



Removal and refitting of the common rail

Readily available commercial tools:

- Open-ended wrench, wrench width 14

Special tools:

- Box spanner insert, long: 01899132
- Plugs and caps: 01899144
- Special wrench: 02992112
- Disassembly tool: 02992127
- Assembly grease: 01016496

DANGER



Never work on the fuel system when the engine is running. The fuel system is under high pressure - risk of death. The pressure in the fuel system may still be as high as several hundred bar even after the engine has been switched off. In this case, the fuel pressure can only be reduced by opening the fuel system to allow fuel to escape.

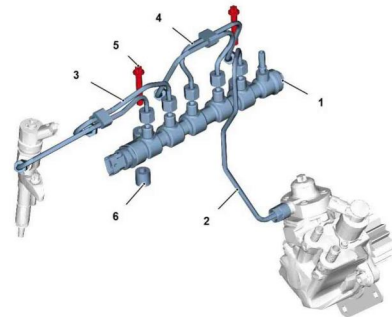
WARNING



Ensure maximum cleanliness during all work. Before proceeding with removal, remove any paint residue or debris. Thoroughly clean the area around the components to be worked on. Dry any wet areas with an air jet. When handling fuel observe the safety directives and specific local regulations. All fuel lines and unions should be closed immediately after opening using new, clean plugs or caps. Remove the plugs and caps only immediately prior to assembly. Collect operating materials in suitable containers and dispose of them in compliance with the applicable regulations.

Removal of the common rail

- 1 - Rail
- 2 - High pressure line
- 3 - Injection pipe
- 4 - Injection pipe
- 5 - Torx screw
- 6 - Spacer



©50552-0



1.

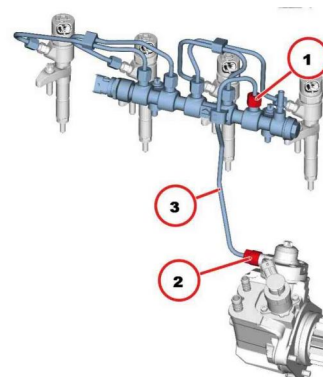
Remove the high pressure line.

- Remove the fuel return pipe.
- Unscrew the sleeve nuts (1) using the special wrench.
- Remove the cable harness mount and turn over on its side.
- Undo the sleeve nut (2) with the special wrench.
- Remove the high pressure line (3).



NOTE

Collect any leaked fuel and dispose of it properly.



©51409-0



1.

Removal of the injection pipes

- Unscrew union nuts (1) using the special wrench.

WARNING



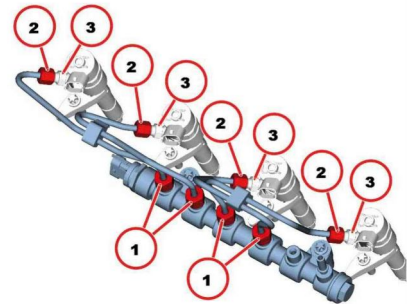
Position (3): if the pipe union is loosened, the injector must be replaced.

- Counterhold the pipe union on the injector.
- Unscrew the union nuts (2).
- Remove the injection pipes.



Note

Collect any leaked fuel and dispose of it properly.

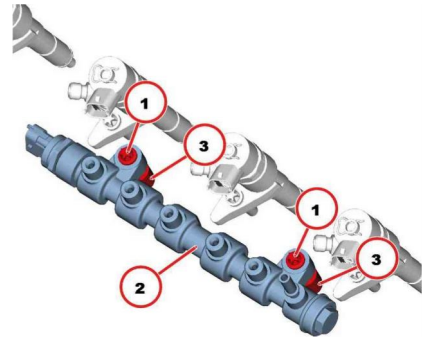


©51410-0



1.

- Unlock the wiring connector.
- Unplug the connector.
- Remove screws (1).
- Remove the rail (2).
- Remove spacers (3).
- Carry out a visual inspection of the components.



