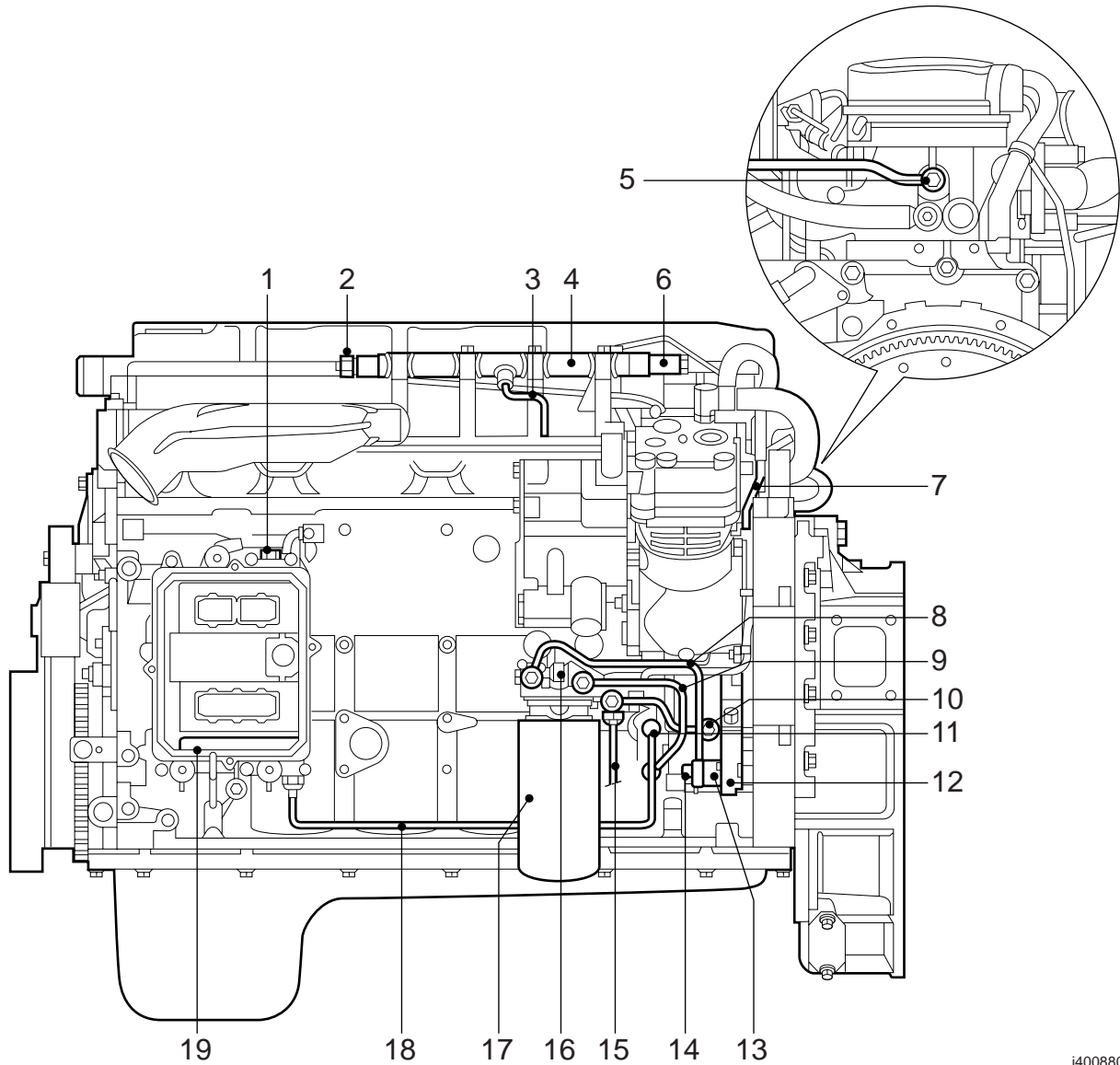


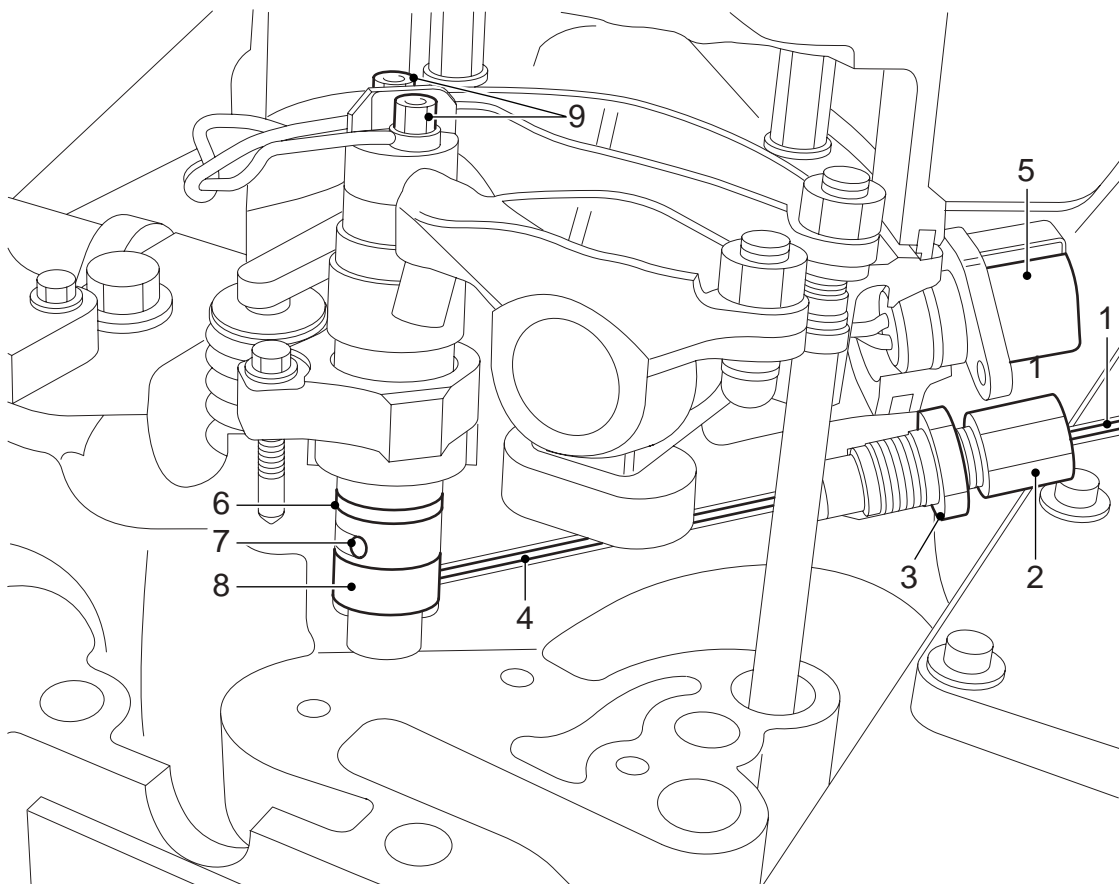
TECHNICAL DATA	0
DIAGNOSTICS	1
CE ENGINE FUEL SYSTEM	2
CE ENGINE INLET/EXHAUST SYSTEM	3
CE ENGINE, ENGINE BRAKE	4
PE ENGINE FUEL SYSTEM	5
PE ENGINE INLET/EXHAUST SYSTEM	6
ENGINE BRAKE, PE ENGINE	7
XE ENGINE FUEL SYSTEM	8
XE ENGINE INLET/EXHAUST SYSTEM	9
ENGINE BRAKE, XE ENGINE	10

