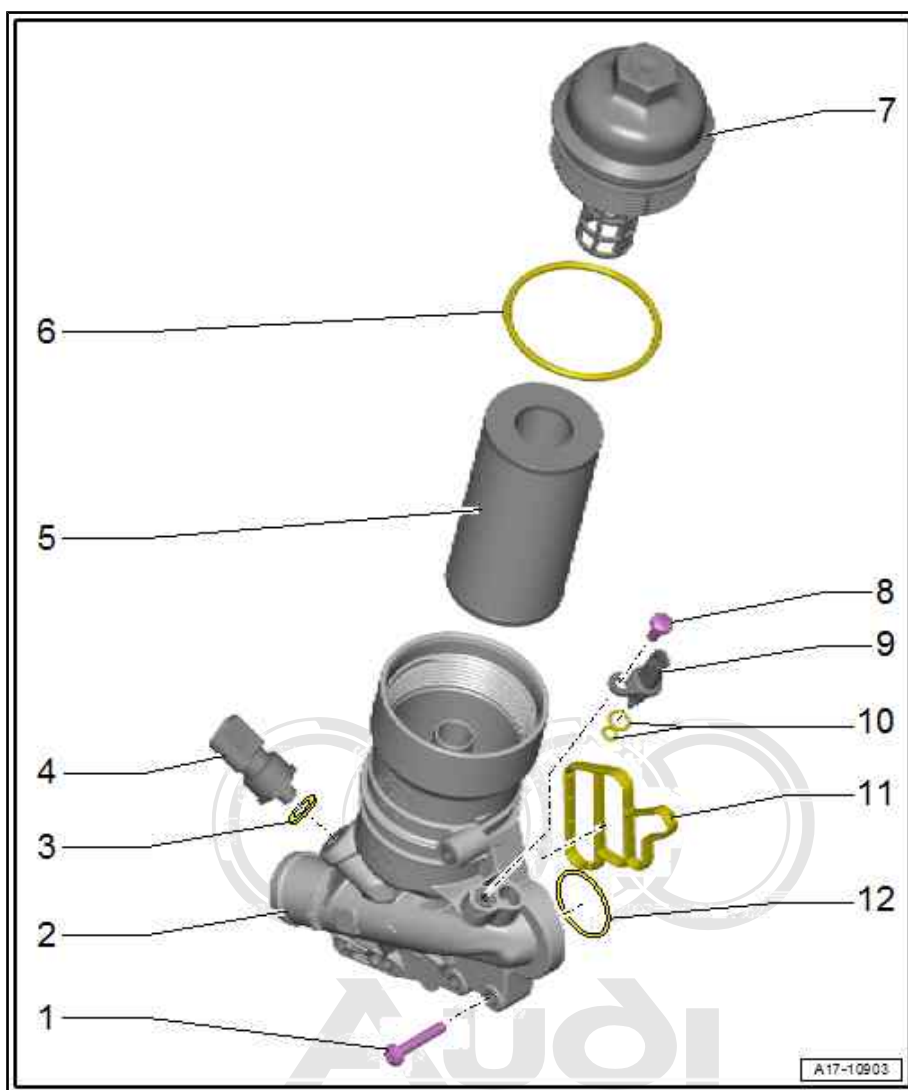
- ❑ With map-controlled engine cooling system thermostat - F265-
- ❑ Removing and installing ⇒ [page 80](#)
- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Exploded view - oil filter

##### 3 - Seal

- ❑ Permanently attached to oil pressure switch; not available as a replacement part

##### 4 - Oil pressure sender - G10-

- ❑ Checking ⇒ Vehicle diagnostic tester
- ❑ Removing and installing ⇒ [page 79](#)
- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Exploded view - oil filter



##### 5 - Oil filter element

- ❑ Removing and installing ⇒ [Maintenance, Booklet 411](#)

##### 6 - O-ring

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

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## 7 - Sealing cap

- ☐ With oil filter bypass valve
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Exploded view - oil filter

## 8 - Bolt

- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Exploded view - oil filter

## 9 - Coolant temperature sender 2 - G802-

- ☐ Removing and installing ⇒ [page 94](#)

## 10 - O-rings

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Exploded view - oil filter

## 11 - Gasket

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Exploded view - oil filter

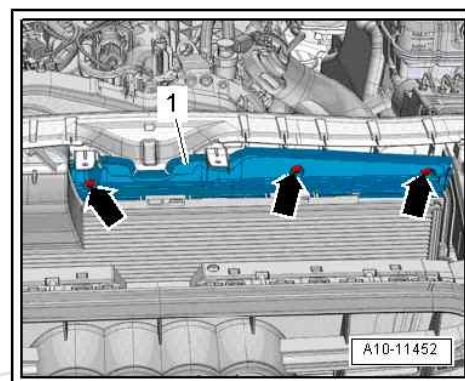
## 12 - O-ring

- ☐ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 17 ; Oil filter/oil pressure switch; Exploded view - oil filter

## 3.2 Removing and installing oil pressure sender - G10-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Remove bolts -arrows- and detach air duct -1-.



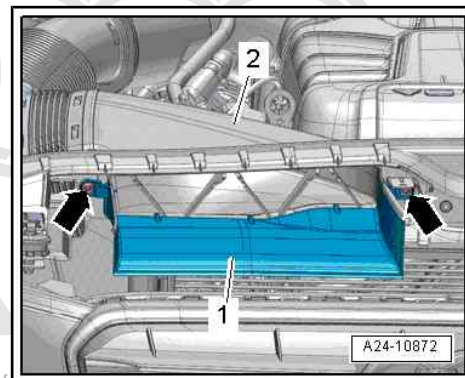
- Remove bolts -arrows-, detach air duct -2- from lock carrier and unclip from air cleaner housing.

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

### Installing

Additional work:

- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Install engine cover panel ⇒ [page 48](#) .



### Tightening torques

- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 128](#)

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### 3.3 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 .

### 3.4 Removing and installing oil filter housing

All 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 .

### 3.5 Removing and installing valve for oil pressure control - N428-

All 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- .

### 3.6 Removing and installing oil temperature sender 2 - G664-

#### Removing

- Remove air cleaner housing ⇒ [page 129](#) .

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

#### Installing

Additional work:

- Install air cleaner housing ⇒ [page 129](#) .

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## 19 – Cooling

### 1 Cooling system/coolant

⇒ [“1.1 Connection diagram - coolant hoses”, page 81](#)

⇒ [“1.2 Checking cooling system for leaks”, page 85](#)

⇒ [“1.3 Draining and filling cooling system”, page 85](#)

#### 1.1 Connection diagram - coolant hoses

⇒ [“1.1.1 Connection diagram - coolant hoses, vehicles without auxiliary heater”, page 81](#)

⇒ [“1.1.2 Connection diagram - coolant hoses, vehicles with auxiliary heater”, page 84](#)

##### 1.1.1 Connection diagram - coolant hoses, vehicles without auxiliary heater



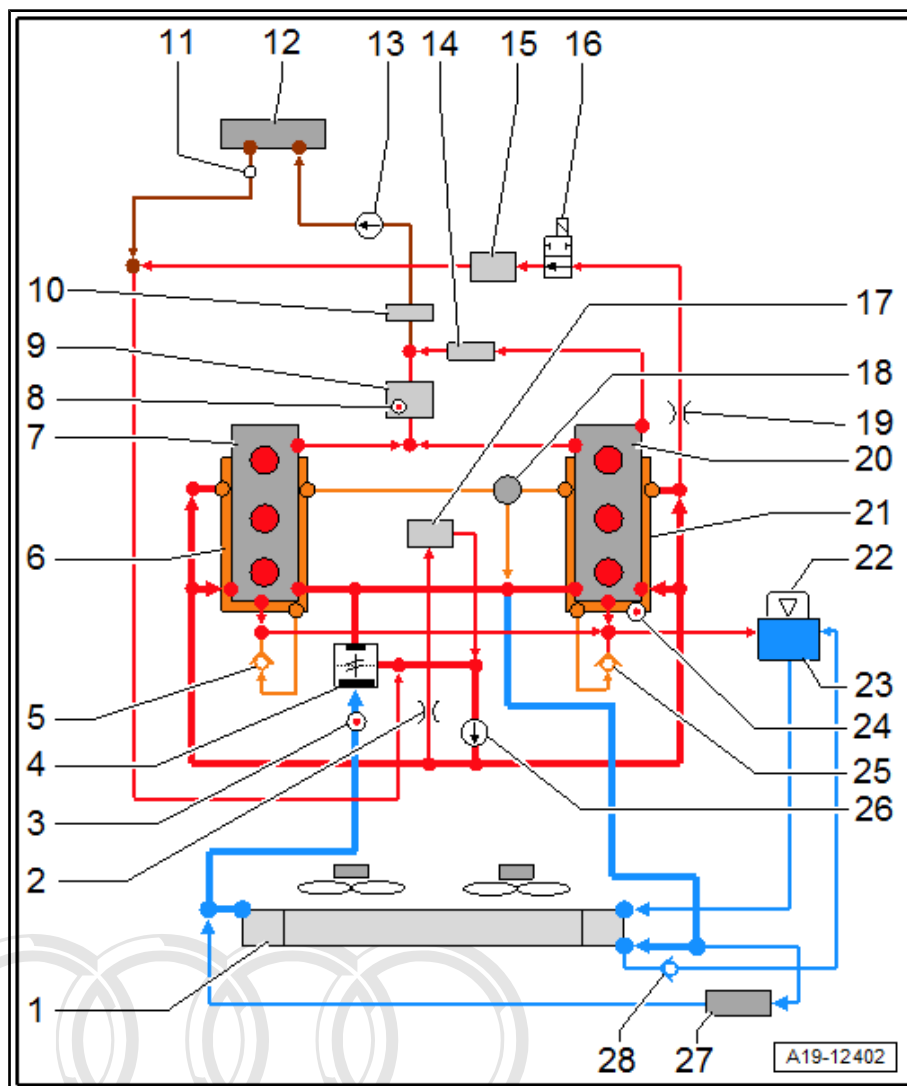
#### Note

- ◆ *Blue = Large coolant circuit.*
- ◆ *Red = Small coolant circuit.*
- ◆ *Orange = Coolant circuit for cylinder block.*
- ◆ *Brown = Heating circuit*
- ◆ *Arrows show direction of coolant flow.*



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- 1 - Radiator
- 2 - Restrictor
- 3 - Coolant temperature sender 2 - G802-
- 4 - Map-controlled engine cooling system thermostat - F265-
- 5 - Non-return valve
- 6 - Cylinder block
  - ☐ Cylinder bank 1 (right-side)
- 7 - Cylinder head
  - ☐ Cylinder bank 1 (right-side)
- 8 - Coolant temperature sender - G62-
- 9 - Exhaust gas recirculation cooler
- 10 - Turbocharger
- 11 - Bleeder hole
- 12 - Heat exchanger for heater
  - ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Front air conditioning unit; Removing and installing heat exchanger
- 13 - Coolant circulation pump - V50-
  - ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Coolant circuit; Overview of fitting locations - coolant circuit



- 14 - Injector for reducing agent - N474-
- 15 - ATF cooler
- 16 - Gearbox oil cooling valve - N509-
- 17 - Engine oil cooler
- 18 - Coolant shut-off valve
- 19 - Restrictor

- 20 - Cylinder head
  - ☐ Cylinder bank 2 (left-side)
- 21 - Cylinder block
  - ☐ Cylinder bank 2 (left-side)
- 22 - Filler cap

- ☐ Checking pressure relief valve ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks

**23 - Coolant expansion tank**

**24 - Temperature sender for engine temperature regulation - G694-**

**25 - Non-return valve**

**26 - Coolant pump**

**27 - Auxiliary radiator**

☐ Optional equipment

**28 - Non-return valve**



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## 1.1.2 Connection diagram - coolant hoses, vehicles with auxiliary heater



### Note

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

1 - Radiator

2 - Restrictor

3 - Coolant temperature sender 2 - G802-

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

5 - Non-return valve

6 - Cylinder block

- ☐ Cylinder bank 1 (right-side)

7 - Auxiliary heater

- ☐ With circulation pump - V55-

- ☐ Removing and installing auxiliary heater; Rep. gr. 82 ; Auxiliary/supplementary heater; Removing and installing auxiliary/supplementary heater

8 - Cylinder head

- ☐ Cylinder bank 1 (right-side)

9 - Coolant temperature sender - G62-

10 - Exhaust gas recirculation cooler

11 - Turbocharger

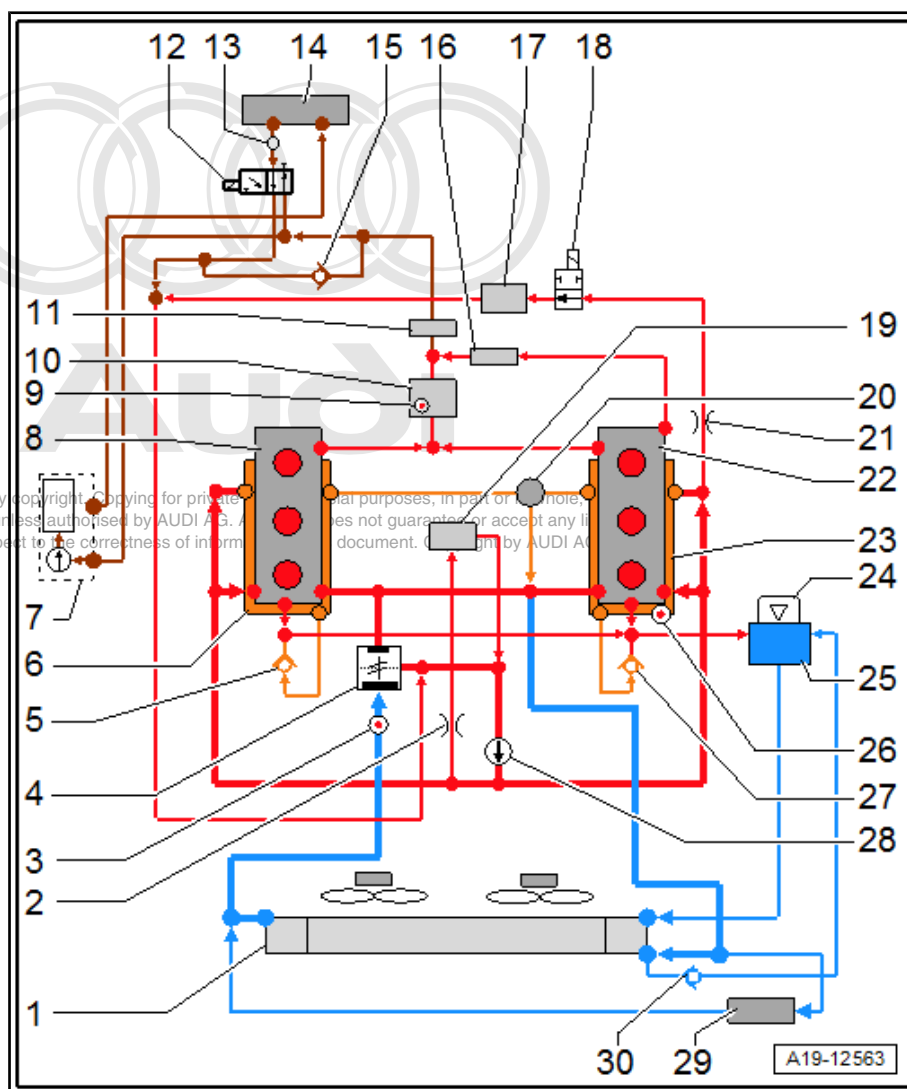
12 - Heater coolant shut-off valve - N279-

- ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Coolant circuit; Overview of fitting locations - coolant circuit

13 - Bleeder hole

14 - Heat exchanger for heater

- ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Front air conditioning unit; Removing and installing heat exchanger



15 - Non-return valve

16 - Injector for reducing agent - N474-

17 - ATF cooler

18 - Gearbox oil cooling valve - N509-

19 - Engine oil cooler

20 - Coolant shut-off valve

21 - Restrictor

22 - Cylinder head

- ☐ Cylinder bank 2 (left-side)

23 - Cylinder block

- ☐ Cylinder bank 2 (left-side)

24 - Filler cap

- ☐ Checking pressure relief valve ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Checking cooling system for leaks

25 - Coolant expansion tank

26 - Temperature sender for engine temperature regulation - G694-

27 - Non-return valve

28 - Coolant pump

29 - Auxiliary radiator

- ☐ Optional equipment

30 - Non-return valve

## 1.2 Checking cooling system for leaks

All 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

- ◆ Drip tray for workshop hoist - VAS 6208-



- ◆ Safety goggles
- ◆ Protective gloves

## Draining



### WARNING

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

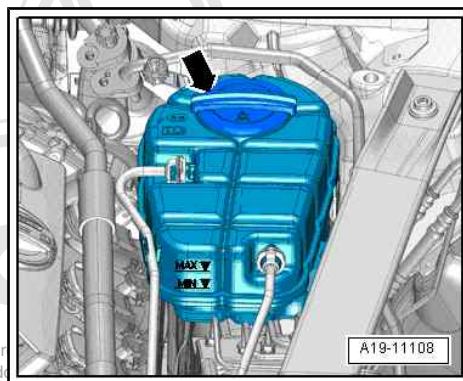
- ◆ *Even when the ignition is switched off, the radiator fans can start up without warning due to accumulated heat in the engine compartment, etc.*



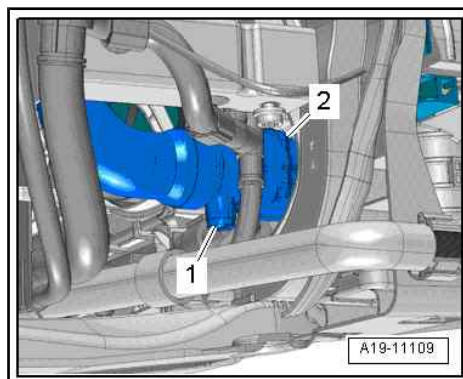
### WARNING

*Risk of scalding due to hot steam and hot coolant.*

- ◆ *The cooling system is under pressure when the engine is hot.*
- ◆ *To allow pressure to dissipate, cover filler cap on coolant expansion tank with cloth and open carefully.*



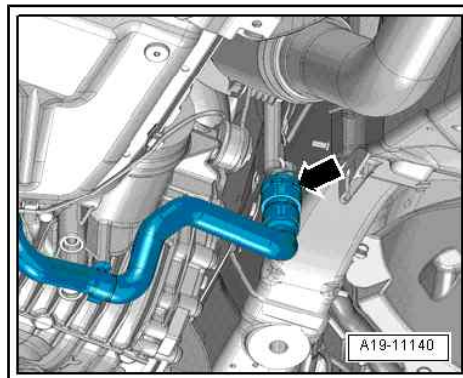
- Open filler cap -arrow- on coolant expansion tank.
- Remove noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Remove drain plug -1- and drain off coolant.
- Lift retaining clip -2- and disconnect coolant hose from radiator.



- Lift retaining clip -arrow-, disconnect coolant hose (rear right) and drain off coolant.
- Connect coolant hoses (version with plug-in connectors) ⇒ [page 105](#) .

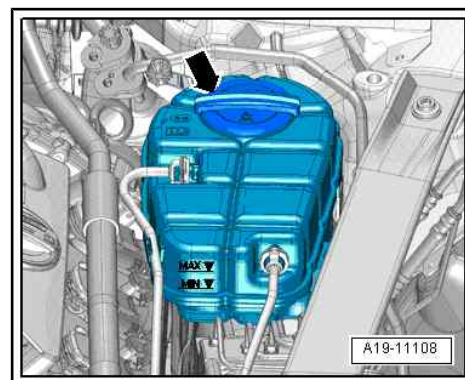
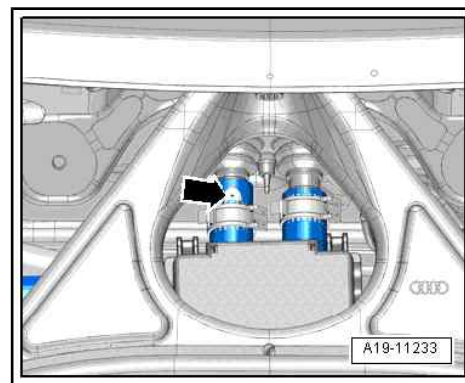
## Preparing coolant mixture and filling cooling system

- Prepare coolant mixture and fill cooling system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Cooling system/coolant; Draining and filling cooling system .



### Bleeding cooling system

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Release coolant hose going to heat exchanger and pull back hose until coolant flows out at bleeder hole -arrow- in coolant hose.
- Push coolant hose back onto connection and secure with hose clip.
- On vehicles with auxiliary heater, switch heater on (for about 30 seconds) and then off again.
- Close filler cap -arrow- on coolant expansion tank (make sure it engages).
- Start engine.

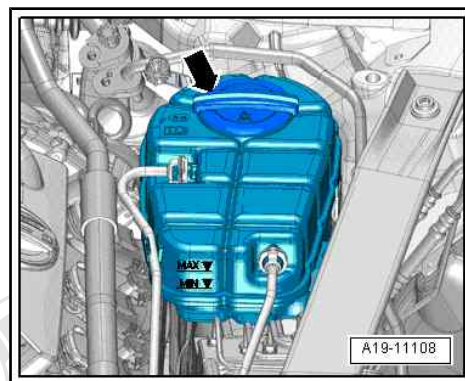


| Time period                                            | Engine speed      | Air conditioner/heater setting                                                                                                                                                           |
|--------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 minutes                                              | 2500 rpm          | <ul style="list-style-type: none"> <li>• Air conditioning system "OFF", LED in <b>AC</b> button not lit</li> <li>• Heating at "HI", select lowest possible blower speed (= 0)</li> </ul> |
| 3 minutes                                              | Idling speed      | <ul style="list-style-type: none"> <li>• Air conditioning system "OFF"</li> <li>• Heating at "HI"</li> </ul>                                                                             |
| 2 minutes                                              | 2500 rpm          |                                                                                                                                                                                          |
| 3 minutes                                              | Idling speed      |                                                                                                                                                                                          |
| 2 minutes                                              | 2500 rpm          |                                                                                                                                                                                          |
| 3 minutes                                              | Idling speed      |                                                                                                                                                                                          |
| 1 minute                                               | Switch off engine |                                                                                                                                                                                          |
| 2 minutes                                              | 2500 rpm          |                                                                                                                                                                                          |
| Until both large coolant hoses at radiator become warm | Idling speed      |                                                                                                                                                                                          |
| 1 minute                                               | 2500 rpm          |                                                                                                                                                                                          |

- Switch off ignition and allow engine to cool down.
- Install noise insulation panels ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation .
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



- Check coolant level.
- The coolant level must be at the -MAX- marking when the engine is cold.
- The coolant level can be above the -MAX- marking when the engine is warm.



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## 2 Coolant pump/thermostat assembly

⇒ [“2.1 Exploded view - coolant pump”, page 89](#)

⇒ [“2.2 Exploded view - thermostat”, page 90](#)

⇒ [“2.3 Exploded view - coolant temperature senders”, page 92](#)

⇒ [“2.4 Removing and installing coolant pump”, page 93](#)

⇒ [“2.5 Removing and installing thermostat housing”, page 93](#)

⇒ [“2.6 Removing and installing map-controlled engine cooling system thermostat F265”, page 93](#)

⇒ [“2.7 Removing and installing coolant temperature sender G62”, page 93](#)

⇒ [“2.8 Removing and installing temperature sender for engine temperature regulation G694”, page 93](#)

⇒ [“2.9 Removing and installing coolant temperature sender 2 G802”, page 94](#)

⇒ [“2.10 Removing and installing coolant valves”, page 94](#)

### 2.1 Exploded view - coolant pump

#### 1 - Bolt

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

#### 2 - Bolt

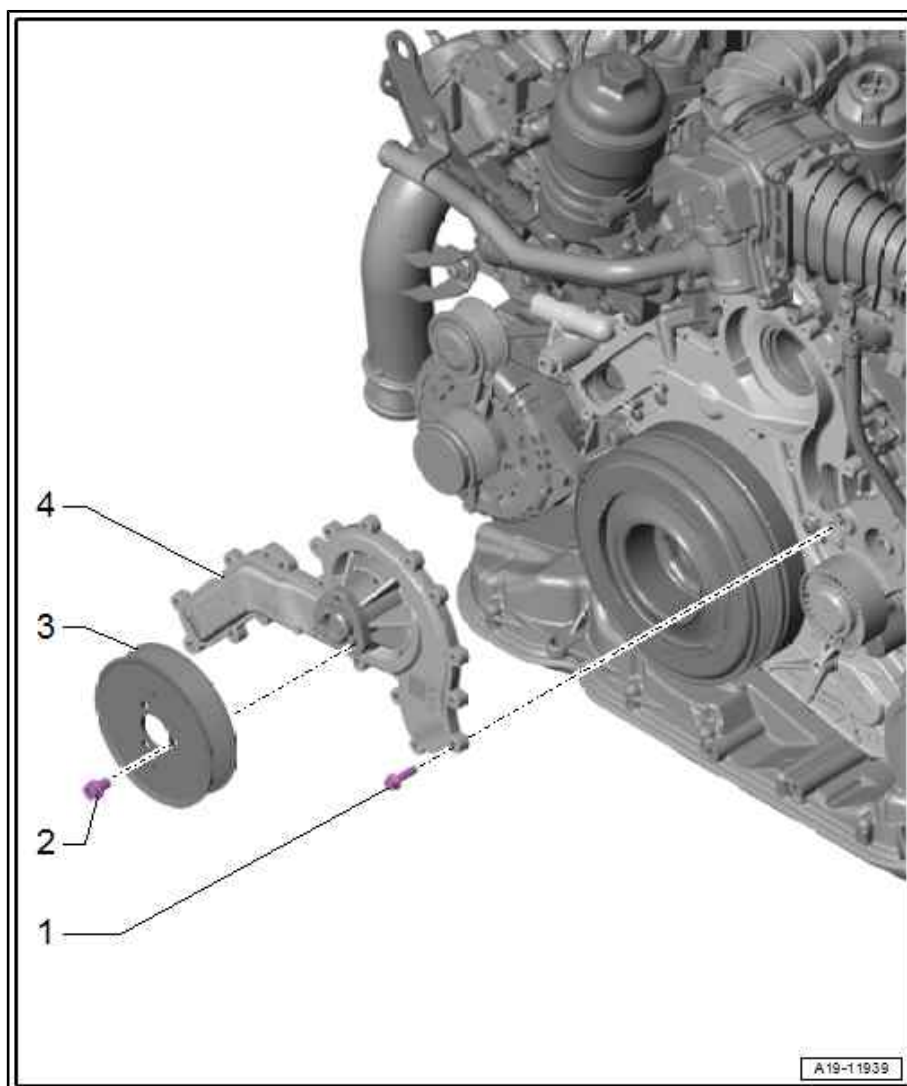
- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - coolant pump

#### 3 - Poly V-belt pulley for coolant pump

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

#### 4 - Coolant pump

- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant pump



## 2.2 Exploded view - thermostat

Map-controlled engine cooling system thermostat - F265-

⇒ [page 90](#)

Coolant shut-off valve ⇒ [page 91](#)

Exploded view - map-controlled engine cooling system thermostat - F265-

### 1 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pipes; Exploded view - coolant pipes

### 2 - Coolant pipe (front)

- ❑ Exploded view ⇒ [page 96](#)

### 3 - O-ring

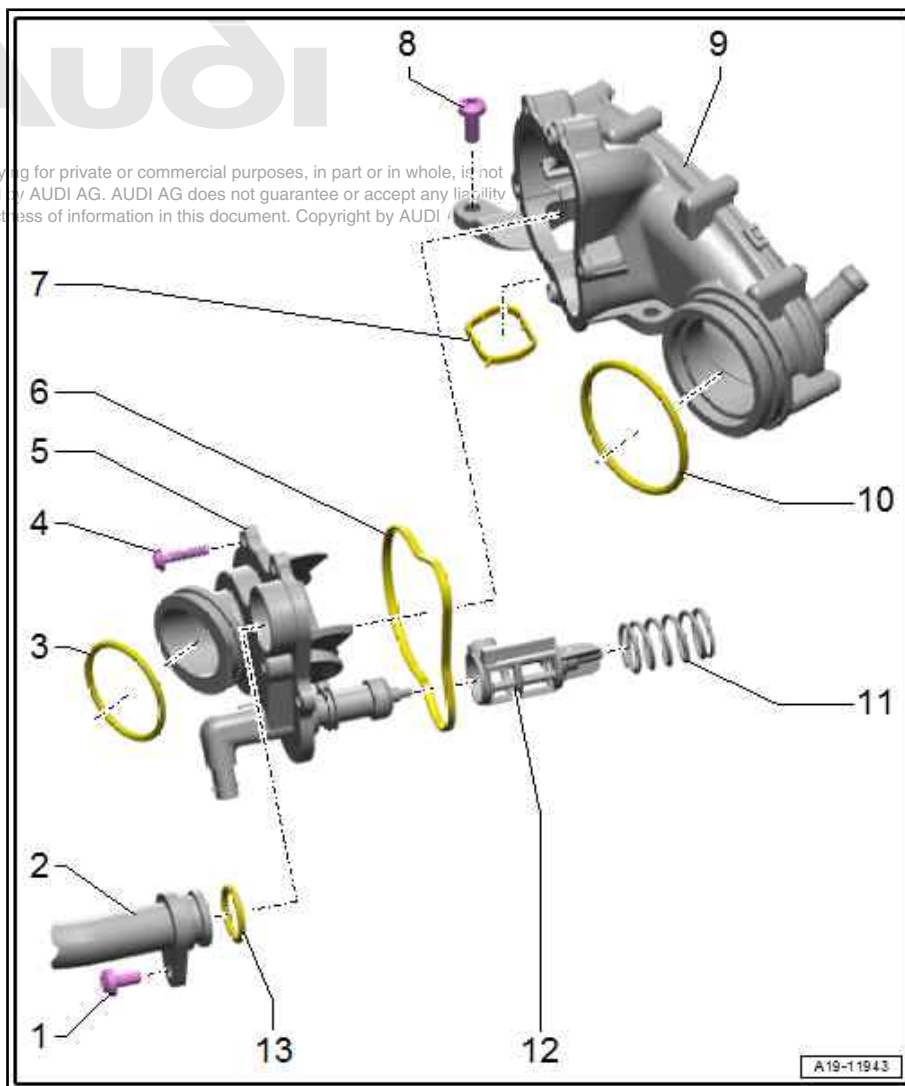
- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - thermostat

### 4 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pipes; Exploded view - coolant pipes

### 5 - Map-controlled engine cooling system thermostat - F265-

- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing map-controlled engine cooling system thermostat - F265-



### 6 - Seal

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

### 7 - Seal

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

### 8 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pipes; Exploded view - coolant pipes

### 9 - Thermostat housing

- ❑ Removing and installing ⇒ [page 93](#)

## 10 - O-ring

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

## 11 - Compression spring

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing map-controlled engine cooling system thermostat - F265-

## 12 - Valve

- ☐ For coolant flap
- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing map-controlled engine cooling system thermostat - F265-

## 13 - O-ring

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

## Exploded view - coolant shut-off valve

### 1 - Seal

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

### 2 - Bolt

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

### 3 - Coolant connection

### 4 - Coolant hose

### 5 - Bolt

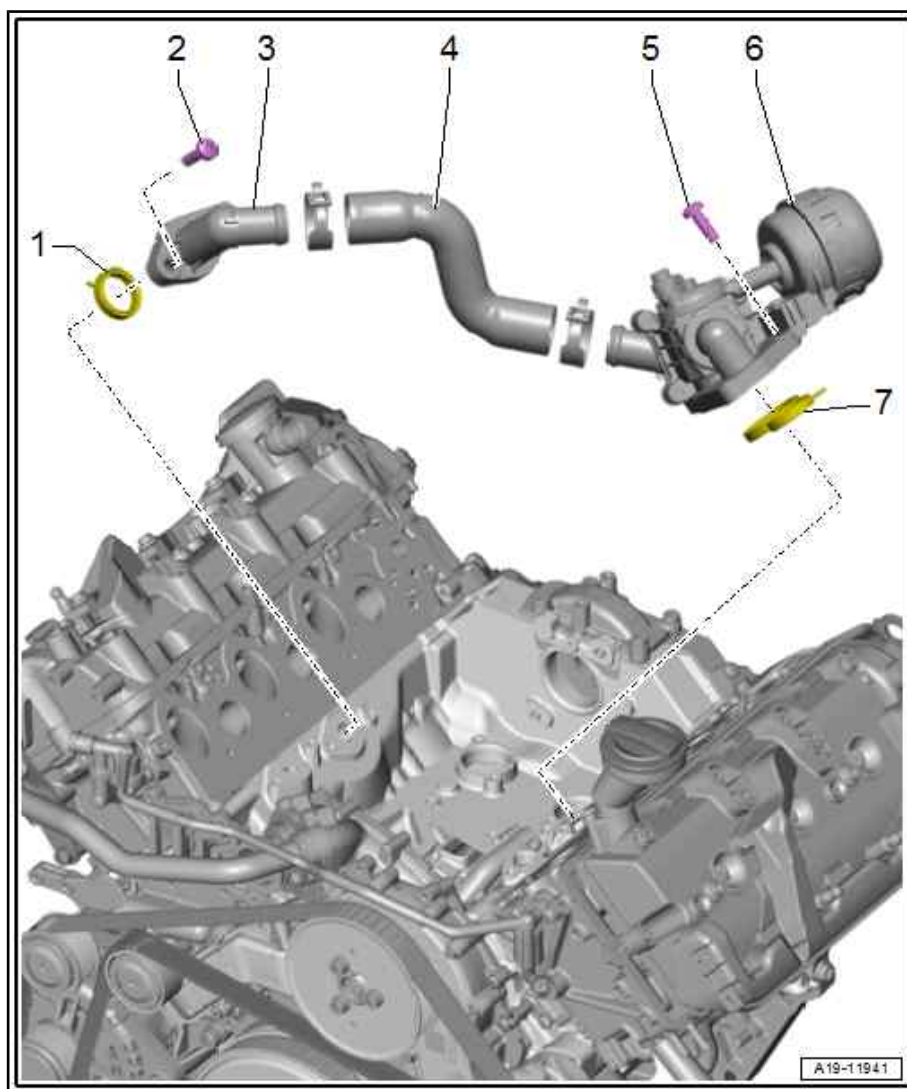
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Exploded view - thermostat

### 6 - Coolant shut-off valve

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant valves

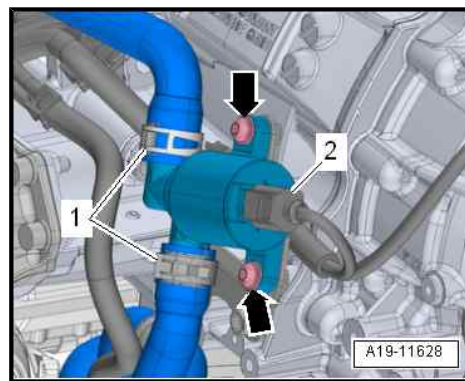
### 7 - Seal

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



## Gearbox oil cooling valve - N509- - tightening torque

- Tighten bolts -arrows- to 9 Nm.



