KÄRCHER

makes a difference

HD 6/15, HD 7/17 (M/MX)
HD 7/14-4, HD 7/16-4, HD 8/18-4 (M/MX) with HD-M Cage variants

5.906-780.0 (05/18)

Contents

1 Foreword

Good service work requires extensive and practical training and clear documentation. That's why we offer all service technicians regular basic training and advanced training for the entire product range.
We also create service handbooks for the important units that can initially be used as instructions and later as reference material.
Furthermore, we provide regular service information on the development of the products.
If you have amendments, corrections or queries regarding this document, please send them with the following subject line:

international-service@de.kaercher.de

Subject: Case 123352

The corresponding product specialist will be take care of your concerns.

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D-71349 Winnenden
www.kaercher.com

2 Safety instructions

Service and maintenance work may only be performed by suitably qualified and specially trained personnel.
Observe the safety instructions in the chapters!

⚠ DANGER
Danger of lethal electric shock from electrical voltage.
Switch off the device immediately and unplug the mains plug before performing work.

⚠ CAUTION
Risk of injury from escaping high-pressure water.
Depressurise the system prior to all work.

⚠ CAUTION
Risk of burns from hot surfaces.
Allow the device to cool down prior to all work.

2.1 Hazard levels

⚠ DANGER
Indication of an imminent threat of danger that will lead to severe injuries or even death.

⚠ WARNING
Indication of a potentially dangerous situation that may lead to severe injuries or even death.

⚠ CAUTION
Indication of a potentially dangerous situation that may lead to minor injuries.

ATTENTION
Indication of a potentially dangerous situation that may lead to damage to property.

3 Shown in this service handbook

3.1 Structure of function groups

010 Safety instructions
020 Overview
030 Function
040 Service activities
050 Service and inspection
060 Fault diagnosis
070 Special features/other

3.2 Textual display

- Preparatory tasks

① Numerical legend

1. Guideline

ATTENTION
Safety instructions
Note on dangers, source of errors.

4 Technical features

General
- Water volume 600 to 800 l/h
- Pressure 140 to 180 bar
- Connection output 3.1 to 4.6 kW
- Drivable device, modular device or cage device versions available
- Device without detergent suction
- Addition of detergent via the cup foam lance or a separate injector
- No pressure regulation via servo control (single-phase devices). Pressure regulation via a separate power control spray lance
- Power nozzle included in scope of delivery

High-pressure pump
- 3-piston axial pump with stainless steel pistons
- Specially hardened piston with fine-ground surface
- Piston diameters of 12, 14 and 18 mm
- Swash plate with axial bearing
- Brass cylinder head and water-bearing parts
- Pressure relief system
- Startup valve (single-phase devices)
- Startup valve, pressure relief valve and pressure switch piston run in replaceable brass sleeves - no wear at the cylinder head
- Easy oil change via oil drain hose and oil tank
- Standing and lying operation possible

Electrical system, drive
- Air-cooled electric motor with winding protection contact
- Overcurrent switch, 1 piece for single-phase devices and 2 pieces for three-phase devices
- Annealed rotor for good motor startup (HD 6/15 M)
- Aluminium winding package (HD 6/15 M)
- Motors for single-phase and three-phase operation
- Two-pole and four-pole motors
- Two-pole pressure switch

Equipment
- Retractable push handle
- Carrying handle
- Nozzle storage for triple nozzle and rotary nozzle
- Transport retainer for surface cleaner
- Holder for cup foam lance

- Cable clips
- Rubber strap as transport lock for mains cable and high-pressure hose (not with CX variant)
- Additional spray lance holder with a clamp for transport
- Metal sieve in water connection

Accessories possible
- Rotary nozzle
- Foam lance
- Power Control spray lance

4.1 Intended use

Use this high-pressure cleaner only for the following types of work:
- Use the high-pressure jet for cleaning machines, vehicles, buildings, tools and similar objects.

We recommend using a rotary nozzle as a special accessory for stubborn soiling.
The HD...Plus is supplied with a rotary nozzle.

4.2 Scope

This service handbook applies for the following units:
HD 6/15, HD 7/17 (M/MX)
HD 7/14-4, HD 7/16-4, HD 8/18-4 (M/MX)

The figures in this service manual show the HD 6/15 MX and HD 8/18 M devices.
Other models have a comparable structure.

4.3 Safety devices

Safety devices protect the user and may not taken out of operation or functionally circumvented.

Adhere to the safety instructions in the chapters!

4.4 Overflow valve with pressure switch

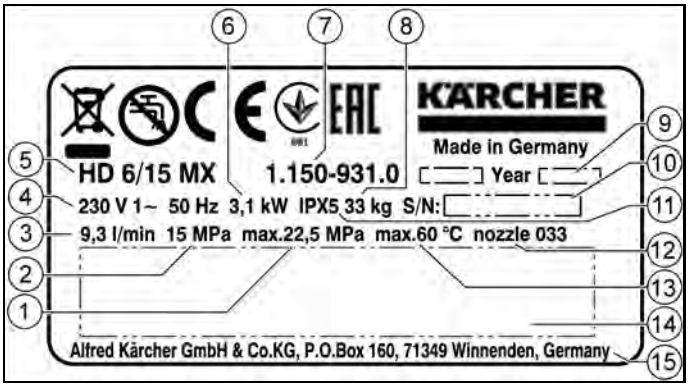
When the water quantity is reduced via the pressure/quantity control, the overflow valve opens and some of the water flows back to the suction side of the pump (not with single-phase devices).

When the trigger on the high-pressure gun is release, the pressure switch switches off the high-pressure pump and the high-pressure jet stops.
The pump switches on again when the trigger is pulled.

4.5 Safety valve

The safety valve opens when the permissible operating pressure is exceeded and the water flows back to the suction side of the pump.

4.6 Type plate



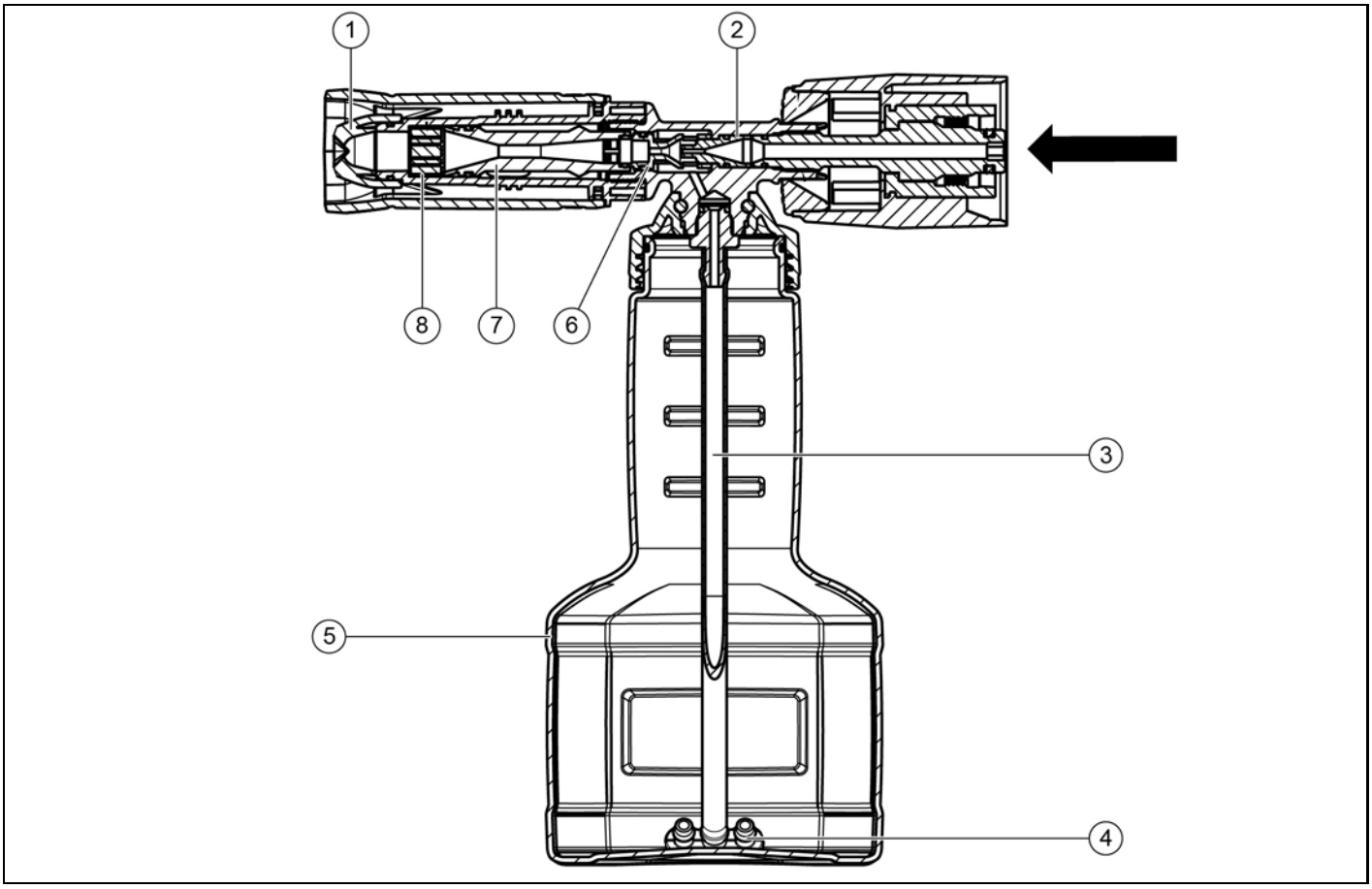
The type plate is located on the left-hand side.

① Operating pressure (max.)
② Working pressure
③ Flow rate
④ Power supply
⑤ Device designation
⑥ Connection output
⑦ Part number
⑧ Operating weight
⑨ Year of manufacture
⑩ Serial number
⑪ Degree of protection
⑫ Nozzle size
⑬ Input temperature (max.)
⑭ Barcode. Includes the part number and the serial number
⑮ Manufacturer's address

4.7 Recommended accessories

Foam lance

4.112-053.0
Foam lance TR Basic 1 (corresponds to nozzle 038) for 400-600 l/h
4.112-054.0
Foam lance TR Basic 2 (corresponds to nozzle 045) for 700-800 l/h
4.112-055.0
Foam lance TR Basic 3 (corresponds to nozzle 038) for 900-2500 l/h



① Foam nozzle
② Driving nozzle
③ Suction hose
④ Gate
⑤ Bottle
⑥ Detergent injector nozzle
⑦ Air injector nozzle
⑧ sieve

The foam lance is used for adding detergent when performing high pressure cleaning.
The water flow through the driving nozzle and detergent injector nozzle generates a vacuum that sucks detergent out of the bottle. The pluggable gate set (sizes 1 - 3) defines the amount of detergent injected. The water-detergent mixture passes through the air injector nozzle and sucks in air through the foam nozzle. The water-detergent-air mixture is intensively mixed by the sieve. The generated foam is expelled through the adjustable foam nozzle.
The foam lance is adjusted to suit the device power via different sizes of driving nozzles and detergent injector nozzles.

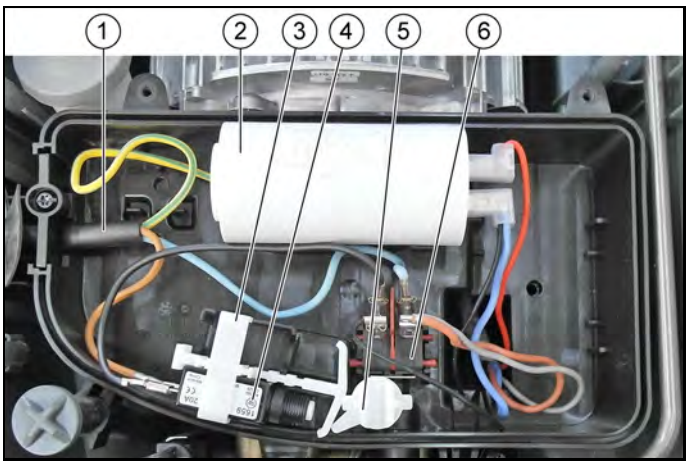
Note

Flush the foam nozzle clear after work and occasionally clean or replace the sieve as necessary.