Location of components, production date  
≥ 2003-21 (chassis number ≥ 0E613993) and  
production date < 2003-49 (chassis number  
< 0E628656)



i400880

## 2.5 OVERVIEW DRAWING, FUEL SYSTEM, CYLINDER HEAD



i400653

1. Injector pipe
2. Union
3. Nut
4. Fuel supply pipe
5. Connector to injectors
6. O-ring
7. Return opening
8. Injector
9. Electrical connection

### 5.5 REMOVAL AND INSTALLATION, FUEL RAIL PRESSURE-LIMITING VALVE



When removing the pressure-limiting valve, fuel will escape. Collect the fuel and avoid the risk of fire.



Dirt in the fuel system can lead to significant damage to parts of the system. Prevent this by cleaning the parts before disassembly and then sealing all open connections.

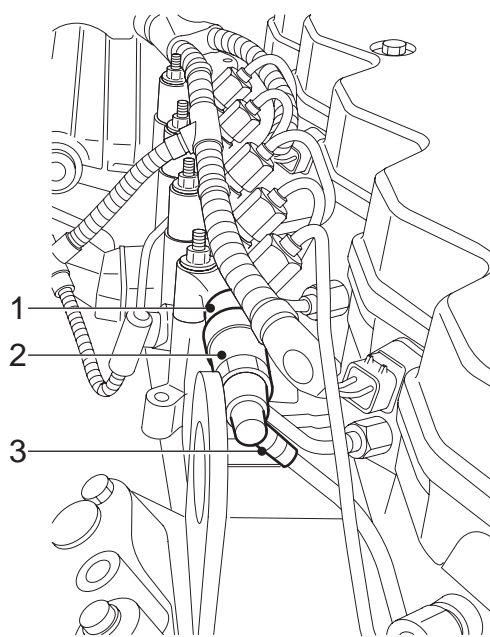
# 2

#### Removing fuel rail pressure-limiting valve

1. Clean the pressure-limiting valve (2) and the surrounding area.
2. Remove the fuel return pipe (3) from the pressure-limiting valve (2).
3. Remove the pressure-limiting valve (2) from the fuel rail (1).

#### Installing fuel rail pressure-limiting valve

1. Check the sealing surface and the screw thread of the pressure-limiting valve and the fuel rail.
2. Install the pressure-limiting valve in the fuel rail and tighten the valve to the specified torque. See "Technical data".
3. Fit the fuel return pipe on the pressure-limiting valve.
4. Start the engine and check the pressure-limiting valve for leaks.



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## 5.10 REMOVAL AND INSTALLATION, FUEL TANK FILTER



When the fuel level element is removed, a quantity of fuel will escape. Collect this fuel, bearing in mind the risk of fire.

## 2

**Removing fuel tank filter**

1. Remove the fuel level element.
2. Remove the fuel tank filter.

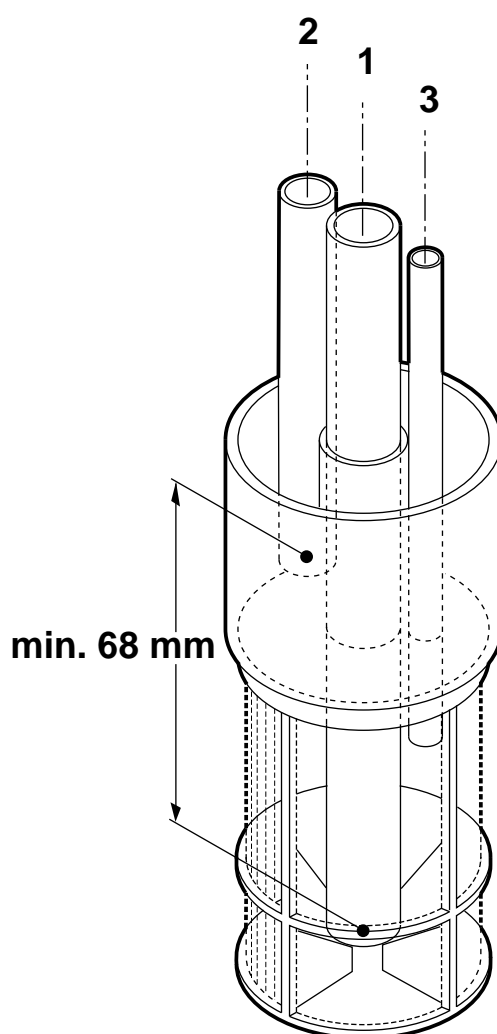
**Fitting fuel tank filter**

1. Check that the difference in length between the supply pipe (1) and return pipe (2) is at least 68 mm.
2. Slide the fuel tank filter as far as possible onto the supply pipe (1).