©51411-0



2.

Removal of the pressure sensor

- Unscrew rail pressure sensor (1) using the long reach socket.



NOTE

Collect any leaked fuel and dispose of it properly.



©51412-0



1.

WARNING



To avoid electrostatic discharge, do not touch the male connectors of the rail pressure sensor with bare hands. Ensure that the connection plug is clean.

- Carry out a visual inspection of the thread and the sealing edge (arrowed) of the rail pressure sensor.



©43017-0



2.

Refitting the pressure sensor

WARNING



Make sure that no foreign material enters the common rail system. Ensure maximum cleanliness. In particular, ensure that the threads and the mating surfaces of the rail are clean. Consult the documentation supplied with the replacement parts. The rail pressure sensor and the pressure relief valve must be renewed together as a pair.

- o Clean the threads and the mating surfaces of the rail.
- o Apply a thin coating of assembly grease to the threads and around the sealing edge of the rail pressure sensor.



©43017-0



1.



WARNING

Tighten the rail pressure sensor by applying the wrench to the hex on the body only.

- o Screw in rail pressure sensor (1)
- o Tighten rail pressure sensor (1) using the box spanner insert: 70 Nm.



©51412-0



2.

Removal of the pressure cut-off valve

- o Unscrew pressure cut-off valve (1).



NOTE

Collect any leaked fuel and dispose of it properly.

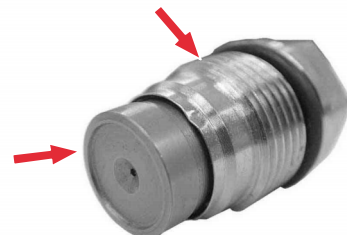


©51413-0



1.

- o Carry out a visual inspection of the thread and the sealing edge of the pressure cut-off valve.



©43253-1



2.

- o Remove the O-ring using the specific tool.



©43335-0



3.

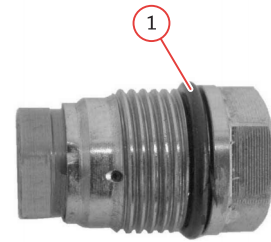
Refitting the pressure cut-off valve

WARNING



Make sure that no foreign material enters the common rail system. Ensure maximum cleanliness. In particular, ensure that the threads and the mating surfaces of the rail are clean. Consult the documentation supplied with the replacement parts. The rail pressure sensor and the pressure relief valve must be renewed together as a pair.

- o Fit a new O-ring (1).

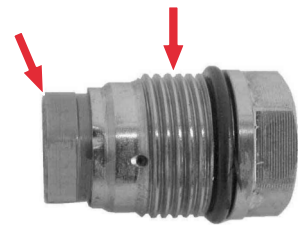


©43254-0



1.

- o Apply a thin coating of assembly grease to the threads and sealing edge of the pressure cut-off valve.



©43254-1



2.

- o Clean the threads and the mating surfaces of the rail.
- o Screw in pressure cut-off valve (1).
- o Tighten the pressure limiting valve: 100 Nm.



©51413-0



3.

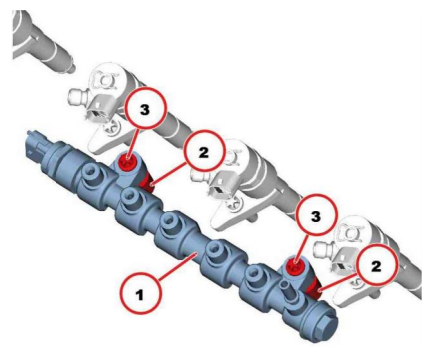
Refitting the common rail

- o Fit rail (1) with spacers (2).
- o Fit rail (1) without tightening screws (3).

NOTE



Do not tighten the screws at this stage.



©S1414-0



1.