5 Overview of the unit

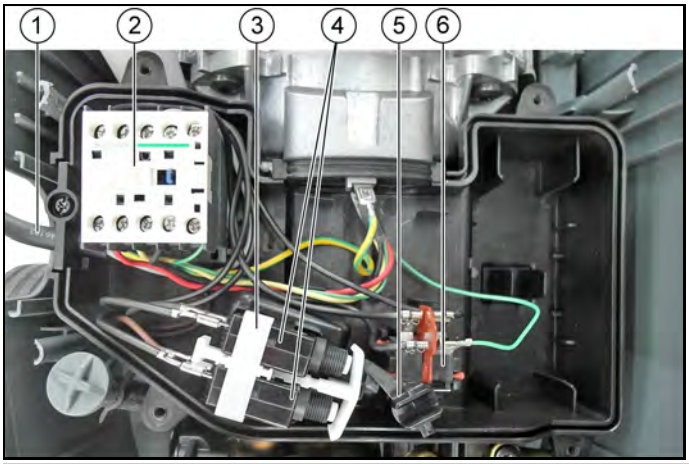
① Water connection
② Pump set
③ Rotary knob
④ Power supply cable
⑤ Hose reel (X variants only)
⑥ Handle
⑦ Trigger spray gun
⑧ Pipelines (X variants only)
⑨ Shoulder module with spray lance holder
⑩ Type plate
⑪ High-pressure outlet (Standard variant)

5.1 Overview of electrical box HD 6/15 MX



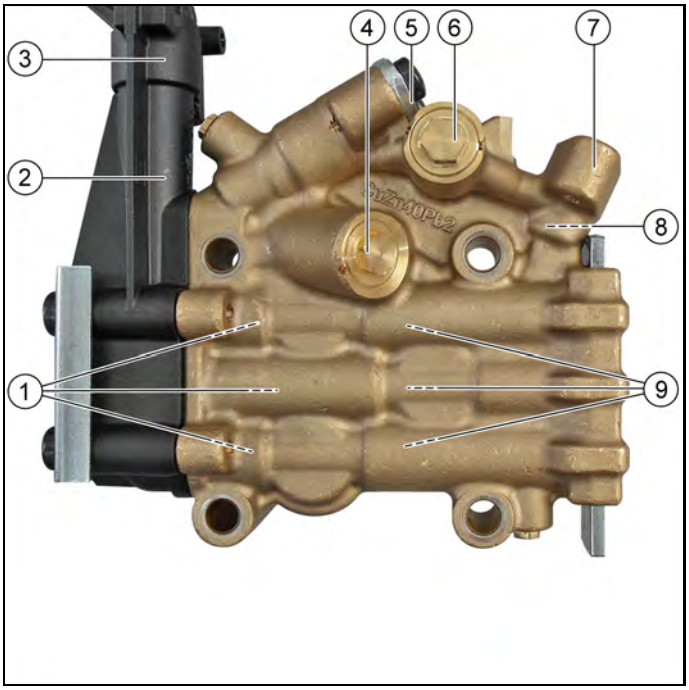
① Power supply cable
② Capacitor
③ Motor circuit breaker reset bow
④ Motor circuit breaker
⑤ Actuator
⑥ Power switch

5.2 Overview of electrical box HD 8/18 M



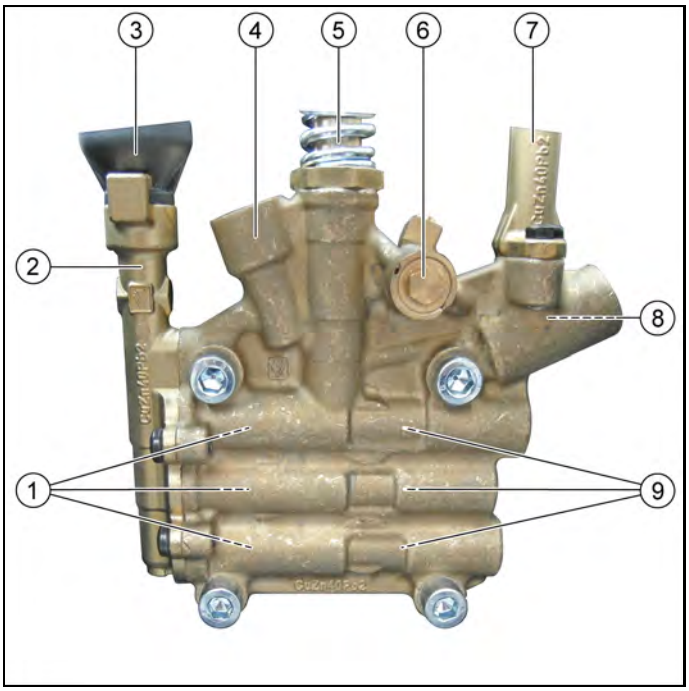
① Power supply cable
② Circuit breaker
③ Motor circuit breaker reset bow
④ Motor circuit breaker
⑤ Actuator
⑥ Power switch

5.3 Pump head HD 6/15 MX overview



① Suction valves
② Suction bridge
③ Water inlet
④ Startup valve
⑤ Pressure relief valve
⑥ Pressure switch
⑦ High-pressure outlet
⑧ Pressure retention valve
⑨ Pressure valves

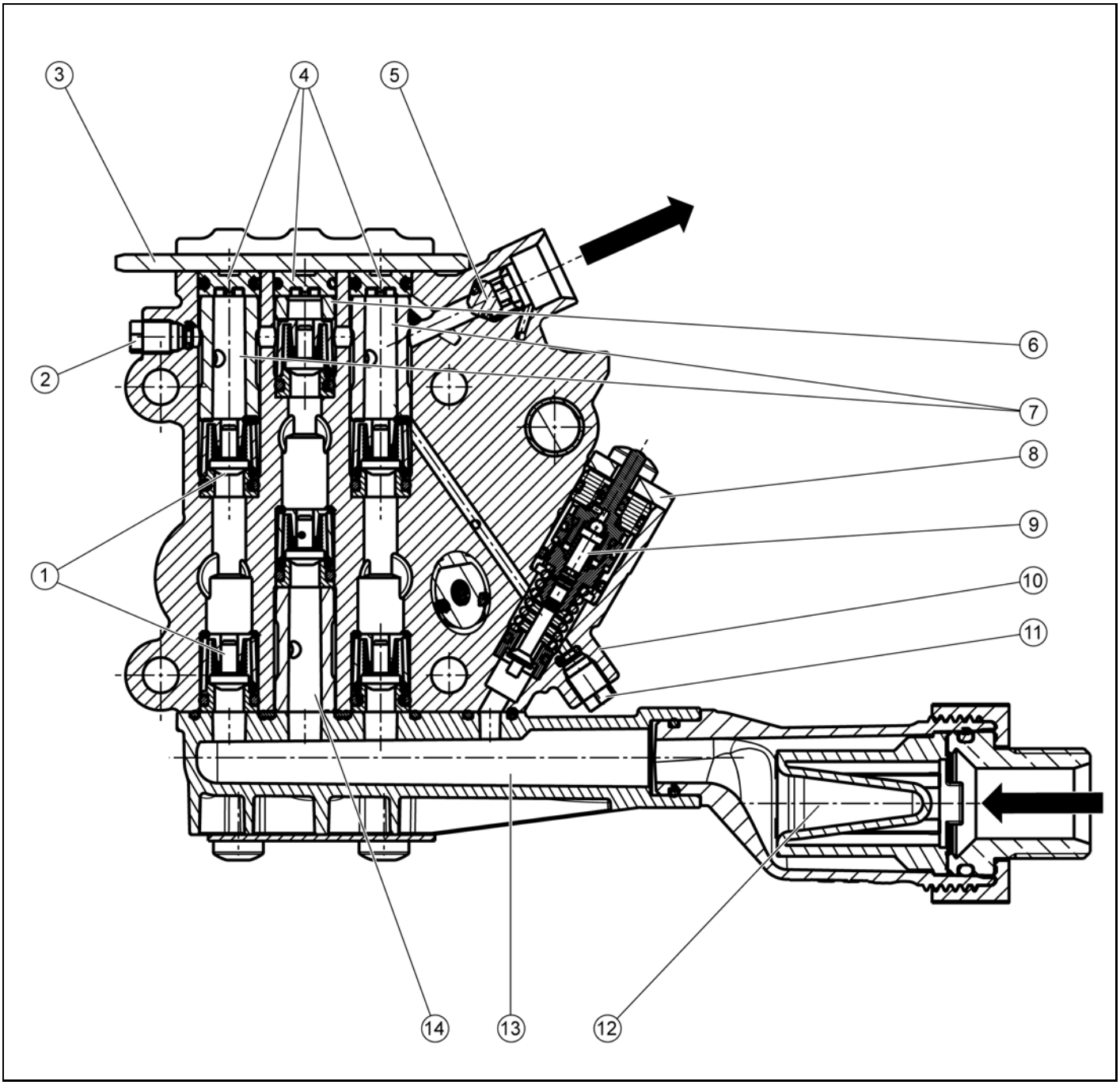
5.4 Pump head HD 8/18 M overview



① Suction valves
② Suction bridge
③ Water inlet
④ Pressure relief valve
⑤ Overflow valve
⑥ Pressure switch
⑦ High-pressure outlet
⑧ Pressure retention valve
⑨ Pressure valves

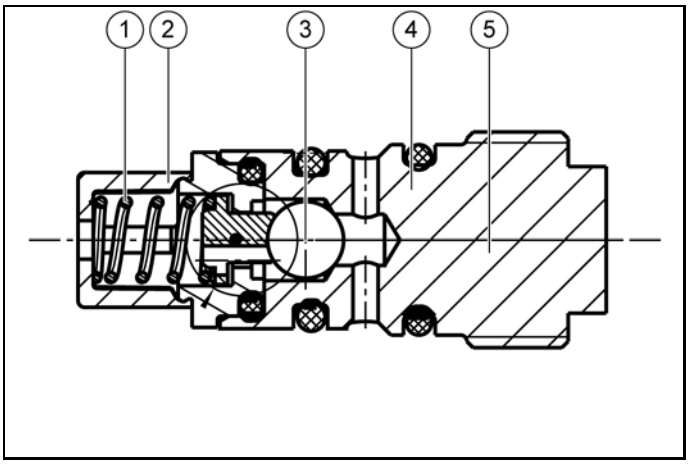
6 HD 6/15 M/MX cross-section drawings

Cylinder head



① Suction/pressure valve
② Plugs
③ Retaining plate
④ Caps
⑤ Pressure retention valve
⑥ Sleeve
⑦ Sleeves
⑧ Plate
⑨ Pressure relief valve
⑩ Cylinder head
⑪ Plugs
⑫ Water inlet with filter
⑬ Suction bridge
⑭ Sleeve

Startup valve

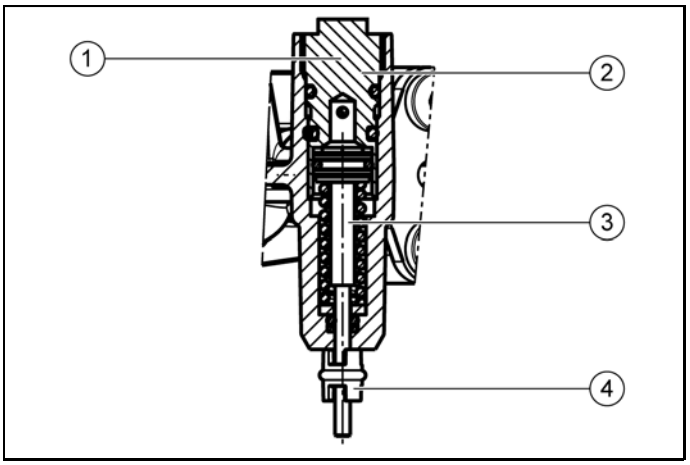


① Spring
② Valve seat
③ Ball
④ Sleeve
⑤ Startup valve

Note
Replacement startup valve only as a complete unit.

The startup valve eases the motor startup in single-phase devices.
The spring holds the ball open when the device is switched off. The motor starts up without back-pressure. After the motor has starts up, the water pressure closes the ball against the spring force.

Pressure switch



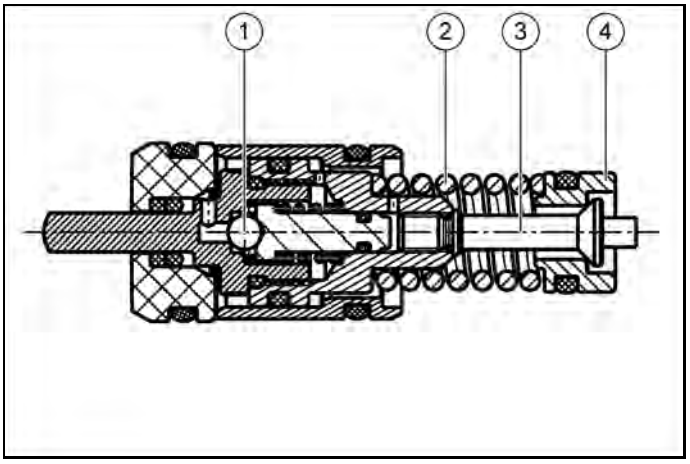
① Pressure switch

Note
Replacement pressure switch only as a complete unit.

② Sleeve
③ Complete pressure switch piston
④ Seal

Note
The seal prevents leakage water from penetrating into the electrical box.