**Note:**

Make sure that when fitting the fuel tank filter the return pipe (2) is inserted into the fuel tank filter by-pass and that the cab heater supply pipe (3), if present, is inserted into the filter part.

3. Fit the fuel level element.



## 5.11 REMOVAL AND INSTALLATION, ELECTRONIC UNIT COOLING PLATE



When removing the cooling plate, fuel will escape. Collect the fuel and avoid the risk of fire.



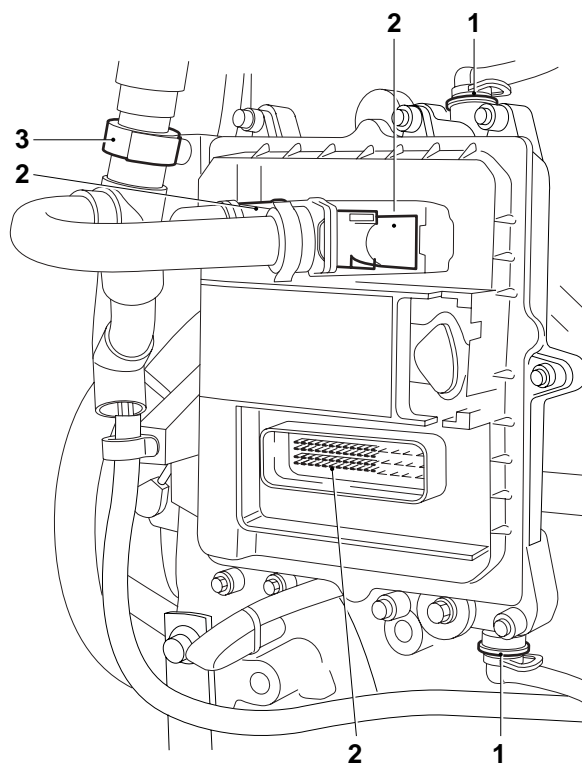
Dirt in the fuel system can lead to significant damage to parts of the system. Prevent this by cleaning the parts before disassembly and then sealing all open connections.

**Note:**

The electronic unit, together with the cooling plate, must first be removed from the engine block, after which the cooling plate must be demounted.

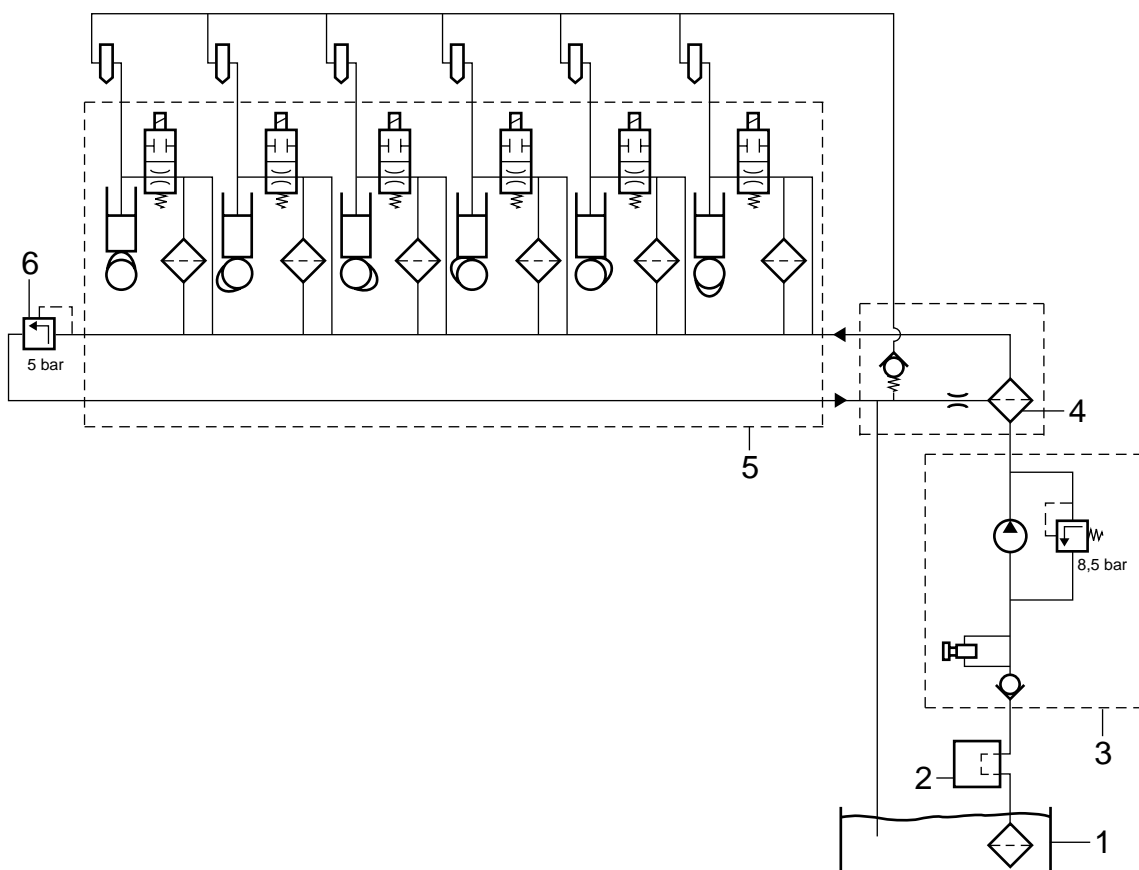
**Removing electronic unit cooling plate**

1. Disconnect the earth lead from the battery terminal.
2. To prevent dirt from entering, first clean the area around the fuel connections.
3. Remove the fuel pipes (1) on the cooling plate of the electronic unit.
4. Uncouple the electrical connectors (2) from the electronic unit and loosen the attachment clip (3) from the cable harness.
5. Remove the attachment bolts by which the electronic unit is fitted to the engine block.
6. Remove the electronic unit and cooling plate.
7. Remove the attachment bolts by which the electronic unit is fitted to the cooling plate and remove the cooling plate.