Refitting the injection pipes



WARNING

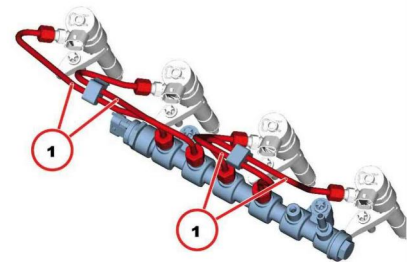
Once disturbed, the injection pipes must be renewed.



NOTE

Make sure the injection pipes are positioned correctly.

- o Fit the new injection pipes (1).



©S1415-0



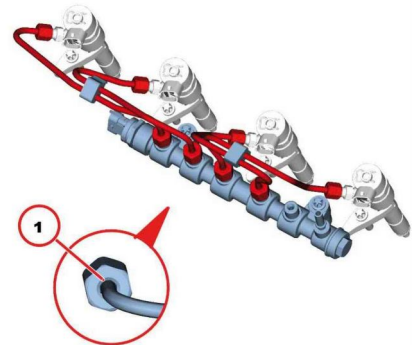
1.



WARNING

Check that the injection pipes are properly aligned. Do not rest wires in the holes (1) of the sleeve nuts. Fit the injection pipe with no contact with surrounding parts and without tightening. Guarantee sufficient distance from the surrounding components.

- o Align the injection pipes.
- o Tighten the sleeve nuts by hand.



©S1416-0



2.

Fit the high pressure line.



WARNING

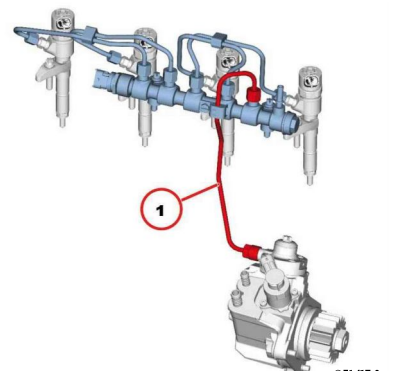
The high pressure line must be completely replaced after removal.



NOTE

Check the installation position is correct.

- o Fit a new high pressure line (1).



©S1417-0



1.

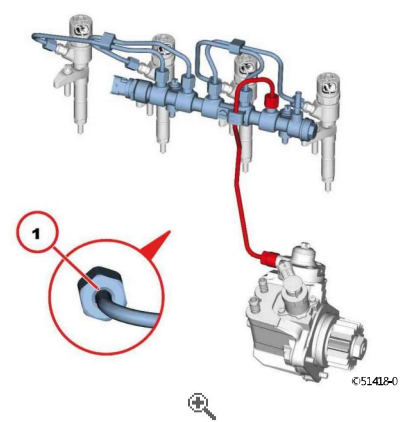


WARNING

Ensure that the high pressure line is aligned correctly. Do not

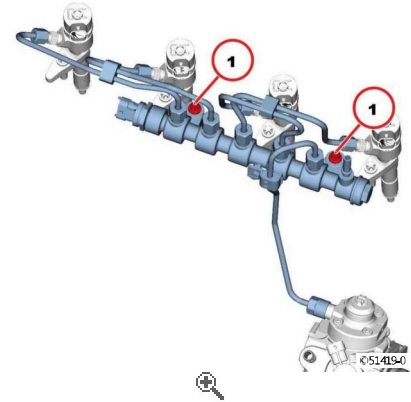
insert the line in the hole (1) of the sleeve nut. Fit the high pressure line with no contact with surrounding parts and without tightening. Guarantee sufficient distance from the surrounding components.

- o Align the high pressure line correctly.
- o Tighten the sleeve nuts by hand.




2.