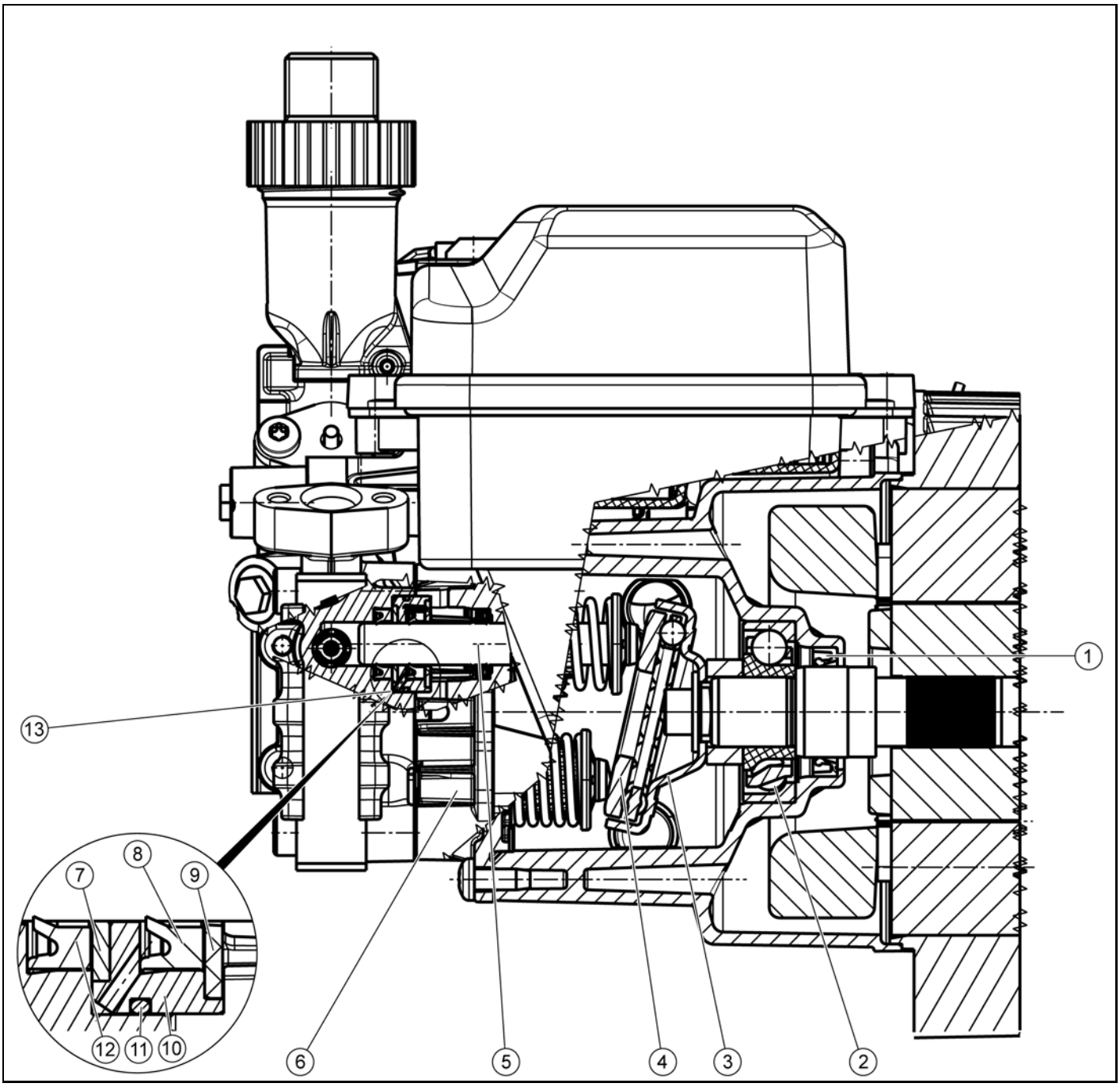
Overflow valve



① Pressure relief
② Spring
③ Piston
④ Valve seat

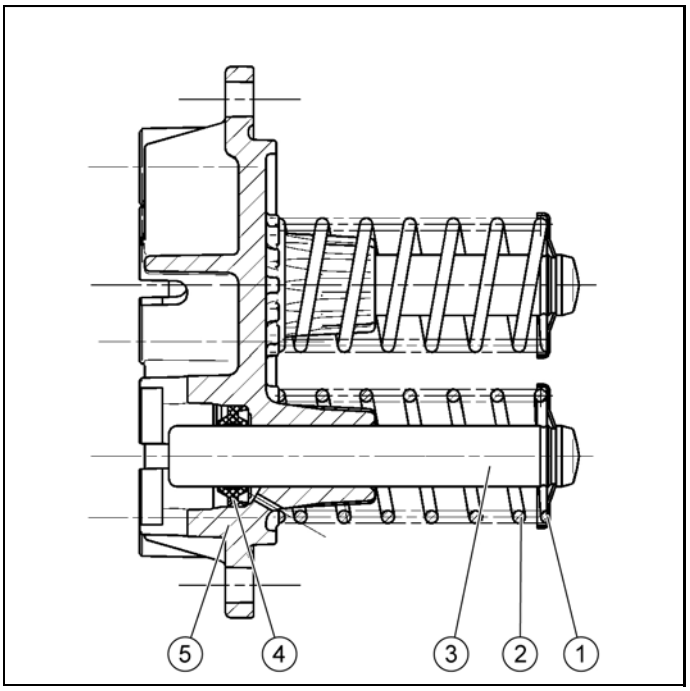
Note
Replacement pressure limiter only as a complete unit.

The pressure limiter protects the device from overpressure. After switching the device off via the gun, the pressure is reduced to approx. 50 bar. This preserves the pipeline system and eases opening of the gun.
When the gun is closed, the pressure tip opens the return line to the suction chamber via the valve seat against the spring force. The pressure relief also opens briefly.



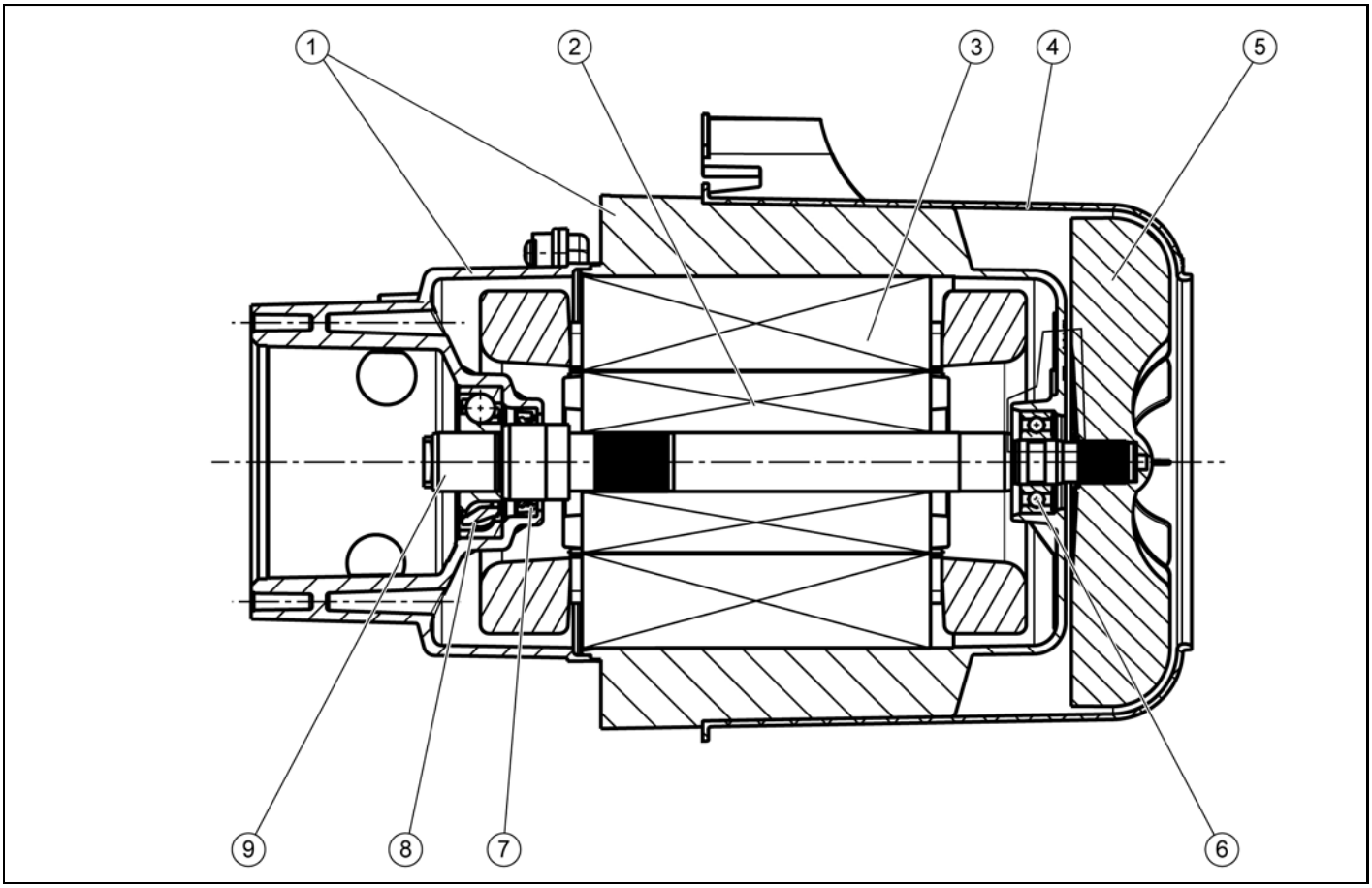
① Radial shaft seal
② Ball bearing (A bearing)
③ Swash plate
④ Axial bearing
⑤ Piston
⑥ Piston guide
⑦ Washer (plastic)
⑧ Low pressure seal
⑨ Washer (brass)
⑩ Socket
⑪ O-ring
⑫ High pressure seal
⑬ Gasket package

Straight thrust guide



① Washer
② Piston spring
③ Piston
④ Oil groove ring
⑤ Piston guide

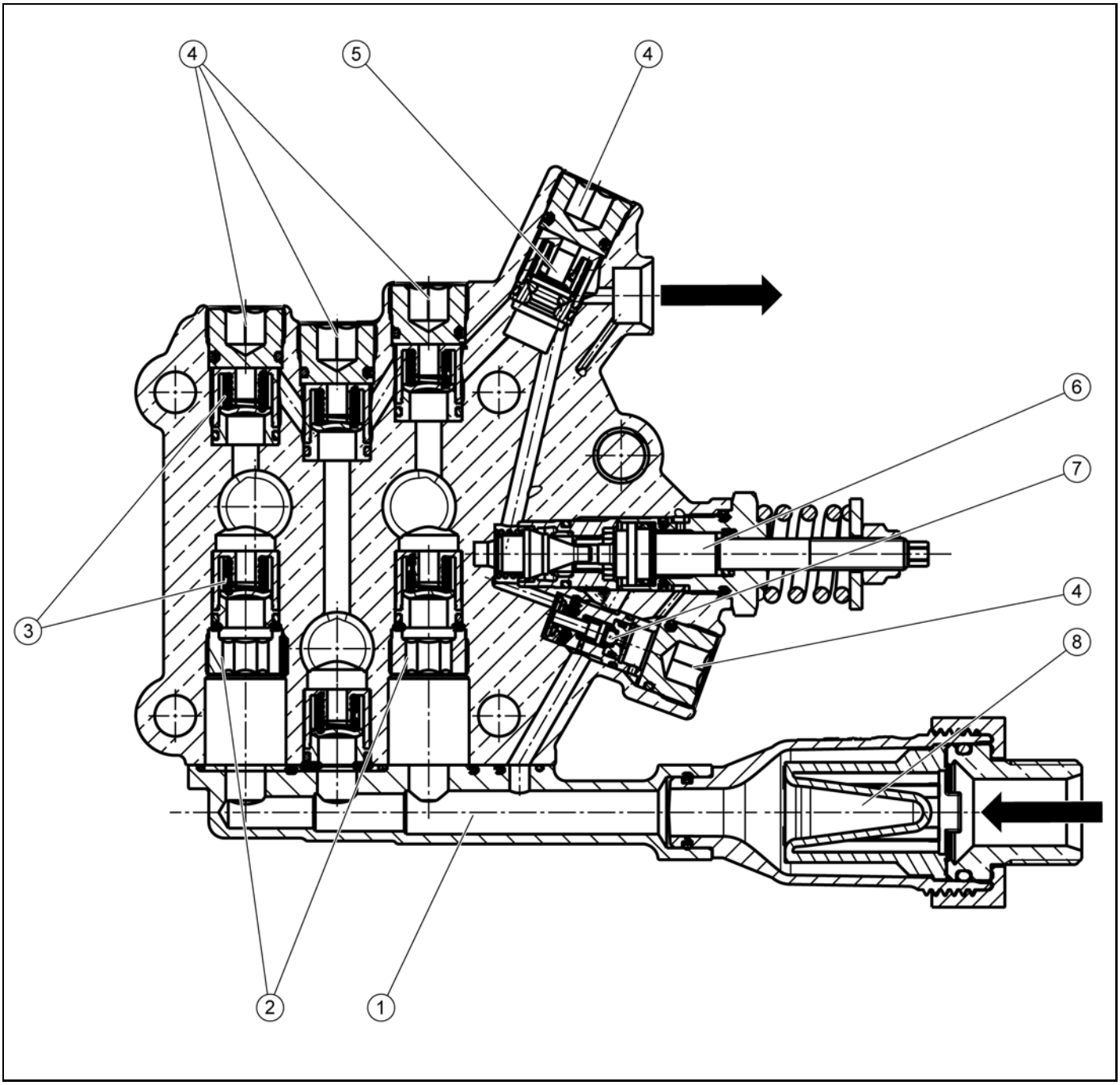
Motor



① Casing
② Rotor
③ Winding
④ Air guide
⑤ Fan
⑥ Ball bearing (B bearing)
⑦ Radial shaft seal
⑧ Ball bearing (A bearing)
⑨ Motor shaft