## 2.3 Exploded view - coolant temperature senders

### 1 - Bolt

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

### 2 - Coolant temperature sender - G62-

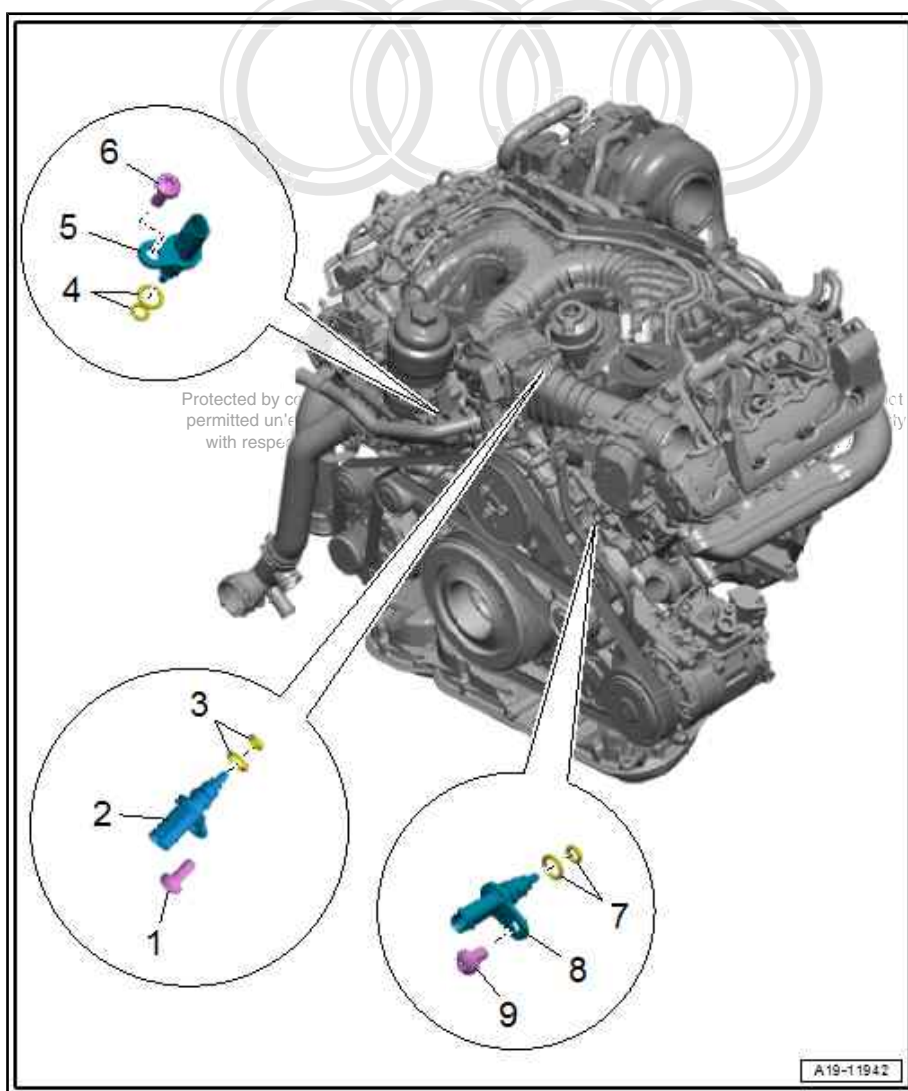
- Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant temperature sender - G62-

### 3 - O-rings

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

### 4 - O-rings

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



### 5 - Coolant temperature sender 2 - G802-

- Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly ; Removing and installing coolant temperature sender 2 - G802-

### 6 - Bolt

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

## 7 - O-rings

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

## 8 - Temperature sender for engine temperature regulation - G694-

- ❑ Removing and installing ⇒ [page 93](#)

## 9 - Bolt

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

## 2.4 Removing and installing coolant pump

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

## 2.5 Removing and installing thermostat housing

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail (EA 897 Gen I); Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing thermostat housing .

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

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing map-controlled engine cooling system thermostat - F265- .

## 2.7 Removing and installing coolant temperature sender - G62-

All 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- .

## 2.8 Removing and installing temperature sender for engine temperature regulation - G694-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing temperature sender for engine temperature regulation - G694- .

### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

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## 2.9 Removing and installing coolant temperature sender 2 - G802-

### Removing

- Remove engine cover panel ➔ [page 48](#) .

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 2 - G802- .

### Installing

Additional work:

- Install engine cover panel ➔ [page 48](#) .

## 2.10 Removing and installing coolant valves

➔ [“2.10.1 Removing and installing coolant shut-off valve”, page 94](#)

➔ [“2.10.2 Removing and installing gearbox oil cooling valve N509”, page 94](#)

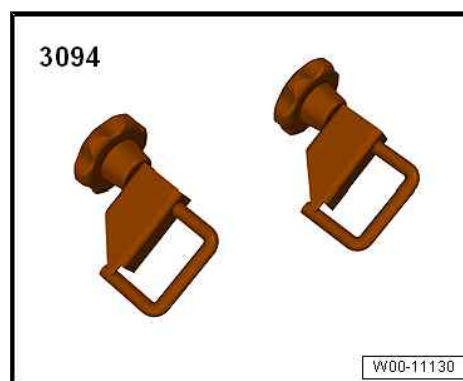
### 2.10.1 Removing and installing coolant shut-off valve

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

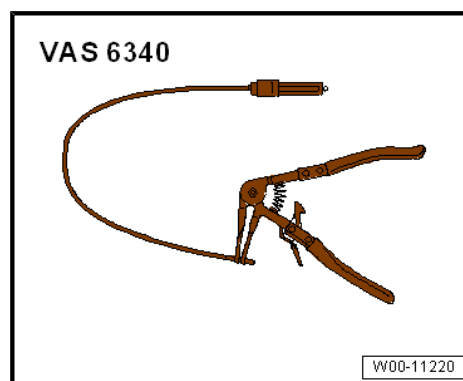
### 2.10.2 Removing and installing gearbox oil cooling valve - N509-

#### Special tools and workshop equipment required

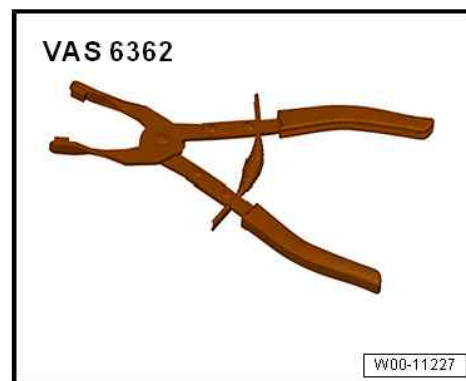
- ◆ Hose clamps, up to 25 mm - 3094-



- ◆ Hose clip pliers - VAS 6340-



- ◆ Hose clip pliers - VAS 6362-



### Removing

- Remove noise insulation (rear) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Unplug electrical connector -2-.
- Clamp off coolant hoses using hose clamps -3094- , release hose clips -1- and disconnect coolant hoses.
- Unscrew bolts -arrows- and remove gear oil cooling valve - N509- .

### Installing

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



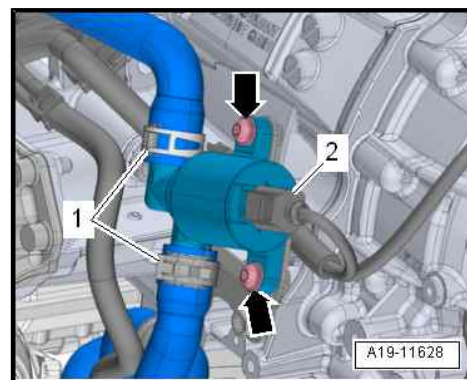
#### Note

- ◆ **To avoid loss of coolant, insert new gearbox oil cooling valve -N509- immediately.** Audi AG. Audi AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by Audi AG.
- ◆ **Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .**

- Fill up with coolant ⇒ [page 85](#) .

### Tightening torques

- ◆ ⇒ Fig. [““ Gearbox oil cooling valve -N509- - tightening torque”“](#), [page 92](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation



### 3 Coolant pipes

⇒ ["3.1 Exploded view - coolant pipes", page 96](#)

⇒ ["3.2 Removing and installing coolant pipes", page 98](#)

#### 3.1 Exploded view - coolant pipes



#### Note

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

##### 1 - Bolt

- ☐ 9 Nm

##### 2 - Coolant pipe (front)

- ☐ Removing and installing  
⇒ [page 98](#)

##### 3 - Bolt

- ☐ 9 Nm

##### 4 - O-ring

- ☐ Renew after removing

##### 5 - O-ring

- ☐ Renew after removing

##### 6 - Coolant pipe (top)

- ☐ Removing and installing  
⇒ [page 98](#)

##### 7 - Seal

- ☐ Renew after removing

##### 8 - O-ring

- ☐ Renew after removing

##### 9 - Bolt

- ☐ 9 Nm

##### 10 - Coolant pipe (front) for turbocharger

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

##### 11 - Bolt

- ☐ 9 Nm

##### 12 - O-ring

- ☐ Renew after removing

##### 13 - O-ring

- ☐ Renew after removing

##### 14 - Bolt

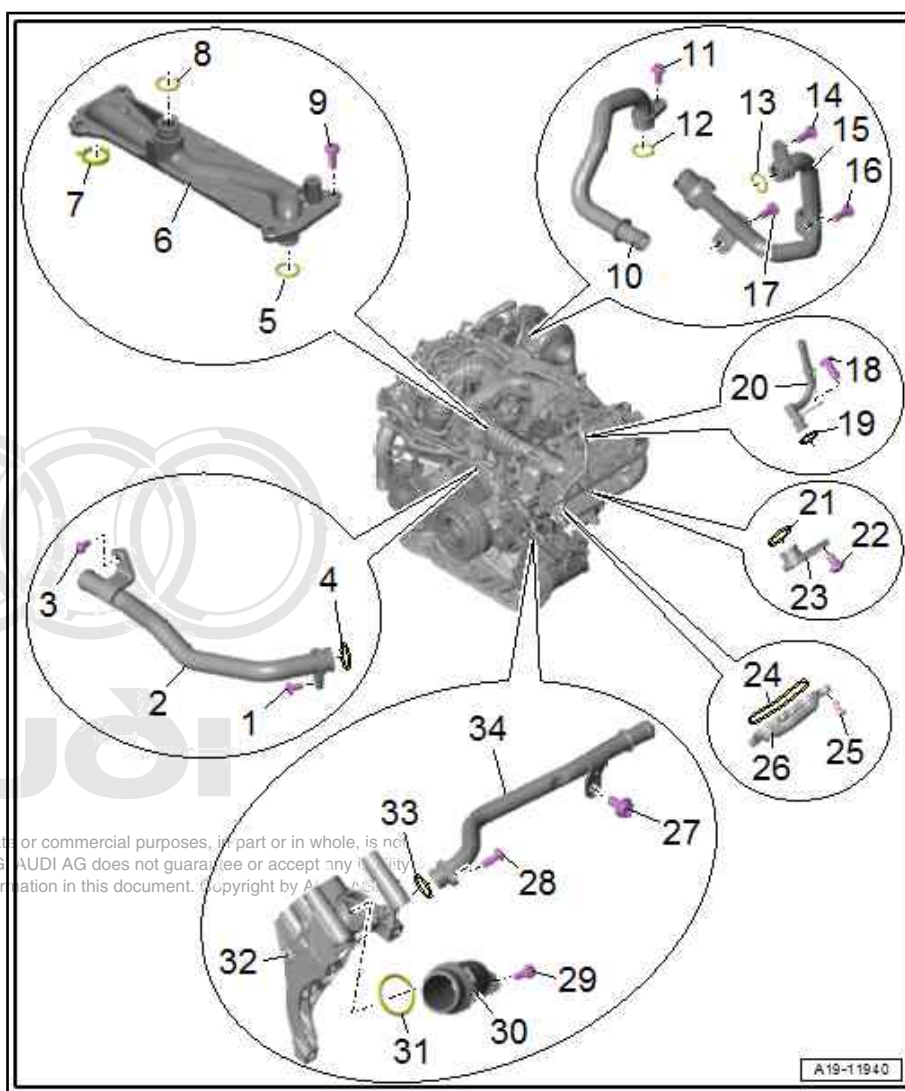
- ☐ 9 Nm

##### 15 - Coolant pipe (rear) for turbocharger

- ☐ Removing and installing ⇒ [page 102](#)

##### 16 - Bolt

- ☐ 9 Nm



A19-11940

**17 - Bolt**

- ☐ 9 Nm

**18 - Bolt**

- ☐ 9 Nm

**19 - O-ring**

- ☐ Renew after removing

**20 - Coolant pipe**

- ☐ For cylinder head

**21 - O-ring**

- ☐ Renew after removing

**22 - Bolt**

- ☐ 9 Nm

**23 - Plug**

- ☐ For cylinder block

**24 - Gasket**

- ☐ Renew after removing

**25 - Bolt**

- ☐ 9 Nm

**26 - Housing cover**

- ☐ For cylinder block
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**27 - Bolt**

- ☐ 9 Nm

**28 - Bolt**

- ☐ 9 Nm

**29 - Bolt**

- ☐ 9 Nm

**30 - Connection**

- ☐ For coolant hose

**31 - O-ring**

- ☐ Renew after removing

**32 - Bracket**

- ☐ For air conditioner compressor
- ☐ Removing and installing ⇒ [page 53](#)

**33 - O-ring**

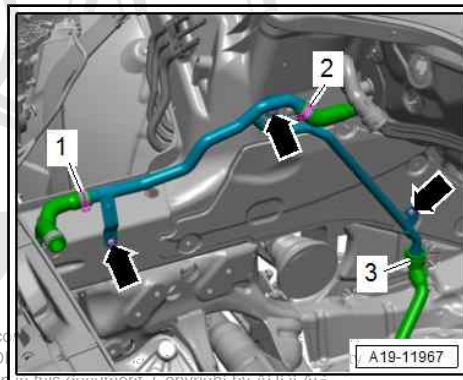
- ☐ Renew after removing

**34 - Coolant pipe (left-side)**

- ☐ Removing and installing ⇒ [page 100](#)

## Coolant pipe (right-side) - tightening torque

- Tighten bolts -arrows- to 9 Nm.



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## 3.2 Removing and installing coolant pipes

⇒ [“3.2.1 Removing and installing coolant pipe \(top\)”, page 98](#)

⇒ [“3.2.2 Removing and installing coolant pipe \(front\)”, page 98](#)

⇒ [“3.2.3 Removing and installing coolant pipe \(left-side\)”, page 100](#)

⇒ [“3.2.4 Removing and installing coolant pipe \(front\) for turbo-charger”, page 101](#)

⇒ [“3.2.5 Removing and installing coolant pipe \(rear\) for turbo-charger”, page 102](#)

### 3.2.1 Removing and installing coolant pipe (top)

#### Removing

- Remove exhaust gas recirculation cooler ⇒ [page 181](#) .
- Unscrew bolts -arrows- and remove coolant pipe (top) -1-.

#### Installing

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



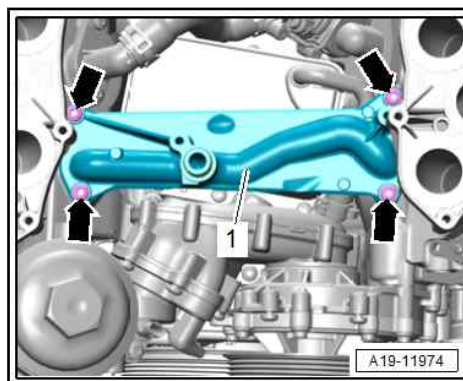
#### Note

*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 181](#) .

#### Tightening torques

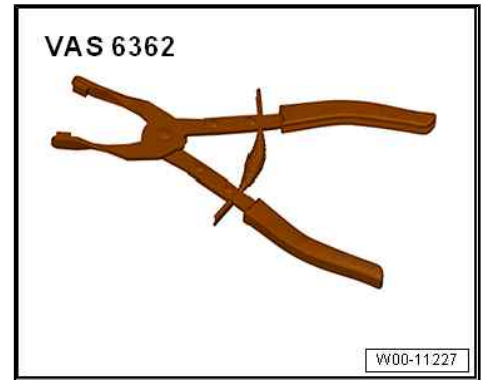
♦ ⇒ [“3.1 Exploded view - coolant pipes”, page 96](#)



### 3.2.2 Removing and installing coolant pipe (front)

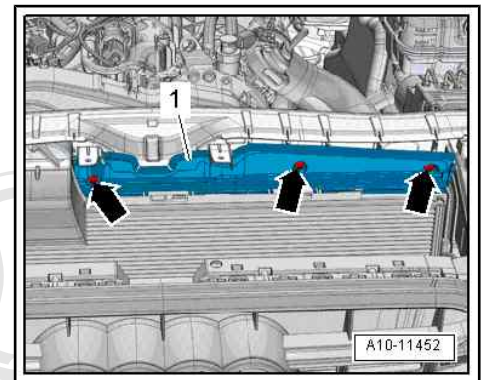
Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



### Removing

- Remove engine cover panel ➔ [page 48](#) .
- Drain coolant ➔ [page 85](#) .
- Remove lock carrier cover ➔ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Remove bolts -arrows- and detach air duct -1-.



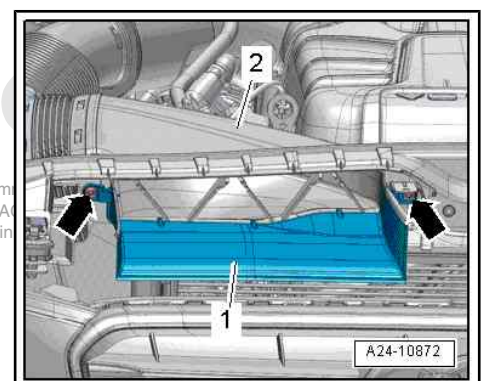
- Remove bolts -arrows-, detach air duct -2- from lock carrier and unclip from air cleaner housing.



### Note

*Disregard -item 1-.*

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- Release hose clip -1- and detach coolant hose.
- Remove bolts -arrows- and detach coolant pipe (front) -2- from map-controlled engine cooling system thermostat - F265- .

### Installing

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



#### Note

- ◆ *Renew O-ring after removal.*
- ◆ *Secure all hose connections with correct type of hose clips (as original equipment) ⇒ [Electronic parts catalogue](#) .*
- Clean and smoothen sealing surface for O-ring.
- Lubricate O-ring with coolant and slide onto coolant pipe.
- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .



#### Note

*Do not reuse coolant.*

- Fill up with coolant ⇒ [page 85](#) .
- Install engine cover panel ⇒ [page 48](#) .

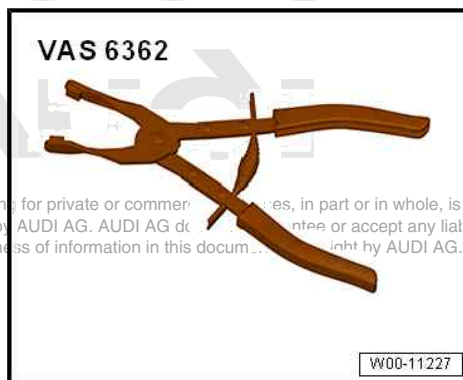
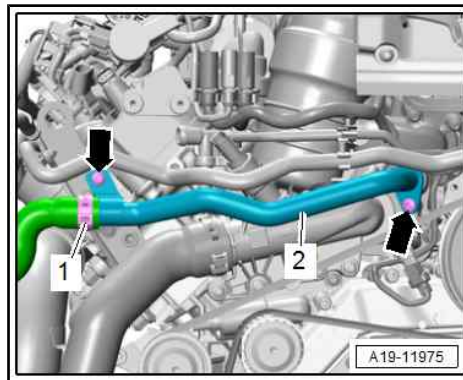
### Tightening torques

- ◆ ⇒ [“3.1 Exploded view - coolant pipes”, page 96](#)
- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 128](#)

## 3.2.3 Removing and installing coolant pipe (left-side)

### Special tools and workshop equipment required

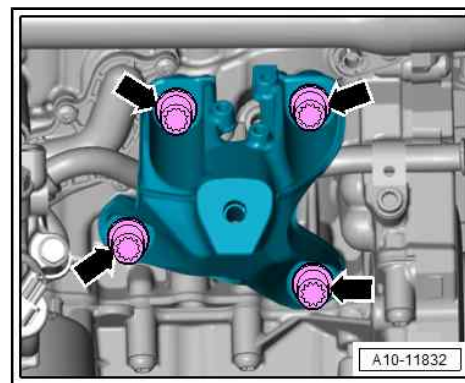
- ◆ Hose clip pliers - VAS 6362-



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## Removing

- Drain coolant ➔ [page 85](#) .
- Remove engine mounting (left-side) ➔ [page 44](#) .
- Unscrew bolts -arrows- and remove engine support (left-side).



- Release hose clip -2- and detach coolant hose from coolant pipe.
- Remove bolts -arrows-.
- Detach coolant pipe (left-side) -1-.

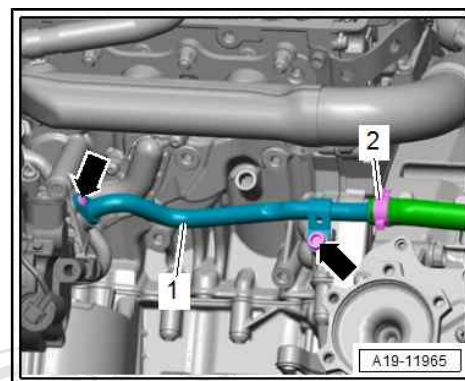
## Installing

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



### Note

- ◆ *Secure all hose connections with correct type of hose clips (as original equipment) ➔ Electronic parts catalogue .*
- ◆ *Do not reuse coolant.*
- Install engine mounting and engine support ➔ [page 44](#) .
- Fill up with coolant ➔ [page 85](#) .



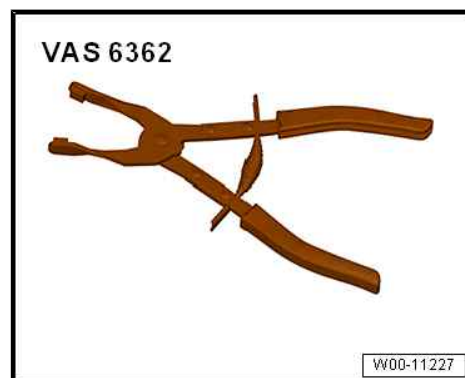
## Tightening torques

- ◆ ➔ ["3.1 Exploded view - coolant pipes", page 96](#)

### 3.2.4 Removing and installing coolant pipe (front) for turbocharger

#### Special tools and workshop equipment required

- ◆ Hose clip pliers - VAS 6362-



## Removing

- Drain coolant ➔ [page 85](#) .
- Remove engine cover panel ➔ [page 48](#) .
- Unscrew bolt -2- and detach coolant pipe -1- from turbocharger.
- Release hose clip -3- and detach coolant hose.

## Installing

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



### Note

- ◆ *Renew O-ring after removal.*
- ◆ *Secure all hose connections with correct type of hose clips (as original equipment) ➔ [Electronic parts catalogue](#) .*
- Install engine cover panel ➔ [page 48](#) .



### Note

*Do not reuse coolant.*

- Fill up with coolant ➔ [page 85](#) .

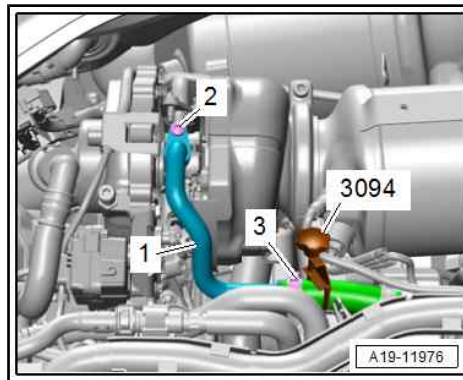
## Tightening torques

- ◆ ➔ ["3.1 Exploded view - coolant pipes", page 96](#)

## 3.2.5 Removing and installing coolant pipe (rear) for turbocharger

### Removing

- Drain coolant ➔ [page 85](#) .
- Remove emission control module ➔ [page 164](#) .



 **Note**

*Place a cloth underneath to catch escaping coolant.*

- Lift retaining clip -2- and disconnect coolant hose.
- Unscrew bolts -arrows- and detach coolant pipe -1- from turbocharger.

**Installing**

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

 **Note**

*Renew O-ring after removal.*

- Install emission control module ➔ [page 164](#) .
- Connect coolant hose with plug-in connector ➔ [page 105](#) .

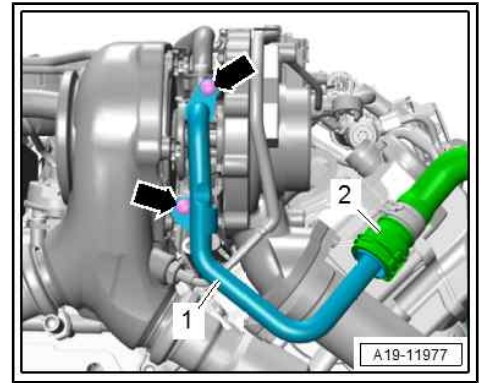
 **Note**

*Do not reuse coolant.*

- Fill up with coolant ➔ [page 85](#) .

**Tightening torques**

- ◆ ➔ [“3.1 Exploded view - coolant pipes”, page 96](#)



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## 4 Radiator/radiator fans

⇒ ["4.1 Exploded view - radiator/radiator fans", page 104](#)

⇒ ["4.2 Removing and installing radiator", page 106](#)

⇒ ["4.3 Removing and installing radiator cowl", page 109](#)

⇒ ["4.4 Removing and installing radiator fan V7 ", page 112](#)

### 4.1 Exploded view - radiator/radiator fans

#### Radiator and condenser

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#### 1 - Sealing strip

#### 2 - Coolant hose

- ☐ Lift retaining clip to detach

- ☐ Connecting  
⇒ [page 105](#)

#### 3 - O-ring

- ☐ Renew after removing

#### 4 - Radiator

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

#### 5 - Coolant hose

- ☐ Lift retaining clip to detach

- ☐ Connecting  
⇒ [page 105](#)

#### 6 - O-ring

- ☐ Renew after removing

#### 7 - Coolant pipe

- ☐ To coolant expansion tank

- ☐ Press release ring to detach

- ☐ Connecting  
⇒ [page 105](#)

#### 8 - O-ring

- ☐ Renew after removing

#### 9 - Rubber bush

- ☐ For radiator

#### 10 - Retaining pin

- ☐ Use screwdriver to release and pull off

#### 11 - Air duct

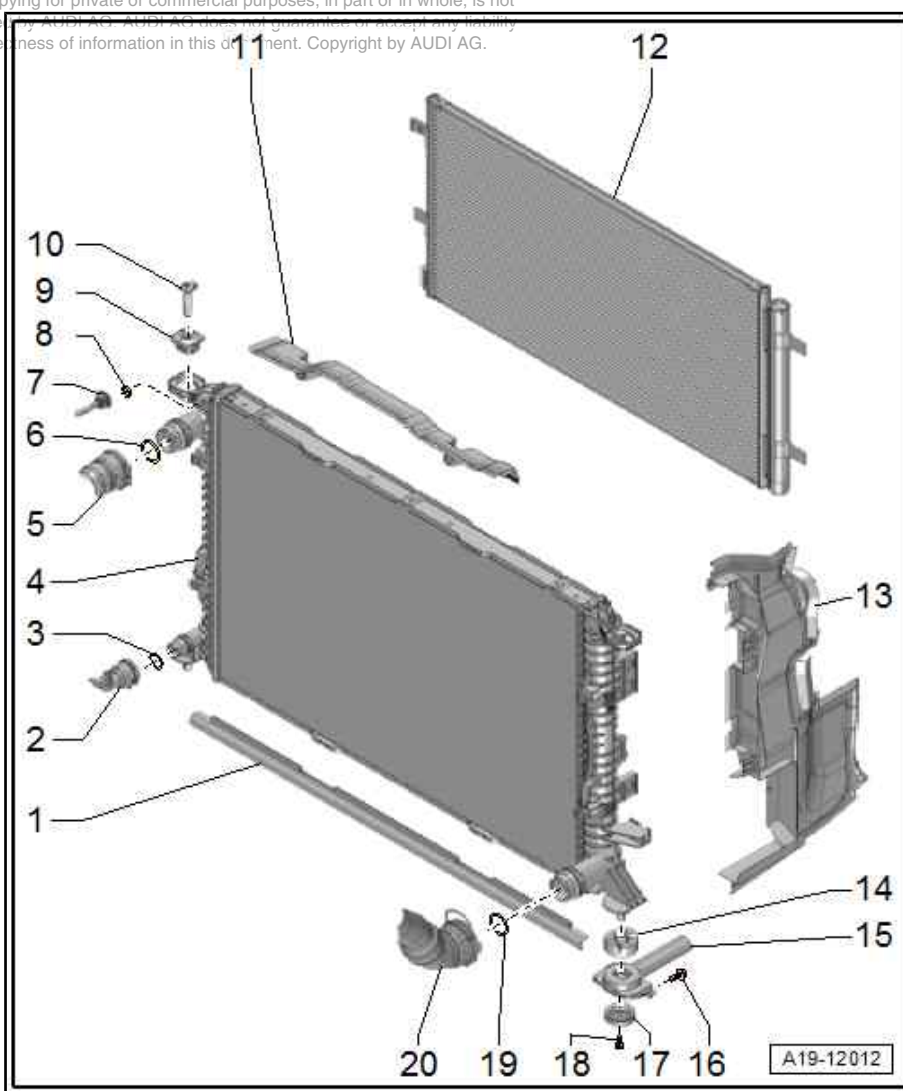
#### 12 - Condenser

- ☐ Removing and installing ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser

#### 13 - Air duct

#### 14 - Rubber bush

- ☐ For radiator



**15 - Radiator bracket**

**16 - Bolt**

- ❑ 5 Nm

**17 - Washer**

**18 - Bolt**

- ❑ 4.5 Nm

**19 - O-ring**

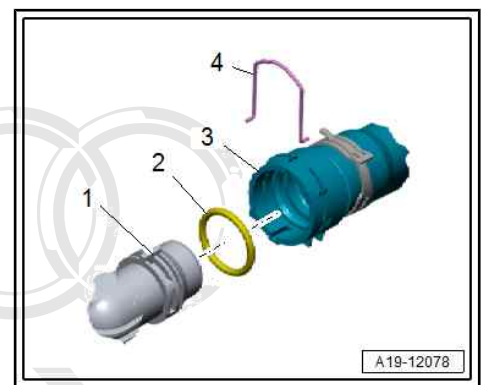
- ❑ Renew after removing

**20 - Coolant hose**

- ❑ Lift retaining clip to detach
- ❑ Connecting to radiator ➔ [page 105](#)

**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**

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### 1 - Radiator fan 2 - V177-

- ☐ With radiator fan control unit 2 - J671-
- ☐ Removing and installing  
⇒ [page 112](#)

### 2 - Radiator fan - V7-

- ☐ With radiator fan control unit - J293-
- ☐ Removing and installing  
⇒ [page 112](#)

### 3 - Radiator cowl

- ☐ Removing and installing  
⇒ [page 109](#)

### 4 - Bolt

- ☐ 3.5 Nm

### 5 - Fan wheel

- ☐ Pin must engage in hole

### 6 - Bolt

- ☐ 5 Nm

### 7 - Fan wheel

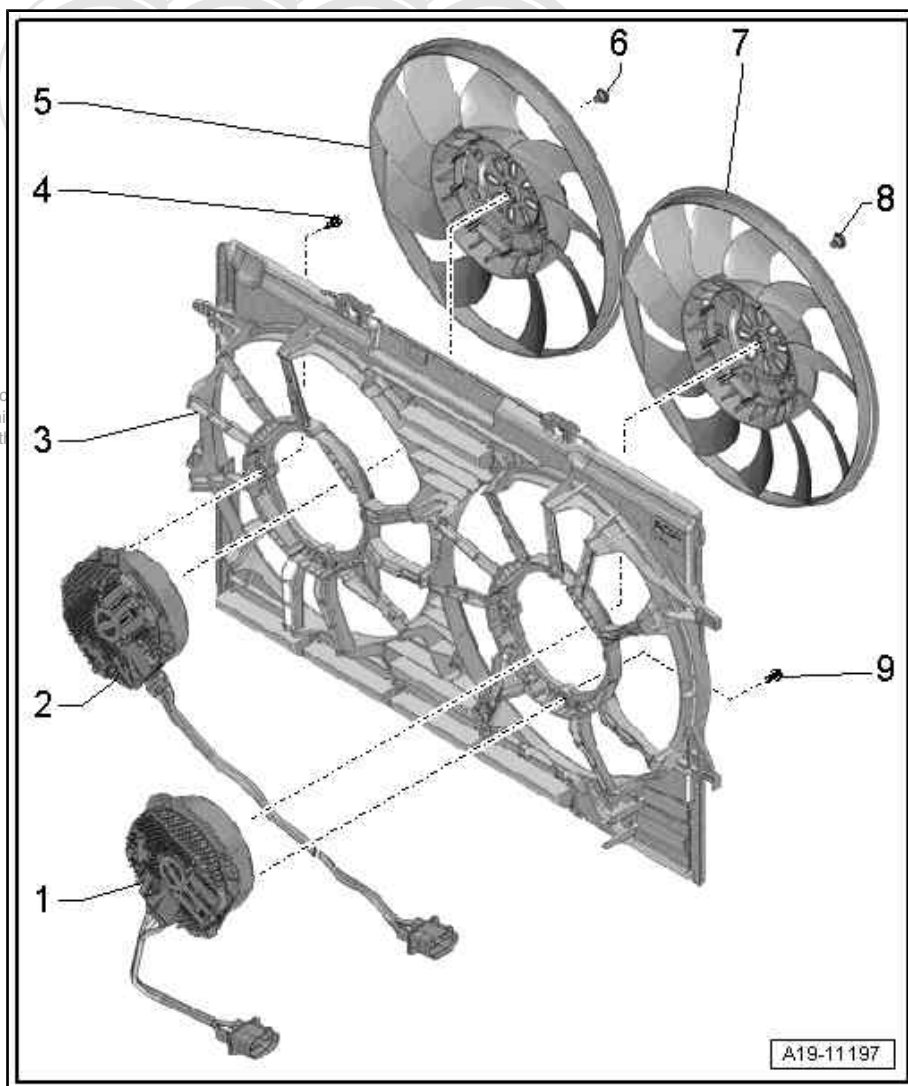
- ☐ Pin must engage in hole

### 8 - Bolt

- ☐ 5 Nm

### 9 - Bolt

- ☐ 3.5 Nm



## 4.2 Removing and installing radiator



### Note

*Radiator and radiator cowl can only be removed and installed together.*

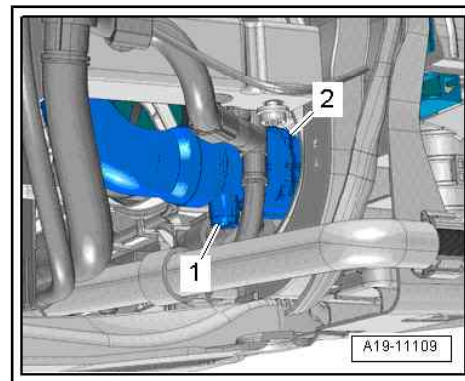
### Special tools and workshop equipment required

- ◆ Drip tray for workshop hoist - VAS 6208-

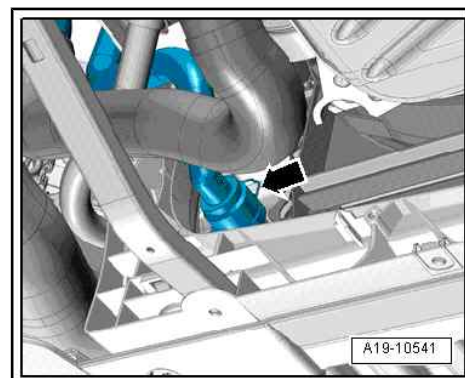


## Removing

- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove impact absorber (front) ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing impact absorber .
- Remove charge air cooler ⇒ [page 117](#) .
- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Remove drain plug -1- and drain off coolant.
- Pull out retaining clip -2- and disconnect coolant hose from radiator.