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2.2 SYSTEM DESCRIPTION, UPEC FUEL SYSTEM



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The fuel lift pump (3) feeds the fuel from the fuel tank (1) through the cooling plate (2).

The purpose of the cooling plate (2) is to ensure that the electronic unit does not become too hot. The fuel lift pump (3) is fitted opposite the pump housing (5) and is driven by the camshaft in the pump housing.

From the fuel lift pump, fuel is forced towards the fuel fine filter (4).

For the purpose of constant bleeding, there is a calibrated bore in the fuel fine filter.

After the filter, the fuel enters the pump housing (5).

The pump units driven by the electronic unit are fitted in the pump housing (5).

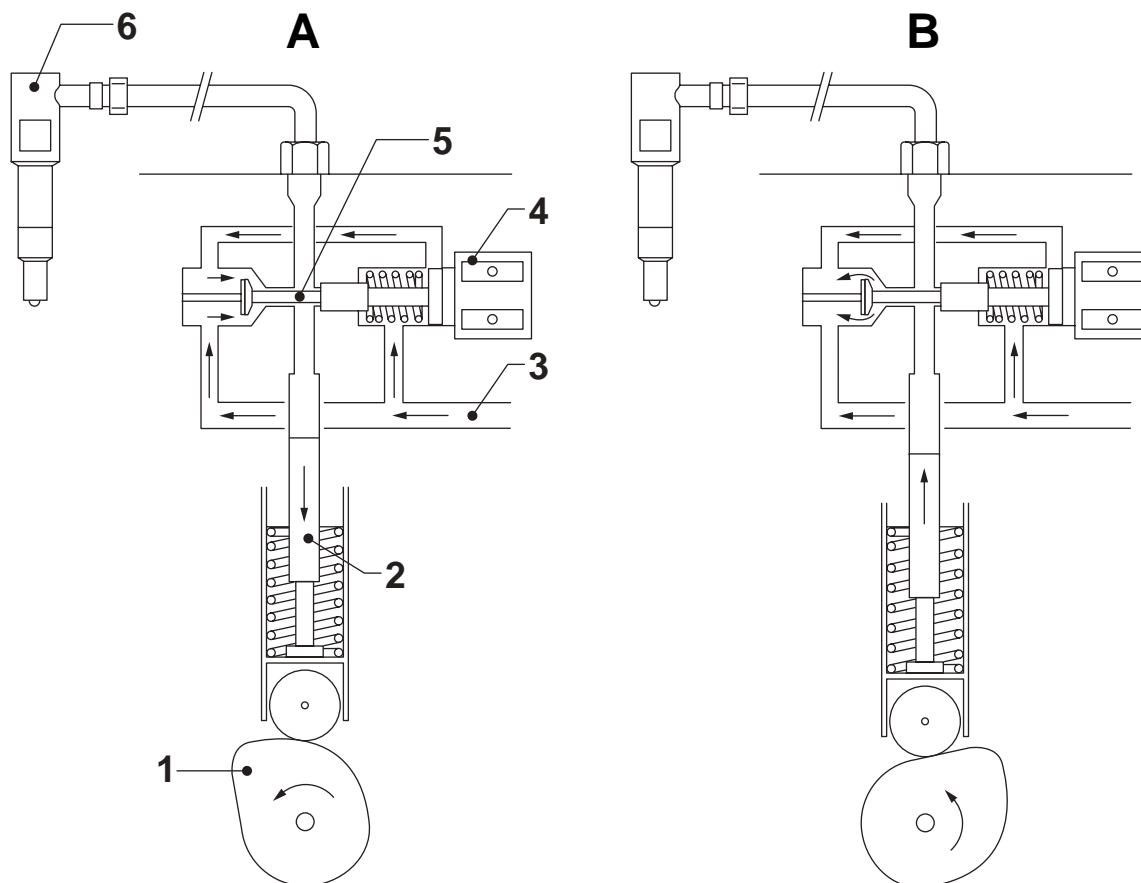
The pump units force the fuel at high pressure (approx. 1600 bar) to the injectors.

At the end of the supply channel, there is a pressure relief valve (6) that connects the supply and discharge channels at a specific supply channel pressure. The pressure relief valve ensures a good degree of filling for the pump units. The discharge channel is connected to the fuel tank (1) return pipe via the fuel fine filter.

The injector leak-off pipe is connected to the return pipe to the fuel tank (1) via a non-return valve in the fuel fine filter.

If the system has been 'open', the fuel system can be bled by means of the integrated primer pump in the fuel lift pump (3).

### Pump unit Operating principle



#### Situation A

In this situation the pump plunger (2) makes the suction stroke.

Due to the constant overpressure in the supply area of the fuel system, the high-pressure area above the pump plunger (2) is filled via the fuel supply ducts (3).