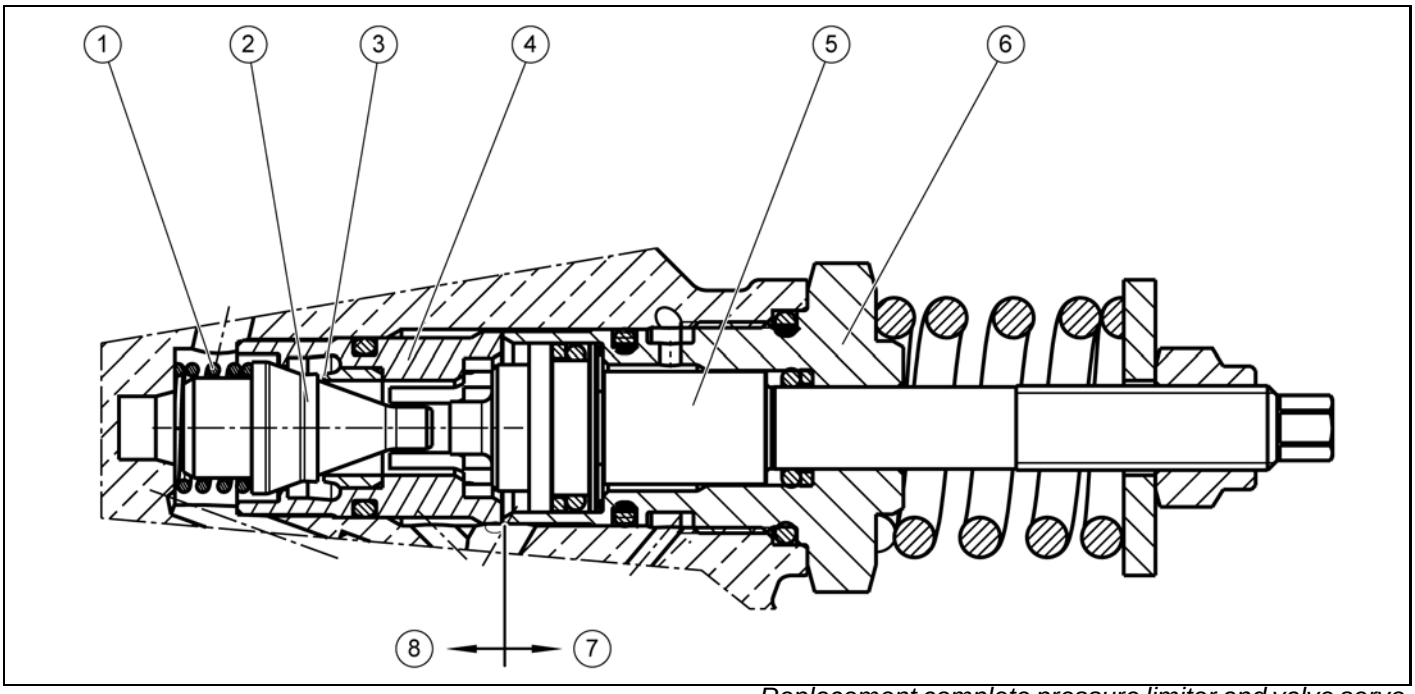
7 HD 8/18 M cross-section drawings

Cylinder head



① Suction bridge
② Screws
③ Suction/pressure valve
④ Valve screws
⑤ Pressure retention valve
⑥ Overflow valve
⑦ Pressure relief valve
⑧ Water inlet with filter

Overflow valve

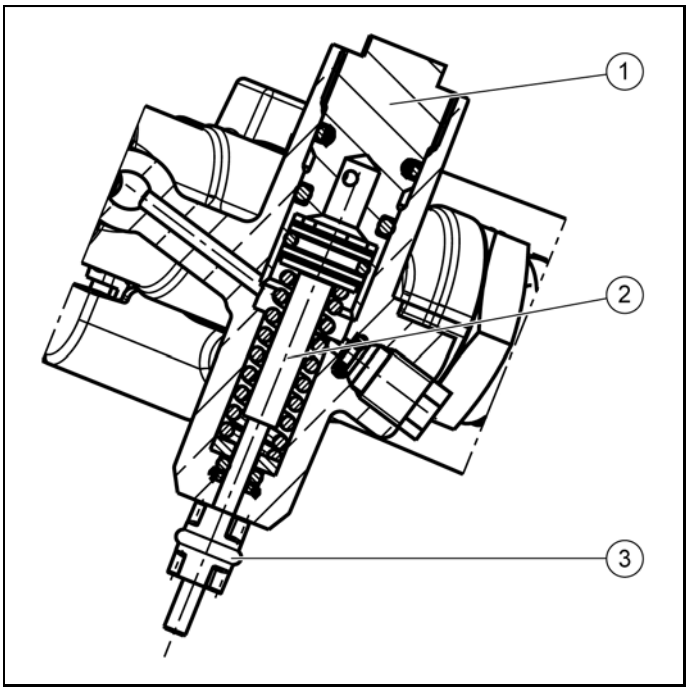


① Spring
② Taper
③ Valve seat
④ Sleeve
⑤ Piston
⑥ Overflow valve
⑦ Complete pressure limiter spare parts kit
⑧ Servo valve spare parts kit
Note
Replacement complete pressure limiter and valve servo only available as a complete spare parts kit.

The overflow valve is used for pressure regulation and provide overpressure protection.

The pressure in the system rises or falls according to the setting of the rotary control on the gun. When the pressure is sufficiently high, the piston lifts the taper more or less from the valve seat and water flows back to the suction side.

Pressure switch

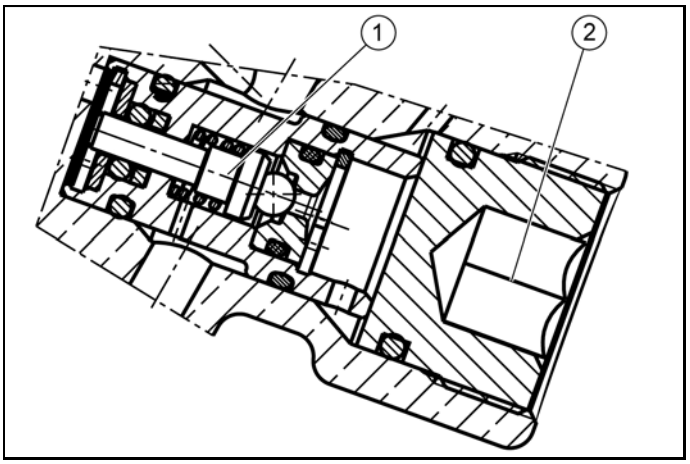


① Sleeve
② Complete pressure switch piston
③ Seal
Note
The seal prevents leakage water from penetrating into the electrical box.
Replacement pressure switch only as a complete unit.

The pressure switch switches off the device in the case of overpressure.

A sufficiently high water pressure in the device presses the pressure switch piston against the spring force and actuates the microswitch. The device switches off and then on again after pressure reduction.

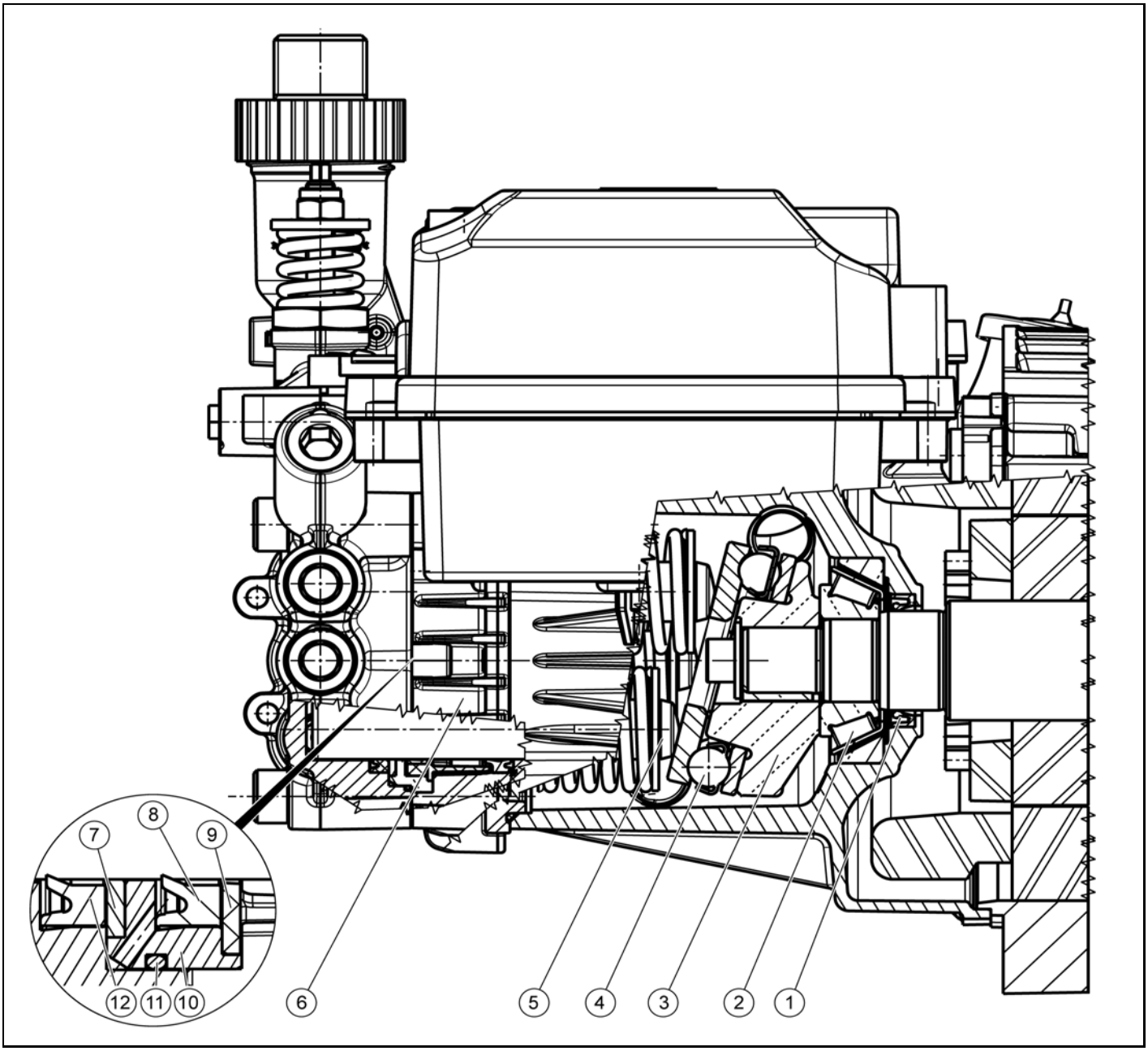
Pressure relief valve



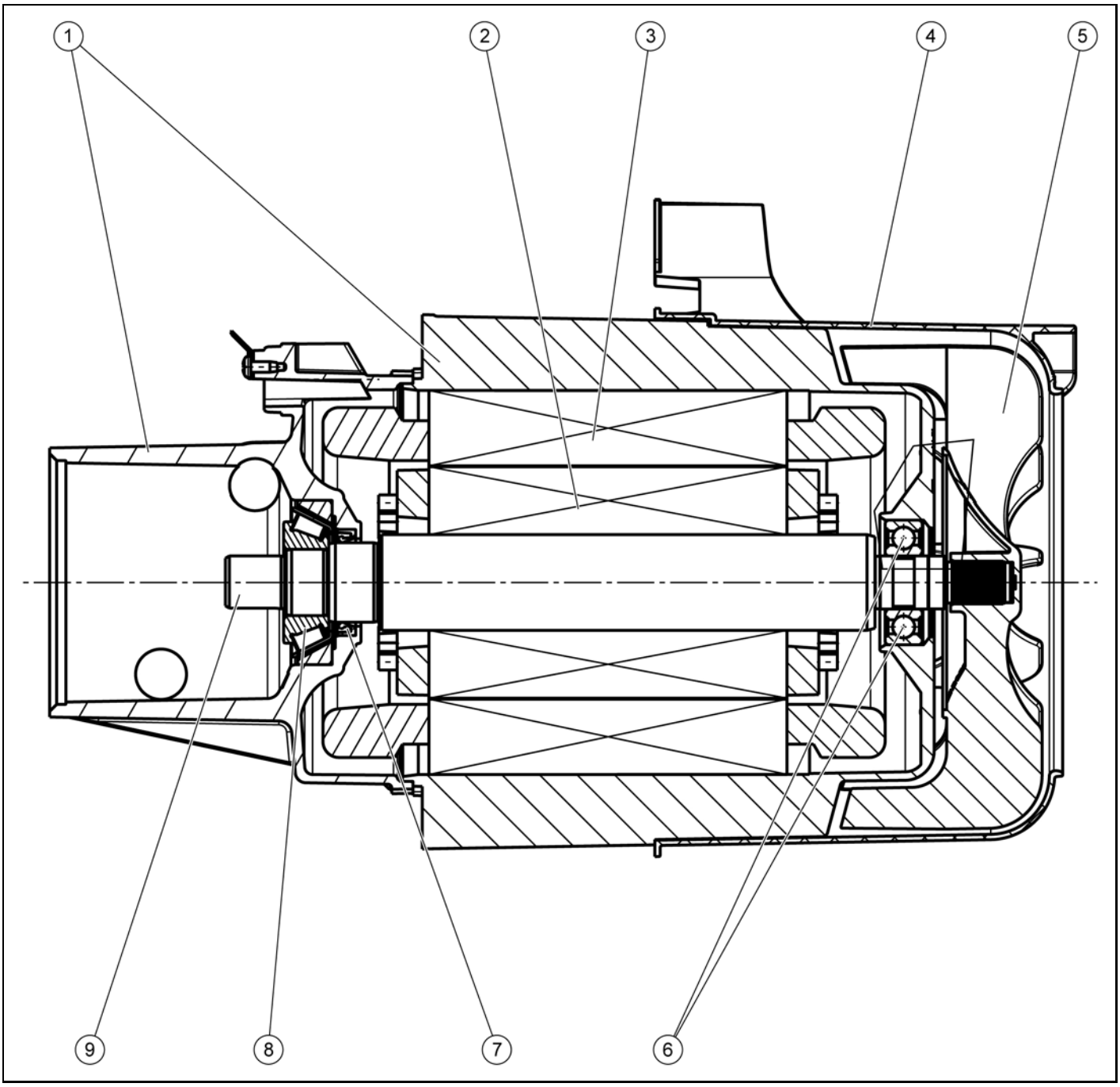
① Pressure relief valve
② Valve screw

After the device is switched off, the pressure relief valve lowers the device pressure to approx. 50 bar via the gun. This preserves the pipeline system and eases opening of the gun.
When the gun is closed, the pressure tip briefly opens the return line to the suction chamber, thus reducing the device pressure.