- Lift retaining clip -arrow- and detach connection (bottom left) from radiator.



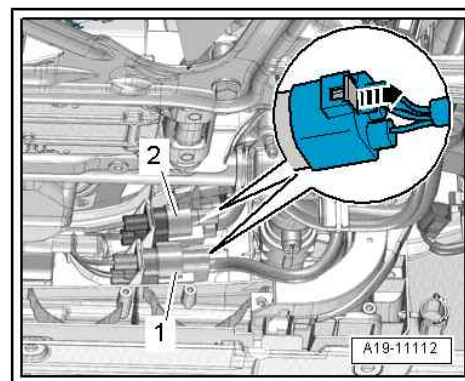
### WARNING

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

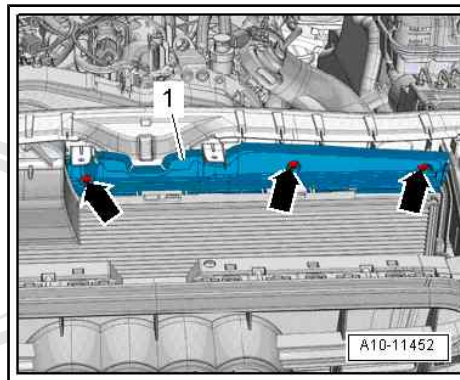
- ◆ **Unplug electrical connectors before starting to work in the area of radiator cowl.**

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- Unplug electrical connector -1- and, if fitted, -2- for radiator fan (push retainer to the rear -arrow- and press down release catch).



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



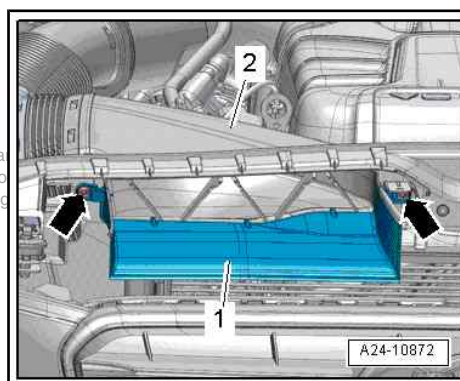
- Remove bolts -arrows- and detach air duct -1- from lock carrier.



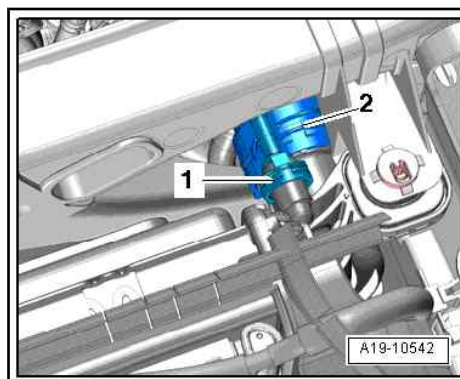
### Note

Disregard -item 2-.

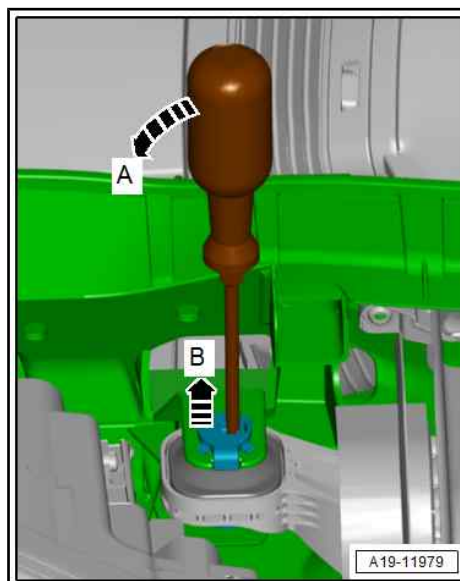
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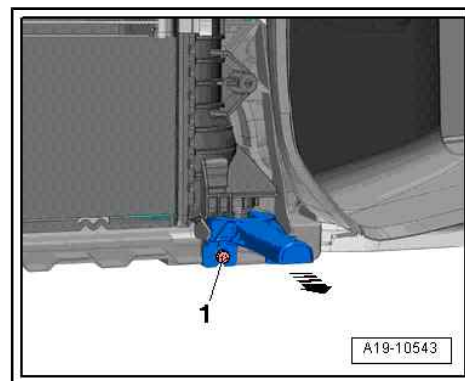
- Lift retaining clips -1, 2- and detach connection from radiator.



- Release retaining pins for radiator on both sides -arrow A- and pull out upwards -arrow B-.
- Remove condenser ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Removing and installing condenser .



- Remove bolt -1- on both sides and detach radiator bracket with radiator from lock carrier -arrow-.
- Detach radiator.



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

### Installing

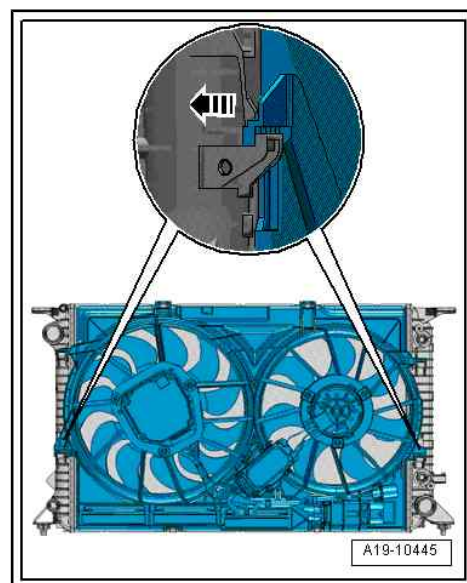
Installation is carried out in reverse order; note the following:



#### Note

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

- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Connect coolant hose with plug-in connector ⇒ [page 105](#) .
- Install charge air cooler ⇒ [page 117](#) .



#### Note

*Do not reuse coolant.*

- Fill up with coolant ⇒ [page 85](#) .

### Tightening torques

- ◆ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 104](#)
- ◆ ⇒ [“3.1 Exploded view - air cleaner housing”, page 128](#)
- ◆ ⇒ Heating, air conditioning; Rep. gr. 87 ; Refrigerant circuit; Exploded view - condenser
- ◆ ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - impact bar
- ◆ ⇒ 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

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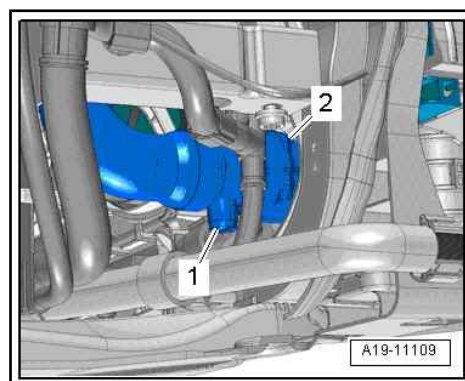
# ♦ Drip tray for workshop hoist - VAS 6208-



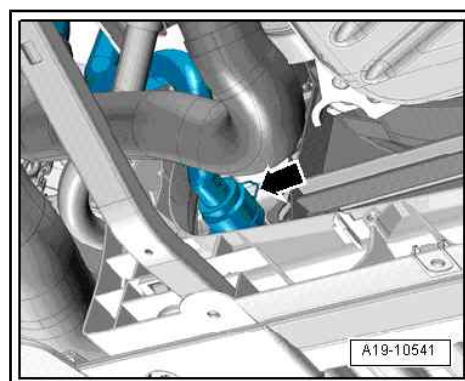
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## Removing

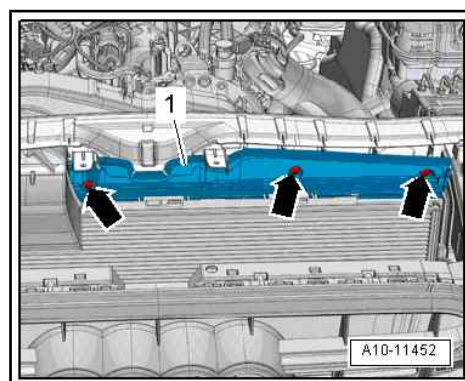
- Remove charge air cooler.
- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Place drip tray for workshop hoist - VAS 6208- beneath engine.
- Remove drain plug -1- and drain off coolant.
- Lift retaining clip -2- and disconnect coolant hose from radiator.



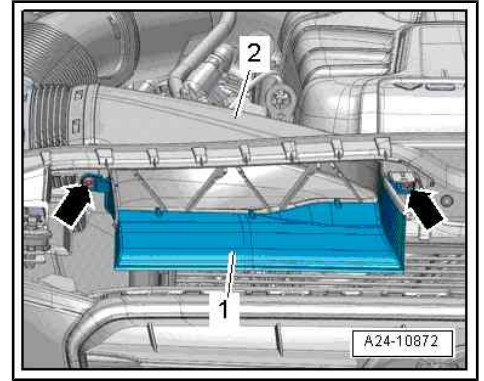
- Detach connection from radiator (lift retaining clip -arrow-).



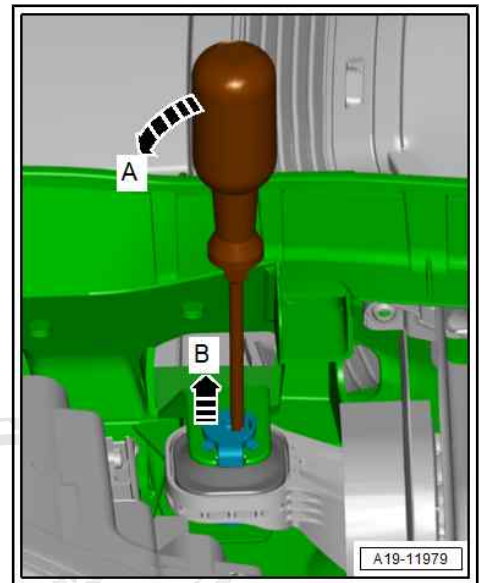
- Remove bolts -arrows- and detach air duct -1-.



- Remove bolts -arrows- and detach air duct -1- from lock carrier.



- Release retaining pins for radiator on both sides -arrow A- and pull out upwards -arrow B-.

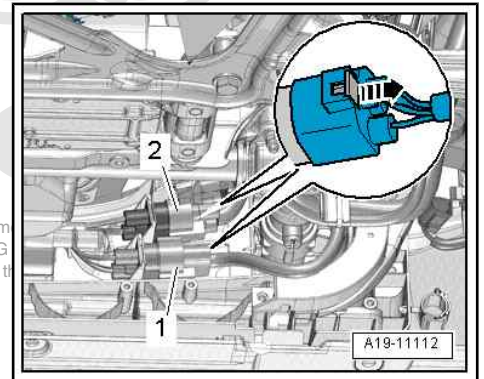


#### WARNING

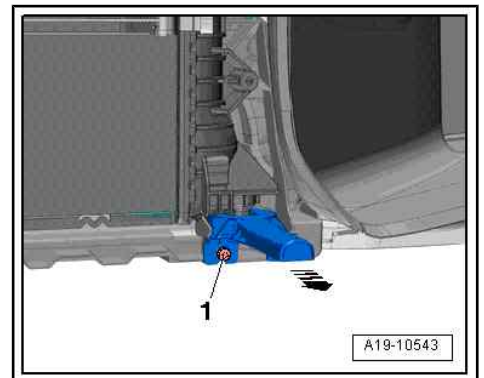
*Risk of injury as the radiator fans may start up automatically.*

- ◆ *Unplug electrical connectors before starting to work in the area of radiator cowl.*

- Unplug electrical connector -1- and, if fitted, -2- for radiator fan (push retainer to the rear -arrow- and press down release catch).



- Remove bolts -1- on both sides and detach radiator bracket with radiator from lock carrier -arrow-.
- Press radiator slightly towards front.



- 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:

- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Connect coolant hose with plug-in connector ⇒ [page 105](#) .
- Install charge air cooler.



### Note

*Do not reuse coolant.*

- Fill up with coolant ⇒ [page 85](#) .

### Tightening torques

- ♦ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 104](#)
- ♦ ⇒ [“3.1 Exploded view - air cleaner housing”, page 128](#)
- ♦ ⇒ 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. 63 ; Bumper (front); Exploded view - impact bar
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

## 4.4 Removing and installing radiator fan - V7-

### Removing



### Note

*Fit all cable ties in the original positions when installing.*

- Remove radiator cowl ⇒ [page 109](#) .
- Remove bolts -1- or -2- and detach corresponding fan wheel.
- Remove bolts -arrows- on radiator fan.
- Move electrical wiring harness clear and detach radiator fan.

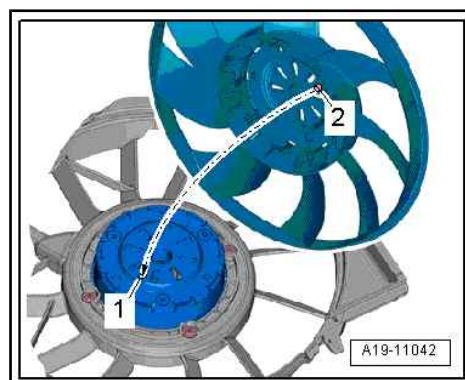
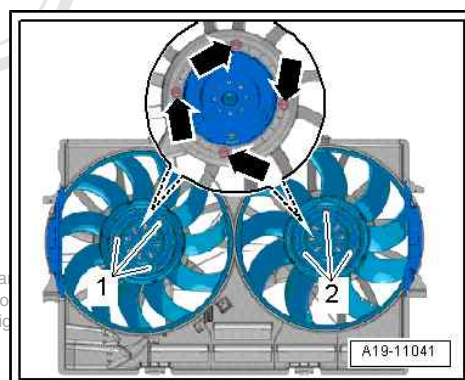
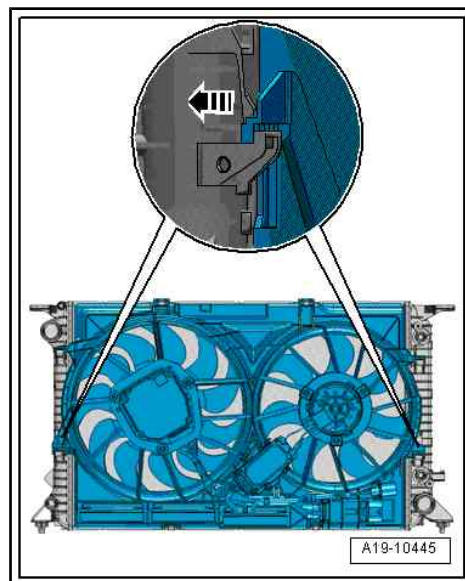
### Installing

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

- Note installation position of fan wheel:
- Pin -2- must engage in hole -1-.
- Install radiator cowl ⇒ [page 109](#) .

### Tightening torques

- ♦ ⇒ [“4.1 Exploded view - radiator/radiator fans”, page 104](#)



## 21 – Turbocharging/supercharging

### 1 Turbocharger

⇒ [“1.1 Exploded view - turbocharger”, page 113](#)

⇒ [“1.2 Removing and installing turbocharger”, page 115](#)

#### 1.1 Exploded view - turbocharger

##### 1 - Gasket

- ❑ Installation instructions  
⇒ Servicing 6-cylinder  
TDI engine, common  
rail; Rep. gr. 21 ; Tur-  
bocharger; Exploded  
view - turbocharger

##### 2 - Engine lifting eye

##### 3 - Bolt

- ❑ Tightening torques ⇒  
Servicing 6-cylinder TDI  
engine, common rail;  
Rep. gr. 21 ; Turbo-  
charger; Exploded view  
- turbocharger

##### 4 - Studs

- ❑ Tightening torques ⇒  
Servicing 6-cylinder TDI  
engine, common rail;  
Rep. gr. 21 ; Turbo-  
charger; Exploded view  
- turbocharger

##### 5 - Gasket

- ❑ Installation instructions  
⇒ Servicing 6-cylinder  
TDI engine, common  
rail; Rep. gr. 21 ; Tur-  
bocharger; Exploded  
view - turbocharger

##### 6 - Gasket

- ❑ Installation instructions  
⇒ Servicing 6-cylinder  
TDI engine, common  
rail; Rep. gr. 21 ; Tur-  
bocharger; Exploded  
view - turbocharger

##### 7 - Bolt

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

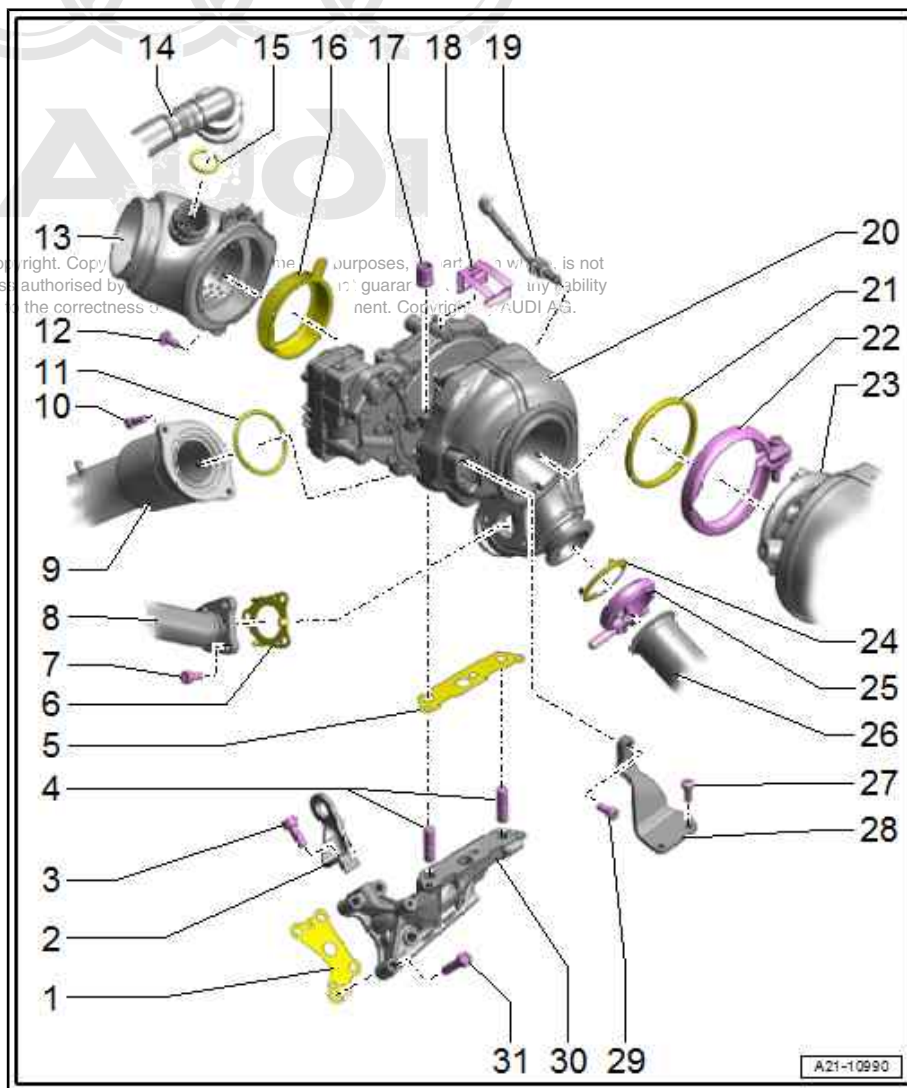
##### 8 - Pipe

- ❑ To exhaust gas recirculation cooler

##### 9 - Air pipe

##### 10 - Bolt

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





## 11 - O-ring

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

## 12 - Bolt

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger
- ❑ Different securing methods - version 1 ⇒ [page 143](#)
- ❑ Different securing methods - version 2 ⇒ [page 143](#)

## 13 - Connection

- ❑ For air hose
- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger
- ❑ Different securing methods - version 1 ⇒ [page 143](#)
- ❑ Different securing methods - version 2 ⇒ [page 143](#)

## 14 - Hose

- ❑ For crankcase breather

## 15 - O-ring

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

## 16 - Seal

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

## 17 - Nut

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

## 18 - Retaining clip

## 19 - Exhaust gas temperature sender 1 - G235-

- ❑ Exploded view ⇒ [page 177](#)
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## 20 - Turbocharger

- ❑ With turbocharger 1 control unit - J724-
- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Removing and installing turbocharger

## 21 - Seal

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

## 22 - Screw-type clip

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

## 23 - Emission control module

- ❑ Exploded view ⇒ [page 161](#)

## 24 - Gasket

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

## 25 - Screw-type clip

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

## 26 - Exhaust manifold

- ❑ Exploded view ⇒ [page 182](#)

#### 27 - Bolt

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

#### 28 - Bracket

- ☐ For turbocharger

#### 29 - Bolt

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

#### 30 - Bracket

- ☐ For turbocharger

#### 31 - Bolt

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

## 1.2 Removing and installing turbocharger

### Removing

- Remove engine cover panel ⇒ [page 48](#) .
- Release hose clips -arrows- and remove air pipe -1-.

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

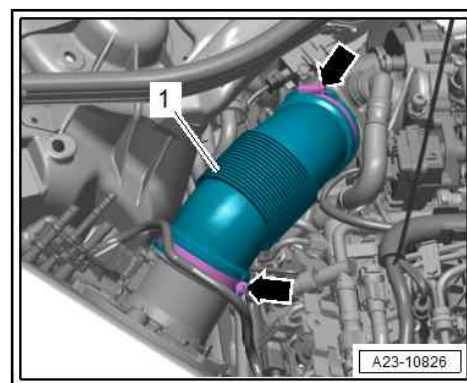
### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

### Tightening torques

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



## 2 Charge air system

⇒ ["2.1 Exploded view - charge air system", page 116](#)

⇒ ["2.2 Exploded view - hose connections for charge air system", page 117](#)

⇒ ["2.3 Removing and installing charge air cooler", page 117](#)

⇒ ["2.4 Removing and installing charge pressure sender G31", page 119](#)

⇒ ["2.5 Checking charge air system for leaks", page 119](#)

### 2.1 Exploded view - charge air system

#### 1 - Sealing strip

#### 2 - Charge air cooler

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

#### 3 - Hose clip

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

#### 4 - Air hose

- ☐ To charge air cooler
- ☐ Must be free of oil or  
grease when installing

#### 5 - Hose clip

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

#### 6 - Bolt

- ☐ 9 Nm

#### 7 - Spacer sleeve

#### 8 - Grommet

#### 9 - Air pipe (right-side)

#### 10 - Bolt

- ☐ 9 Nm

#### 11 - O-ring

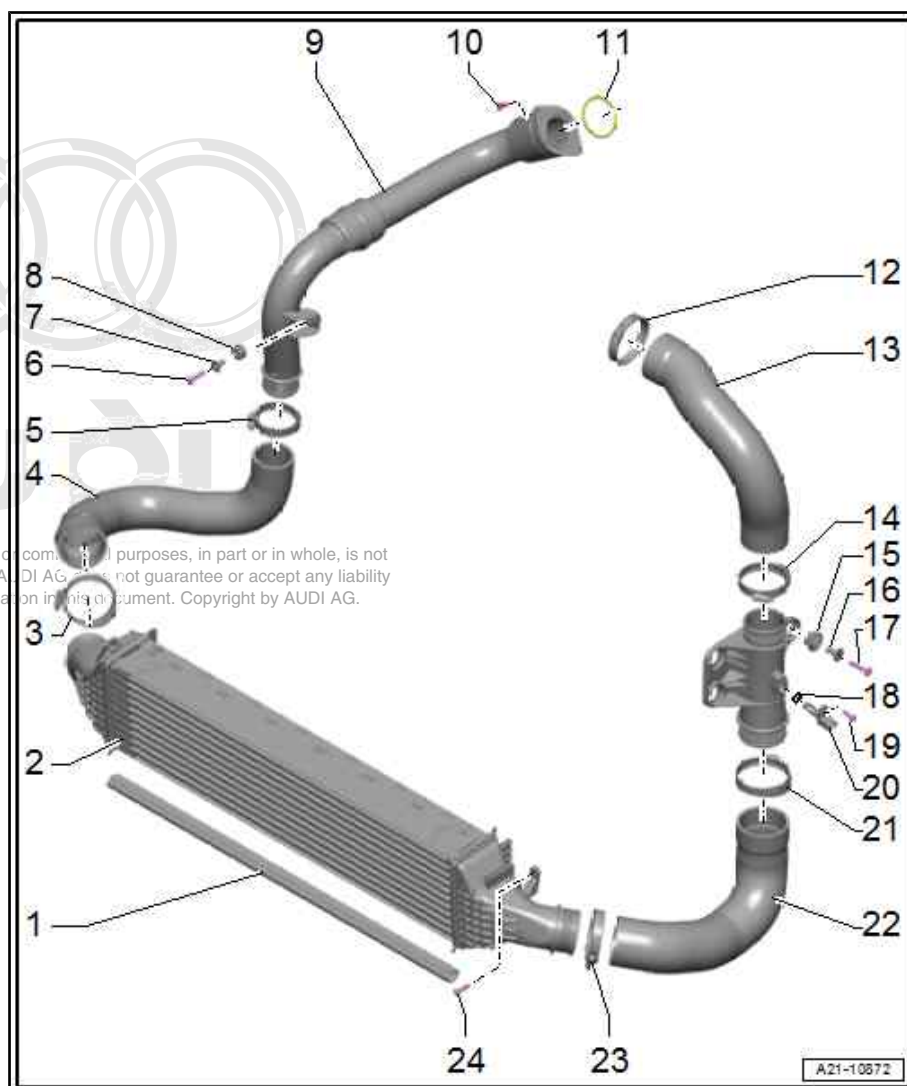
- ☐ Renew after removing

#### 12 - Hose clip

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

#### 13 - Air hose

- ☐ To turbocharger
- ☐ Must be free of oil or grease when installing



#### 14 - Hose clip

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

#### 15 - Grommet

#### 16 - Spacer sleeve

#### 17 - Bolt

- ☐ 9 Nm

#### 18 - O-ring

- ☐ Renew after removing

#### 19 - Bolt

- ☐ 5 Nm

#### 20 - Intake air temperature sender - G42-

- ☐ Removing and installing ⇒ [page 140](#)

#### 21 - Hose clip

- ☐ Tightening torque ⇒ [page 117](#)

#### 22 - Air hose

- ☐ To intake manifold
- ☐ Must be free of oil or grease when installing

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#### 23 - Hose clip

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

#### 24 - Bolt

- ☐ 7 Nm

## 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 notes; Rules for cleanliness .
- Remove closure plate for bumper cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .



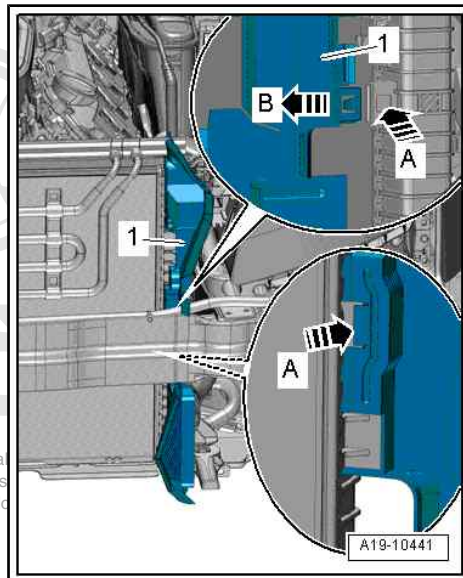
### WARNING

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

- ◆ *Unplug electrical connectors before starting to work in the area of radiator cowl.*

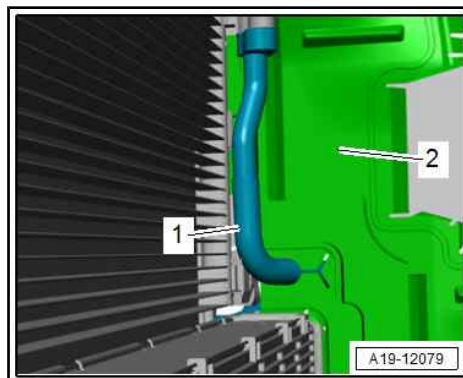
- Release catches -arrows A- and swivel air duct -1- on left and right to centre of vehicle -arrow B-.

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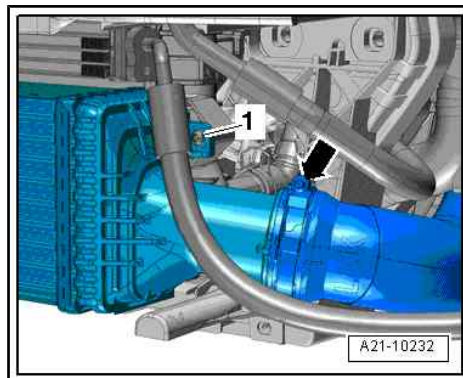


#### Note

- ◆ Depending on the version, an air duct -2- that surrounds the refrigerant line -1- may be fitted on the left, as shown in the illustration.
- ◆ This air duct cannot be removed and remains in its installation position after the radiator has been unclipped.



- Release hose clip -arrow- and detach air hose from charge air cooler.
- Remove bolt -1-.



- Release hose clip -1- and detach air hose from charge air cooler.
- Push catch down -arrow A- and move top of charge air cooler slightly in direction of -arrow B-.
- Detach charge air cooler by pulling upwards.
- Remove charge air cooler, paying special attention to air ducts (left-side).

### Installing

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



#### Note

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

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



#### Note

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

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### Tightening torques

- ♦ ⇒ [“2.1 Exploded view - charge air system”, page 116](#)
- ♦ ⇒ [“2.2 Exploded view - hose connections for charge air system”, page 117](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

## 2.4 Removing and installing charge pressure sender - G31-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Removing and installing charge pressure sender - G31- .

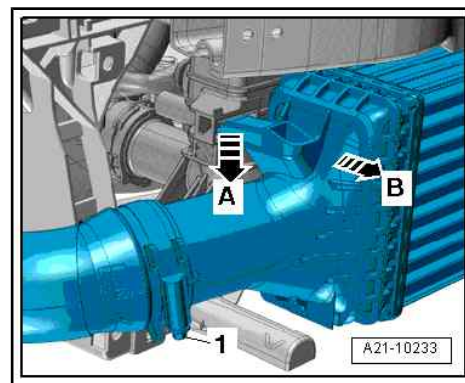
### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

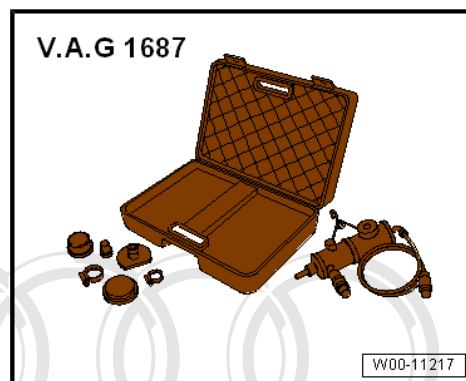
## 2.5 Checking charge air system for leaks

Special tools and workshop equipment required





- ◆ Charge air system tester - V.A.G 1687- with adapters /6, /11, /13-1, /13-2



### Procedure

- Observe rules for cleanliness ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes; Rules for cleanliness .
- Remove engine cover panel ⇒ [page 48](#) .
- Release hose clips -arrows- and remove air pipe -1-.