#### Situation B

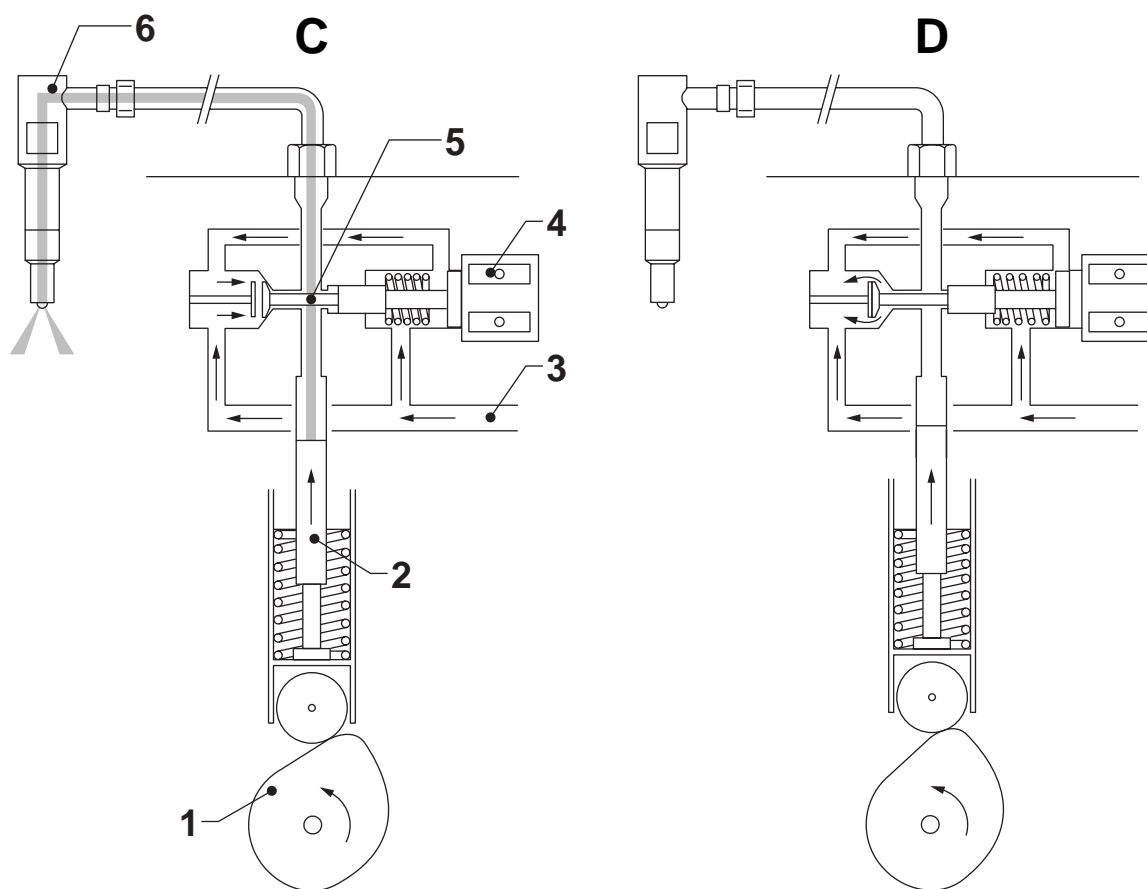
In this situation the pump plunger (2) makes the compression stroke.

As the valve (5) has not yet closed the link to the fuel supply ducts (3), there is no pressure build-up.

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**Situation C**

In this situation, the injection timing is determined.  
 The solenoid valve (4) is activated by the electronic unit.  
 In this way, the valve (5) closes the link between the space above the pump plunger (2) and the fuel supply ducts (3).  
 There is now a pressure build-up above the pump plunger (2), causing fuel to be injected via the injector (6).

**Situation D**

In this situation the quantity of fuel to be injected is determined.  
 The solenoid valve (4) is no longer activated by the electronic unit  
 The valve (5) opens the connection between the space above the pump plunger (2) and the fuel supply ducts (3).  
 The fuel pressure above the pump plunger (2) will be quickly reduced.

**Pump unit**

The valve (6), back plate (8) and the pump plunger (13) are located in the top of the pump unit.

These parts are lubricated by the fuel.

A roller (17), tappet (15) and a spring (14) with spring retainer (16) are situated on the bottom of the pump unit.

These parts are lubricated by the engine lubrication system.

The lower sealing ring on the pump unit separates the fuel system from the engine lubrication system.

A pressure valve (5) is fitted on the top of the pump unit.

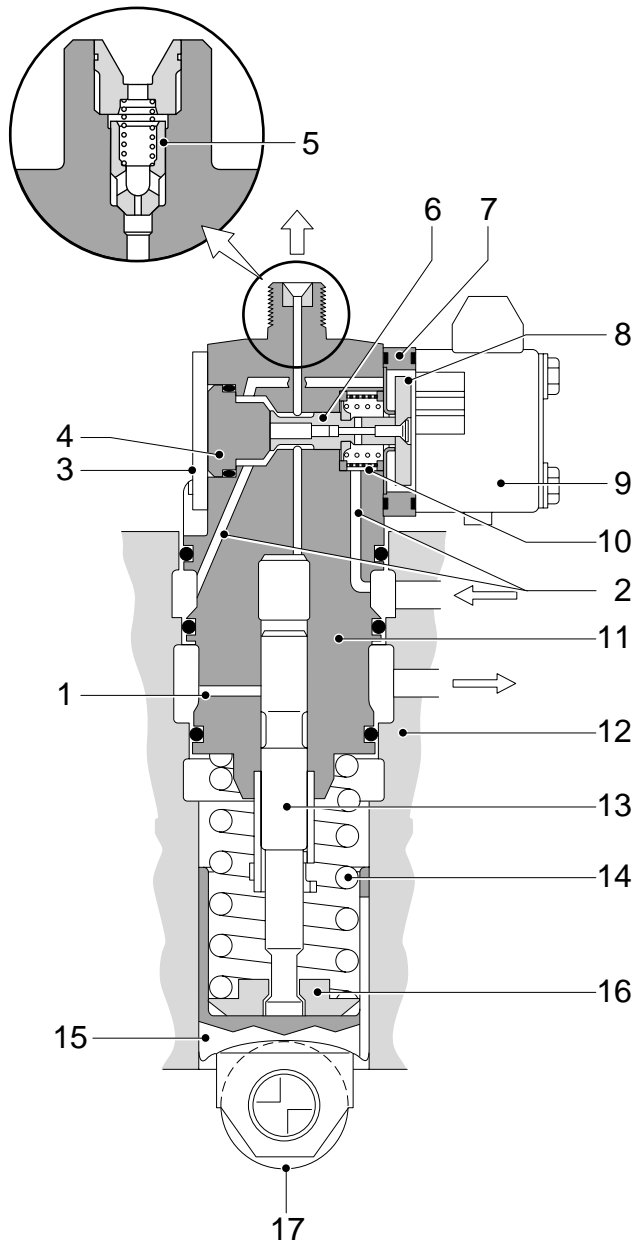
The function of the pressure valve is to prevent the supply section from being interrupted by pressure peaks from the injector pipe.