Pump set HD 8/18 M



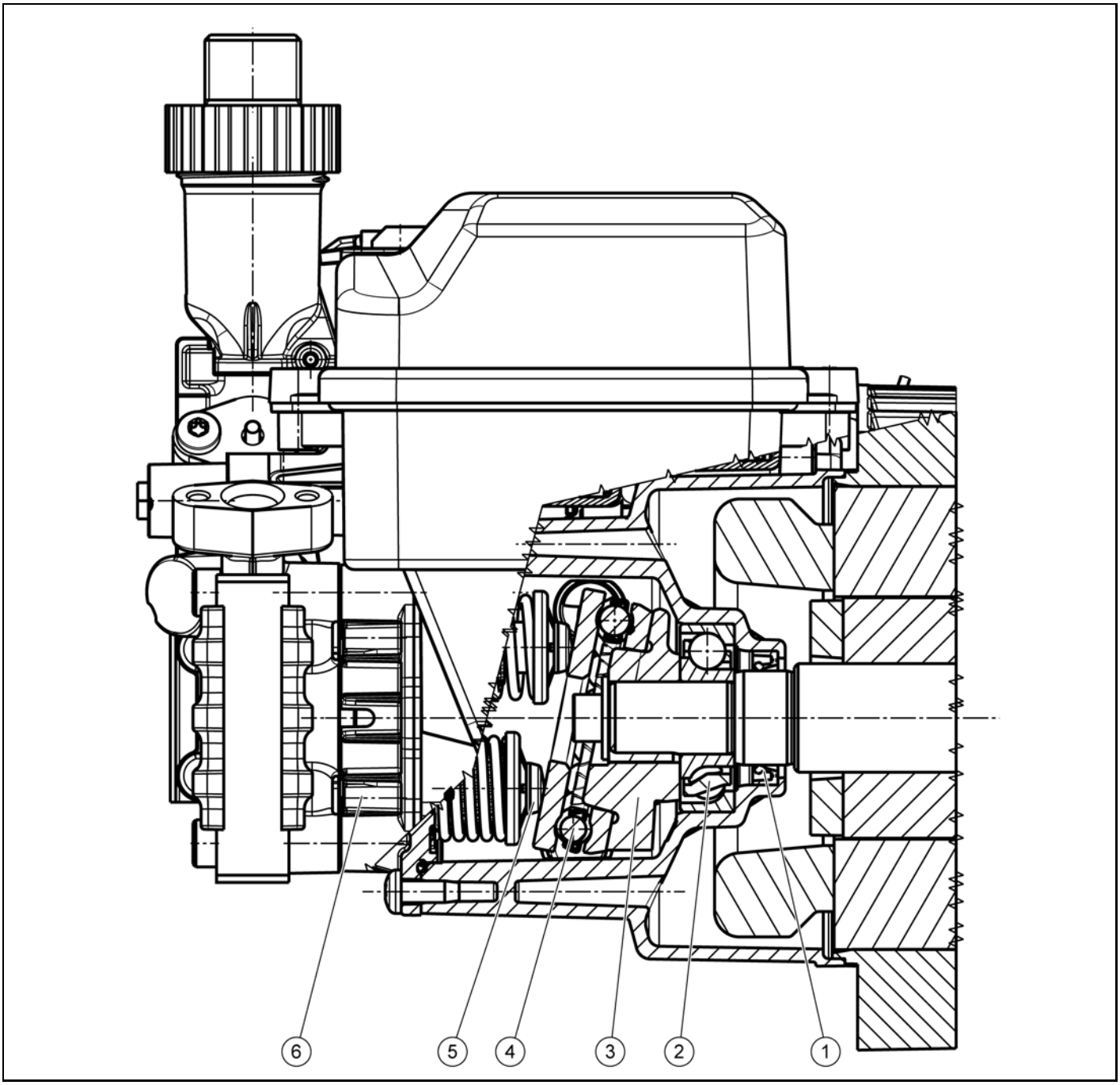
① Radial shaft seal
② Tapered ball bearing (A bearing)
③ Swash plate
④ Axial bearing
⑤ Piston
⑥ Piston guide
⑦ Washer (plastic)
⑧ Low pressure seal
⑨ Washer (brass)
⑩ Socket
⑪ O-ring
⑫ High pressure seal



① Casing
② Rotor
③ Winding
④ Air guide
⑤ Fan
⑥ Ball bearing (B bearing)
⑦ Radial shaft seal
⑧ Tapered ball bearing (A bearing)
⑨ Motor shaft

8 HD 7/17 M cross-section drawings

Pump set



① Radial shaft seal
② Ball bearing (A bearing)
③ Swash plate
④ Axial bearing
⑤ Piston
⑥ Piston guide

9 Structure of service group

9.1 010 Safety instructions

⚠ DANGER

Danger of lethal electric shock from electrical voltage.

Switch off the device immediately and unplug the mains plug before performing work.

⚠ CAUTION

Risk of injury from escaping high-pressure water.

Depressurise the system prior to all work.

⚠ CAUTION

Risk of burns from hot surfaces.

Allow the device to cool down prior to all work.

9.2 020 Structure overview

① 9.4.2 Opening / closing the electrical box
9.4.3 Removing/installing the electrical box HD 6/15 MX
9.4.4 Removing/installing the electrical box HD 8/18 M

② 9.4.1 Opening / closing the cover

③ 9.4.6 Removing/installing the hose reel angle piece

④ 9.4.9 Removing/installing the hose reel

⑤ 9.4.7 Removing/installing, disassembling the shoulder module

⑥ 9.4.5 Removing/installing the chassis

⑦ 9.4.8 Removing/installing a wheel

⑧ 9.4.10 Removing/installing the power switch linkage

9.3 030 Function

No special functional features.

9.4 040 Service activities

Note

Unless otherwise described, installation is performed in reverse order.

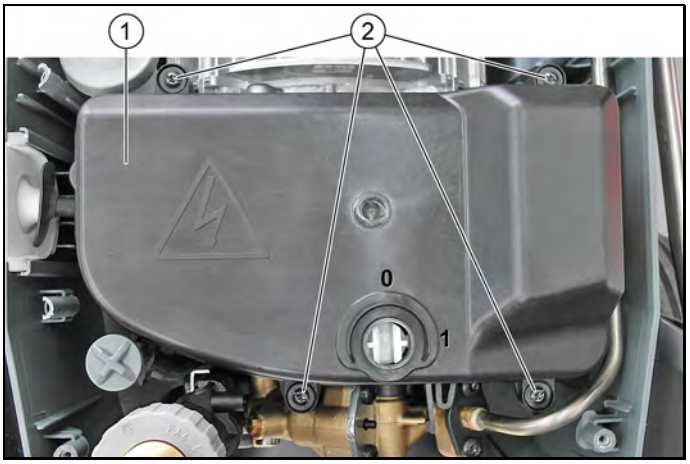
9.4.1 Opening / closing the cover

① Rotary knob
② Cover
③ Screws

1. Turn the rotary knob to position "0".
2. Unscrew the screws.
3. Remove the cover.

9.4.2 Opening / closing the electrical box

- 9.4.1 Opening / closing the cover

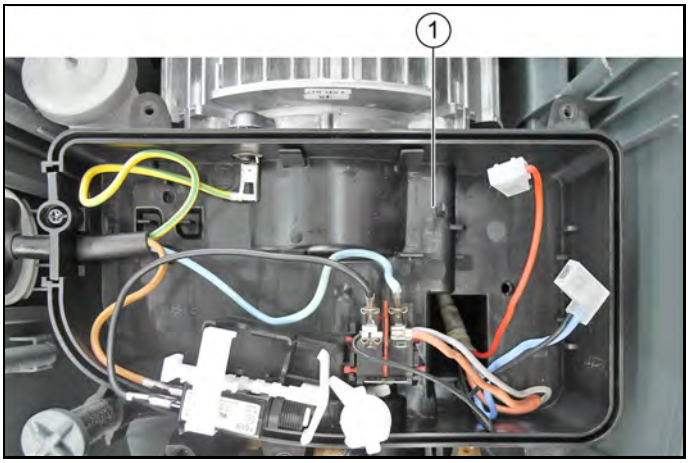


① Cover
② Screws

1. Unscrew the screws.
2. Remove the cap.

9.4.3 Removing/installing the electrical box HD 6/15 MX

- 9.4.2 Opening / closing the electrical box
- 10.4.1 Removing/installing the capacitor
- 10.4.4 Removing/installing the power supply cable
- 10.4.2 Removing/installing the motor circuit breaker
- 10.4.6 Removing/installing the power switch

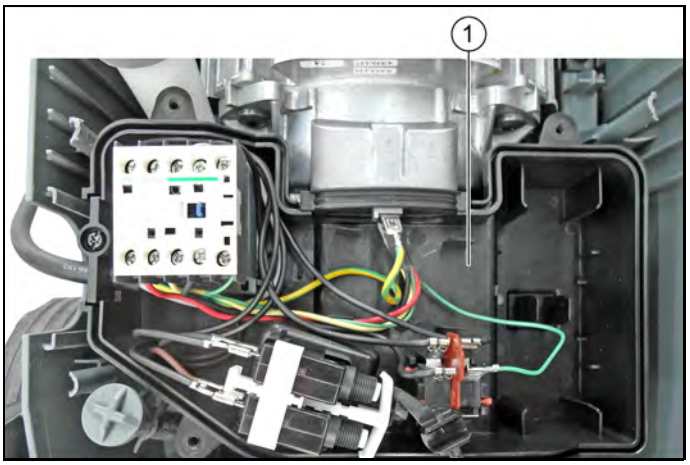


① Electrical box

1. Remove the electrical box.

9.4.4 Removing/installing the electrical box HD 8/18 M

- 9.4.2 Opening / closing the electrical box
- 10.4.3 Removing/installing the motor circuit breaker
- 10.4.5 Removing/installing the power supply cable
- 10.4.6 Removing/installing the power switch
- 10.4.7 Removing/installing the contactor HD 8/18 M

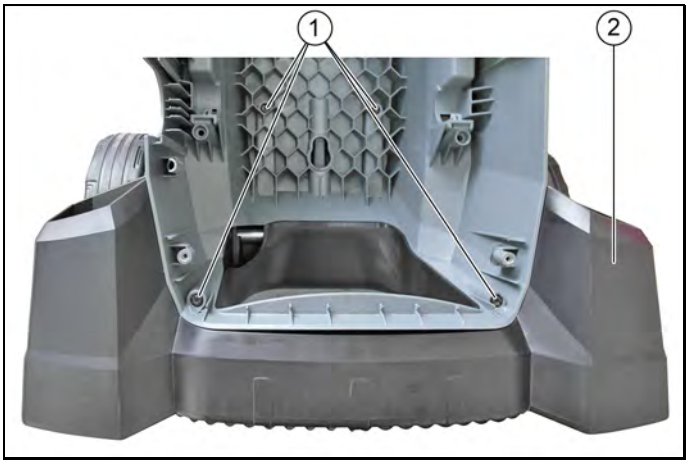


① Electrical box

1. Remove the electrical box.

9.4.5 Removing/installing the chassis

- 11.4.15 Removing/installing the pump set (non-cage variants)

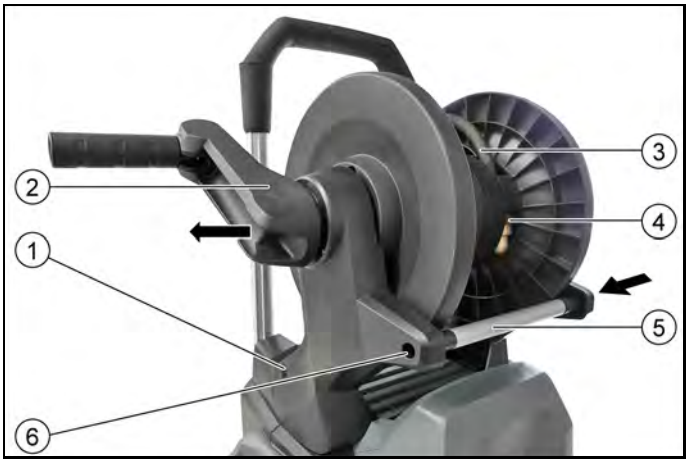


① Screws
② Chassis

1. Unscrew the screws.
2. Remove the chassis.

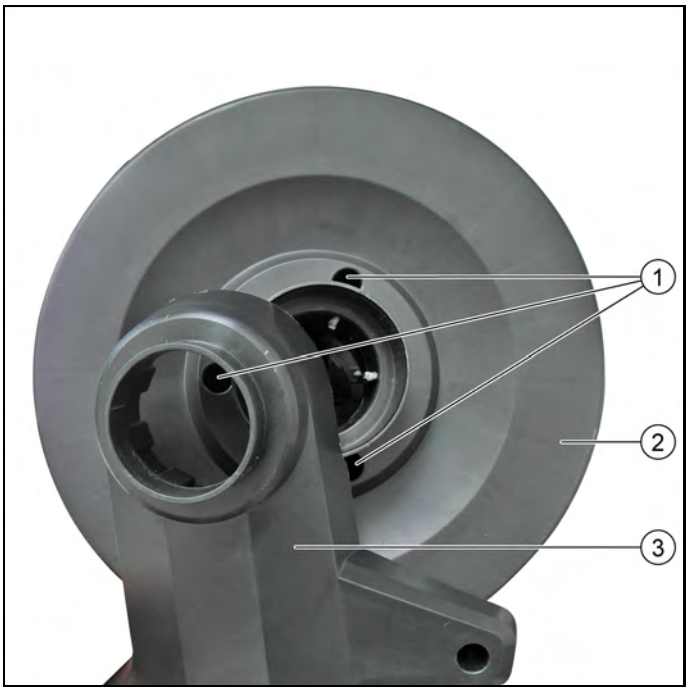
9.4.6 Removing/installing the hose reel angle piece