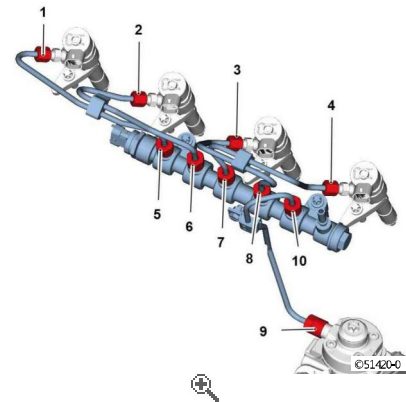
- o Tighten the screws (1): 30 Nm.



3.

- o Tighten the sleeve nuts following the specific tightening sequence. 30 (+1.5, -1.5) Nm.
- o Check that the injection pipes are positioned correctly.
- o Check that the high-pressure pipe is positioned correctly.
- o Fit the fuel return pipe.
- o Fit the cable harness mount.
- o Connect and lock the wiring connector.

NOTE
 Check that the connection is made correctly.



4.

Technical data

Tightening torque

ID no.	Designation	Screws type	Indications/observations	Value
A21 003	Injection pipe connection to common rail and injector, high-pressure pipe connection to high-pressure pump and common rail	Sleeve nut	Observe the assembly indications. Use a new pipe	30 (+1.5, - 1.5) Nm
A21 038	Common rail on cylinder head		Observe the assembly indications.	30 Nm
A21 039	Pressure relief valve on common rail		Apply a thin coating of assembly grease to the threads and around the sealing edge.	100 Nm
A21 040	Pressure sensor on rail	M18x1.5	Apply a thin coating of assembly grease to the	70 Nm

			threads and around the sealing edge.	
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NOTE

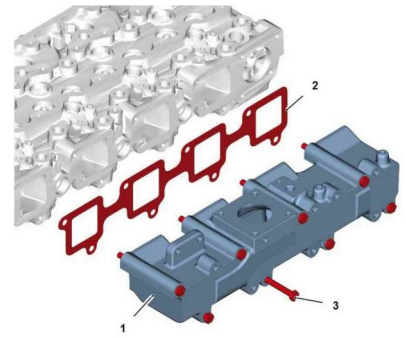
When tightening fasteners to the specified torque using a torque wrench, a torque dispersion of +/- 10 % is permitted.



Removal and refitting of the charge air duct

Removal of the charge air duct

- 1 - Turbocharging air duct
- 2 - Gasket
- 3 - Hex screw

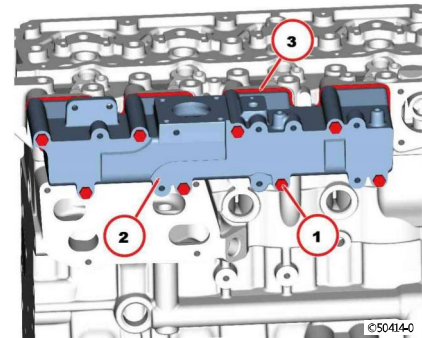


©50413-0



1.

- Remove the fuel return pipe.
- Unlock and detach the connectors.
- Remove screws (1).
- Remove charge air duct (2).
- Remove seal (3).
- Carry out a visual inspection of the components.



©50414-0



2.

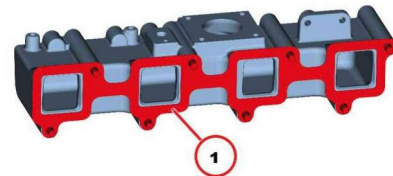
Refitting the charge air duct

- Clean the mating surfaces.
- Fit the new gasket (1).
- Insert the screws so that their threads engage the female threads in the gaskets by a few turns.



NOTE

The gasket is held in position by the screw thread. Check that the gasket assembly position is correct.



©50415-0



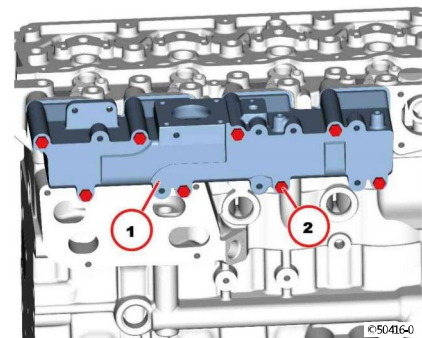
1.