The injection timing and the quantity of fuel to be injected are controlled by a solenoid valve (9) that consists of an electromagnet and valve (6) with back plate (8), via the electronic unit control.

If the solenoid valve (9) is not energised, the valve (6) is forced against the valve stop (4) by the force of the valve spring.

This creates a very small opening between the space above the pump plunger (13) and the supply ducts (2).

The fuel will now flow via the fuel supply ducts (2) to the space above the pump plunger (13).



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If the solenoid valve (9) is energised by the electronic unit, the back plate (8) with the valve (6) will be attracted by the electromagnet due to the influence of the magnetic field.

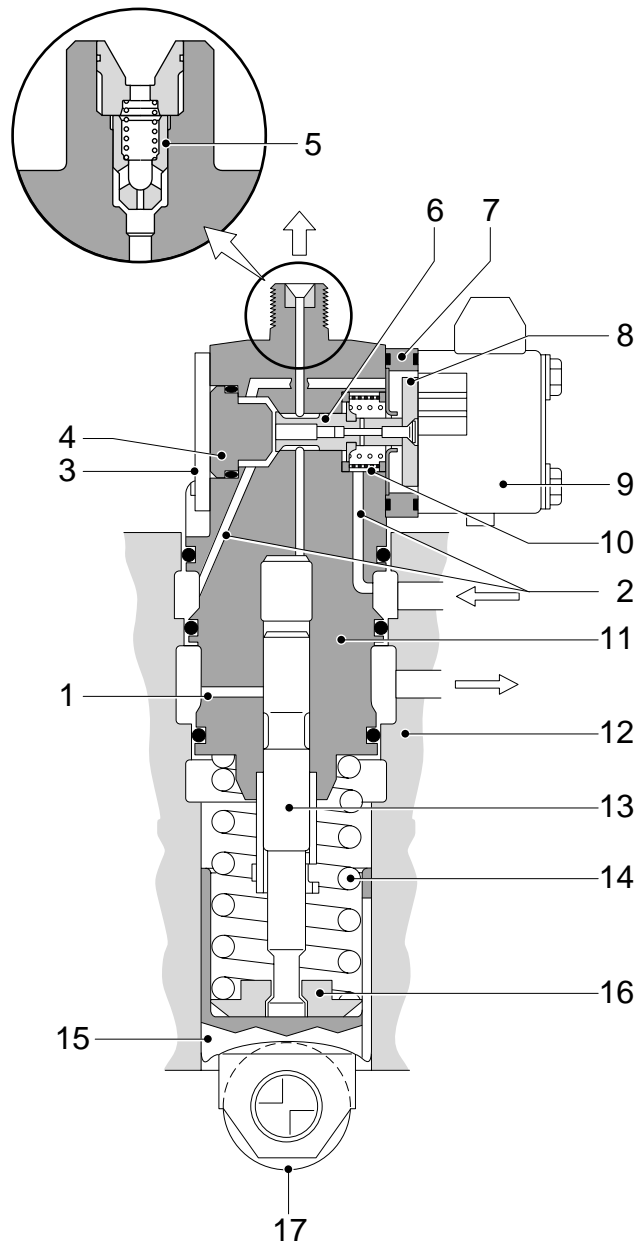
The valve (6) closes the connection between the space above the pump plunger (13) and the supply ducts (2), causing pressure to build up in the space above the plunger (13). This causes an injection.

The valve (6) is not re-opened against the force of the magnet by the high-pressure in the high-pressure area, as the forces in the valve (6) slot are balanced.

In other words, the left and right surfaces in the valve (6) slot are equal.

The time at which the valve (6) shuts depends on the injection timing calculated by the electronic unit.

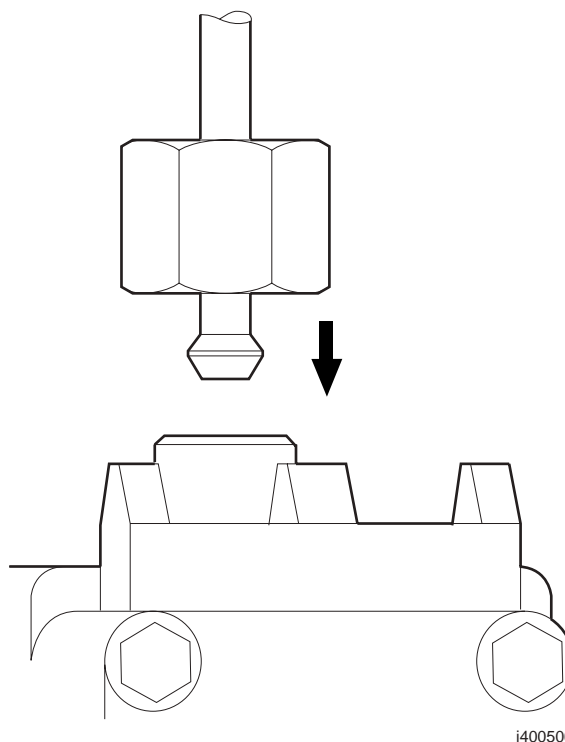
The time that the valve (6) remains closed, and therefore the quantity of fuel injected, is also calculated by the electronic unit.