- 11.4.1 Removing/installing the pipeline HD 6/15 MX



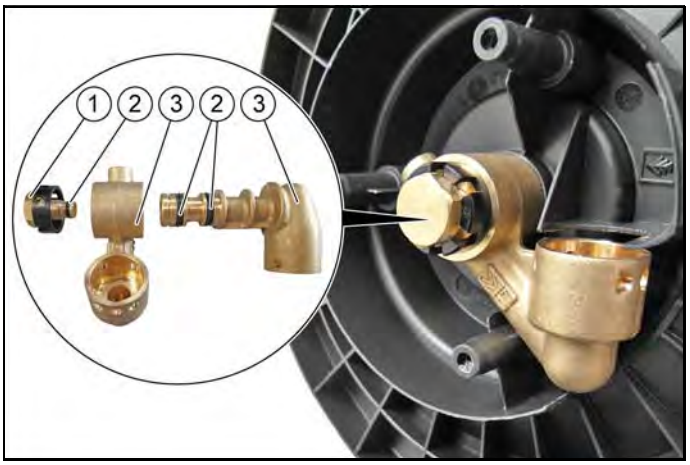
① Screw
② Handle
③ High-pressure hose
④ Clip
⑤ Sleeve and rod
⑥ Rod screw

1. Unroll the high-pressure hose.
2. Pull out the clip.
3. Pull off the high-pressure hose.
4. Remove the handle.
5. Unscrew the screw.
6. Press the rod into the latch and counter-hold in order to loosen and tighten the rod screw.
7. Remove the sleeve and rod.



① Screws
② Hose reel half
③ Hose reel holder

8. Pull the hose reel halves apart.
9. Unscrew the screws.
10. Remove the hose reel halves.



① Screw
② O-rings
③ Angle piece

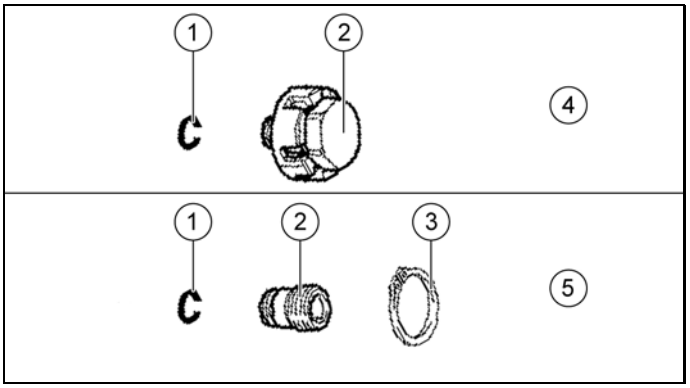
11. Unscrew the screw and remove the retaining ring.
12. Pull off the angle piece.

Installation information

Check the O-ring and angle piece for wear and damage and replace if necessary.

Grease the O-rings before installation.

	Item number
Silicon grease	6.288-044.0

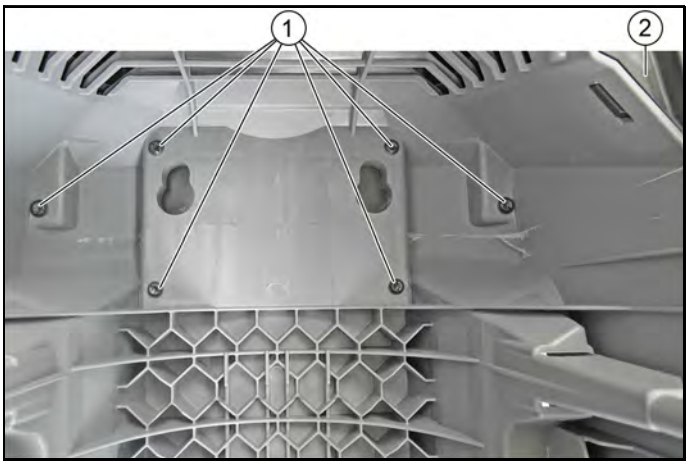


① O-ring
② Screw
③ Retaining ring
④ Series design illustration
⑤ Replacement design illustration

13.Install the angle piece according to the version.

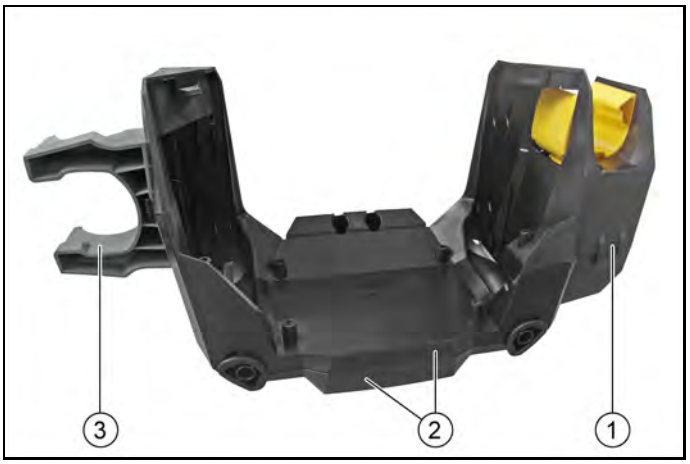
9.4.7 Removing/installing, disassembling the shoulder module

- 9.4.9 Removing/installing the hose reel
- 11.4.15 Removing/installing the pump set (non-cage variants)



① Screws
② Shoulder module

1. Unscrew the screws.
2. Remove the shoulder module.



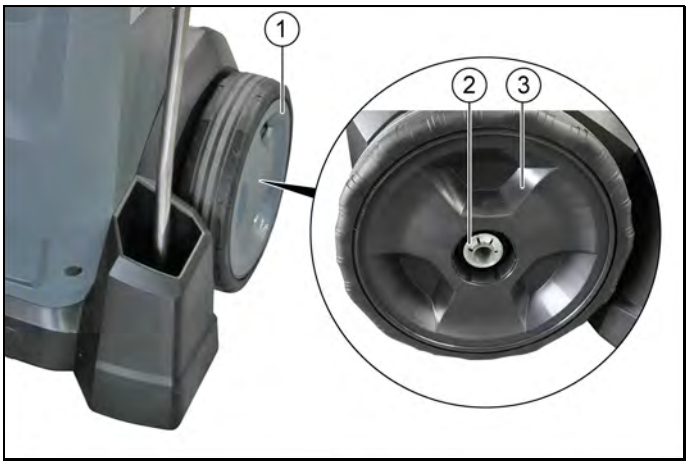
① Lock
② Shoulder module
③ Cup foam lance holder

3. Release the lock.
4. Pull the cup foam lance holder upwards and off.
5. Disconnect the shoulder module.

① Shoulder module
② Handle
③ Spring
④ Handle lock
⑤ Spray lance holder

6. As necessary:
   Replace the handle, spring, handle lock or spray lance holder.

9.4.8 Removing/installing a wheel



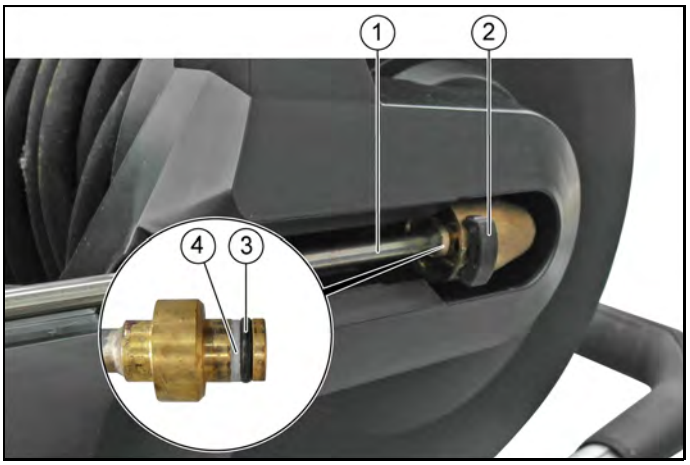
① Hubcap
② Retaining ring
③ Wheel

1. Remove the hubcap.
2. Remove the retaining ring.
3. Remove the wheel.

Installation information

Use a new retaining ring.

9.4.9 Removing/installing the hose reel

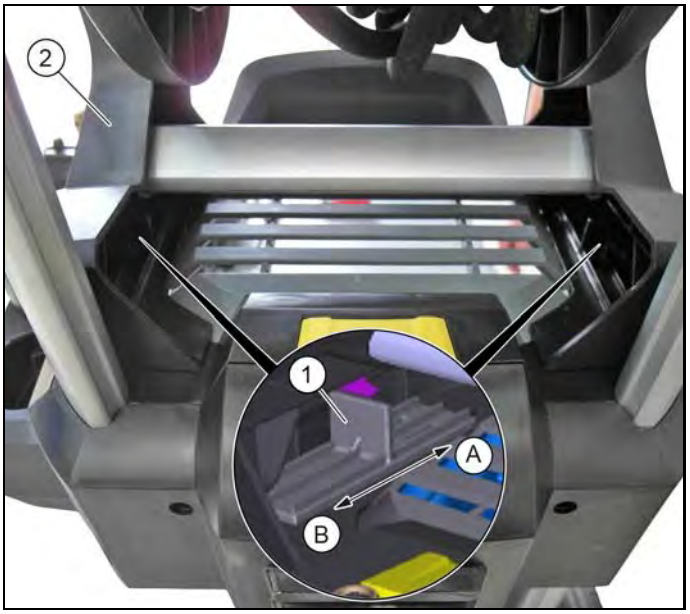


① Pipeline
② Clip
③ O-ring
④ Support ring

1. Pull out the clip.
2. Pull ff the pipeline.

Installation information

Check the O-ring and support ring for damage and replace if necessary.



① Slide
② Hose reel

3. Unlock the slide.

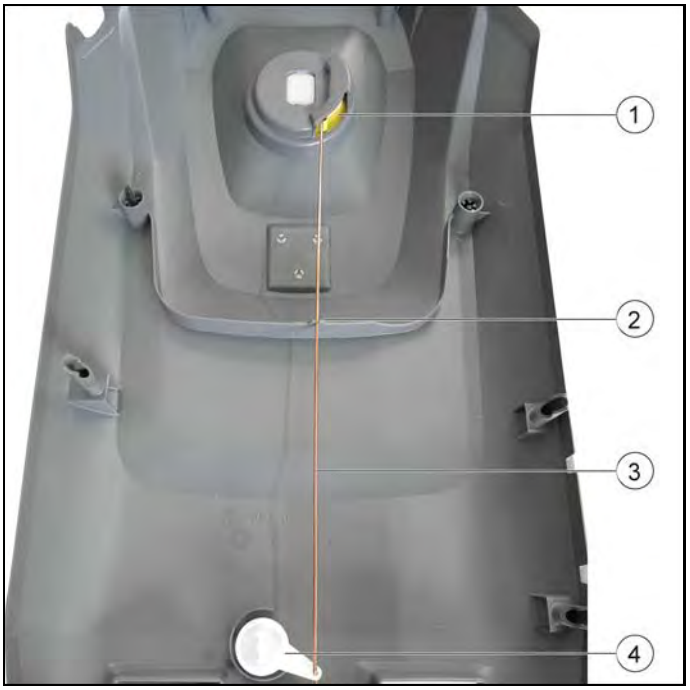
Note

Press the slide in direction A to unlock.
Push the slide in direction B to lock.

4. Remove the hose reel.

9.4.10 Removing/installing the power switch linkage

- 9.4.1 Opening / closing the cover

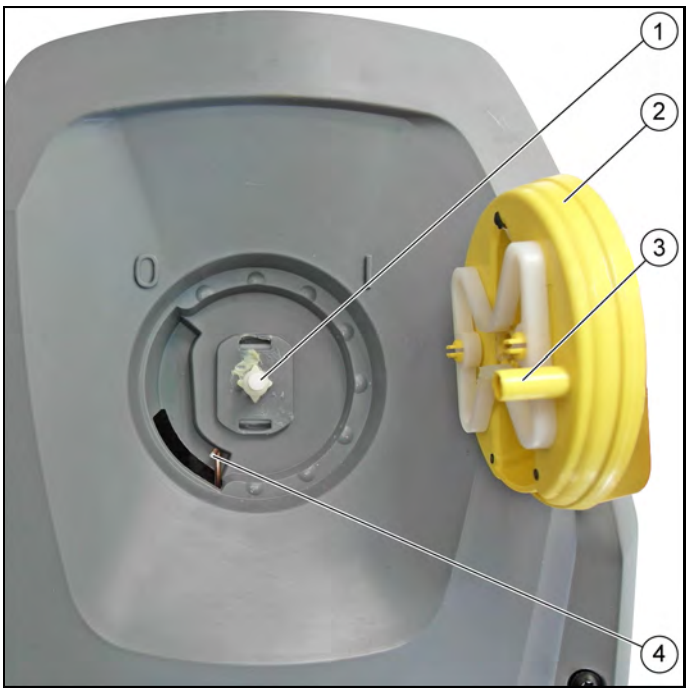


① Rotary knob
② Guide
③ Power switch linkage
④ Lever

1. Pull off the rotary knob.
2. Pull the power switch linkage out of the guide.
3. Remove the power switch linkage from the lever.
4. Remove the power switch linkage.