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

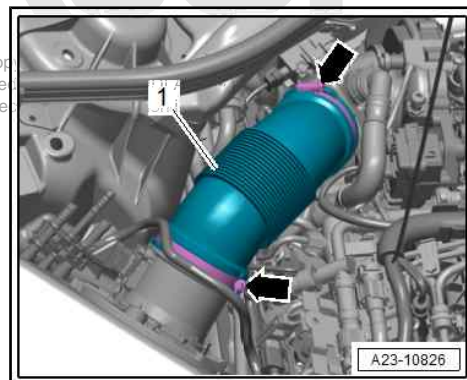
### Attaching

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

### Tightening torques

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



## 23 – Mixture preparation - injection

### 1 Injection system

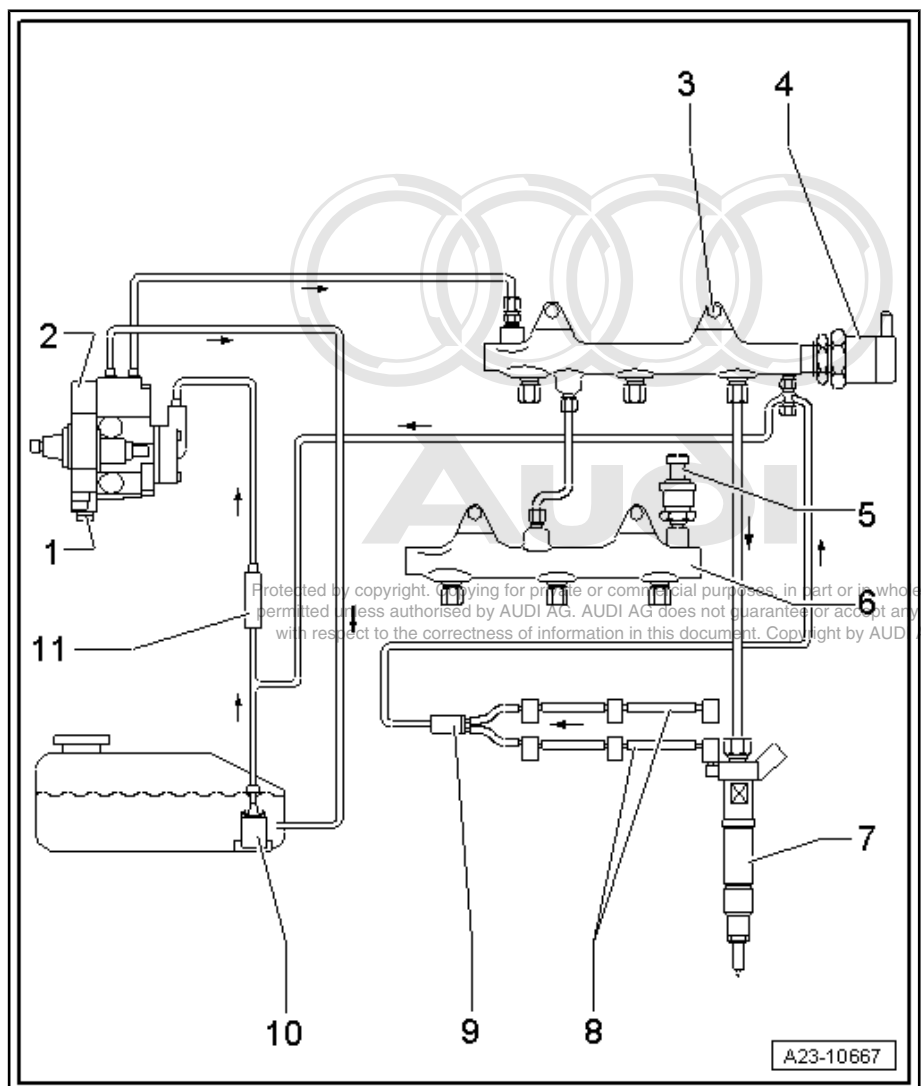
⇒ [“1.1 Overview - fuel system”, page 121](#)

⇒ [“1.2 Overview of fitting locations - injection system”, page 122](#)

⇒ [“1.3 Filling and bleeding fuel system”, page 126](#)

#### 1.1 Overview - fuel system

- 1 - Fuel metering valve - N290-
- 2 - High-pressure pump
- 3 - High-pressure reservoir (rail)
  - ☐ For cylinder bank 1 (right-side)
- 4 - Fuel pressure regulating valve - N276-
- 5 - Fuel pressure sender - G247-
- 6 - High-pressure reservoir (rail)
  - ☐ For cylinder bank 2 (left-side)
- 7 - Injector
- 8 - Fuel return hoses
- 9 - Restrictor
  - ☐ Maintains a residual pressure in fuel return hoses
- 10 - Fuel system pressurisation pump - G6-
- 11 - Fuel filter



## 1.2 Overview of fitting locations - injection system

### Engine compartment

#### 1 - Air mass meter - G70-

- ☐ Exploded view  
⇒ [page 128](#)

#### 2 - Right electrohydraulic engine mounting solenoid valve - N145-

- ☐ Integrated in engine mounting (right-side)  
⇒ [page 123](#)

#### 3 - Pressure differential sender - G505-

- ☐ Exploded view  
⇒ [page 148](#)

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

- ☐ Exploded view  
⇒ [page 148](#)

#### 5 - Exhaust gas temperature sender 3 - G495-

- ☐ Exploded view  
⇒ [page 177](#)

#### 6 - Accelerator position sender - G79- and accelerator position sender 2 - G185-

- ☐ Fitting location  
⇒ [page 123](#)

#### 7 - Brake light switch - F-

- ☐ Fitting location  
⇒ [page 123](#)

#### 8 - Engine control unit - J623-

- ☐ Removing and installing  
⇒ [page 152](#)

#### 9 - Intake air temperature sender - G42-

- ☐ Fitting location ⇒ [page 123](#)

#### 10 - Left electrohydraulic engine mounting solenoid valve - N144-

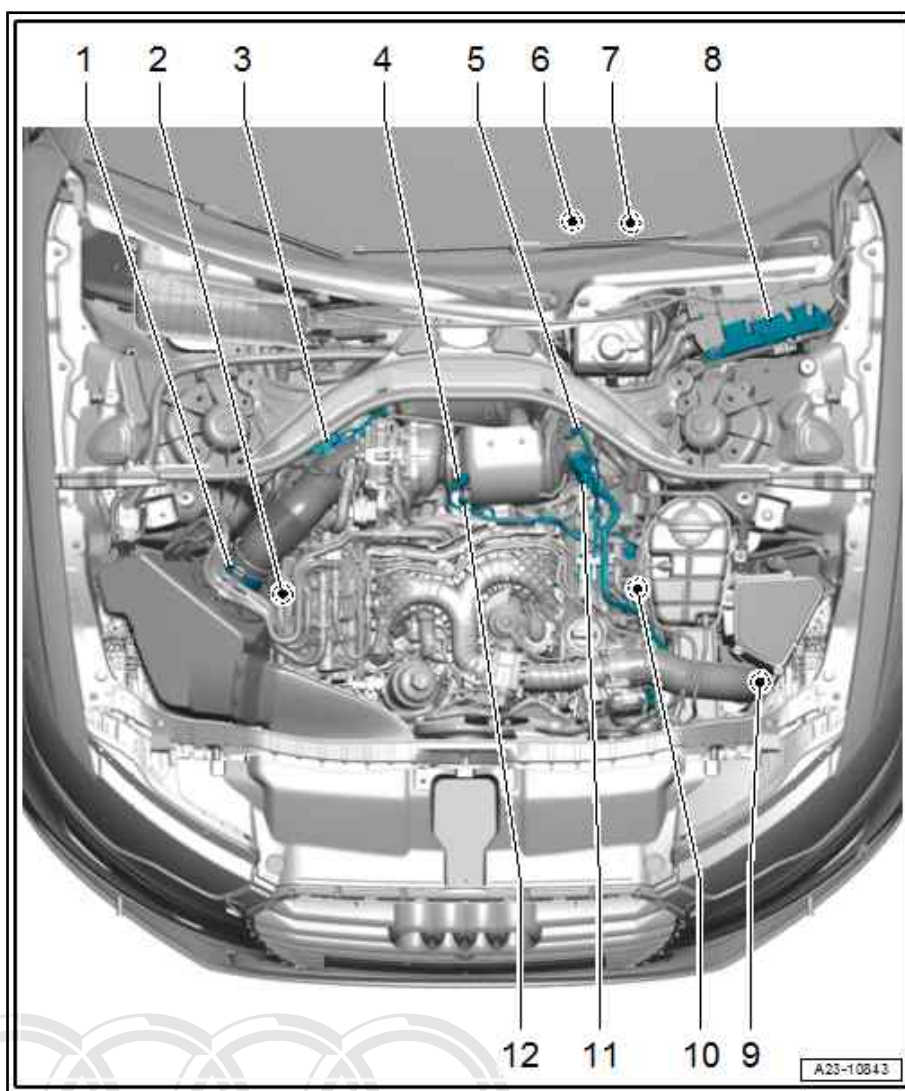
- ☐ Integrated in engine mounting (left-side) ⇒ [page 123](#)

#### 11 - Injector for reducing agent - N474-

- ☐ Exploded view ⇒ [page 168](#)

#### 12 - Exhaust gas temperature sender 2 - G448-

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



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

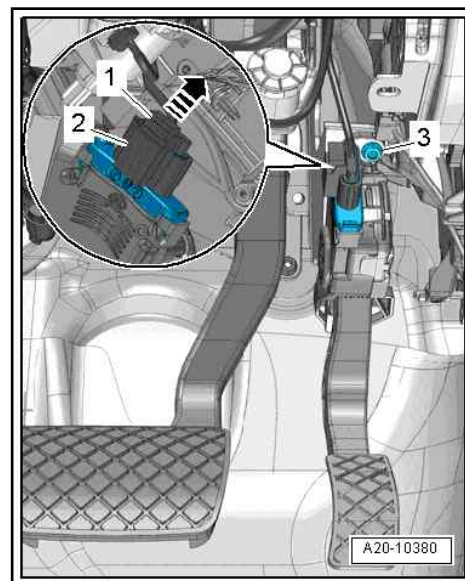
- ◆ In accelerator pedal module



### Note

*The accelerator position sender - G79- and accelerator position sender 2 - G185- are integrated in the accelerator pedal module and cannot be renewed individually.*

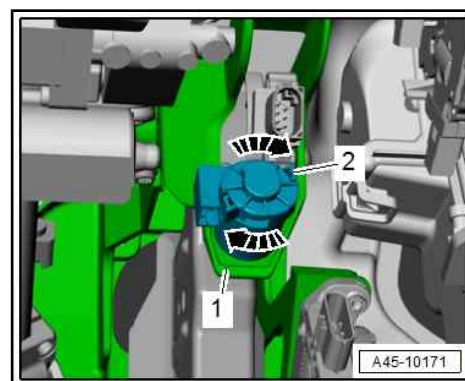
Removing and installing ⇒ Fuel supply system, diesel engines; Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender -G79- / -G185- .



## Fitting location of brake light switch - F-

- ◆ In footwell on brake pedal

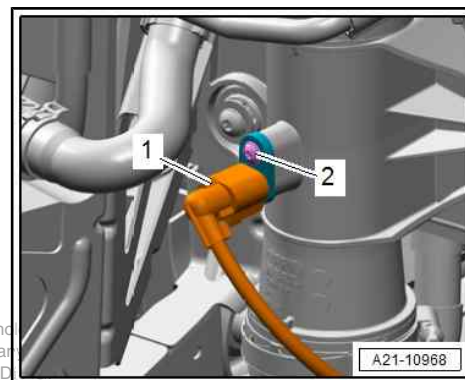
Removing and installing ⇒ Brake system; Rep. gr. 45 ; Sensors; Removing and installing brake light switch



## Fitting location of intake air temperature sender - G42-

- ◆ On air pipe (left-side)

Removing and installing ⇒ [page 140](#)



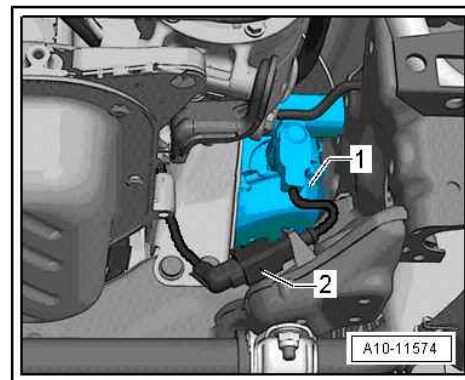
## Fitting location of electrohydraulic engine mounting solenoid valve

- ◆ Integrated in engine mounting.

1 - Left electrohydraulic engine mounting solenoid valve - N144-

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

Removing and installing ⇒ [page 44](#)



## Engine (top view)

# 1 - Fuel pressure regulating valve - N276-

- ☐ Removing and installing  
⇒ [page 146](#)

# 2 - Injectors for cylinder bank 1 (right-side)

- ◆ Injector, cylinder 1 - N30-
- ◆ Injector, cylinder 2 - N31-
- ◆ Injector, cylinder 3 - N32-
  - ☐ Exploded view  
⇒ [page 135](#)

# 3 - Control unit for turbocharger 1 - J724-

- ☐ On turbocharger
- ☐ Exploded view  
⇒ [page 113](#)

# 4 - Fuel metering valve - N290-

# 5 - Exhaust gas recirculation control motor - V338-

- ☐ With exhaust gas recirculation potentiometer - G212-
- ☐ Exploded view  
⇒ [page 180](#)

# 6 - Fuel pressure sender - G247-

- ☐ Removing and installing  
⇒ [page 142](#)

# 7 - Injectors for cylinder bank 2 (left-side)

- ◆ Injector, cylinder 6 - N84-
- ◆ Injector, cylinder 5 - N83-
- ◆ Injector, cylinder 4 - N33-
  - ☐ Exploded view ⇒ [page 135](#)

# 8 - Glow plugs for cylinder bank 2 (left-side)

- ◆ Glow plug 6 - Q15-
- ◆ Glow plug 5 - Q14-
- ◆ Glow plug 4 - Q13-
  - ☐ Exploded view ⇒ [page 188](#)

# 9 - Exhaust gas recirculation temperature sensor - G98-

- ☐ Exploded view ⇒ [page 180](#)

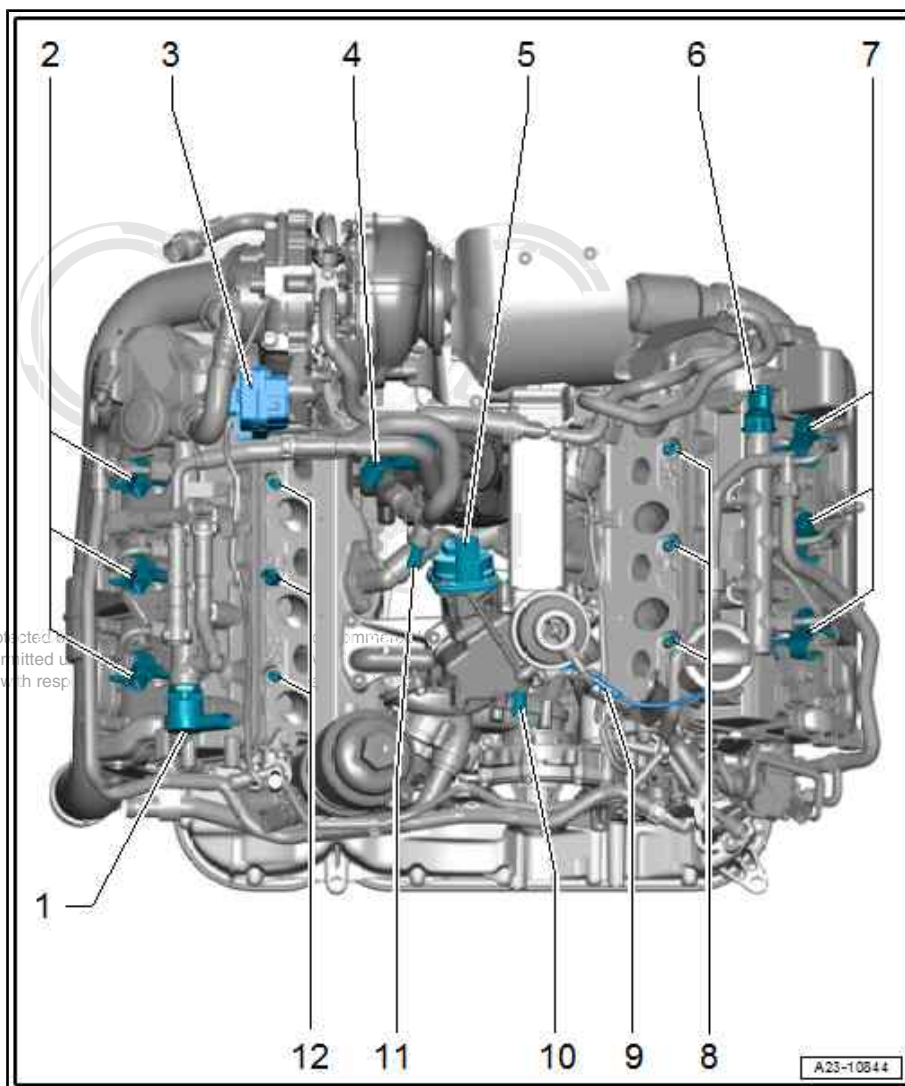
# 10 - Coolant temperature sender - G62-

- ☐ Exploded view ⇒ [page 92](#)

# 11 - Fuel temperature sender - G81-

# 12 - Glow plugs for cylinder bank 1 (right-side)

- ◆ Glow plug 1 - Q10-
- ◆ Glow plug 2 - Q11-
- ◆ Glow plug 3 - Q12-



- ☐ Exploded view ➔ [page 188](#)

### Engine (front view)

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

2 - Oil temperature sender 2 - G664-

- ☐ Exploded view  
➔ [page 51](#)

3 - Oil pressure sender - G10-

4 - Coolant temperature sender 2 - G802-

- ☐ Exploded view  
➔ [page 92](#)

5 - Intake manifold flap motor - V157-

- ☐ Exploded view  
➔ [page 131](#)

6 - Charge pressure sender - G31-

- ☐ Exploded view  
➔ [page 131](#)

7 - Throttle valve module - J338-

- ☐ Exploded view  
➔ [page 131](#)

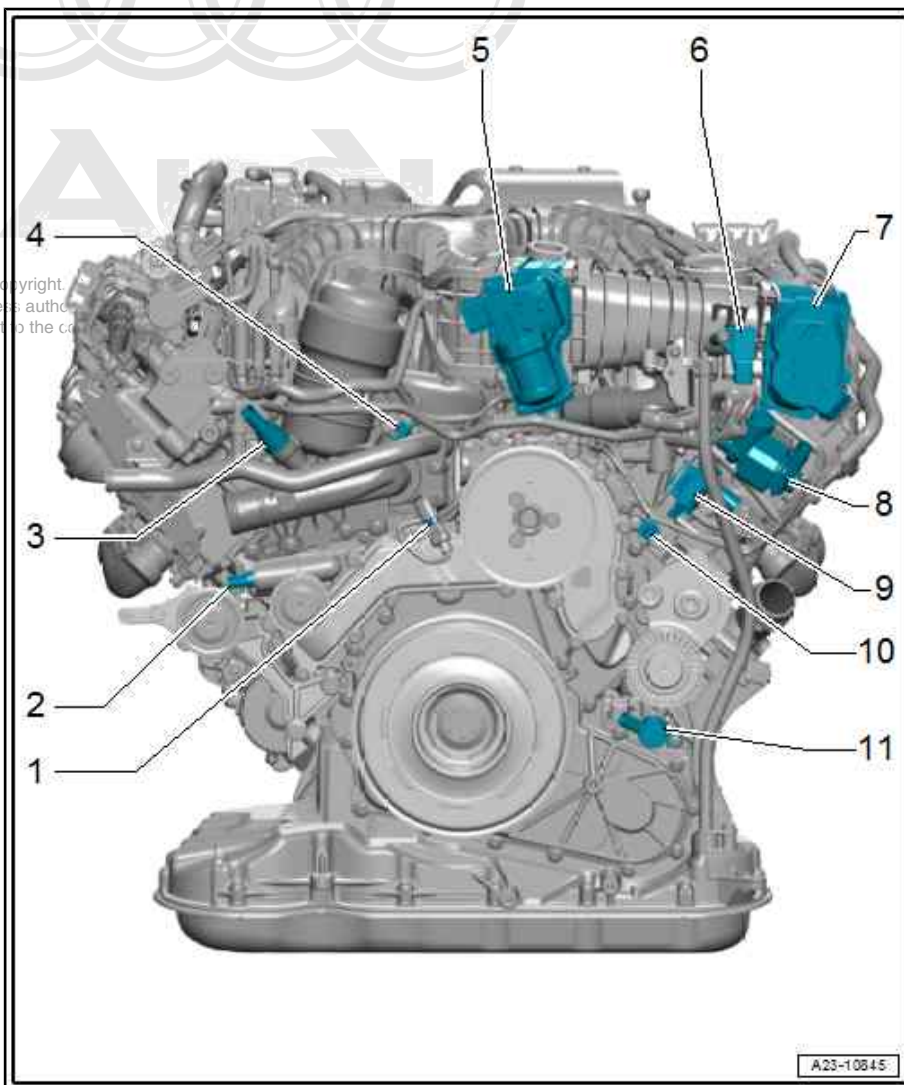
8 - Coolant valve for cylinder head - N489-

9 - Exhaust gas recirculation cooler change-over valve - N345-

10 - Temperature sender for engine temperature regulation - G694-

11 - Valve for oil pressure control - N428-

- ☐ Exploded view ➔ [page 72](#)



### Engine (side view, right-side)

### 1 - Engine speed sender - G28-

- ☐ Exploded view  
⇒ [page 188](#)

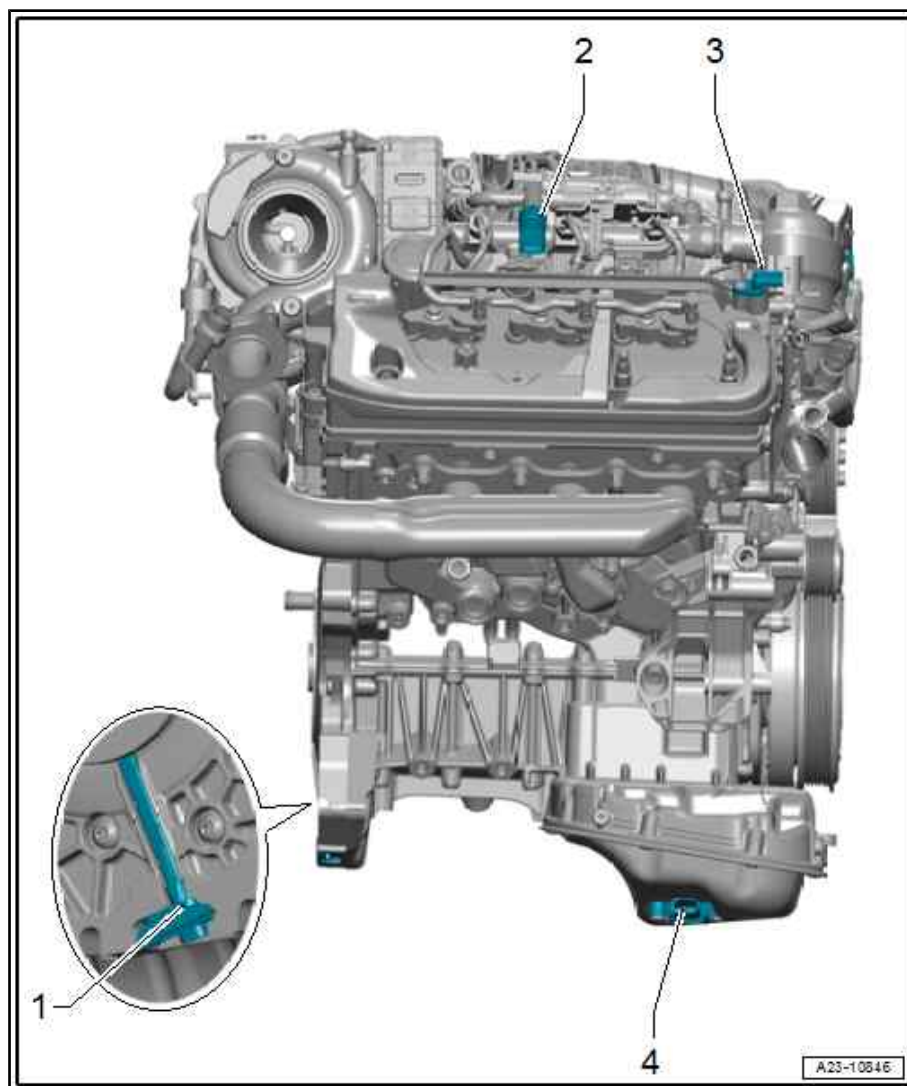
### 2 - Fuel pressure sender for low pressure - G410-

### 3 - Hall sender - G40-

- ☐ Exploded view  
⇒ [page 188](#)

### 4 - Oil level and oil temperature sender - G266-

- ☐ Exploded view  
⇒ [page 72](#)



## 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 .



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## 2 Vacuum system

⇒ [“2.1 Connection diagram - vacuum system”, page 127](#)

⇒ [“2.2 Checking vacuum system”, page 127](#)

### 2.1 Connection diagram - vacuum system

**1 - Exhaust gas recirculation cooler change-over valve - N345-**

**2 - Vacuum hose**

- ☐ From exhaust gas recirculation cooler change-over valve - N345- to vacuum unit at exhaust gas recirculation cooler

**3 - Vacuum unit**

- ☐ At exhaust gas recirculation cooler

**4 - Vacuum unit**

- ☐ At coolant shut-off valve

**5 - Vacuum line**

- ☐ From coolant valve for cylinder head - N489- to vacuum unit at coolant shut-off valve

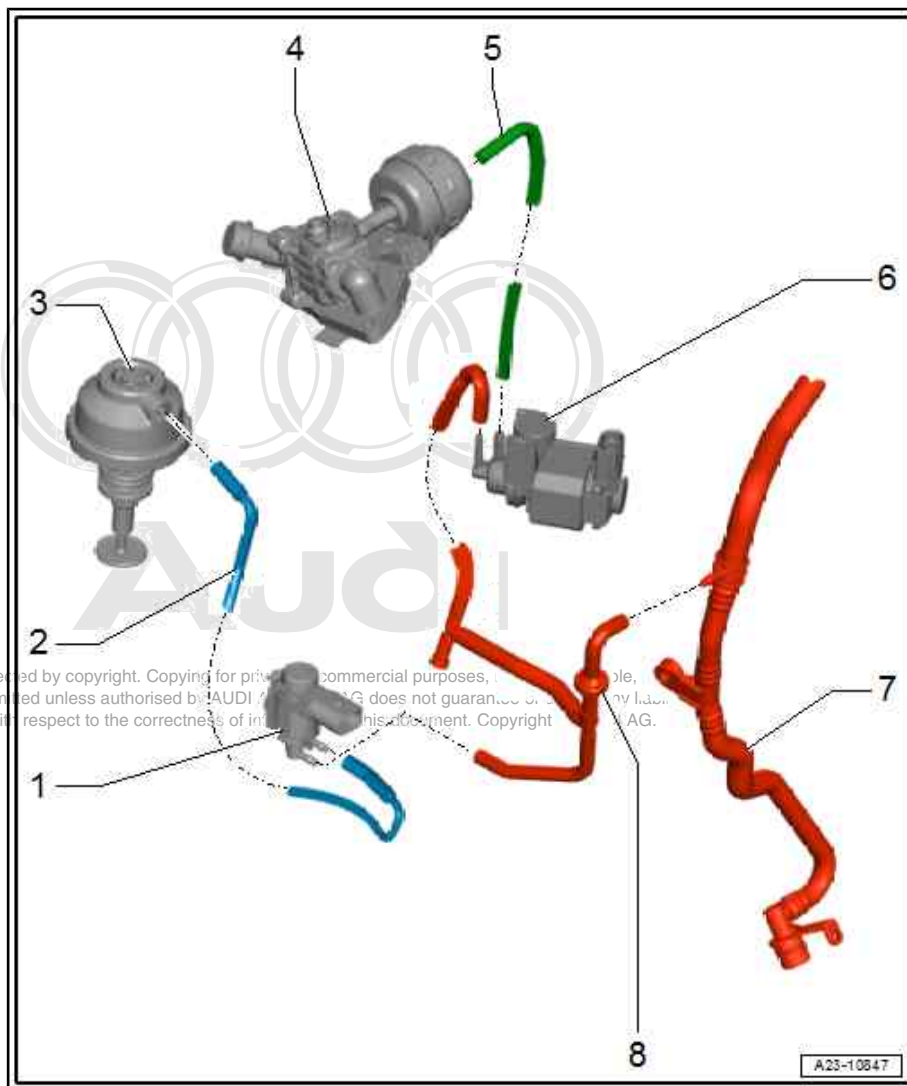
**6 - Coolant valve for cylinder head - N489-**

**7 - Vacuum supply hose**

- ☐ With non-return valve
- ☐ Leading from vacuum pump to brake servo

**8 - Vacuum supply hose**

- ☐ With non-return valve
- ☐ To coolant valve for cylinder head - N489- and exhaust gas recirculation cooler change-over valve - N345-



### 2.2 Checking vacuum system

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

### 3 Air cleaner

⇒ "3.1 Exploded view - air cleaner housing", page 128

⇒ "3.2 Removing and installing air cleaner housing", page 129

#### 3.1 Exploded view - air cleaner housing

##### 1 - Mounting

- ☐ For air cleaner housing

##### 2 - Air cleaner housing

- ☐ Clean out salt deposits, dirt and leaves, etc.
- ☐ Removing and installing  
⇒ [page 129](#)

##### 3 - Cover

- ☐ For air cleaner housing
- ☐ Remove any salt deposits or dirt
- ☐ Removing and installing  
⇒ Maintenance ; Booklet 411

##### 4 - Grommet

##### 5 - Bolt

- ☐ Not installed on all versions
- ☐ 3.5 Nm

##### 6 - Air mass meter - G70-

- ☐ Removing and installing  
⇒ [page 140](#)

##### 7 - Air pipe

- ☐ 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

##### 8 - Air filter element

- ☐ Use genuine air filter element ⇒ Electronic parts catalogue
- ☐ Change intervals ⇒ Maintenance tables
- ☐ Removing and installing ⇒ Maintenance ; Booklet 411

##### 9 - Air duct

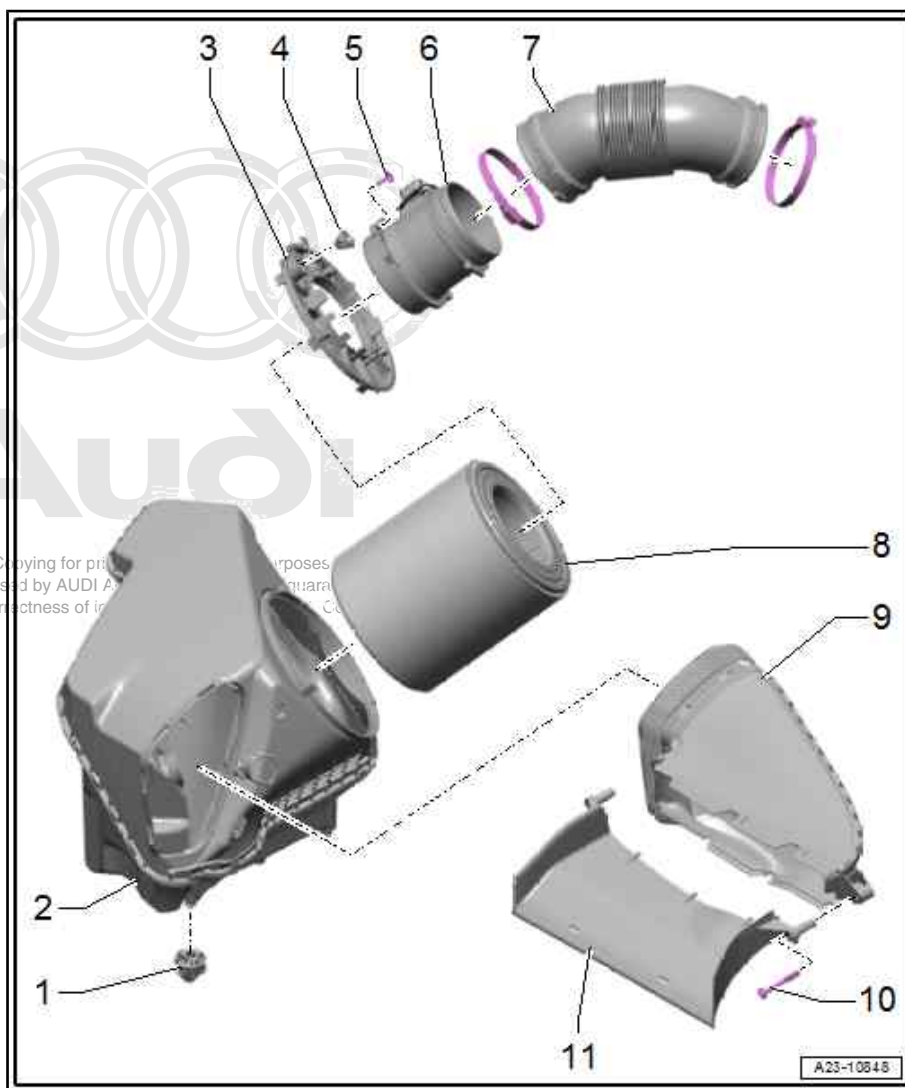
- ☐ Clean out salt deposits, dirt and leaves, etc.