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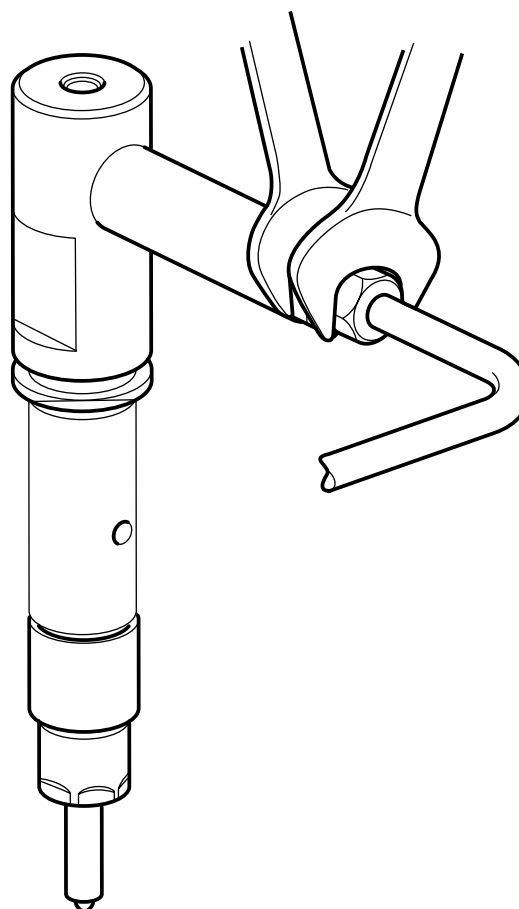
### Installing the fuel injection pipe

1. Blow the injector pipes with dry compressed air. Then turn the injector side towards the injectors.
2. Position the set of injector pipes with the head on the connection of the pump unit (see diagram).
3. Tighten the union nuts to the pump connection by hand in the order 1-2-3 or 4-5-6.
4. Then tighten the union nuts on the injector side by hand in the order 1-2-3 or 4-5-6.
5. Then tighten the union nuts on the pump side in the order 1-2-3-4-5-6. Tighten them to the specified torque. See "Technical data".
6. Now tighten the union nuts on the injector side in the order 1-2-3-4-5-6.



**When tightening the injector pipe union nuts, hold the injector's side connection back using an open-end spanner. If this is not done, there is a good chance that the side connection will leak.**

7. Tighten the injector pipe union nuts to the specified tightening torque. See "Technical data".



## 5. CLEANING

### 5.1 CLEANING THE EXTERIOR OF RADIATOR/AIR COOLER



Inhalation of dust may have serious consequences for your health. Take the necessary precautions, such as wearing goggles and a face mask.

#### Cleaning wire mesh

1. Remove the lower grille.
2. Remove the wire mesh.
3. Clean the wire mesh.

#### Cleaning, radiator/air cooler

With the aid of a simple tool, the radiator and the air cooler can be blow-cleaned.

This tool can be made in your own workshop. It cannot be ordered from DAF.

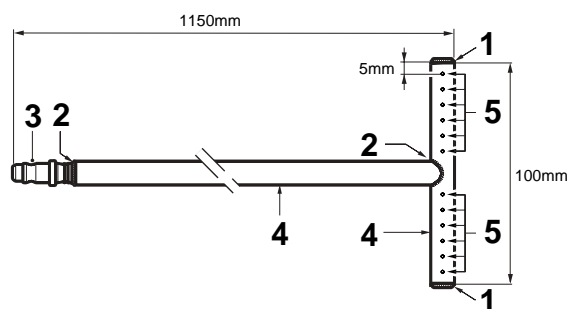
Key to drawing:

1. Solder up
2. Solder
3. Quick-release coupling for air hose
4. Steel pipe,  $\varnothing$  10 mm
5. 6 x  $\varnothing$  1.5 mm between holes, with a centre-to-centre distance between the holes of 7 mm, drilled on one side.

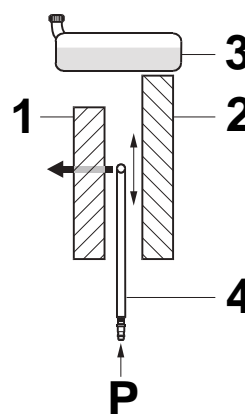
#### Note:

Make sure that the air cooler and radiator element are not damaged when positioning the radiator cleaner.

1. From below, insert the radiator cleaner (4) between the air cooler (1) and radiator (2), with the air holes facing the air cooler (1).
2. Apply air pressure to the radiator cleaner (4) and continue blow-cleaning the air cooler (1) until no more dirt comes out.