Installation information

Observe the position of the rotary knob (0-I), the lever and the switch in the electrical box when installing the cover.

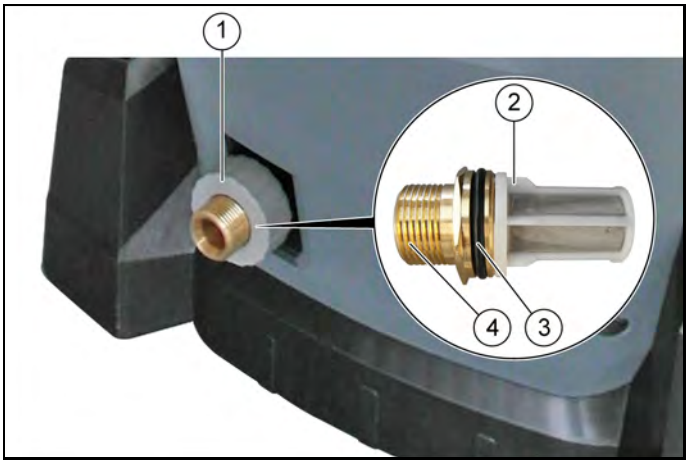


① Rotary knob fastening
② Rotary knob
③ Guide
④ Power switch linkage

When fitting the rotary knob, take care to ensure that the power switch linkage sits correctly in the guide.

9.5 050 Service and inspection

9.5.1 Cleaning the water filter



① Nut
② Water filter
③ O-ring
④ Water connection

1 Unscrew the nuts.
2 Pull out and clean the water connection with water filter.

Installation information

Check the O-rings for wear and damage and replace if necessary.

9.6 060 Fault diagnosis

This service group does not have fault diagnosis

9.7 070 Special features / other

This service group does not have any special features.

10 Electrical system service group

10.1 010 Safety instructions

⚠ **DANGER**

Danger of lethal electric shock from electrical voltage.

Switch off the device immediately and unplug the mains plug before performing work.

⚠ **CAUTION**

Risk of injury from escaping high-pressure water.

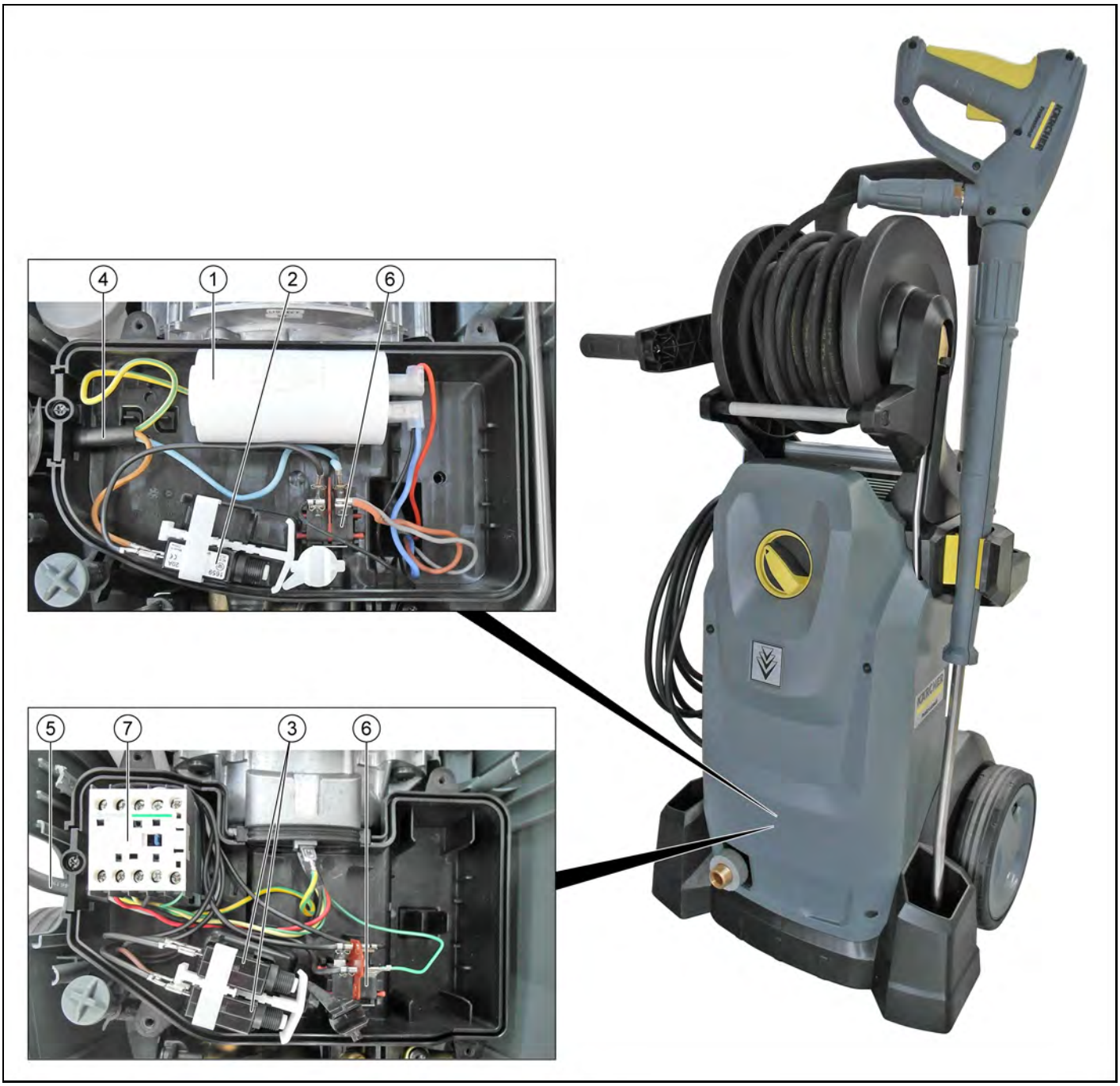
Depressurise the system prior to all work.

⚠ **CAUTION**

Risk of burns from hot surfaces.

Allow the device to cool down prior to all work.

10.2 020 Overview



① 10.4.1 Removing/installing the capacitor
② 10.4.2 Removing/installing the motor circuit breaker
③ 10.4.3 Removing/installing the motor circuit breaker
④ 10.4.4 Removing/installing the power supply cable
⑤ 10.4.5 Removing/installing the power supply cable
⑥ 10.4.6 Removing/installing the power switch
⑦ 10.4.7 Removing/installing the contactor HD 8/18 M

10.3 030 Function

No special functional features.

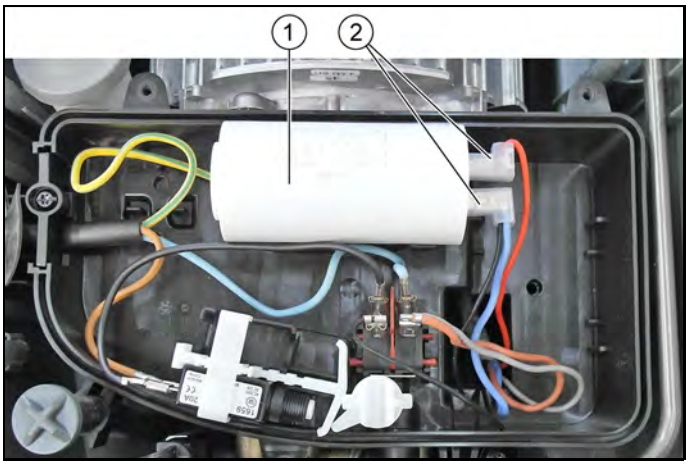
10.4 040 Service activities

Note

Unless otherwise described, installation is performed in reverse order.

10.4.1 Removing/installing the capacitor

- 9.4.2 Opening / closing the electrical box

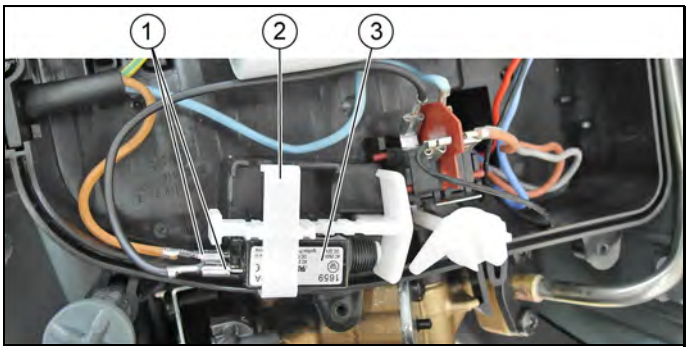


① Capacitor
② Electric socket plug connections

1. Disconnect electrical socket plug connections.
2. Remove the capacitor.

10.4.2 Removing/installing the motor circuit breaker

- 9.4.2 Opening / closing the electrical box

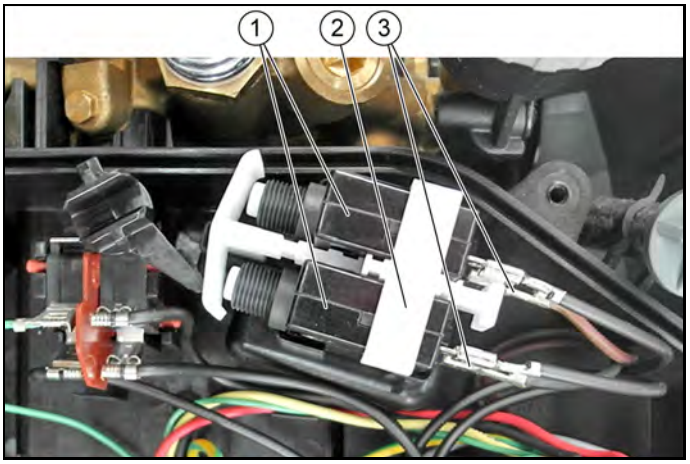


① Electric socket plug connections
② Bow
③ Motor circuit breaker

1. Remove the bow.
2. Disconnect electrical socket plug connections.
3. Remove the motor circuit breaker.

10.4.3 Removing/installing the motor circuit breaker

- 9.4.2 Opening / closing the electrical box

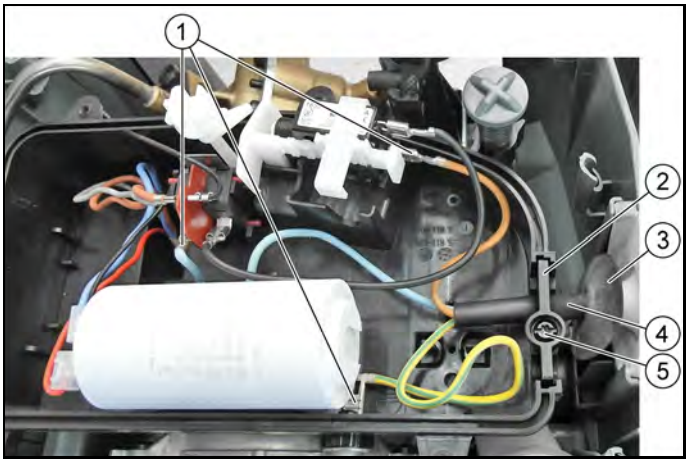


① Motor circuit breaker
② Bow
③ Electric socket plug connections

1. Remove the bow.
2. Mark the electric socket plug connections.
3. Disconnect electrical socket plug connections.
4. Remove the motor circuit breaker.

10.4.4 Removing/installing the power supply cable

- 9.4.2 Opening / closing the electrical box



① Electric socket plug connections
② Strain relief
③ Seal
④ Power supply cable
⑤ Screw

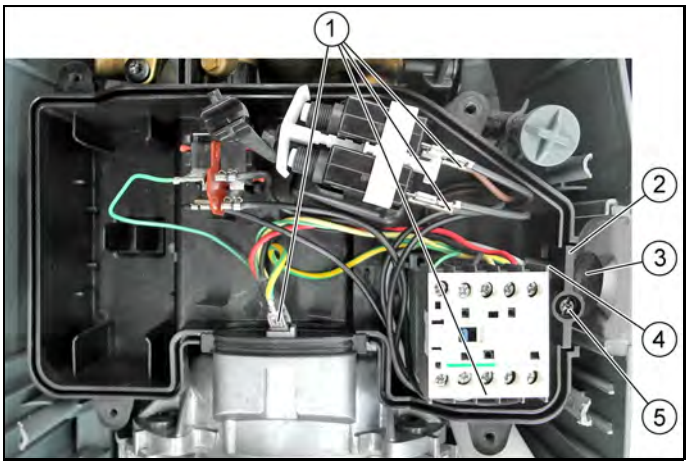
1. Mark the electric socket plug connections.
2. Disconnect electrical socket plug connections.
3. Unscrew the screw.
4. Remove the strain relief.
5. Unthread the mains power cable.

Installation information

Observe the position of the seal during installation.