##### 10 - Bolt

- ☐ 3.5 Nm

##### 11 - Air duct

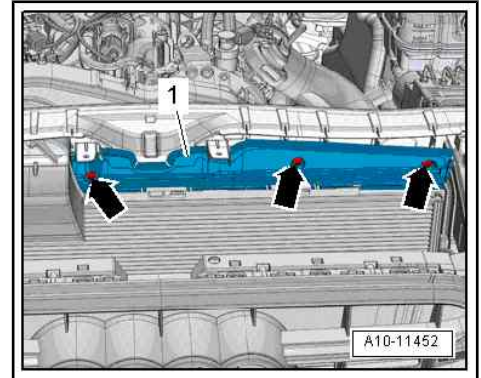
- ☐ Clean out salt deposits, dirt and leaves, etc.



## 3.2 Removing and installing air cleaner housing

### Removing

- Remove engine cover panel ⇒ [page 48](#) .
- Remove lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Remove bolts -arrows- and detach air duct -1-.

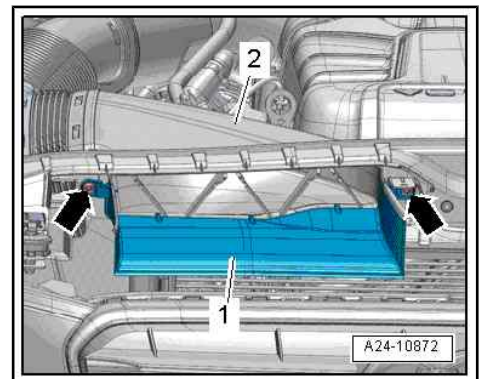


- Remove bolts -arrows-, detach air duct -2- from lock carrier and unclip from air cleaner housing.

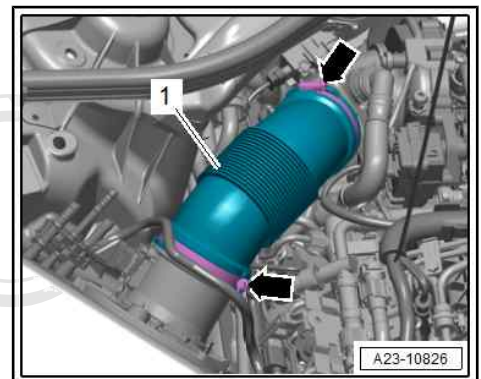


### Note

*Disregard -item 1-.*



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



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- Detach retaining clip -3- with fuel hoses from air cleaner housing and push to one side.
- Unplug electrical connector -2- at air mass meter - G70- and move clear.
- Lift off air cleaner housing -1-.

## Installing



### Note

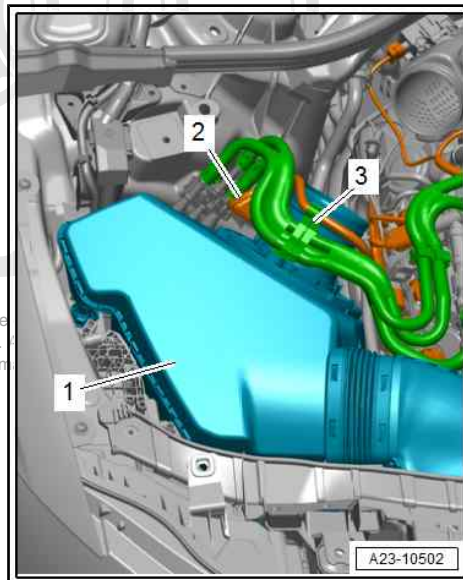
- ◆ *The air cleaner housing must always be clean.*
- ◆ *To prevent malfunctions, cover critical parts of the engine air intake (air mass meter, air pipes etc.) with a clean cloth when blowing out the air cleaner housing with compressed air.*
- ◆ *Hose connections and air pipes/hoses must be free of oil and grease prior to fitting.*
- ◆ *Use a lubricant (silicone-free) when installing air hoses.*
- ◆ *Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .*
- Check air pipe (engine intake side) for salt residue, dirt and leaves.
- Check air duct leading from lock carrier to air cleaner housing for dirt and leaves.

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

- Install lock carrier cover ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Removing and installing attachments .
- Install engine cover panel ⇒ [page 48](#) .

## Tightening torques

- ◆ ⇒ ["3.1 Exploded view - air cleaner housing", page 128](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system



## 4 Intake manifold

⇒ ["4.1 Exploded view - intake manifold", page 131](#)

⇒ ["4.2 Removing and installing intake manifold \(top section\)", page 133](#)

⇒ ["4.3 Removing and installing intake manifold \(bottom section\)", page 133](#)

⇒ ["4.4 Removing and installing intake manifold flap motor V157", page 133](#)

⇒ ["4.5 Removing and installing throttle valve module J338", page 134](#)

### 4.1 Exploded view - intake manifold

#### 1 - Bolt

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

#### 2 - Pipe

- ☐ For exhaust gas recirculation

#### 3 - Seal

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

#### 4 - Bolt

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

#### 5 - Bolt

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

#### 6 - Bracket

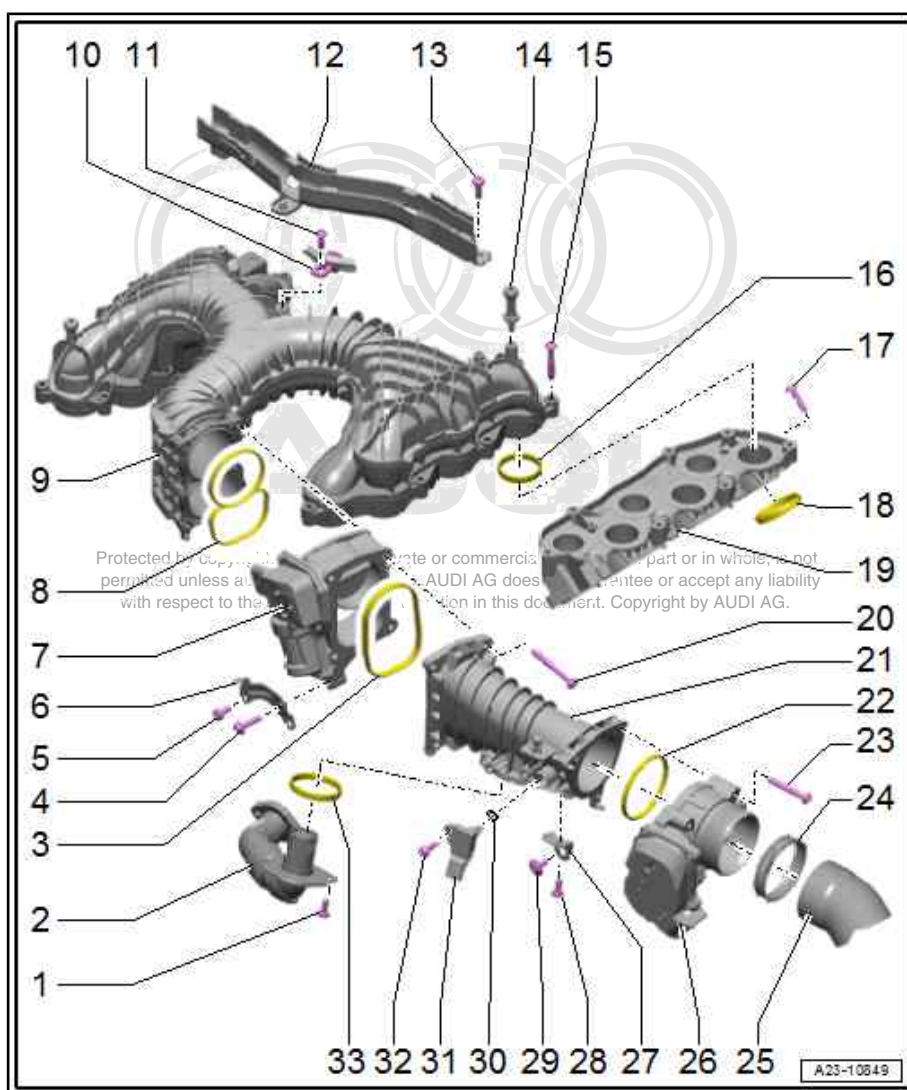
- ☐ For air pipe

#### 7 - Intake manifold flap motor - V157-

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Removing and installing intake manifold flap motor - V157-

#### 8 - Gasket

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





## 9 - Intake manifold (top section)

- ☐ Removing and installing ⇒ [page 133](#)

## 10 - Bracket

- ☐ For high-pressure pipe

## 11 - Bolt

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

## 12 - Cable guide

## 13 - Bolt

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

## 14 - Mounting pin

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

## 15 - Bolt

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

## 16 - Seal

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

## 17 - Bolt

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

## 18 - Seal

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

## 19 - Intake manifold (bottom section)

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

## 20 - Bolt

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

## 21 - Air pipe

## 22 - Seal

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

## 23 - Bolt

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

## 24 - Screw-type clip

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

## 25 - Air hose

## 26 - Throttle valve module - J338-

- ☐ Removing and installing ⇒ [page 134](#)

## 27 - Bracket

- ☐ For air pipe

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#### 28 - Bolt

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

#### 29 - Bolt

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

#### 30 - O-ring

- ❑ Renew after removing

#### 31 - Charge pressure sender - G31-

- ❑ Removing and installing ⇒ [page 119](#)

#### 32 - Bolt

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

#### 33 - Seal

- ❑ Installation instructions ⇒ 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)

### Removing

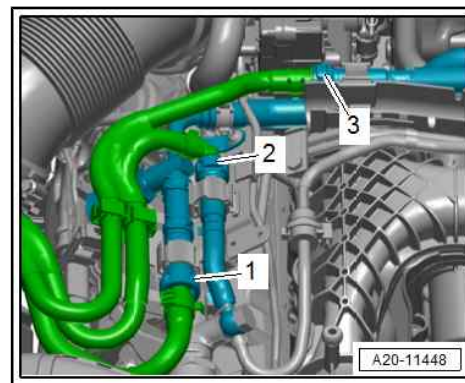
- Remove engine cover panel ⇒ [page 48](#) .
- Disconnect fuel hoses -1, 2, 3- ⇒ Fuel supply system, diesel engines; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .
- Move coolant hoses clear and move to right side.

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

### Installing

Additional work:

- Connect fuel hoses ⇒ Fuel supply system, diesel engines; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Install engine cover panel ⇒ [page 48](#) .



## 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-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Removing and installing intake manifold flap motor - V157- .



## 4.5 Removing and installing throttle valve module - J338-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Intake manifold; Removing and installing throttle valve module - J338- .

### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#)

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## 5 Injectors/high-pressure reservoir (rail)

⇒ [“5.1 Exploded view - injectors”, page 135](#)

⇒ [“5.2 Checking injectors”, page 137](#)

⇒ [“5.3 Performing adaption of correction values for injectors”, page 137](#)

⇒ [“5.4 Checking for injectors sticking open”, page 137](#)

⇒ [“5.5 Checking return flow rate of injectors with engine running”, page 137](#)

⇒ [“5.6 Checking return flow rate of injectors at starter cranking speed”, page 138](#)

⇒ [“5.7 Checking restrictor in fuel return line”, page 138](#)

⇒ [“5.8 Removing and installing injectors”, page 138](#)

⇒ [“5.9 Removing and installing high-pressure pipes”, page 139](#)

⇒ [“5.10 Removing and installing high-pressure reservoir \(rail\)”, page 139](#)

### 5.1 Exploded view - injectors



#### Caution

*Risk of malfunctions caused by dirt.*

- ◆ *Observe rules for cleanliness ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes; Rules for cleanliness .*



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### 1 - Support bracket

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

### 2 - Clamping piece

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

### 3 - Bolt

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

### 4 - Fuel return hose

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

### 5 - High-pressure pipe

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

### 6 - High-pressure reservoir (rail)

- ❑ Removing and installing ⇒ [page 139](#)

### 7 - High-pressure pipe

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

### 8 - Retaining clamp

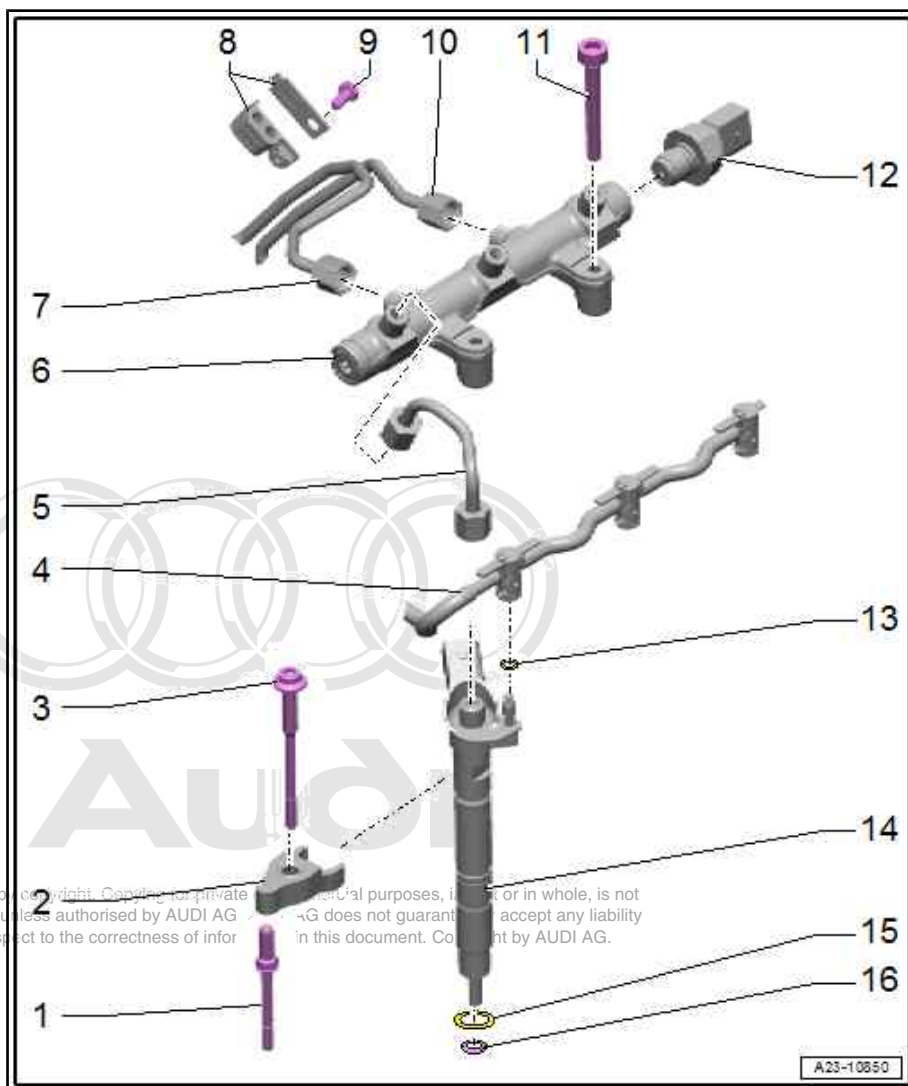
- ❑ For high-pressure pipe

### 9 - Bolt

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

### 10 - High-pressure pipe

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



## 11 - Bolt

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

## 12 - Fuel pressure sender - G247-

- ❑ Removing and installing ⇒ [page 142](#)

## 13 - O-ring

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

## 14 - Injector

- ❑ Removing and installing ⇒ [page 138](#)

## 15 - O-ring

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

## 16 - Copper seal

- ❑ Installation instructions ⇒ 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

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

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## 5.5 Checking return flow rate of injectors with engine running

### Procedure

- Remove engine cover panel ⇒ [page 48](#) .
- Cylinder bank 1 (right-side): Remove air cleaner housing ⇒ [page 129](#) .

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 .

- Install air cleaner housing to perform test with engine running ⇒ [page 129](#) .

### Attaching

Additional work:

- Removing/installing air cleaner housing ⇒ [page 129](#) .
- Install engine cover panel ⇒ [page 48](#) .

## 5.6 Checking return flow rate of injectors at starter cranking speed

### Procedure

- Remove engine cover panel ➔ [page 48](#) .
- Cylinder bank 1 (right-side): Remove air cleaner housing ➔ [page 129](#) .

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 .

- Install air cleaner housing for test ➔ [page 129](#) .

### Attaching

Additional work:

- Removing/installing air cleaner housing ➔ [page 129](#) .
- Install engine cover panel ➔ [page 48](#) .

## 5.7 Checking restrictor in fuel return line

### Procedure

- Remove engine cover panel ➔ [page 48](#) .

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

### Attaching

Additional work:

- Install engine cover panel ➔ [page 48](#) .

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## 5.8 Removing and installing injectors

### Removing



#### Note

*All cable ties which are released or cut open when removing must be refitted in the same position when installing.*

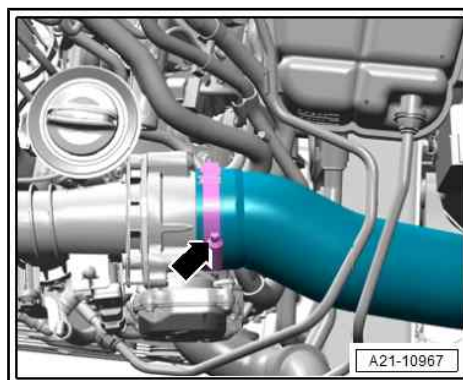
- Remove engine cover panel ➔ [page 48](#) .

**Cylinder bank 1 (right-side):**

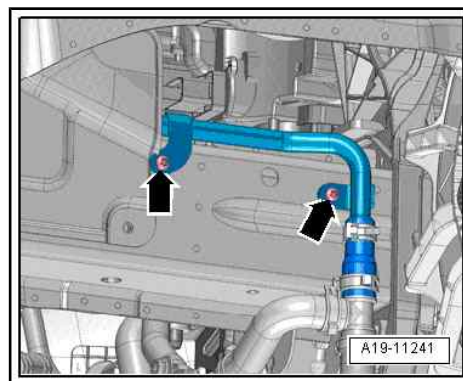
- Remove air cleaner housing ➔ [page 129](#) .

**Cylinder bank 2 (left-side):**

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



- Unscrew nuts -arrows- and move clear coolant pipe on longitudinal member.



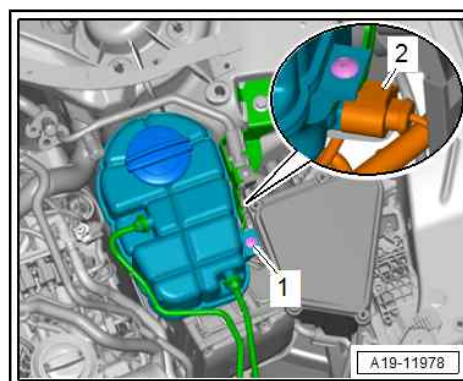
- Unscrew bolt -1- and detach coolant expansion tank.
- Unplug electrical connector -2- and move coolant expansion tank to one side with coolant hoses attached.

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:

- Install air cleaner housing ⇒ [page 129](#) .
- Install engine cover panel ⇒ [page 48](#) .



### Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; 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 ⇒ [page 48](#) .
- Cylinder bank 1 (right-side): Release hose clips -arrows- and remove air pipe -1-.

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) .

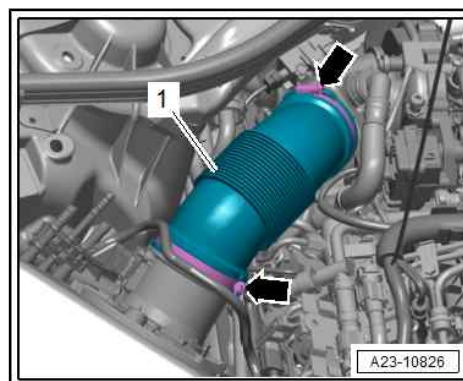
### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

### 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 intake air temperature sender G42”, page 140](#)

⇒ [“6.2 Removing and installing air mass meter G70”, page 140](#)

⇒ [“6.3 Removing and installing fuel temperature sender G81”, page 141](#)

⇒ [“6.4 Removing and installing fuel pressure sender G247”, page 142](#)

⇒ [“6.5 Removing and installing fuel pressure sender for low pressure G410”, page 142](#)

⇒ [“6.6 Removing and installing pressure differential sender G505”, page 142](#)

⇒ [“6.8 Removing and installing fuel pressure regulating valve N276”, page 146](#)

⇒ [“6.7 Checking fuel pressure regulating valve N276”, page 144](#)

### 6.1 Removing and installing intake air temperature sender - G42-

#### Removing

- Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Removing and installing wheel housing liner (front) .
- Unplug electrical connector -1-.

Unscrew bolt -2- and pull intake air temperature sender - G42- out of air pipe.

#### Installing

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



#### Note

*Renew O-ring after removal.*

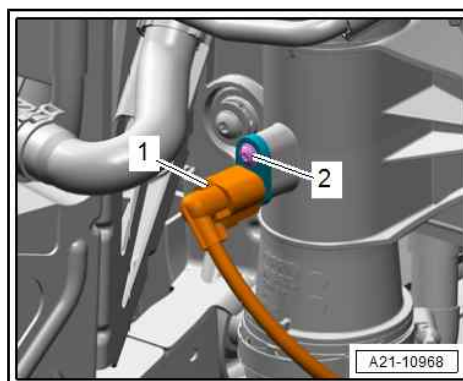
#### Tightening torques

- ♦ ⇒ [“2.1 Exploded view - charge air system”, page 116](#)
- ♦ Wheel spoiler ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front)

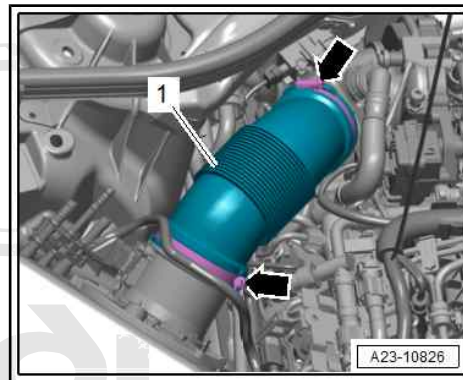
### 6.2 Removing and installing air mass meter - G70-

#### Removing

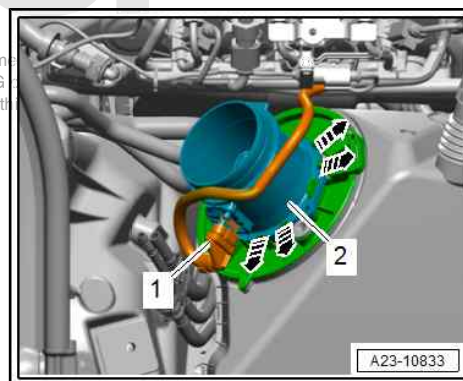
- Remove engine cover panel ⇒ [page 48](#) .



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



- Unplug electrical connector -1-.
- Release fasteners -arrows- all around and detach air mass meter - G70- -item 2-.



### 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.



#### Note

- ◆ *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.*
- ◆ *Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .*
- Press air mass meter - G70- into air cleaner housing until it clicks into place.
- Install engine cover panel ⇒ [page 48](#) .

### Tightening torques

- ◆ ⇒ 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-

### Removing

- Remove air cleaner housing ⇒ [page 129](#) .

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

### Installing

Additional work:

- Install air cleaner housing ⇒ [page 129](#) .

## 6.4 Removing and installing fuel pressure sender - G247-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .

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 - G247- .

### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

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

### Removing

- Remove engine cover panel ⇒ [page 48](#) .

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

### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

## 6.6 Removing and installing pressure differential sender - G505-



### Note

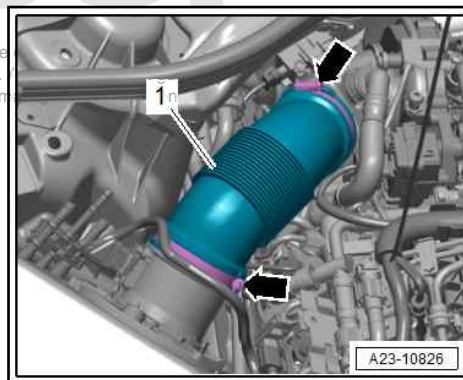
*The pressure differential sender - G505- detects the amount of deposits in the emission control module.*

### Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

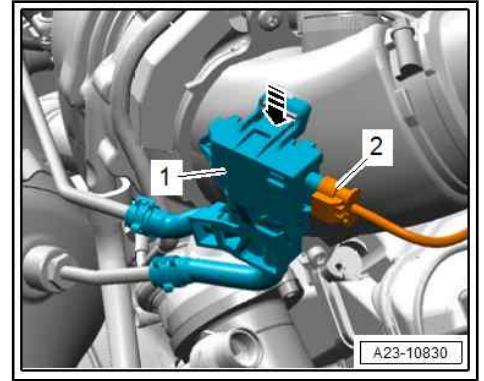
### Removing

- Remove engine cover panel ⇒ [page 48](#) .
- Release hose clips -arrows- and remove air pipe -1-.



- Unplug electrical connector -2-.
- Release catches -arrow- and detach bracket with pressure differential sender - G505- -item 1- from connection.

#### Version 1



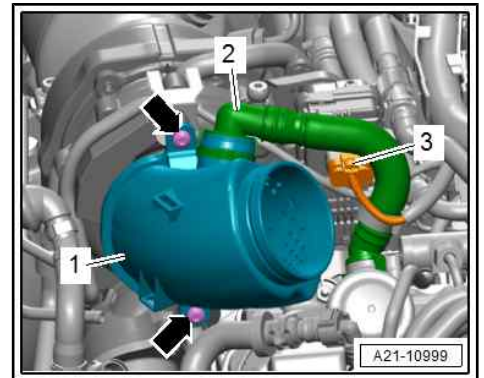
- Press release tabs on both sides and disconnect crankcase breather hose -2-.
- Unscrew bolts -arrows- and detach intake connecting pipe -1-.



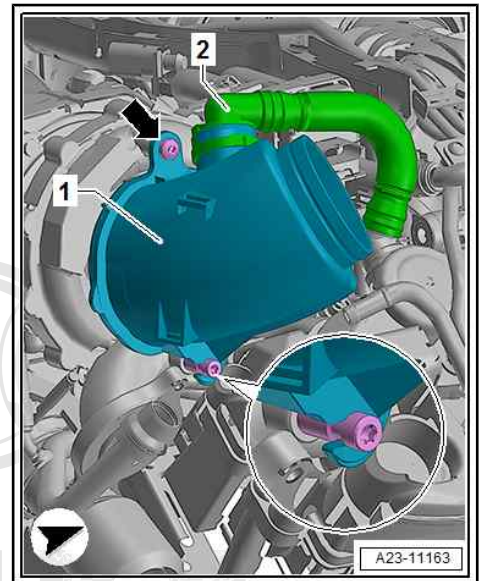
#### Note

*Disregard -item 3-.*

#### Version 2



- Press release tabs on both sides and disconnect crankcase breather hose -2-.
- Unscrew bolt -1-, turn intake connecting pipe -1- anti-clockwise and detach it.



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- Detach pressure differential sender - G505- -item 1- from bracket -2-; to do so, release catches -arrows- and move hoses clear.
- Release clips -3- and spray hoses 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:



#### Note

- ◆ *Renew O-ring after removal.*
- ◆ *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 that there are no leaks.*
- ◆ *If pressure pipes have been detached from emission control module, tighten connections to specified torque.*
- ◆ *Secure all hose connections with correct type of hose clips (as original equipment) ⇒ Electronic parts catalogue .*

- Install engine cover panel ⇒ [page 48](#) .
- If pressure differential sender - G505- has been renewed, perform adaption in Guided Function 0001 - Adapt learnt values - after component replacement ⇒ Vehicle diagnostic tester.

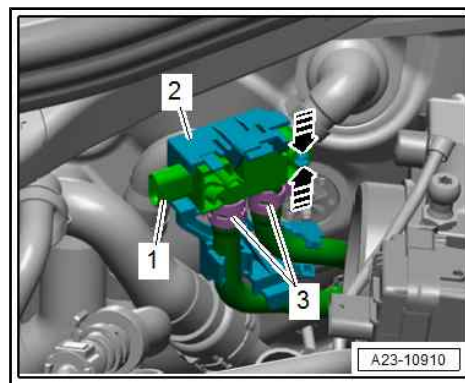
### Tightening torques

- ◆ ⇒ ["8.1 Exploded view - Lambda probe", page 148](#)
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbocharger; Exploded view - turbocharger

## 6.7 Checking fuel pressure regulating valve - N276-

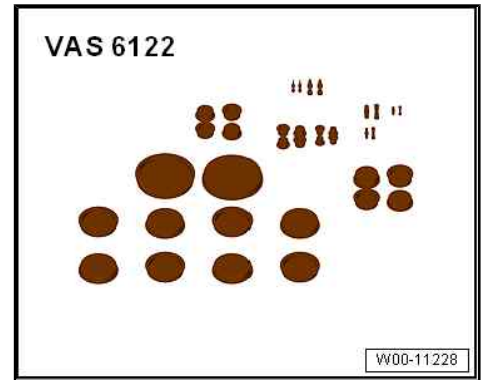
### Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-



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- ◆ Engine bung set - VAS 6122-



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

#### Procedure



#### WARNING

*Risk of malfunctions caused by dirt.*

- ◆ **Observe rules for cleanliness ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Repair notes; Rules for cleanliness .**

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- Remove engine cover panel ⇒ [page 48](#) .



#### Note

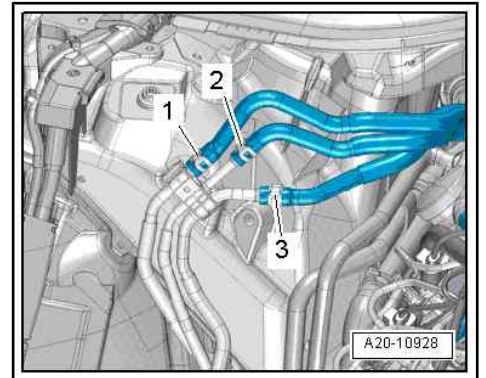
*Fuel temperature above 15 °C.*

- Detach fuel return hose -2-.

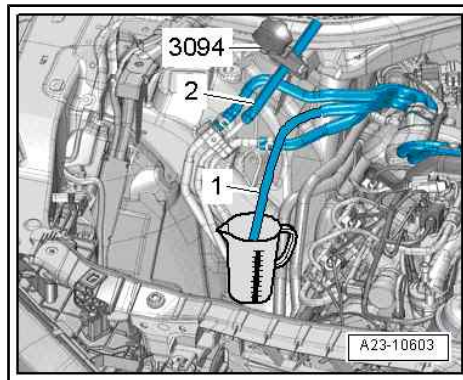


#### Note

*Disregard items -1 and 3-.*



- Seal off open return line connection with a test hose -2- and a hose clamp up to 25 mm - 3094- .
- Hold end of fuel return hose -1- in measuring container.
- 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:



### Note

- ♦ 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 137](#) .
- 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.

### Attaching

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

- Connect fuel return hose ⇒ Fuel supply system; Rep. gr. 20 ; Plug-in connectors; Disconnecting plug-in connectors .
- Install engine cover panel ⇒ [page 48](#) .

## 6.8 Removing and installing fuel pressure regulating valve - N276-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .
- All further 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- .

### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

## 7 High-pressure pump

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



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## 8 Lambda probe

⇒ ["8.1 Exploded view - Lambda probe", page 148](#)

⇒ ["8.2 Removing and installing Lambda probe", page 149](#)

⇒ ["8.3 Removing and installing NOx sender", page 149](#)

### 8.1 Exploded view - Lambda probe

#### 1 - Not fitted

#### 2 - NOx sender 2 - G687- with control unit for NOx sender 2 - J881-

- ☐ Removing and installing ⇒ [page 150](#)
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

#### 3 - Not fitted

#### 4 - Pressure differential sender - G505-

- ☐ Removing and installing ⇒ [page 142](#)
- ☐ Tightening torques and installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

#### 5 - Exhaust gas temperature sender 3 - G495-

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

#### 6 - NOx sender - G295- with control unit for NOx sender - J583-

- ☐ Removing and installing ⇒ [page 149](#)
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Exploded view - Lambda probe

#### 7 - Exhaust gas temperature sender 2 - G448-

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

#### 8 - Lambda probe - G39- with Lambda probe heater - Z19-

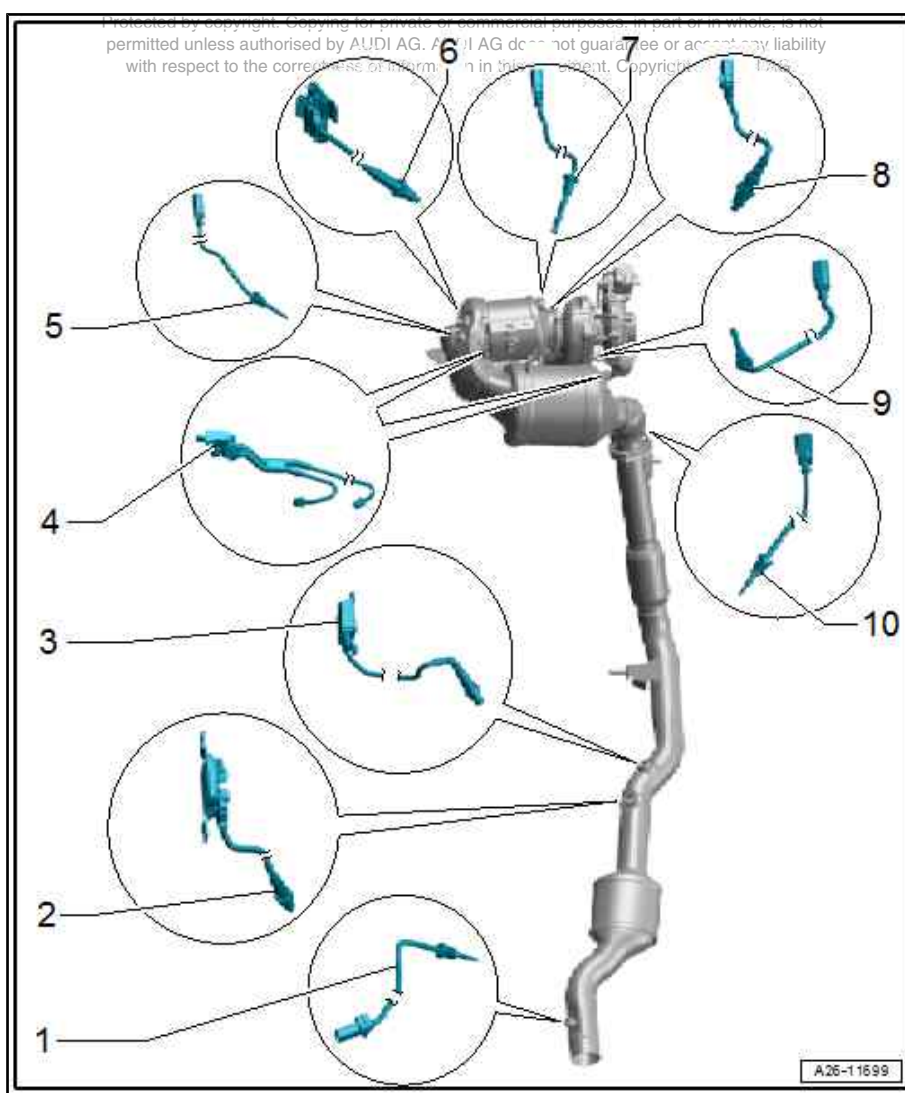
- ☐ Removing and installing ⇒ [page 149](#)

#### 9 - Exhaust gas temperature sender 1 - G235-

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender

#### 10 - Exhaust gas temperature sender 4 - G648-

- ☐ Removing and installing ⇒ [page 179](#)



## 8.2 Removing and installing Lambda probe

### Removing

- Remove engine cover panel ➔ [page 48](#) .