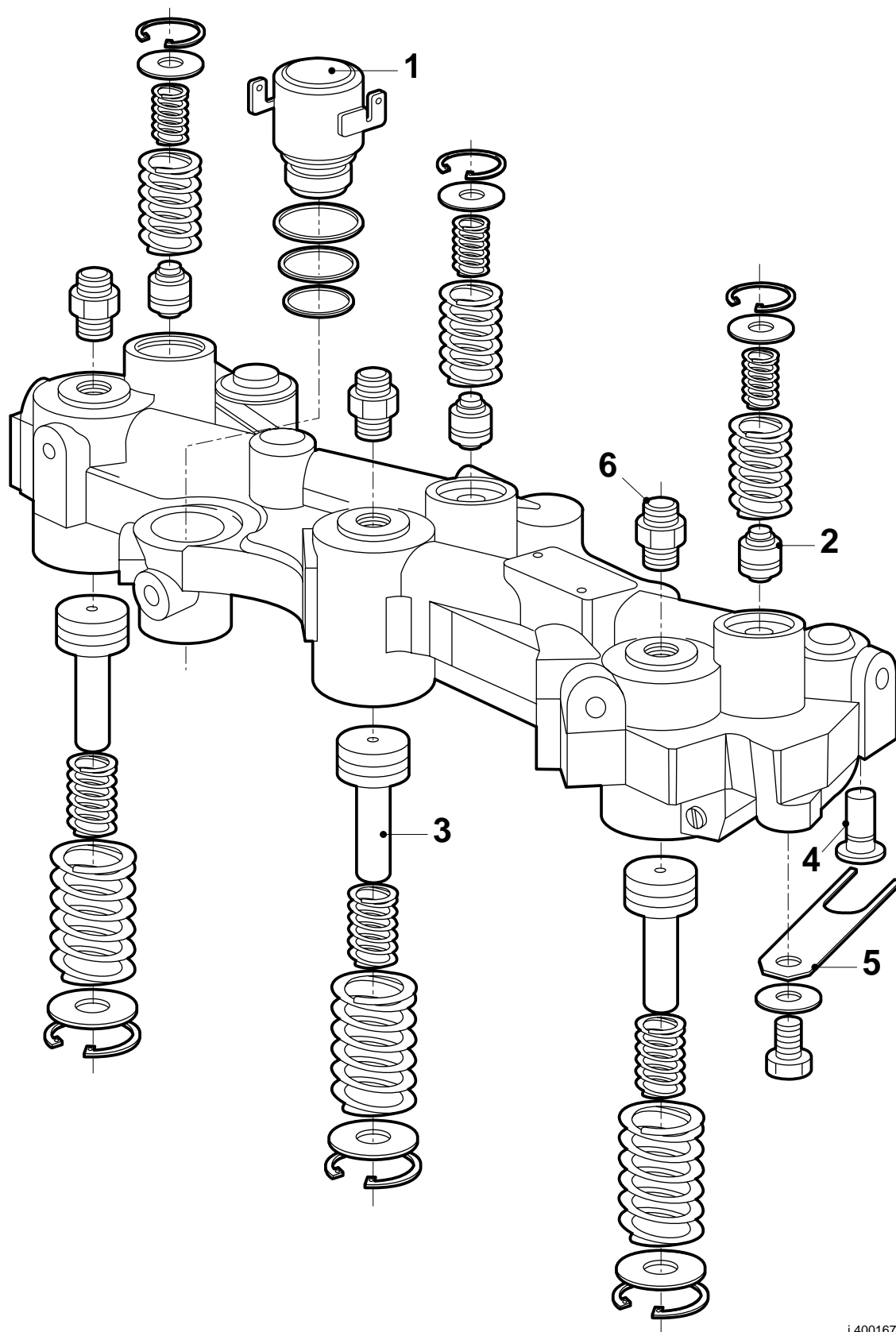


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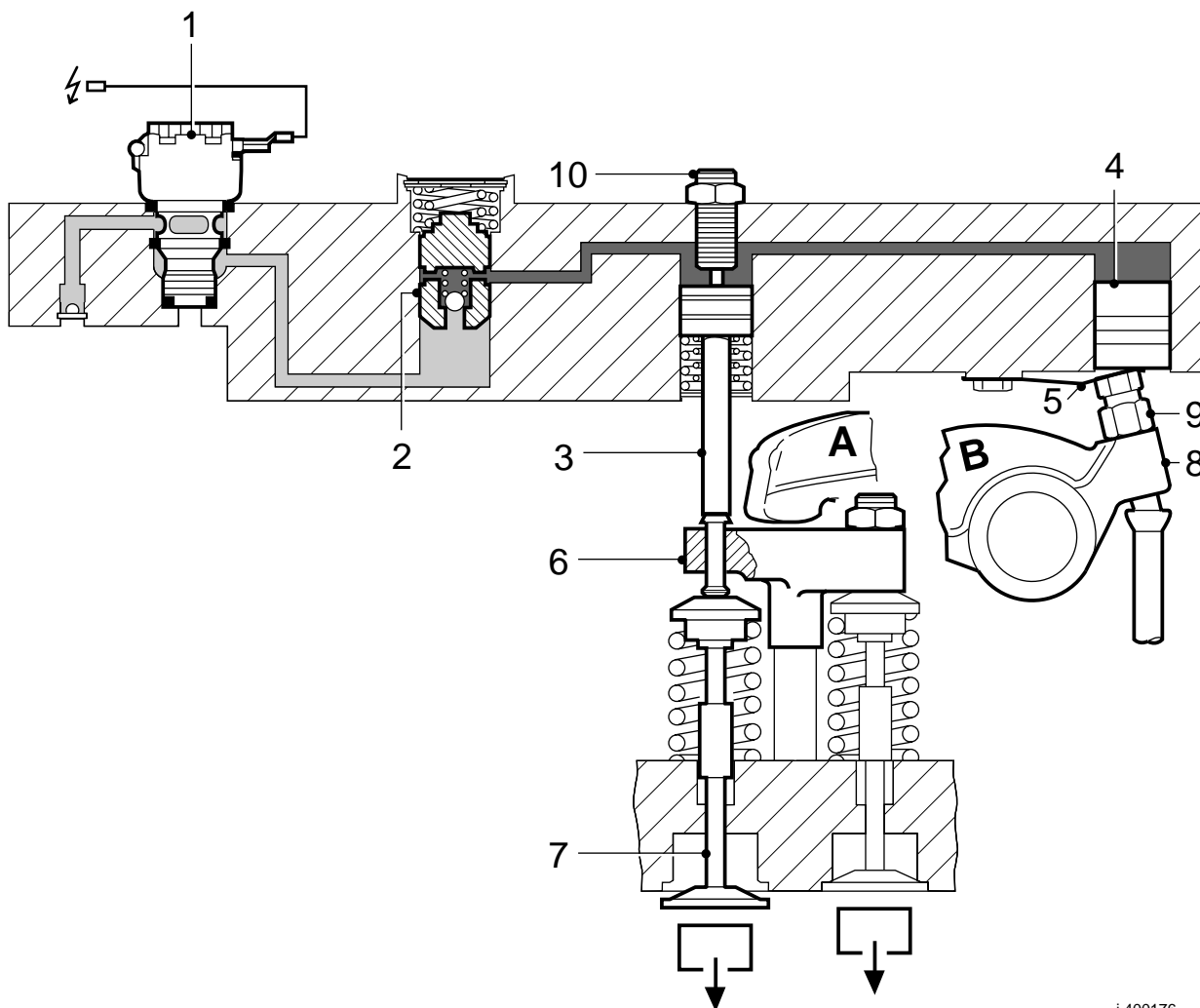
M2109

**2.2 LOCATION OF COMPONENTS, DEB HOUSING**



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If the main piston (4) continues to move up, this movement is transferred hydraulically to the operating piston (3). The operating piston (3) moves downwards against the spring pressure, opening one exhaust valve. In the case of loss of oil during operation, this will automatically be compensated for by the control valve (2).