- Fit the charge air duct (1).
- Tighten screws (2).



NOTE

Do not move the gasket.



©50416-0



2.

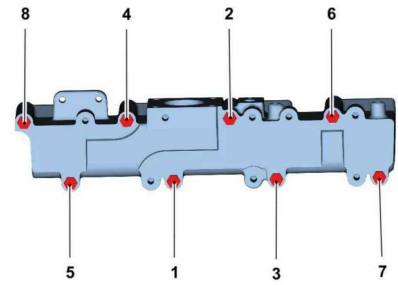
- o Tighten the screws in the sequence indicated: 30 Nm.



WARNING

Check that the cables are positioned correctly.

- o Connect and lock the wiring connector.
- o Fit the fuel return pipe.



©50417-0



3.

Technical data

Tightening torque

ID no.	Designation	Screws type	Indications/observations	Value
A22 030	Charge air duct connected to cylinder head			30 Nm



NOTE

When tightening fasteners to the specified torque using a torque wrench, a torque dispersion of +/- 10 % is permitted.



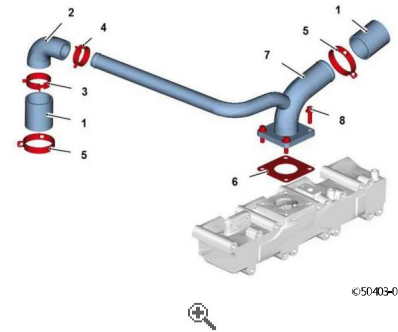
Removal and refitting of the charge air manifold

Readily available commercial tools:

- Circlip pliers: 01899112

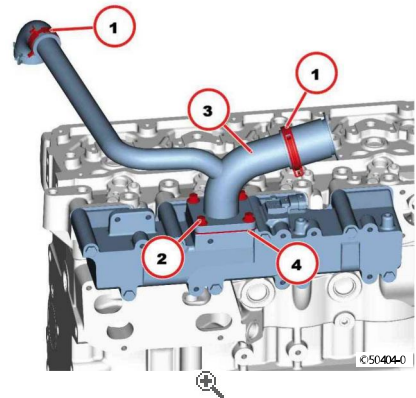
Removal of the charge air manifold

- 1 - Rubber sleeve
- 2 - Flexible pipe union
- 3 - Spring clip
- 4 - Spring clip
- 5 - Spring clip
- 6 - Gasket
- 7 - Turbocharging air manifold
- 8 - Hex screw



1.

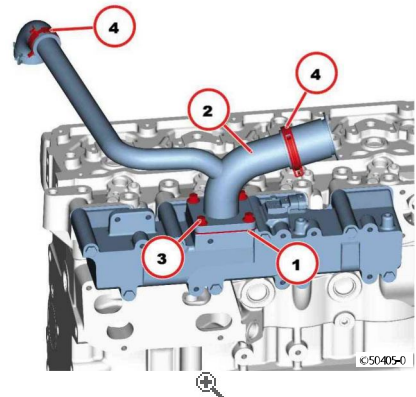
- Open the spring clips (1) with the spring clip pliers.
- Remove screws (2).
- Remove charge air manifold (3).
- Remove gasket (4).
- Carry out a visual inspection of the component.



2.

Refitting the charge air manifold

- Clean the mating surfaces.
- Fit the new gasket (1).
- Fit charge air manifold (2).
- Tighten screws (3).
- Tighten the screws in alternate sequence: 30 Nm.
- Fit the spring clips (4) with the specific pliers.



1.

Technical data

Tightening torque

ID no.	Designation	Screws type	Indications/observations	Value
A22 046	Turbocharging air elbow in correspondence of the turbocharging air duct			30 Nm

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