All further procedures are described in ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 23 ; Lambda probe; Removing and installing Lambda probe .

### Installing

Additional work:

- Install engine cover panel ➔ [page 48](#) .

## 8.3 Removing and installing NOx sender

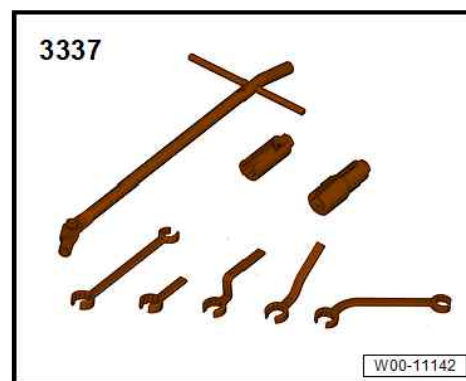
➔ **[“8.3.1 Removing and installing NOx sender G295”](#)**,  
**[page 149](#)** permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability  
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➔ **[“8.3.2 Removing and installing NOx sender 2 G687”](#)**,  
**[page 150](#)**

### 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



#### WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Safety precautions; Safety precautions when working on the exhaust system .*

- Remove engine cover panel ➔ [page 48](#) .

- Unplug electrical connector -1-.
- Remove nut -arrow-.
- Move clear electrical wiring.
- Unscrew NOx sender - G295- -2-.

### Installing

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



### Note

*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 ⇒ [page 48](#) .

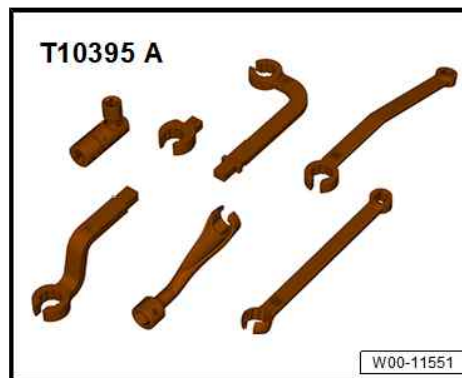
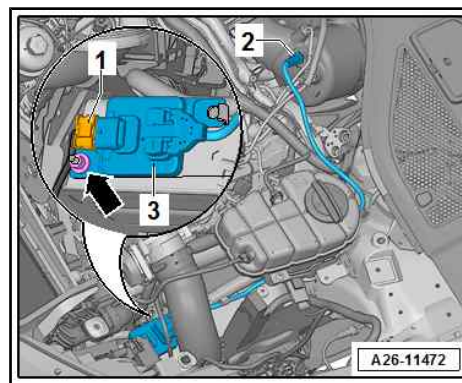
### Tightening torques

- ♦ ⇒ 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

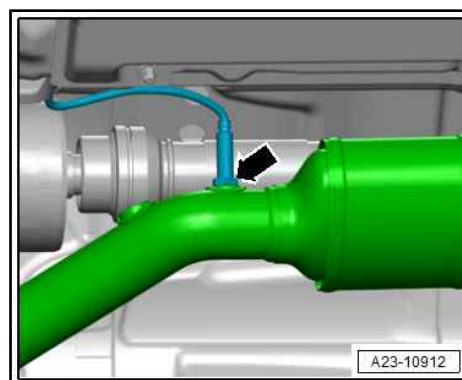
- ♦ Tool set - T10395 A- with suitable tool insert



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### Removing

- Unscrew NOx sender 2 - G687- -arrow- using a tool from tool set - T10395 A- .



- Remove bolts -3-.
- Unplug electrical connector -1-.
- Unscrew nuts -arrows- and detach control unit for NOx sender 2 - J881- -item 2- from bracket.
- Move clear electrical wiring.

### Installing

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

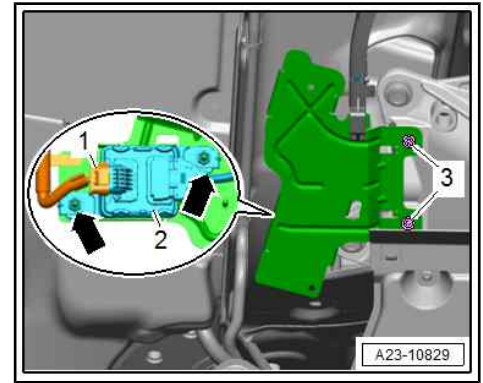


*Coat thread with high-temperature paste; for high-temperature paste refer to ⇒ [Electronic parts catalogue](#) .*

- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

### Tightening torques

- ◆ ⇒ [“8.1 Exploded view - Lambda probe”, page 148](#)



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## 9 Engine control unit

⇒ **"9.1 Removing and installing engine/motor control unit J623 "**,  
page 152

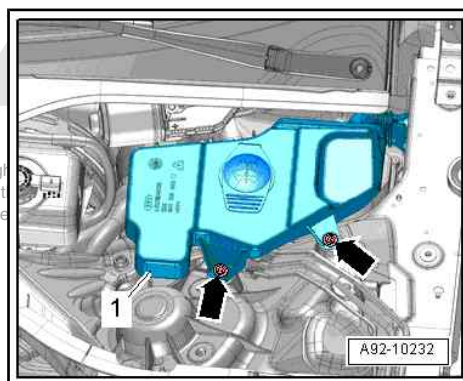
### 9.1 Removing and installing engine/motor control unit - J623-

#### Removing

Adaption must be performed after renewing engine control unit  
⇒ Vehicle diagnostic tester.

If the adaption values of the injectors cannot be read out of the old (defective) engine control unit, they must be entered into the new engine control unit manually and the adaption procedure must be performed accordingly.

- Remove plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Unscrew bolts -arrows- and pull filler neck -1- out of washer fluid reservoir and through opening in body to right side.

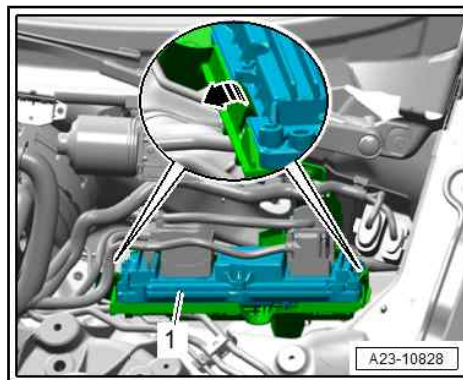


- Release catches -arrow- and detach engine/motor control unit - J623- -item 1- from bracket.

#### Installing

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

- Install filler neck for washer fluid reservoir ⇒ Electrical system; Rep. gr. 92 ; Windscreen washer system; Exploded view - windscreen washer system .
- Install plenum chamber cover ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- If engine/motor control unit - J623- has been renewed, perform adaption in Guided Function 0001 - Adapt learnt values - after component replacement ⇒ Vehicle diagnostic tester.



## 26 – Exhaust system

### 1 Exhaust pipes/silencers

⇒ [“1.1 Exploded view - silencers”, page 153](#)

⇒ [“1.2 Removing and installing front exhaust pipe”, page 155](#)

⇒ [“1.3 Separating exhaust pipes/silencers”, page 157](#)

⇒ [“1.4 Removing and installing silencers”, page 158](#)

⇒ [“1.5 Stress-free alignment of exhaust system”, page 159](#)

⇒ [“1.6 Checking exhaust system for leaks”, page 160](#)

#### 1.1 Exploded view - silencers



##### WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

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# 1 - Nut

- 23 Nm

# 2 - Clamp (front)

- Before tightening, align exhaust system so it is free of stress  
⇒ [page 159](#)
- Installation position  
⇒ [page 155](#)
- Tighten bolted connections evenly

# 3 - Y-pipe

- Combined in one unit with rear silencers as original equipment
- Y-pipe and rear silencer can be renewed separately as required
- Cutting point: Y-pipe / rear silencer  
⇒ [page 157](#)
- Align exhaust system so it is free of stress  
⇒ [page 159](#)

# 4 - Clamp (rear)

- For separate replacement of double pipe and rear silencer
- Before tightening, align exhaust system so it is free of stress  
⇒ [page 159](#)
- Installation position  
⇒ [page 155](#)
- Tighten bolted connections evenly

# 5 - Rear silencer (left-side)

- Combined with Y-pipe in one unit as original equipment
- Y-pipe and rear silencer can be renewed separately as required
- Cutting point: Y-pipe / rear silencer ⇒ [page 157](#)
- Align exhaust system so it is free of stress ⇒ [page 159](#)

# 6 - Mounting

- Renew if damaged
- Check preload ⇒ ["1.5 Stress-free alignment of exhaust system", page 159](#)

# 7 - Nut

- 20 Nm

# 8 - Nut

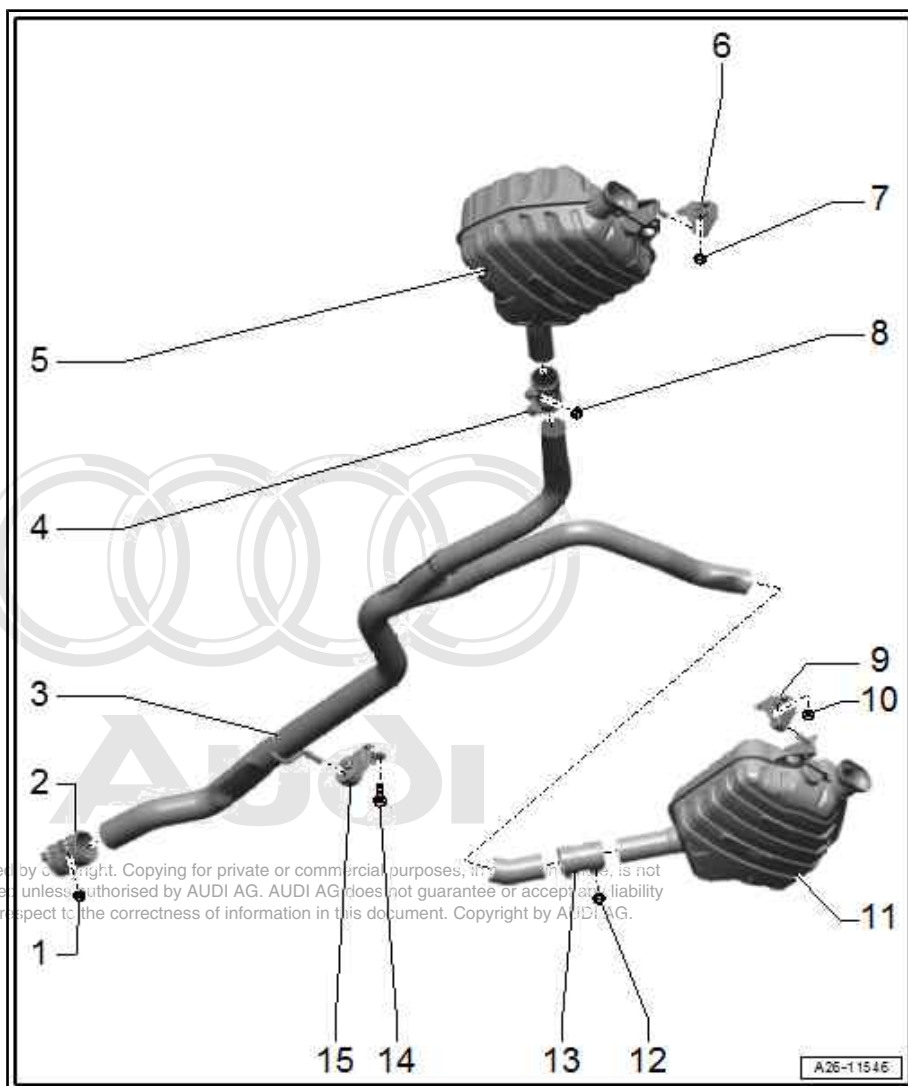
- 23 Nm

# 9 - Mounting

- Renew if damaged
- Check preload ⇒ ["1.5 Stress-free alignment of exhaust system", page 159](#)

# 10 - Nut

- 20 Nm



### 11 - Rear silencer (right-side)

- ☐ Combined with Y-pipe in one unit as original equipment
- ☐ Y-pipe and rear silencer can be renewed separately as required
- ☐ Cutting point: Y-pipe / rear silencer ⇒ [page 157](#)
- ☐ Align exhaust system so it is free of stress ⇒ [page 159](#)

### 12 - Nut

- ☐ 23 Nm

### 13 - Clamp (rear)

- ☐ For separate replacement of double pipe and rear silencer
- ☐ Before tightening, align exhaust system so it is free of stress ⇒ [page 159](#)
- ☐ Installation position ⇒ [page 155](#)
- ☐ Tighten bolted connections evenly

### 14 - Bolt

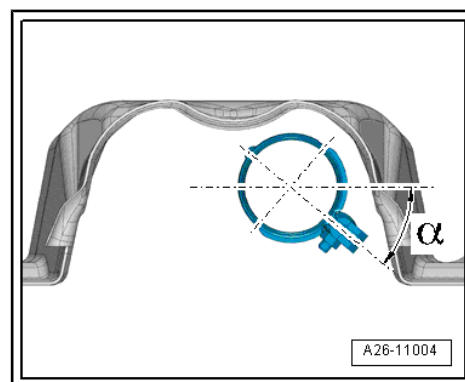
- ☐ 20 Nm

### 15 - Mounting

- ☐ Renew if damaged

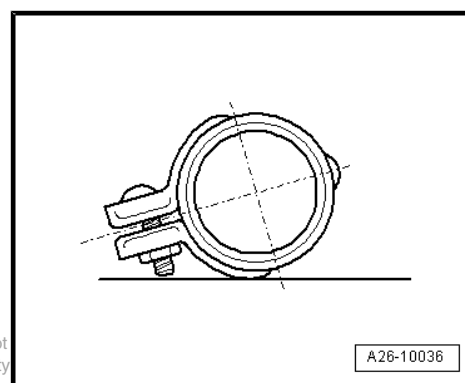
#### Installation position of front clamp

- Installation position: bolted connections face outwards.
- Angle  $\alpha = 10^\circ$



#### Installation position of rear clamps

- Install clamps so that the bolt ends do not protrude beyond bottom of clamp.
- Installation position: bolted connections face forwards.



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## 1.2 Removing and installing front exhaust pipe

### Removing

- Remove engine cover panel ⇒ [page 48](#) .



## WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

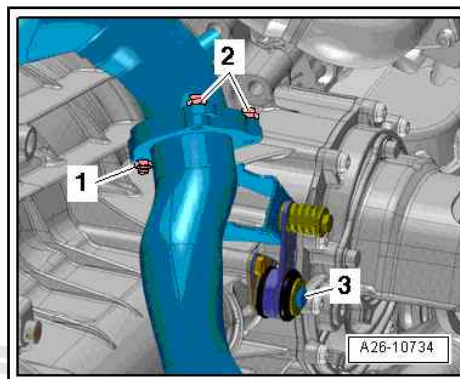
- Remove nuts (accessible from above) -2- for front exhaust pipe.



## Note

*The nut -1- and bolt -3- are removed at a later stage.*

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

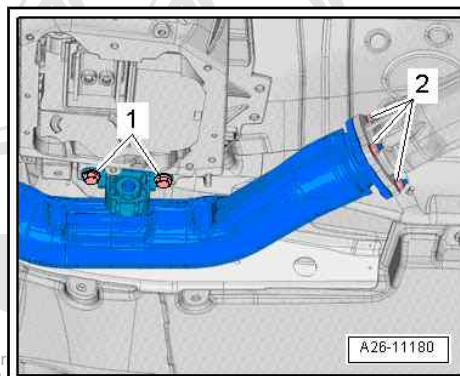


## Caution

*Risk of damage to flexible joint in front exhaust pipe.*

- ◆ *Do NOT bend flexible joint in front exhaust pipe more than 10°.*

- Remove bolts -1- and nuts -2- and lower exhaust pipe slightly.



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- Remove bolt -3-.
- Lower front exhaust pipe slightly at rear and unscrew nut -1-.
- Detach front exhaust pipe.

## Installing

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



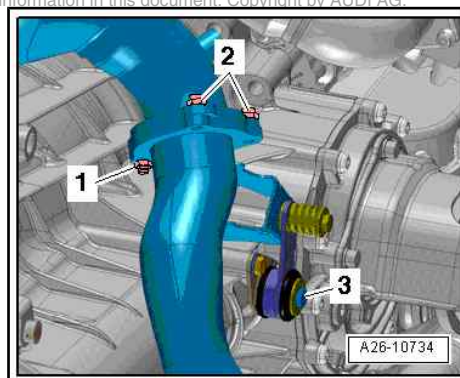
## Note

*Renew gaskets and self-locking nuts after removal.*

- Align the exhaust system so it is free of stress ⇒ [page 159](#) .
- Install engine cover panel ⇒ [page 48](#) .

## Tightening torques

- ◆ ⇒ [“2.1 Exploded view - emission control system”, page 161](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

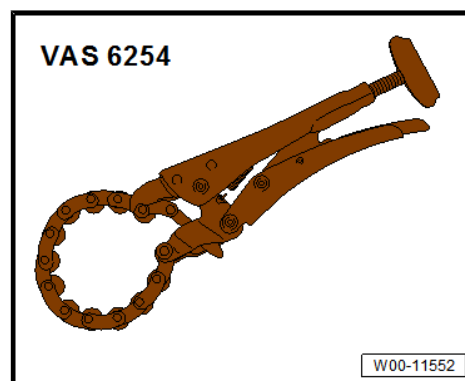


### 1.3 Separating exhaust pipes/silencers

- ◆ The connecting pipe can be cut through at the point marked in order to renew the Y-pipe or rear silencer(s) 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-



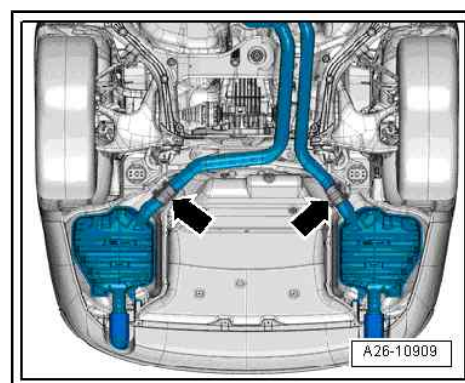
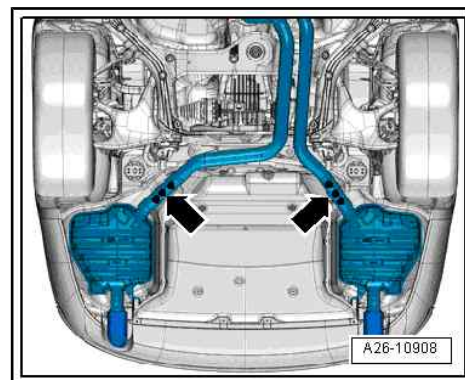
#### Procedure



#### WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*
- Cut through exhaust pipes at right angles at the positions marked -arrows- using chain pipe cutter - VAS 6254- .
  - Position centre of clamps -arrows- over cutting location.



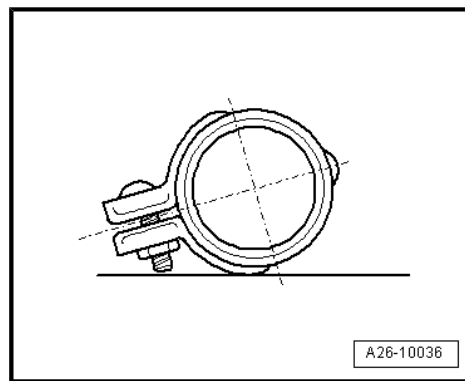
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- Install clamps so that the bolt ends do not protrude beyond bottom of clamp.
- Installation position: bolted connections face forwards.
- Align the exhaust system so it is free of stress ➔ [page 159](#).

#### Tightening torques

- ♦ ➔ ["1.1 Exploded view - silencers", page 153](#)



## 1.4 Removing and installing silencers

### Removing

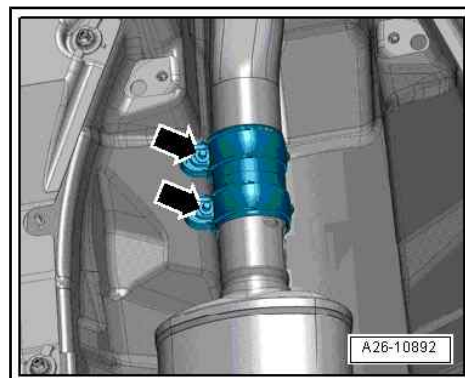


#### WARNING

*When working on all parts of the exhaust system:*

- ♦ *Observe safety precautions when working on the exhaust system ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system.*

- Remove tunnel cross-piece (rear) ➔ General body repairs, exterior; Rep. gr. 66; Underbody trim; Removing and installing tunnel cross-piece.
- Unfasten connections -arrows-, push clamp towards rear and tie up SCR catalytic converter.





## WARNING

*Risk of accident caused by weight of silencers.*

- ◆ *A second mechanic is required for removal of the rear silencers.*

- Unscrew bolts -1, 2- and remove silencers.

## Installing

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



## Note

*Renew gaskets and self-locking nuts after removal.*

- Align the exhaust system so it is free of stress ➔ [page 159](#) .

## Tightening torques

- ◆ Tunnel cross-piece ➔ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Overview of fitting locations - trim panels

## 1.5 Stress-free alignment of exhaust system

### Procedure



## WARNING

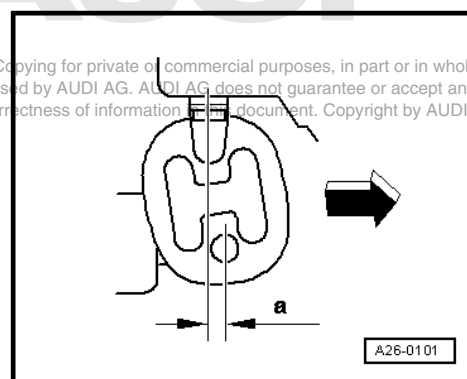
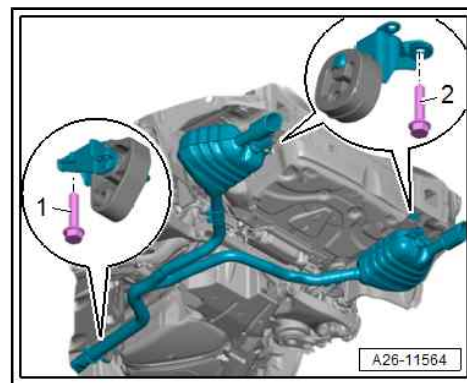
*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Safety precautions; Safety precautions when working on the exhaust system .*

- The exhaust system must be aligned when it is cool.

### Vehicles without clamps between Y-pipe and rear silencers

- Loosen bolt connections for front clamp(s).
- Push exhaust system towards front of vehicle -arrow- until mountings for Y-pipe are preloaded by -a- = 6 ... 10 mm.
- Tighten bolted connections on clamps evenly.



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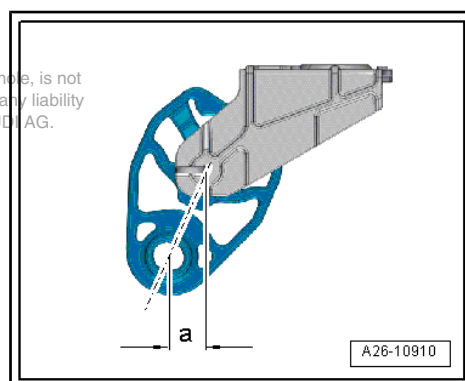
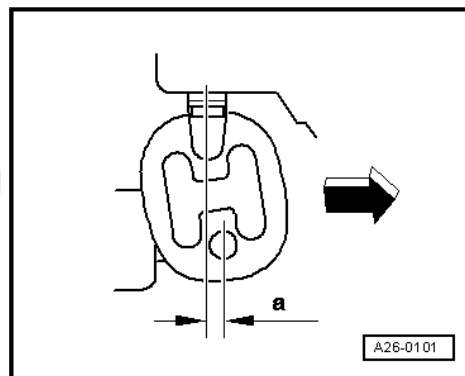
## Vehicles with clamps between Y-pipe and rear silencers



### Note

On a vehicle with clamps fitted between Y-pipe and rear silencers, it is also necessary to align the Y-pipe.

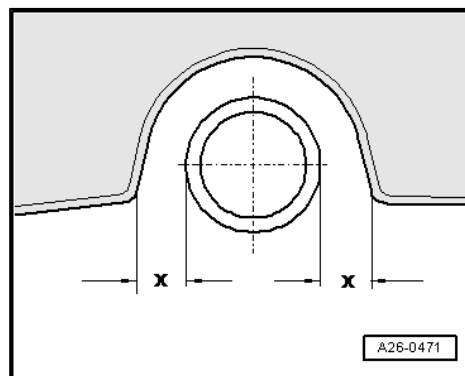
- Loosen bolted connections on front and rear clamps.
- Push exhaust system towards front of vehicle -arrow- until mountings for Y-pipe are preloaded by -a- = 6 ... 10 mm.
- Tighten bolt connections on front clamp(s) evenly.
- Push rear section of exhaust system towards front of vehicle -arrow-, so that mountings (rear) for rear silencers are preloaded by -a- = 11 ... 15 mm.
- Align rear silencers so they are horizontal.
- Tighten bolted connections on rear clamps evenly.



- Check clearance between tailpipes and bumper on both sides:
  - Dimension -x- (left-side) = dimension -x- (right-side)

### Tightening torques

- ♦ ⇒ ["1.1 Exploded view - silencers", page 153](#)



## 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 .

## 2 Emission control system

⇒ "2.1 Exploded view - emission control system", page 161

⇒ "2.2 Removing and installing catalytic converter", page 163

⇒ "2.3 Removing and installing emission control module", page 164

### 2.1 Exploded view - emission control system



#### WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

#### 1 - Front exhaust pipe

- ☐ With flexible joint; do not bend flexible joint more than 10° – otherwise it can be damaged
- ☐ Protect against knocks and impact
- ☐ Removing and installing ⇒ page 155
- ☐ Align exhaust system so it is free of stress ⇒ page 159

#### 2 - Nut

- ☐ Renew after removing
- ☐ 23 Nm

#### 3 - Gasket

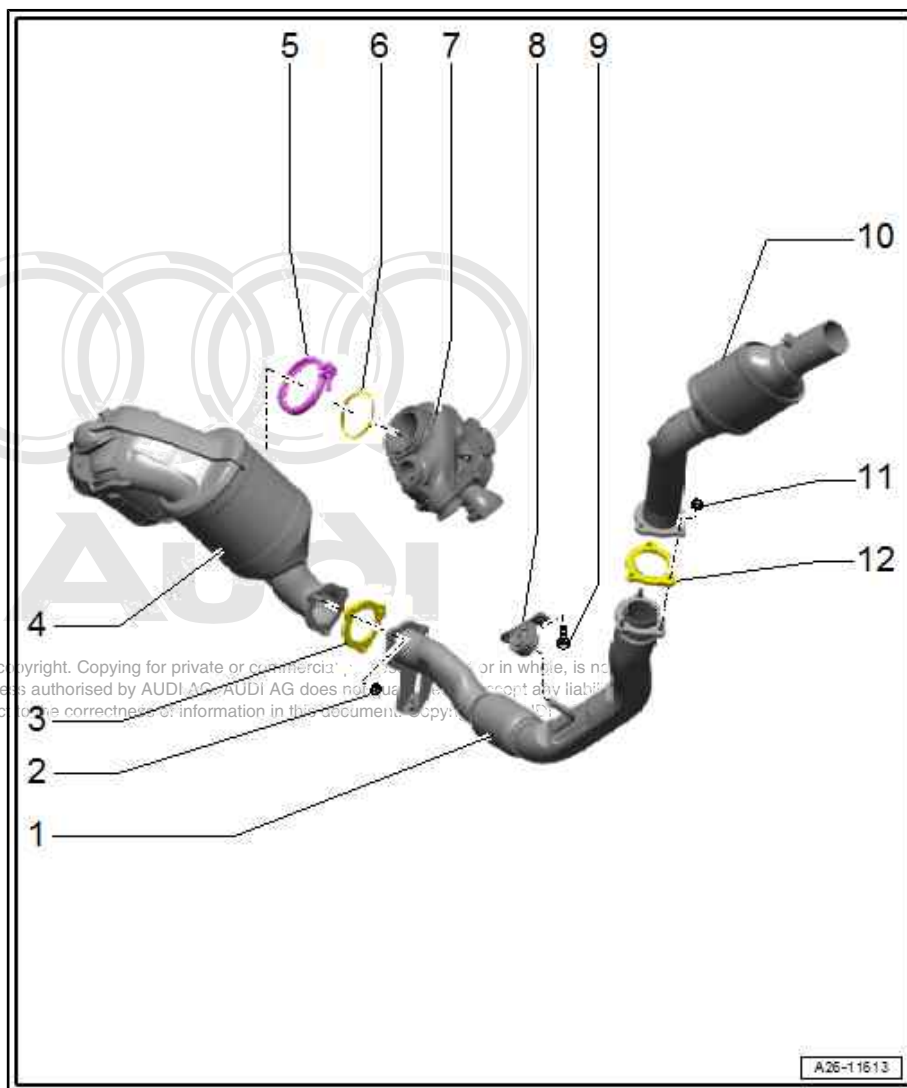
- ☐ Renew after removing

#### 4 - Emission control module

- ☐ With pressure line for pressure differential sender - G505- ⇒ Item 4 (page 148)
- ☐ Removing and installing ⇒ page 164
- ☐ After renewing, perform adaption in Guided Function [0001 - Adapt learnt values - after component replacement] ⇒ Vehicle diagnostic tester

#### 5 - Screw-type clip

- ☐ Installation position ⇒ page 162
- ☐ Renew after removing
- ☐ Tightening torque: 15 Nm



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## 6 - Seal

- ☐ Renew after removing

## 7 - Turbocharger

## 8 - Mounting

- ☐ Renew if damaged
- ☐ Check preload ⇒ ["1.5 Stress-free alignment of exhaust system", page 159](#)

## 9 - Bolt

- ☐ 23 Nm

## 10 - SCR catalytic converter

- ☐ Removing and installing ⇒ [page 163](#)

## 11 - Nut

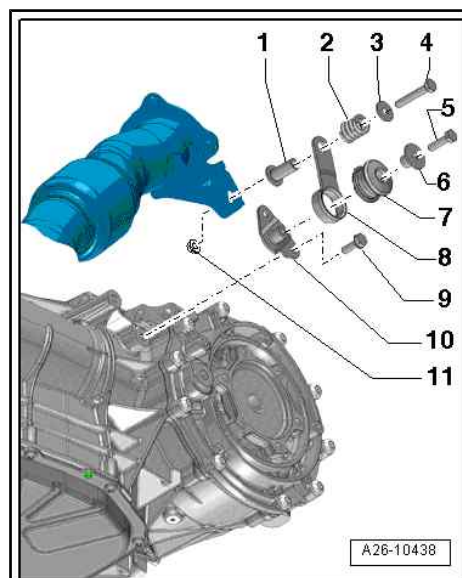
- ☐ Renew after removing
- ☐ 23 Nm

## 12 - Gasket

- ☐ Renew after removing

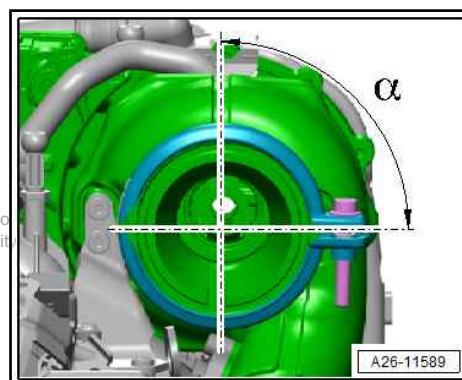
### Components of mountings (front) for front exhaust pipe on dual clutch gearbox

- 1 - Spacer sleeve
- 2 - Compression spring
- 3 - Washer
- 4 - Bolt, 23 Nm
- 5 - Bolt, 23 Nm
- 6 - Spacer sleeve
- 7 - Rubber buffer
- 8 - Bracket
- 9 - Bolt, 23 Nm
- 10 - Bracket
- 11 - Nut



### Installation position of screw-type clip for emission control module

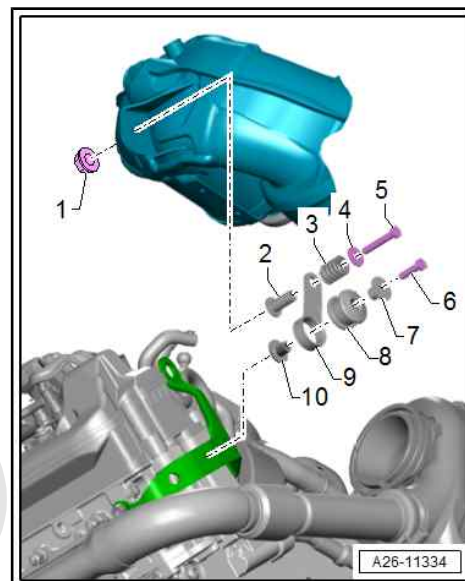
- Angle  $\alpha$  = 90°



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## Mounting components for emission control module

- 1 - Nut
- 2 - Spacer sleeve
- 3 - Compression spring
- 4 - Washer
- 5 - Bolt, 23 Nm
- 6 - Bolt, 23 Nm
- 7 - Spacer sleeve
- 8 - Rubber buffer
- 9 - Bracket
- 10 - Spacer sleeve



## 2.2 Removing and installing catalytic converter

### Special tools and workshop equipment required

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

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### Removing



#### WARNING

*When working on all parts of the exhaust system:*

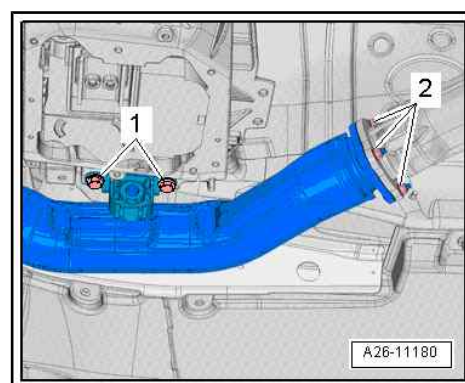
- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

- Remove nuts -2-.

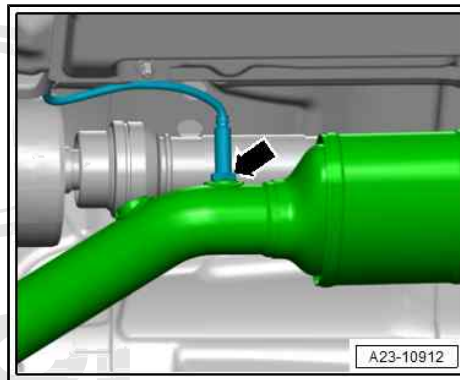


#### Note

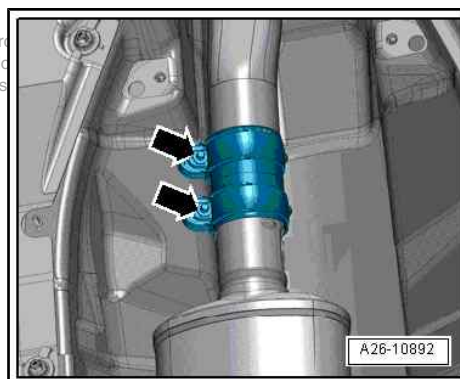
*Disregard -item 1-.*



- Unscrew NOx sender 2 - G687- -arrow- using a tool from tool set - T10395 A- .



- Unfasten connections -arrows-, push clamp towards rear and detach SCR catalytic converter.



### Installing

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



#### Note

*Renew gaskets and self-locking nuts after removal.*

- Install NOx sender 2 - G687- ➔ [page 149](#) .
- Align the exhaust system so it is free of stress ➔ [page 159](#) .

### Tightening torques

- ♦ ➔ [“2.1 Exploded view - emission control system”, page 161](#)

## 2.3 Removing and installing emission control module

### Removing

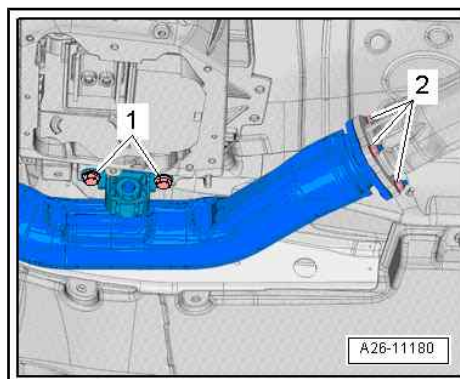


#### WARNING

*When working on all parts of the exhaust system:*

- ♦ *Observe safety precautions when working on the exhaust system ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

- Remove noise insulation (rear) ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove bolts -1- and nuts -2- and lower exhaust pipe slightly.

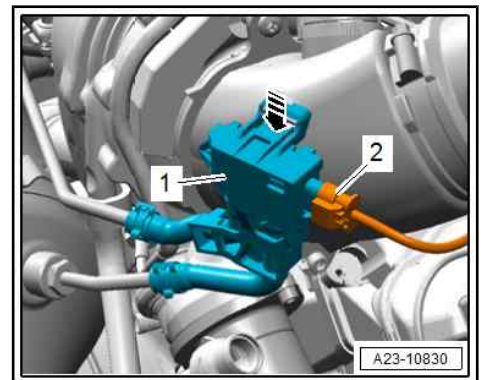
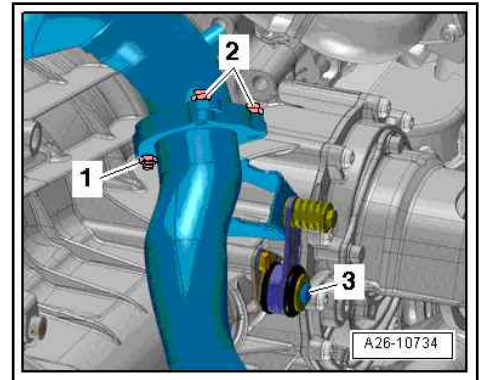


- Unscrew nut -1-.



#### Note

- ◆ *The nuts -2- are removed at a later stage.*
- ◆ *Disregard -item 3-.*
- Secure front exhaust pipe to SCR catalytic converter with a nut.
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Unplug electrical connector -2-.
- Release catch -arrow- and detach bracket with pressure differential sender - G505- -item 1- from connection.

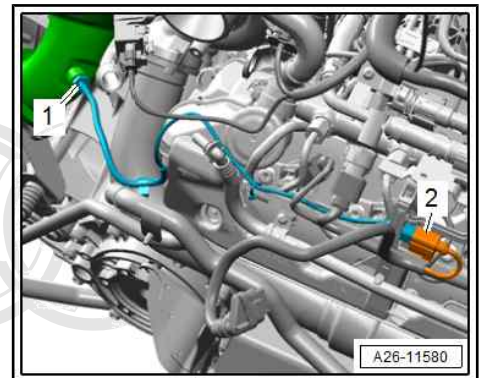


- Unplug electrical connector -2- at exhaust gas temperature sender 4 - G648- and move electrical wiring clear.

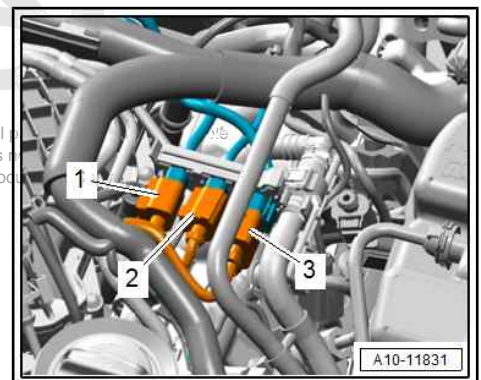


#### Note

*Disregard -item 1-.*

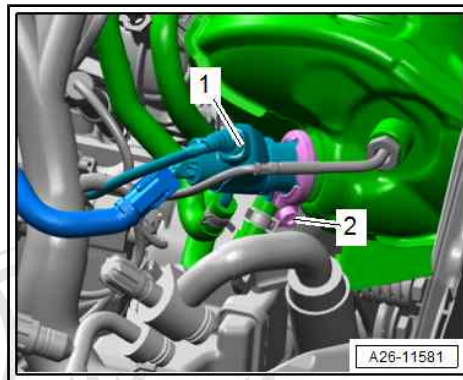


- Unplug electrical connectors -1, 2, 3- and move electrical wiring clear.



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



- Remove bolt -3- on retainer.
- Open screw-type clip -1- and place it on intake funnel of emission control module.
- Remove emission control module -2-.

### Installing

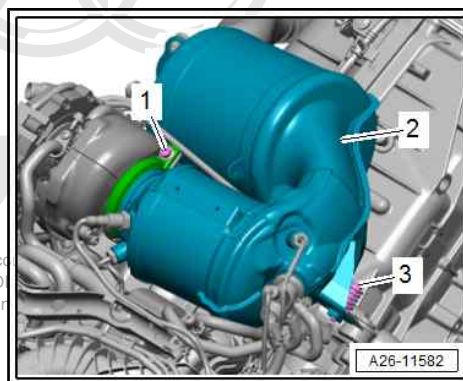
Installation is carried out in reverse order; note the following:



#### Note

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*Renew gaskets and self-locking nuts after removal.*



- Electrical connections and routing ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.
- Install injector for reducing agent - N474- ⇒ [page 175](#) .
- Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- If emission control module has been renewed, perform adaptation in Guided Function [0001 - Adapt learnt values - after component replacement] ⇒ Vehicle diagnostic tester.

### Tightening torques

- ♦ ⇒ [“1.1 Exploded view - silencers”, page 153](#)
- ♦ ⇒ [“2.1 Exploded view - emission control system”, page 161](#)
- ♦ ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

### 3 SCR (selective catalytic reduction) system

⇒ [“3.1 Exploded view - reducing agent tank”, page 167](#)

⇒ [“3.2 Exploded view - reducing agent supply line”, page 168](#)

⇒ [“3.3 Exploded view - delivery unit for reducing agent”, page 168](#)

⇒ [“3.4 Exploded view - control unit for reducing agent metering system J880”, page 169](#)

⇒ [“3.5 Draining reducing agent tank”, page 170](#)

⇒ [“3.6 Removing and installing reducing agent tank”, page 171](#)

⇒ [“3.7 Removing and installing delivery unit for reducing agent”, page 173](#)

⇒ [“3.8 Removing and installing injector for reducing agent N474”, page 175](#)

⇒ [“3.9 Removing and installing control unit for reducing agent metering system J880”, page 175](#)

#### 3.1 Exploded view - reducing agent tank

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**1 - Nut**  
□ 2 Nm

**2 - Cover**  
□ For reducing agent tank

**3 - Bolt**  
□ 20 Nm

**4 - Sleeve**

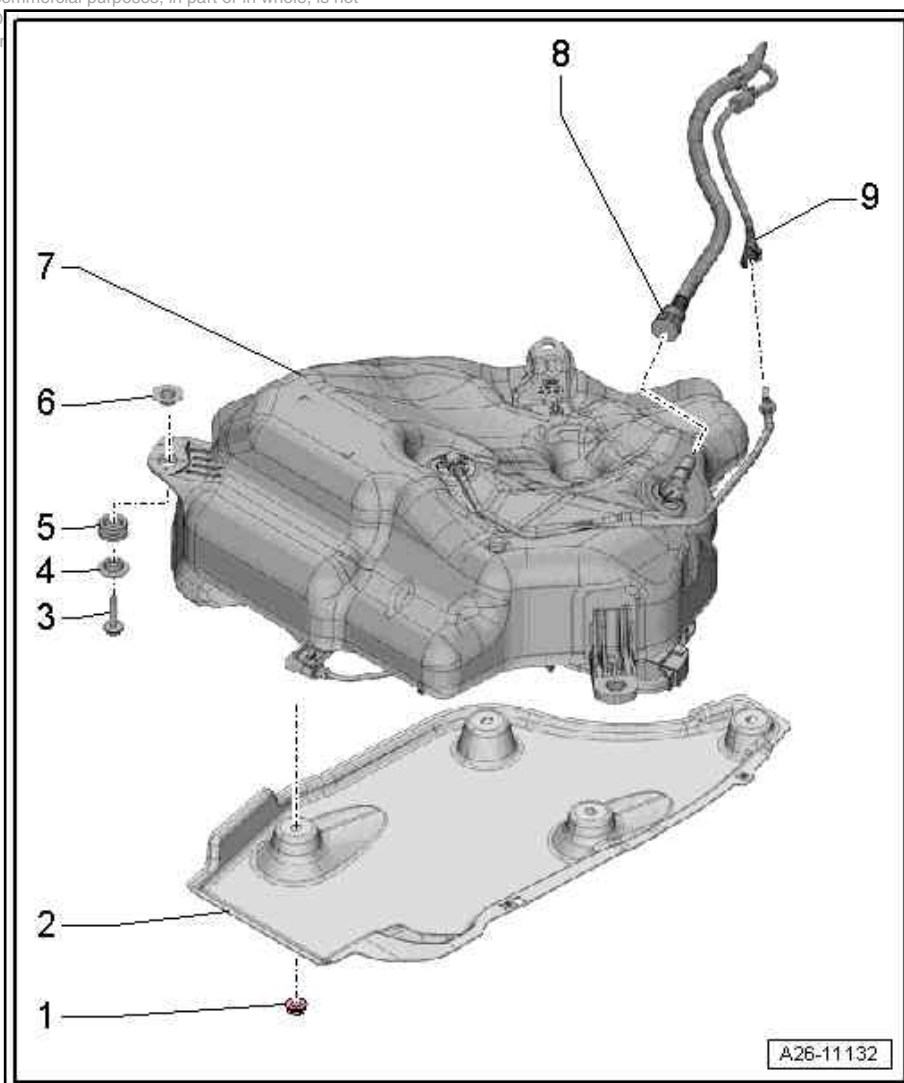
**5 - Grommet**

**6 - Sleeve**

**7 - Reducing agent tank**  
□ Fitting location: Beneath left rear seat on underside of vehicle.  
□ Removing and installing  
⇒ [page 171](#)

**8 - Filler line**  
□ From filler neck

**9 - Breather line**  
□ To filler neck



## 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 Exploded view - delivery unit for reducing agent

### 1 - Reducing agent tank

- ☐ Removing and installing  
➔ [page 171](#)

### 2 - Electrical wiring harness

### 3 - Seal

- ☐ Renew after removing
- ☐ Install dry

### 4 - Reservoir

- ☐ with:

- ◆ Filter
- ◆ Pump for reducing agent - V437-
- ◆ Tank sender for reducing agent - G684-
- ◆ Temperature sender for reducing agent - G685-
- ◆ Pressure sender for reducing agent metering system - G686-
- ◆ Heater for reducing agent tank - Z102-

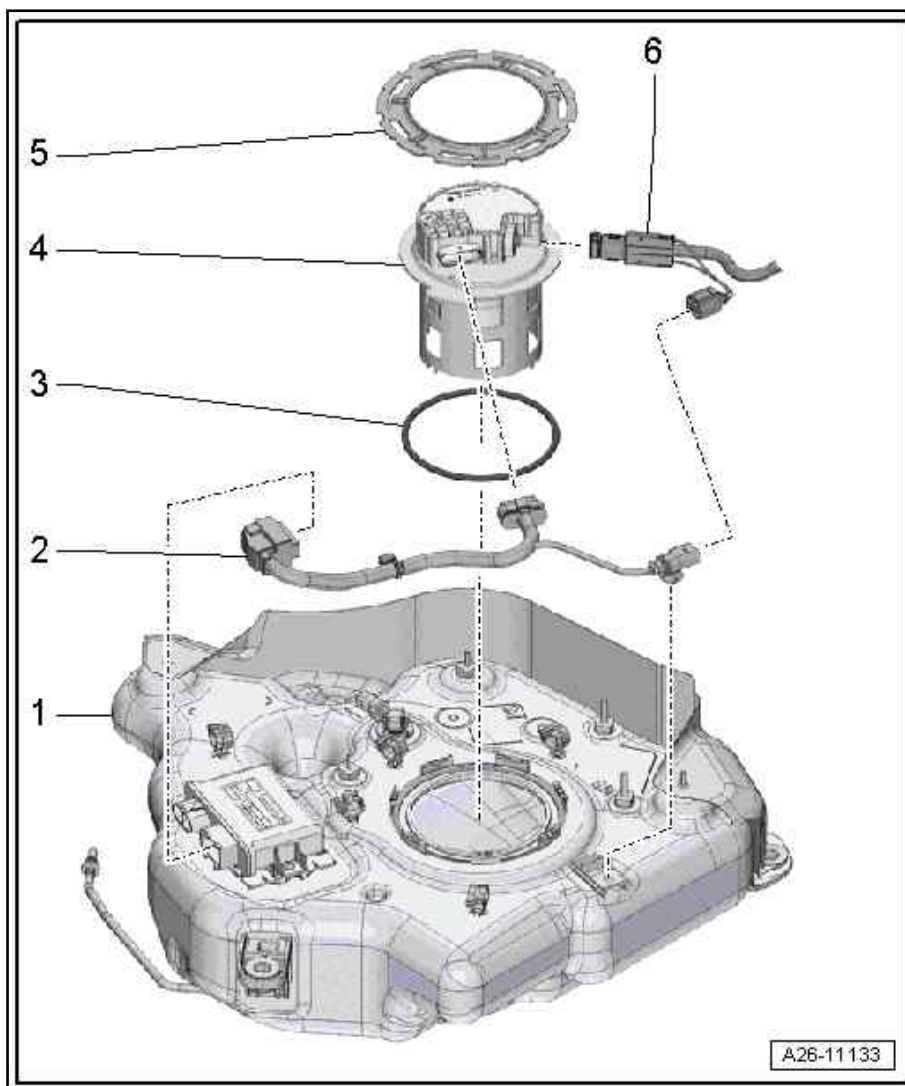
- ☐ Removing and installing reservoir ➔ [page 173](#)
- ☐ Do not kink heating mats when installing

### 5 - Locking ring

- ☐ Release and lock with wrench -T40268-
- ☐ Renew after removing

### 6 - Metering line

- ☐ To injector for reducing agent - N474-
- ☐ With heater for reducing-agent line - Z104-
- ☐ Press release tabs to disconnect



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### 3.4 Exploded view - control unit for reducing agent metering system - J880-

#### 1 - Base plate

- ☐ For control unit for reducing agent metering system - J880-
- ☐ Is combined with reducing agent tank

#### 2 - Clip nut

#### 3 - Control unit for reducing agent metering system - J880-

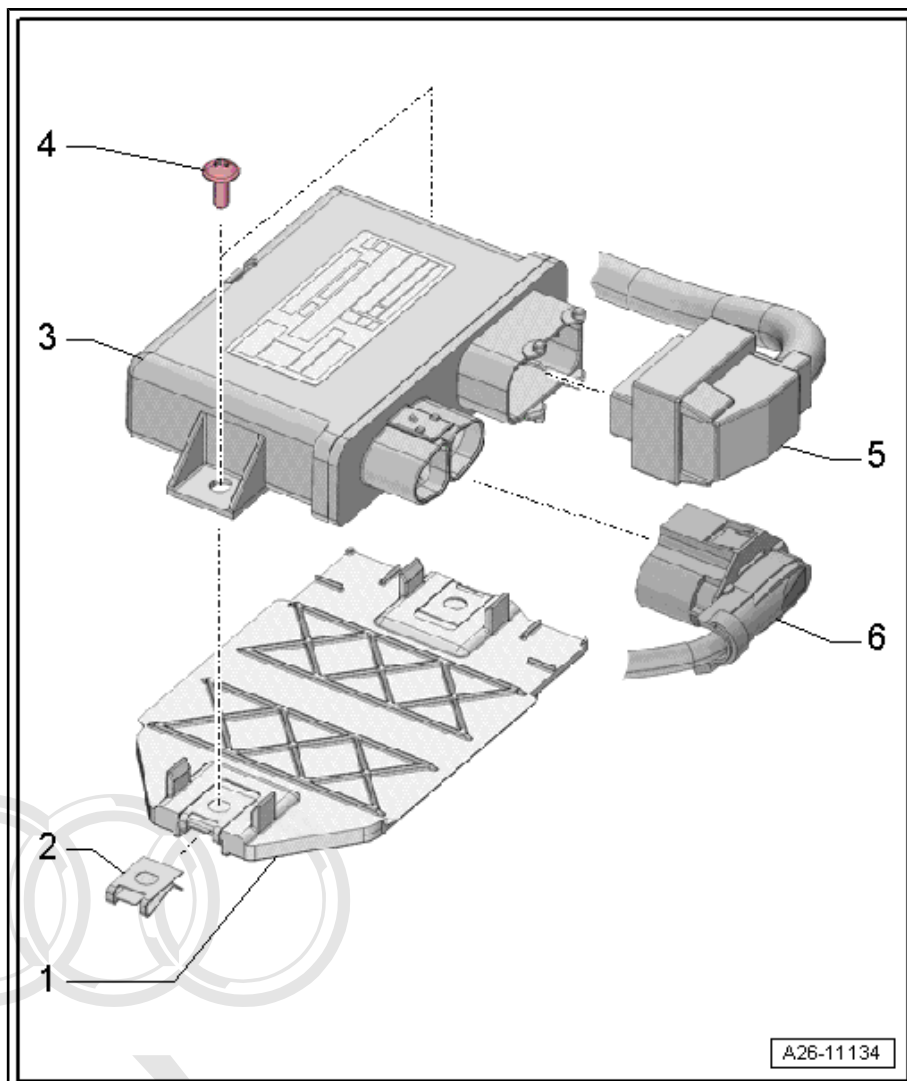
- ☐ At bottom of reducing agent tank
- ☐ Check in Guided Fault Finding ⇒ Vehicle diagnostic tester
- ☐ If control unit for reducing agent metering system - J880- has been renewed, perform adaption in Guided Function 0001 - Adapt learnt values - after component replacement ⇒ Vehicle diagnostic tester
- ☐ Removing and installing ⇒ [page 175](#)

#### 4 - Bolt

- ☐ 4.5 Nm

#### 5 - Electrical connector

#### 6 - Electrical connector



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## 3.5 Draining reducing agent tank

### Procedure



#### WARNING

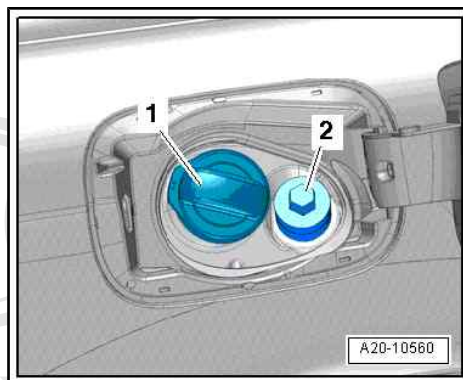
*Reducing agent can cause skin irritation.*

- ◆ *Observe safety measures when handling reducing agent  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Safety precautions; Safety precautions when working on the SCR system .*

- ◆ *Put on safety goggles.*

*Safety risk due to escaping reducing agent.*

- ◆ *To prevent large amounts of reducing agent from escaping when the metering line is opened, wait until the reducing agent has been drawn back automatically ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Safety precautions; Safety precautions when working on the SCR system .*



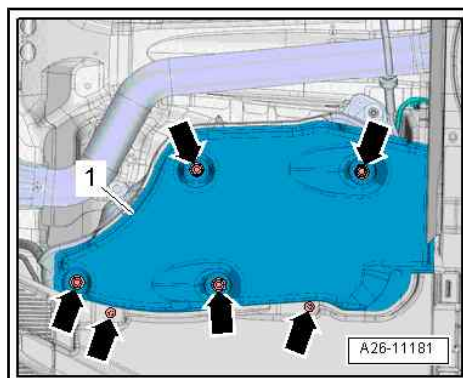
- Switch off ignition.
- Open tank flap.
- Unscrew filler cap -2- from filler neck for reducing agent.



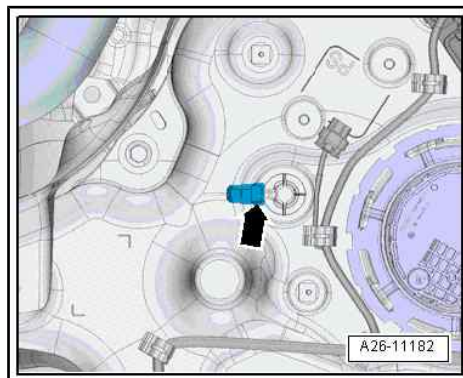
#### Note

*Disregard -item 1-.*

- Remove bolt and nuts -arrows- and detach cover -1- for reducing agent tank.



- Place drip tray underneath.
- Press release tab to remove plug -arrow-, drain off reducing agent into a drip tray and refit plug.
- Adapt learnt value after filling with reducing agent or renewing components ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes; Adapting learnt values for SCR system .



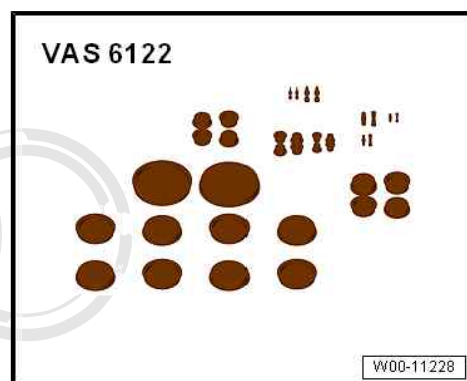
### 3.6 Removing and installing reducing agent tank

#### Special tools and workshop equipment required

- ◆ Engine and gearbox jack - VAS 6931-



- ◆ Engine bung set - VAS 6122-



#### Removing



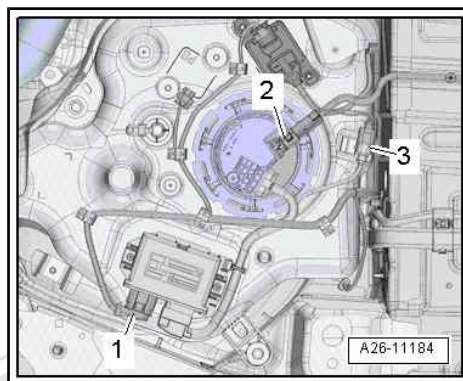
#### WARNING

**Reducing agent can cause skin irritation.**

- ◆ **Observe safety measures when handling reducing agent**  
⇒ **Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the SCR system.**
- ◆ **Put on safety goggles.**

- Drain reducing agent tank ⇒ [page 170](#) .
- Detach underbody trim (rear left) ⇒ General body repairs, exterior; Rep. gr. 66; Underbody trim; Removing and installing underbody trim .

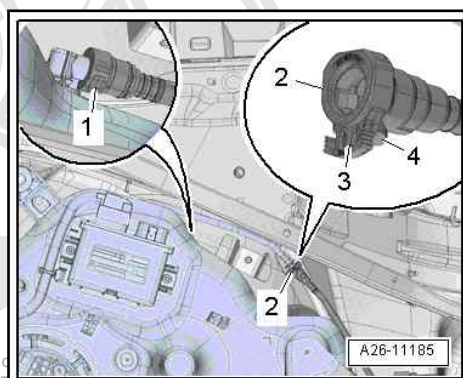
- Press release tabs and disconnect metering line -2-.
- Unplug electrical connectors -1, 3- and move electrical wiring harness clear.



### Note

*Hold a clean cloth under the separating point to catch escaping reducing agent.*

- Press release tab and disconnect filler line -1-.
- Press blue slider -4- to release catch -3- and disconnect breather lines -2-.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122-

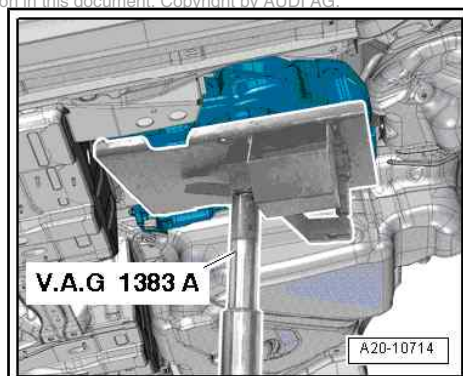


### WARNING

**Safety risk due to escaping reducing agent.**

◆ **Reducing agent tank must be empty when it is removed.**

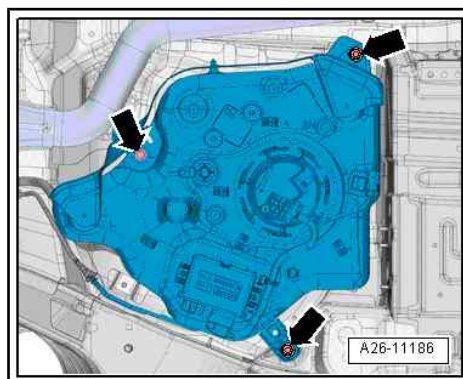
- Position engine and gearbox jack underneath reducing agent tank with a soft foam surface in between for support.
- Remove bolts -arrows- (have a second mechanic support the reducing agent tank by hand).



### Note

*For greater clarity the reducing agent tank is shown without the engine and gearbox jack.*

- Lower reducing agent tank using engine and gearbox jack, simultaneously guiding reducing agent tank down by hand.
- 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:

- Push filler line -1- and breather line -2- onto connection so that they engage audibly.
- Pull to check that plug-in connectors are correctly engaged.
- Press in catch -3- to secure.
- Check that lines are clipped onto reducing agent tank.



### Note

Disregard -item 4-.

- Adapt learnt value after filling with reducing agent or renewing components ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Repair notes; Adapting learnt values for SCR system.

## Tightening torques

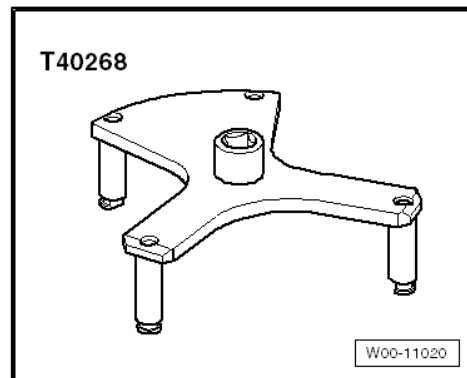
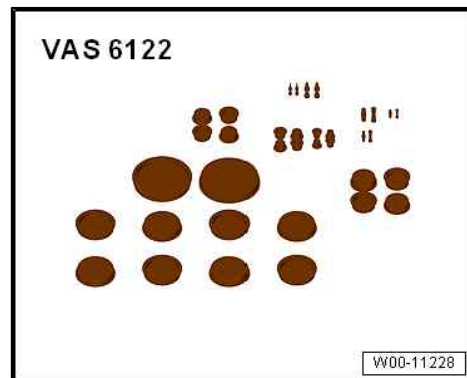
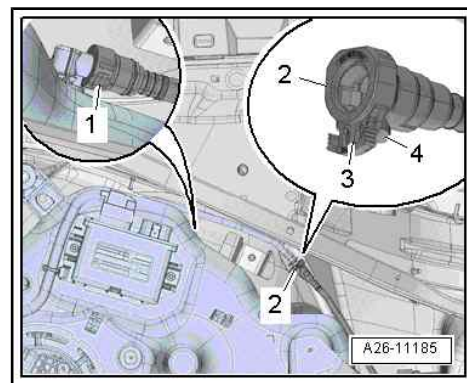
- ◆ ⇒ [“3.1 Exploded view - reducing agent tank”, page 167](#)
- ◆ ⇒ General body repairs, exterior; Rep. gr. 66 ; Underbody trim; Overview of fitting locations - trim panels

## 3.7 Removing and installing delivery unit for reducing agent

### Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-

- ◆ Key - T40268-



## Removing



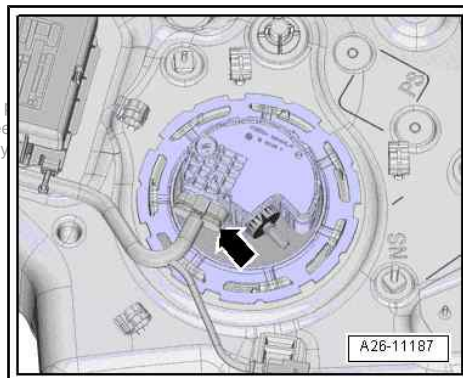
### WARNING

*Reducing agent can cause skin irritation.*

- ◆ *Observe safety measures when handling reducing agent  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Safety precautions; Safety precautions when working on the SCR system .*

- Remove reducing agent tank ⇒ [page 171](#) .
- Unplug electrical connector -arrow-.
- Seal off open lines and connections with plugs (thoroughly cleaned) from engine bung set - VAS 6122- .

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- Turn locking ring -1- anti-clockwise with wrench -T40268- to release and detach.
- Pull reservoir with pump for reducing agent - V437- out of reducing agent tank.

## Installing

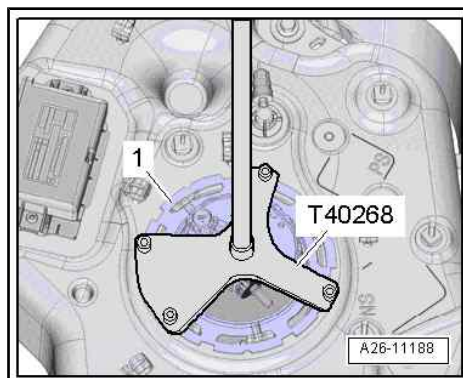
Installation is carried out in reverse order; note the following:



### Caution

*Take care to keep components clean.*

- ◆ *Observe rules for cleanliness ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes; Rules for cleanliness .*



### Note

- ◆ *Renew seal after removing.*
- ◆ *Thoroughly clean sealing surfaces for seal.*

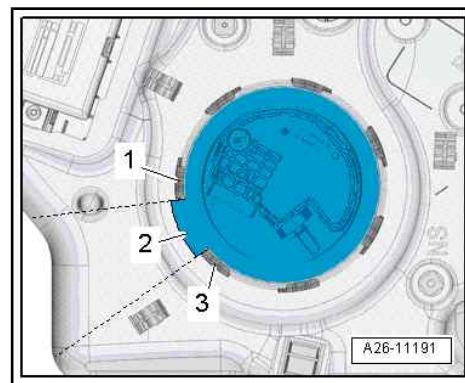


### Caution

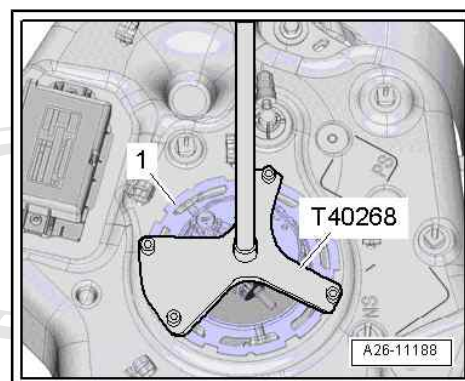
*Risk of malfunctions.*

- ◆ *The seal must not be twisted.*
- ◆ *Do not kink heating mats when installing.*

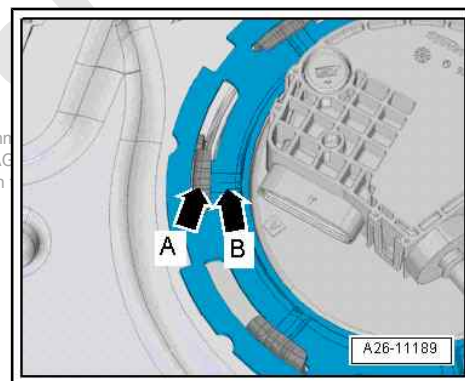
- Move reservoir into installation position:
- Lug -2- on flange must be between tabs -1- and -3-.
- Direction of installation for lug -2- as shown in illustration.



- Turn locking ring -1- clockwise with wrench -T40268- to lock.



- Locking ring is properly locked when lugs on locking ring are opposite lugs on support ring of reducing agent tank -arrows A, B-.
- Install reducing agent tank ➔ [page 171](#).
- Adapt learnt value after filling with reducing agent or renewing components ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Repair notes; Adapting learnt values for SCR system .



### 3.8 Removing and installing injector for reducing agent - N474-

#### Removing

- Remove engine cover panel ➔ [page 48](#) .

All further 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- .

#### Installing

Additional work:

- Install engine cover panel ➔ [page 48](#) .

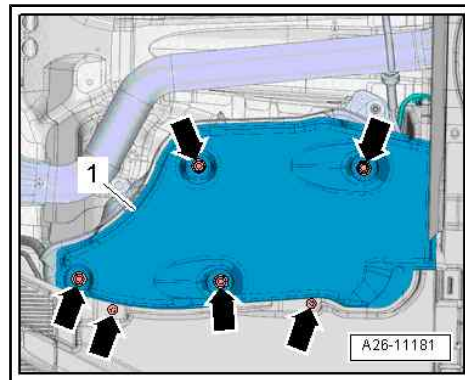
### 3.9 Removing and installing control unit for reducing agent metering system - J880-

#### Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

## Removing

- Switch off ignition.
- Remove bolt and nuts -arrows- and detach cover -1- for reducing agent tank.

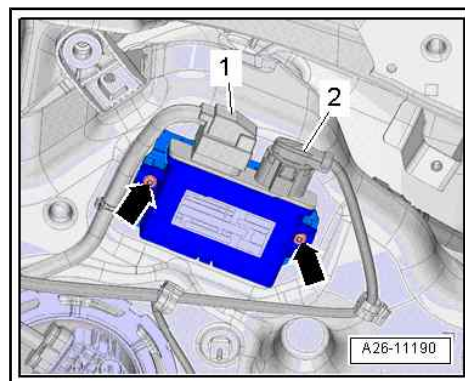


- Remove bolts -arrows- and detach control unit for reducing agent metering system - J880- .
- Unplug electrical connectors -1, 2-.

## Installing

Installation is carried out in reverse sequence.

- If control unit for reducing agent metering system - J880- has been renewed, perform adaption in Guided Function 0001 - Adapt learnt values - after component replacement ⇒ Vehicle diagnostic tester.



## Tightening torques

- ♦ ⇒ [“3.4 Exploded view - control unit for reducing agent metering system J880”, page 169](#)
- ♦ ⇒ [“3.1 Exploded view - reducing agent tank”, page 167](#)



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## 4 Exhaust gas temperature control

⇒ ["4.1 Exploded view - exhaust gas temperature control", page 177](#)

⇒ ["4.2 Removing and installing exhaust gas temperature senders", page 178](#)

### 4.1 Exploded view - exhaust gas temperature control



#### WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

1 - NOx sender 2 - G687- with control unit for NOx sender 2 - J881-

- ☐ Removing and installing  
⇒ [page 149](#)

2 - Nut

- ☐ Push on as far as stop

3 - Exhaust gas temperature sender 3 - G495-

- ☐ Removing and installing  
⇒ [page 178](#)
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Exploded view - exhaust gas temperature control

4 - Exhaust gas temperature sender 2 - G448-

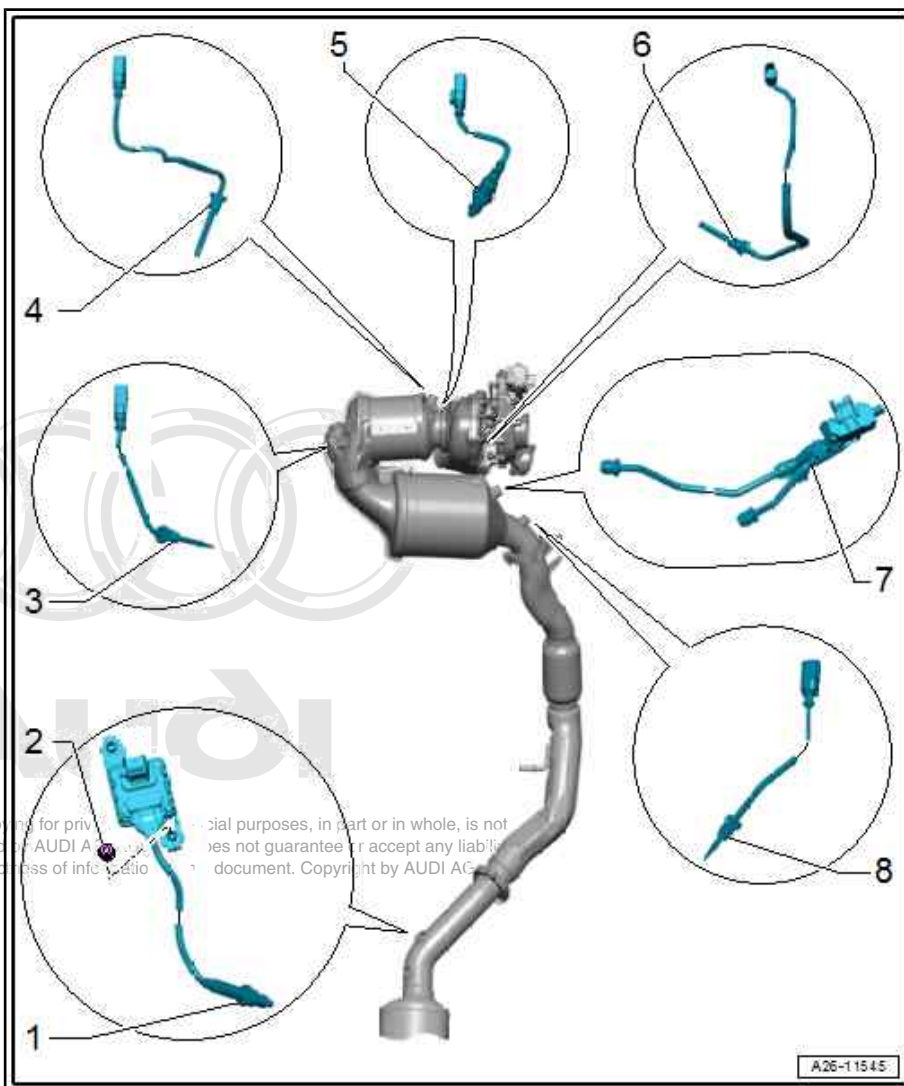
- ☐ Removing and installing  
⇒ [page 178](#)
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Exploded view - exhaust gas temperature control

5 - Lambda probe - G39- with Lambda probe heater - Z19-

- ☐ Removing and installing  
⇒ [page 149](#)

6 - Exhaust gas temperature sender 1 - G235-

- ☐ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender





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

#### 7 - Pressure differential sender - G505-

- ❑ Removing and installing ⇒ [page 142](#)

#### 8 - Exhaust gas temperature sender 4 - G648-

- ❑ Removing and installing ⇒ [page 179](#)
- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Exploded view - exhaust gas temperature control

## 4.2 Removing and installing exhaust gas temperature senders

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⇒ **"4.2.1 Removing and installing exhaust gas temperature sender 1 G235", page 178**

⇒ **"4.2.2 Removing and installing exhaust gas temperature sender 2 G448", page 178**

⇒ **"4.2.3 Removing and installing exhaust gas temperature sender 3 G495", page 178**

⇒ **"4.2.4 Removing and installing exhaust gas temperature sender 4 G648", page 179**

### 4.2.1 Removing and installing exhaust gas temperature sender 1 - G235-

All procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender .

### 4.2.2 Removing and installing exhaust gas temperature sender 2 - G448-

#### Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender .

#### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

### 4.2.3 Removing and installing exhaust gas temperature sender 3 - G495-

#### Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender .

#### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

## 4.2.4 Removing and installing exhaust gas temperature sender 4 - G648-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas temperature control; Removing and installing exhaust gas temperature sender .

### Installing

- Remove noise insulation (rear) to tighten exhaust gas temperature sender ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Install engine cover panel ⇒ [page 48](#) .

### Tightening torques

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



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## 5 Exhaust gas recirculation

⇒ **"5.1 Exploded view - exhaust gas recirculation system",**  
page 180

⇒ **"5.2 Removing and installing exhaust gas recirculation cooler",**  
page 181

⇒ **"5.3 Removing and installing exhaust gas recirculation temperature sensor G98",** page 181

### 5.1 Exploded view - exhaust gas recirculation system

#### 1 - Exhaust gas recirculation pipe

- ❑ To intake manifold

#### 2 - Bolt

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

#### 3 - Gasket

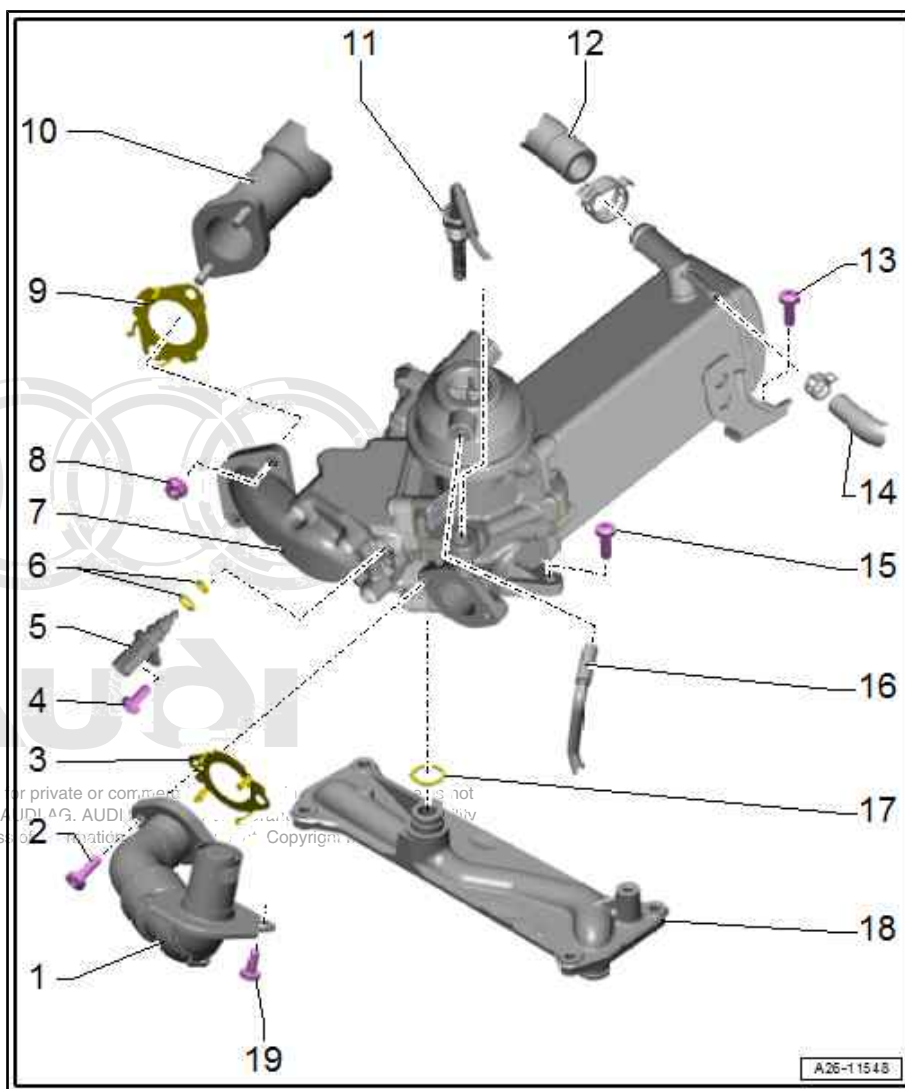
- ❑ Installation instructions ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

#### 4 - Bolt

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

#### 5 - Coolant temperature sender - G62-

- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 19 ; Coolant pump/thermostat assembly; Removing and installing coolant temperature sender - G62-



#### 6 - O-rings

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

#### 7 - Exhaust gas recirculation cooler

- ❑ With exhaust gas recirculation control motor - V338- and exhaust gas recirculation potentiometer - G212-
- ❑ Removing and installing ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Removing and installing exhaust gas recirculation cooler

## 8 - Nut

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

## 9 - Gasket

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

## 10 - Exhaust gas recirculation pipe

- ☐ From turbocharger

## 11 - Exhaust gas recirculation temperature sensor - G98-

- ☐ Removing and installing ⇒ [page 181](#)
- ☐ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust gas recirculation; Exploded view - exhaust gas recirculation

## 12 - Coolant hose

## 13 - Bolt

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

## 14 - Coolant hose

## 15 - Bolt

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

## 16 - Vacuum hose

## 17 - O-ring

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

## 18 - Coolant pipe (top)

- ☐ Removing and installing ⇒ [page 98](#)

## 19 - Bolt

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

## 5.2 Removing and installing exhaust gas recirculation cooler

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 .

## 5.3 Removing and installing exhaust gas recirculation temperature sensor - G98-

### Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further 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- .

### Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

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## 6 Exhaust manifolds

⇒ ["6.1 Exploded view - exhaust manifold", page 182](#)

⇒ ["6.2 Removing and installing exhaust manifolds", page 183](#)

### 6.1 Exploded view - exhaust manifold



#### WARNING

*When working on all parts of the exhaust system:*

- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00 ; Safety precautions; Safety precautions when working on the exhaust system .*



#### Note

*The illustration shows the exhaust manifold for cylinder bank 2 (left-side).*

#### 1 - Nut

- ❑ Tightening torques and installation instructions  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifold; Exploded view - exhaust manifold

#### 2 - Exhaust manifold

- ❑ Removing and installing  
⇒ [page 183](#)

#### 3 - Gasket

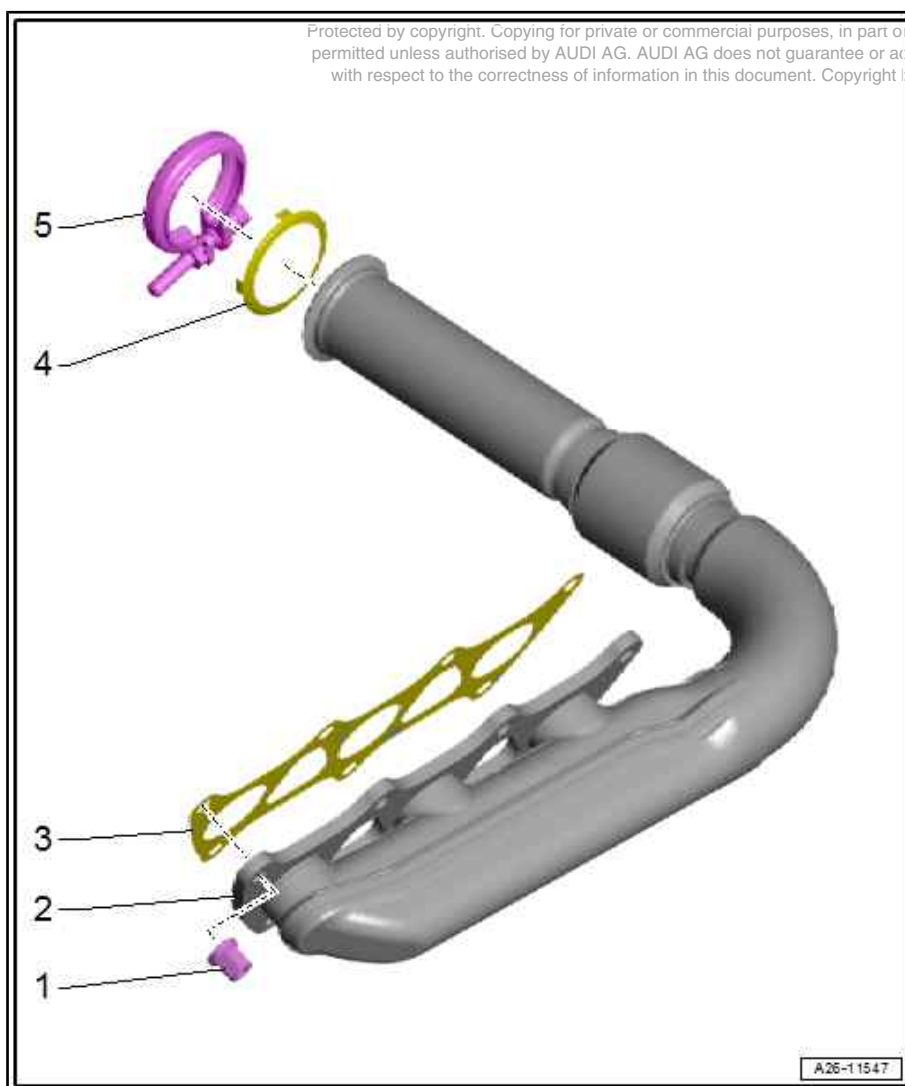
- ❑ Installation instructions  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifolds; Exploded view - exhaust manifold

#### 4 - Gasket

- ❑ Installation instructions  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifolds; Exploded view - exhaust manifold

#### 5 - Screw-type clip

- ❑ Tightening torques ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Turbo-charger; Exploded view - turbocharger



- ❑ Mark position of screw-type clip prior to removal

## 6.2 Removing and installing exhaust manifolds

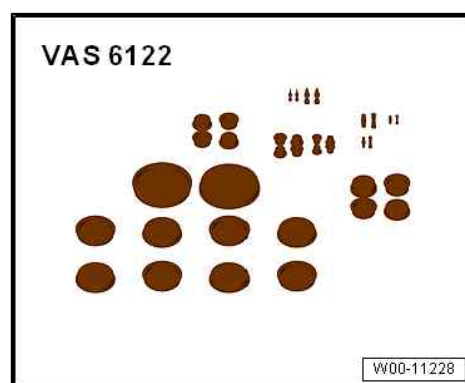
⇒ [“6.2.1 Removing and installing exhaust manifold \(left-side\)”, page 183](#)

⇒ [“6.2.2 Removing and installing exhaust manifold \(right-side\)”, page 185](#)

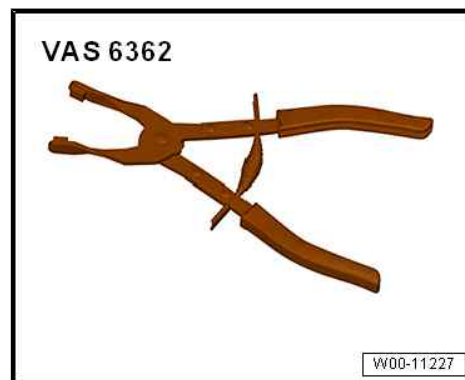
### 6.2.1 Removing and installing exhaust manifold (left-side)

Special tools and workshop equipment required

- ◆ Engine bung set - VAS 6122-



- ◆ Hose clip pliers - VAS 6362-



#### Removing



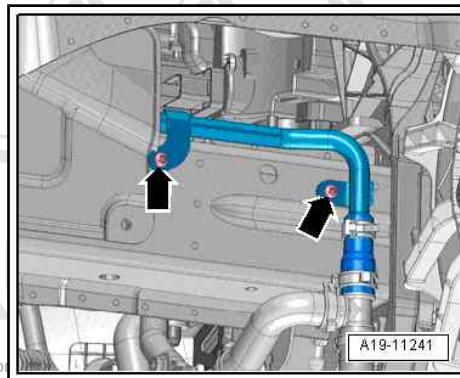
#### WARNING

*When working on all parts of the exhaust system:*

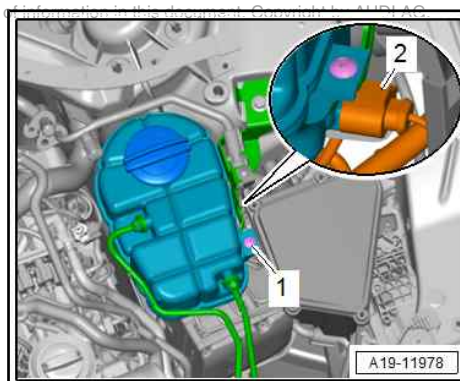
- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

- Remove emission control module ⇒ [page 164](#)
- Remove throttle valve module - J338- ⇒ [page 134](#) .
- Remove poly V-belt ⇒ [page 52](#) .

- Unscrew nuts -arrows- and move clear coolant pipe on longitudinal member.



- Unscrew bolt -1- and detach coolant expansion tank.
- Unplug electrical connector -2- and move coolant expansion tank to one side with coolant hoses attached.
- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Remove wheel spoiler (front left) ⇒ General body repairs, exterior; Rep. gr. 66 ; Wheel housing liners; Exploded view - wheel housing liner (front) .



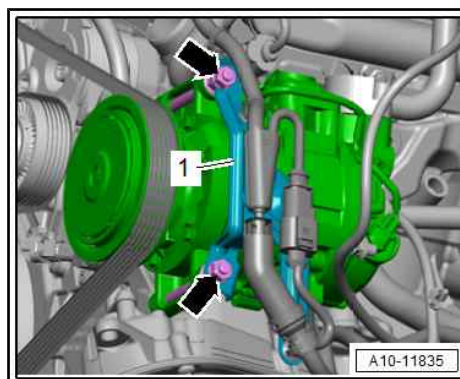
- Remove nuts -arrows- and press bracket -1- to one side.



### Caution

***Danger of damage to refrigerant lines and hoses.***

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



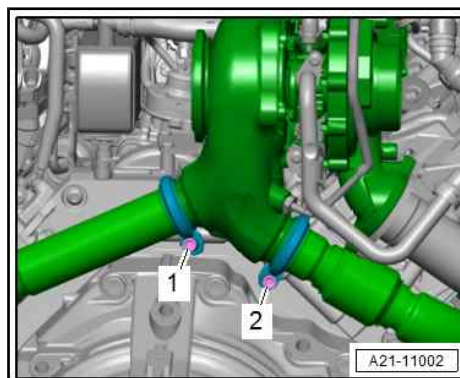
- Remove air conditioner compressor from bracket and tie up to front ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .

- Use a felt-tip pen to mark installation position of screw-type clip -1-.
- Unfasten and detach screw-type clip -1-.



### Note

***Disregard -item 2-.***



- Remove nuts -arrows- and detach exhaust manifold.

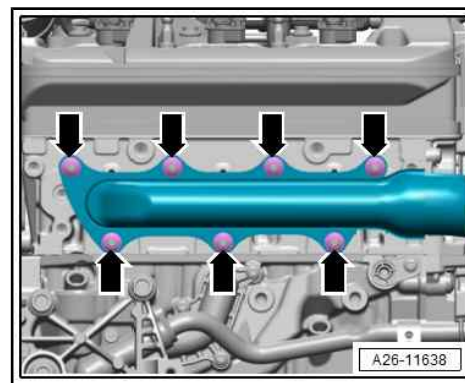
### Installing

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



#### Note

- ◆ *Renew gaskets, seals, self-locking nuts and screw-type clip after removal.*
- ◆ *If installation positions have been marked, pay attention to these when installing parts.*
- Install air conditioner compressor ⇒ Heating, air conditioning; Rep. gr. 87 ; Air conditioner compressor; Detaching and attaching air conditioner compressor at bracket .
- Install poly V-belt ⇒ [page 52](#) .
- Install throttle valve module - J338- ⇒ [page 134](#) .
- Install emission control module ⇒ [page 164](#) .



### Tightening torques

- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifolds; Exploded view - exhaust manifold
- ◆ ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ◆ Wheel spoiler ⇒ 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

## 6.2.2 Removing and installing exhaust manifold (right-side)

### Special tools and workshop equipment required

- ◆ Hose clamps, up to 25 mm - 3094-

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## Removing



### WARNING

*When working on all parts of the exhaust system:*

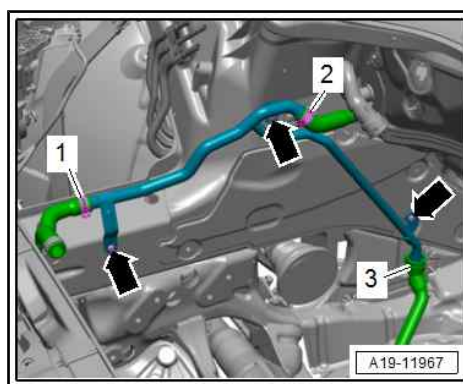
- ◆ *Observe safety precautions when working on the exhaust system ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 00; Safety precautions; Safety precautions when working on the exhaust system .*

- Remove emission control module ⇒ [page 164](#) .
- Remove air cleaner housing ⇒ [page 129](#) .
- Remove noise insulation (front) ⇒ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Removing and installing noise insulation .
- Clamp off coolant hoses with hose clamps -3094- .
- Lift retaining clip -3-, release hose clips -1 and 2- and detach coolant hoses.
- Unscrew bolts -arrows- and coolant pipe (right-side) from longitudinal member.

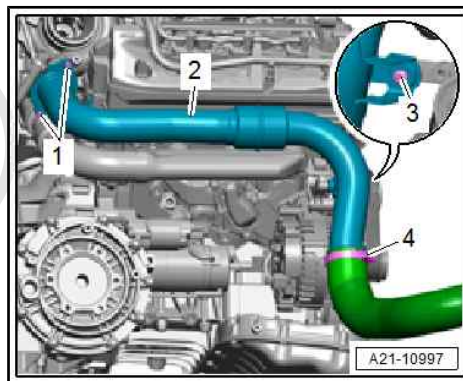


### Note

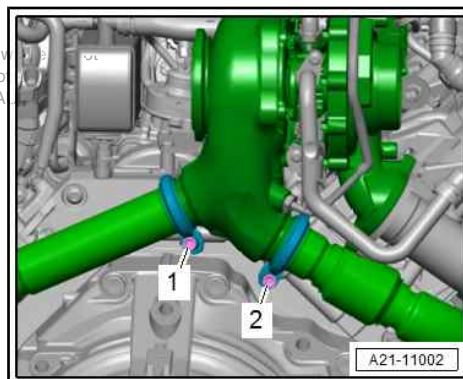
*For illustration purposes, the installation position is shown with the engine removed.*



- Release hose clip -4- and detach air hose from air pipe.
- Unscrew bolts -1 and 3- and move air pipe -2- to rear.



- Use a felt-tip pen to mark installation position of screw-type clip -2-.
- Unfasten and detach screw-type clip -2-.



### Note

*Disregard -item 1-.*

- Remove nuts -arrows- and detach exhaust manifold.

### Installing

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



#### Note

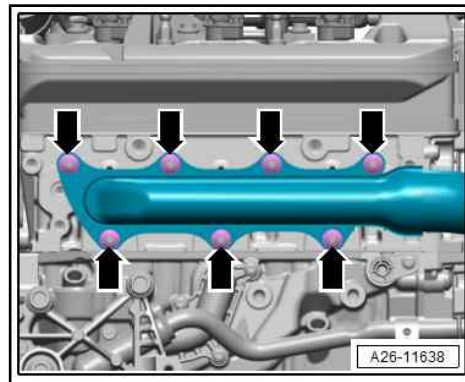
- ◆ *Renew gaskets, seals, self-locking nuts and screw-type clip after removal.*
- ◆ *If installation positions have been marked, pay attention to these when installing parts.*

- Install air cleaner housing ➔ [page 129](#) .
- Install emission control module ➔ [page 164](#) .

### Tightening torques

- ◆ ➔ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 26 ; Exhaust manifolds; Exploded view - exhaust manifold
- ◆ ➔ [“2.1 Exploded view - charge air system”, page 116](#)
- ◆ ➔ General body repairs, exterior; Rep. gr. 66 ; Noise insulation; Exploded view - noise insulation

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## 28 – Glow plug system

### 1 Glow plug system

⇒ "1.1 Exploded view - glow plug system", page 188

⇒ "1.2 Removing and installing glow plug", page 189

⇒ "1.3 Removing and installing Hall sender G40 ", page 189

⇒ "1.4 Removing and installing engine speed sender G28 ", page 189

#### 1.1 Exploded view - glow plug system

##### 1 - Sender wheel

- ☐ For engine speed sender - G28-
- ☐ Removing and installing  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 13; Crankshaft; Removing and installing sender wheel

##### 2 - Glow plug

- ☐ Cylinder bank 1 (right-side):
- ◆ Glow plug 1 - Q10-
- ◆ Glow plug 2 - Q11-
- ◆ Glow plug 3 - Q12-
- ☐ Cylinder bank 2 (left-side):
- ◆ Glow plug 4 - Q13-
- ◆ Glow plug 5 - Q14-
- ◆ Glow plug 6 - Q15-
- ☐ Removing and installing  
⇒ page 189
- ☐ Tightening torques ⇒  
Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

##### 3 - Electrical connector

##### 4 - O-ring

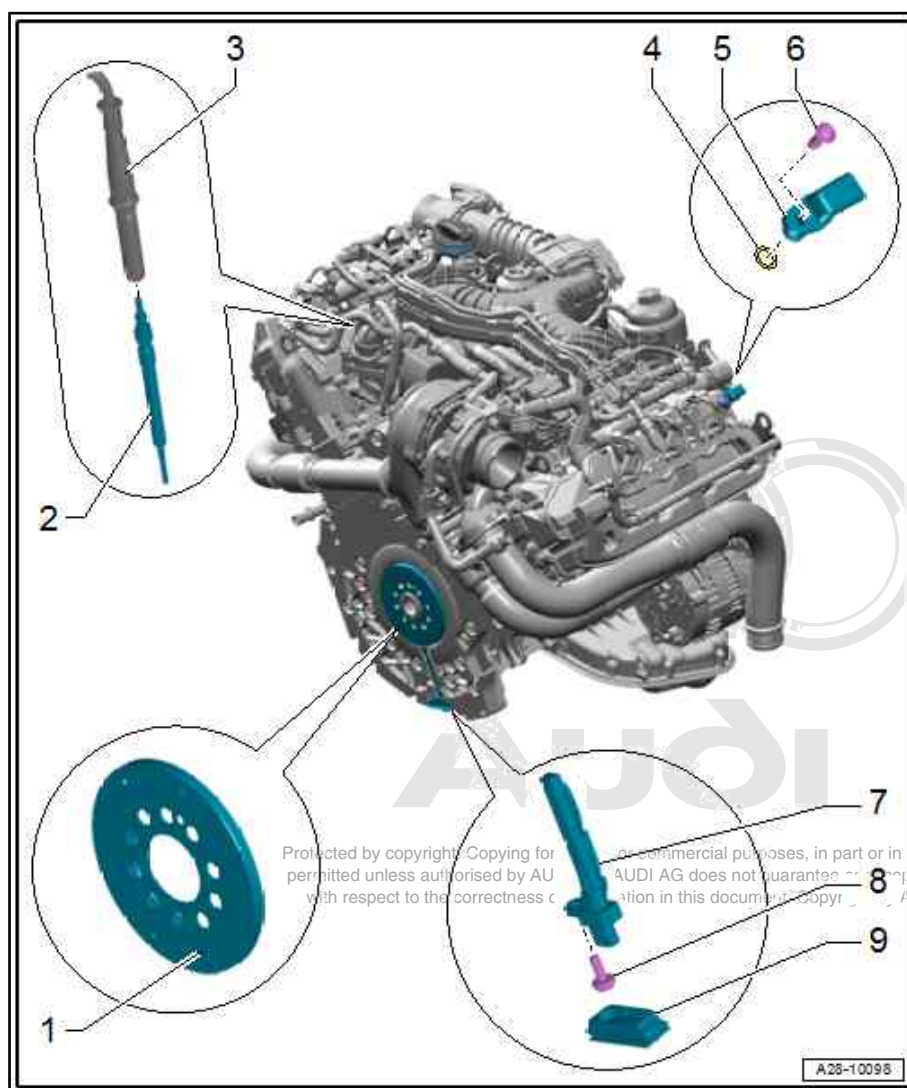
- ☐ Installation instructions  
⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Exploded view - glow plug system

##### 5 - Hall sender - G40-

- ☐ Removing and installing ⇒ page 189

##### 6 - Bolt

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



## 7 - Engine speed sender - G28-

- ❑ Removing and installing ⇒ [page 189](#)

## 8 - Bolt

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

## 9 - Cover

# 1.2 Removing and installing glow plug

## Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Removing and installing glow plug .

## Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

# 1.3 Removing and installing Hall sender - G40-

## Removing

- Remove engine cover panel ⇒ [page 48](#) .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Removing and installing Hall sender - G40- .

## Installing

Additional work:

- Install engine cover panel ⇒ [page 48](#) .

# 1.4 Removing and installing engine speed sender - G28-

## Removing

- Unbolt ATF cooler and press to side slightly ⇒ Gearbox; Rep. gr. 34 ; ATF circuit; Removing and installing ATF cooler .

All further procedures are described in ⇒ Servicing 6-cylinder TDI engine, common rail; Rep. gr. 28 ; Glow plug system; Removing and installing engine speed sender - G28- .

## Tightening torques

- ◆ ⇒ Gearbox; Rep. gr. 34 ; ATF circuit; Exploded view - ATF circuit

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