10.4.5 Removing/installing the power supply cable

- 9.4.2 Opening / closing the electrical box



① Electric socket plug connections
② Strain relief
③ Seal
④ Power supply cable
⑤ Screw

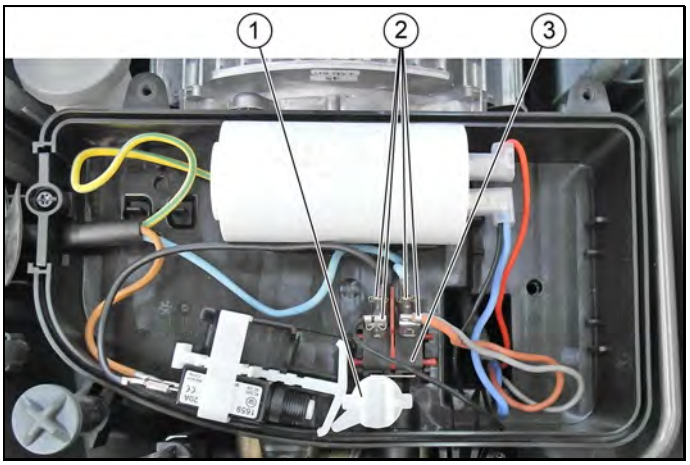
1. Mark the electric socket plug connections.
2. Disconnect electrical socket plug connections.
3. Unscrew the screw.
4. Remove the strain relief.
5. Unthread the mains power cable.

Installation information

Observe the position of the seal during installation.

10.4.6 Removing/installing the power switch

- 9.4.2 Opening / closing the electrical box

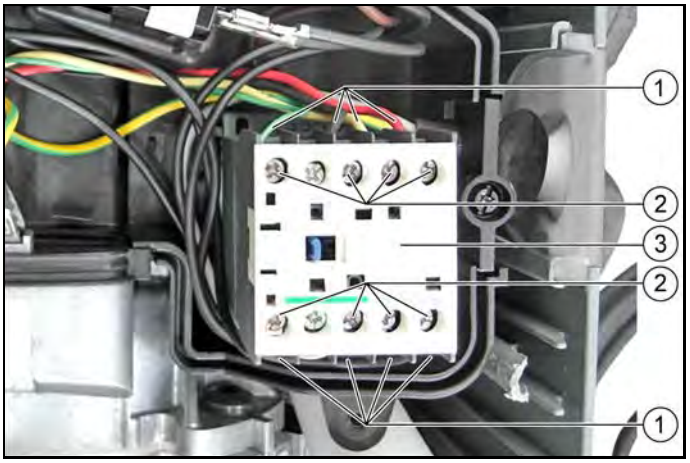


① Switch
② Electric socket plug connections
③ Power switch

1. Remove the switch.
2. Mark the electric socket plug connections.
3. Disconnect electrical socket plug connections.
4. Remove the power switch.

10.4.7 Removing/installing the contactor HD 8/18 M

- 9.4.2 Opening / closing the electrical box



① Electrical power cable
② Screws
③ Circuit breaker

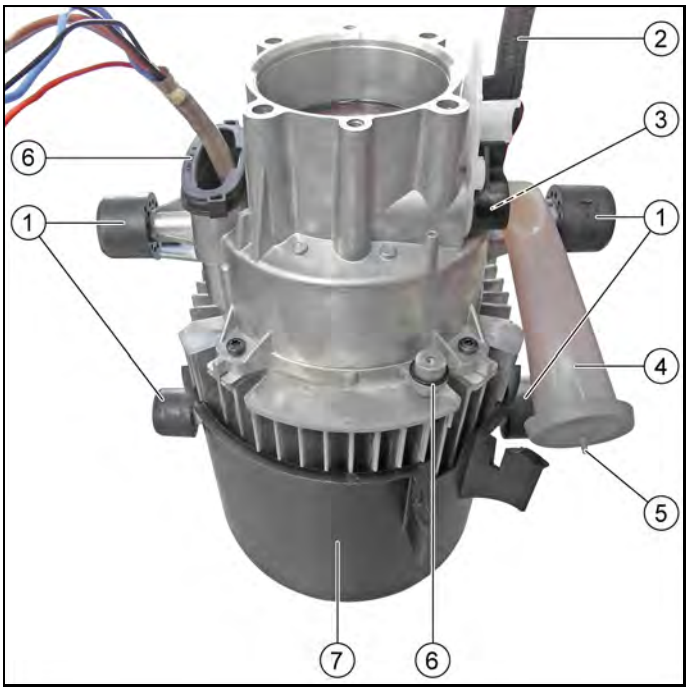
1. Mark the electrical power cable.
2. Unscrew the screws.
3. Remove the electrical power cable.
4. Remove the contactor.

Note

Remove the electrical power cables individually from the defective contactor and immediately connect to the new contactor.
Observe the current circuit diagram.

10.4.8 Removing/installing the motor HD 6/15 MX

- 11.5.1 Draining/replacing the pump oil
- 11.4.15 Removing/installing the pump set (non-cage variants)
- 9.4.3 Removing/installing the electrical box HD 6/15 MX
- 11.4.18 Removing/installing the swash plate for 2-pole motors



① Motor bearing
② Oil drain hose
③ Screw
④ Oil filler neck with cap
⑤ Venting
⑥ Seals
⑦ Air guide

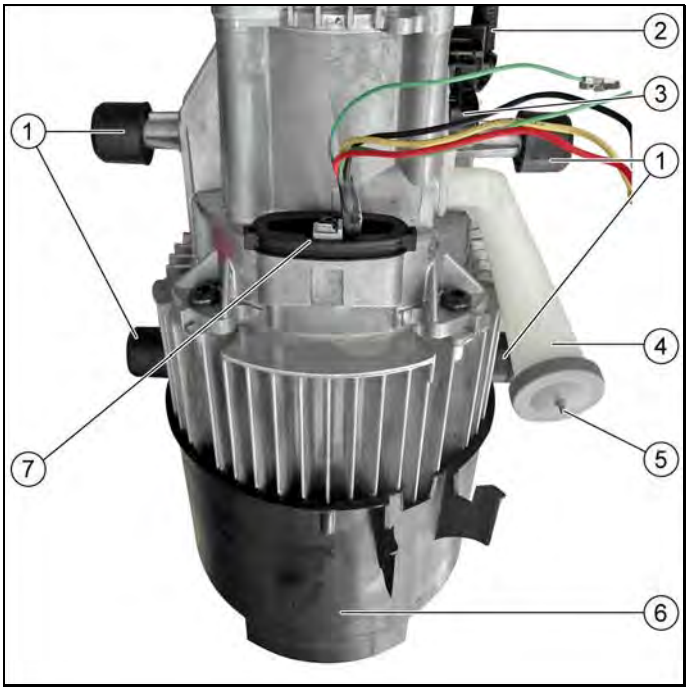
1. Pull off the motor bearing.
2. Unscrew the screw.
3. Remove the oil drain hose and oil filler neck with cap.
4. Remove the seals.
5. Pull off the air guide.

Note

Do not cut off the breather.

10.4.9 Removing/installing the motor HD 8/18 M

- 11.5.1 Draining/replacing the pump oil
- 11.4.15 Removing/installing the pump set (non-cage variants)
- 9.4.4 Removing/installing the electrical box HD 8/18 M
- 11.4.19 Removing/installing the swash plate for 4-pole motors



① Motor bearing
② Oil drain hose
③ Screw
④ Oil filler neck with cap
⑤ Venting
⑥ Air guide
⑦ Seal

1. Pull off the motor bearing.
2. Unscrew the screw.
3. Remove the oil drain hose and oil filler neck with cap.
4. Remove the seal.
5. Pull off the air guide.

Note

Do not cut off the breather.

10.5 050 Service and inspection

Service group does not contain any maintenance and inspection points.

10.6 060 Fault diagnosis

This service group does not have fault diagnosis

10.7 070 Special features / other

This service group does not have any special features.

11 Pump service group

11.1 010 Safety instructions

⚠ DANGER

Danger of lethal electric shock from electrical voltage.

Switch off the device immediately and unplug the mains plug before performing work.

⚠ CAUTION

Risk of injury from escaping high-pressure water.

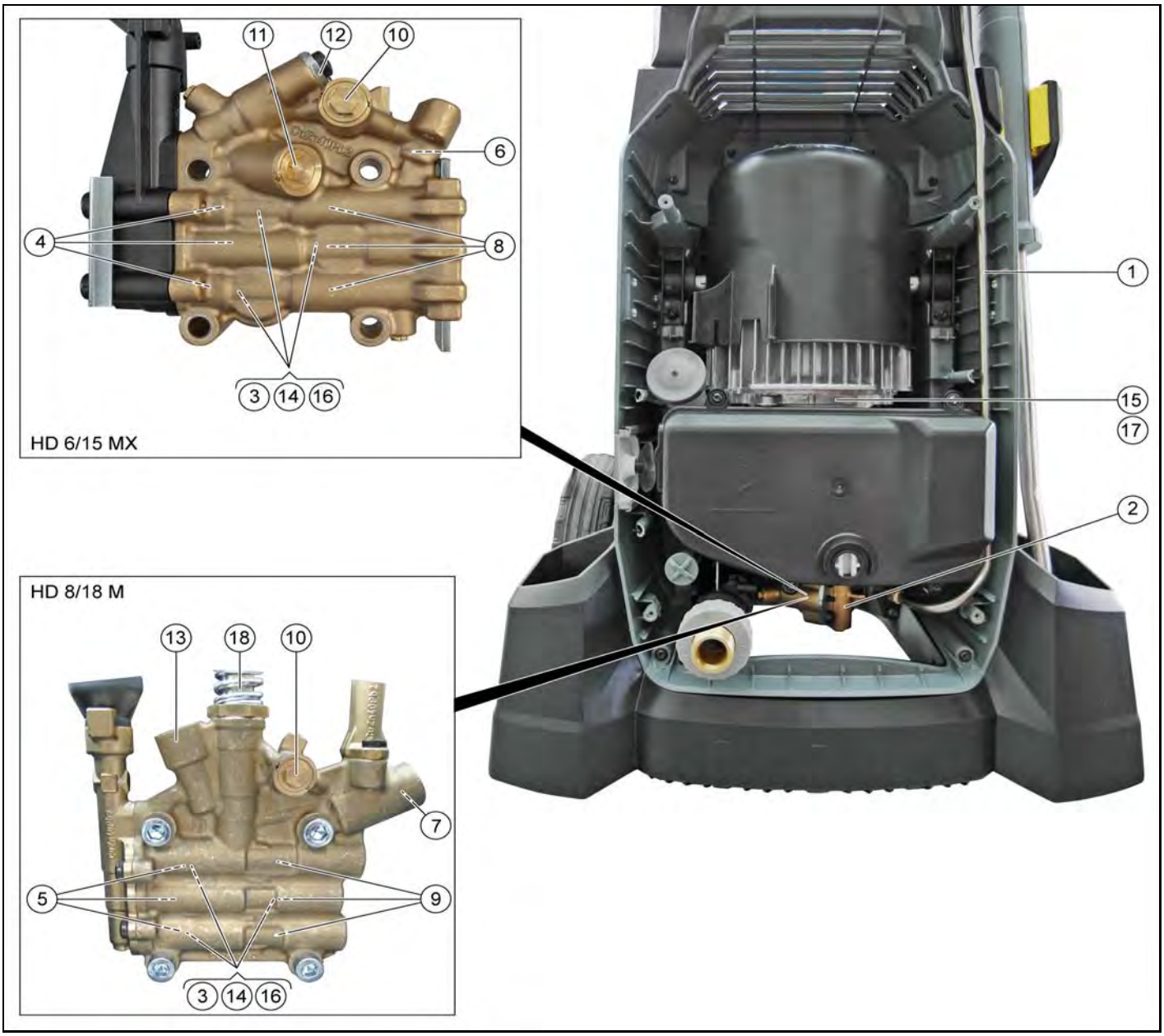
Depressurise the system prior to all work.

⚠ CAUTION

Risk of burns from hot surfaces.

Allow the device to cool down prior to all work.

11.2 020 Overview



① 11.4.1 Removing/installing the pipeline HD 6/15 MX
② 11.4.2 Removing/installing the pump head
③ 11.4.3 Removing/installing high pressure seals
④ 11.4.4 Removing/installing the suction valves HD 6/15 MX
⑤ 11.4.5 Removing/installing the suction valves HD 8/18 M
⑥ 11.4.6 Removing/installing the pressure retention valves HD 6/15 MX
⑦ 11.4.7 Removing/installing the pressure retention valves HD 8/18 M
⑧ 11.4.8 Removing/installing the pressure valves HD 6/15 MX
⑨ 11.4.9 Removing/installing the pressure valves HD 8/18 M
⑩ 11.4.10 Removing/installing the pressure switch
⑪ 11.4.11 Removing/installing the startup valve HD 6/15 MX
⑫ 11.4.12 Removing/installing the pressure relief valve HD 6/15 MX
⑬ 11.4.13 Removing/installing the pressure relief valve HD 8/18 M
⑭ 11.4.14 Removing/installing the low pressure seals
⑮ 11.4.15 Removing/installing the pump set (non-cage variants)
11.4.16 Removing/installing the pump set (cage variants)
⑯ 11.4.17 Removing/installing the pistons and oil seals
⑰ 11.4.18 Removing/installing the swash plate for 2-pole motors
11.4.19 Removing/installing the swash plate for 4-pole motors
⑱ 11.4.21 Removing/installing the overflow valve

11.3 030 Function

No special functional features.

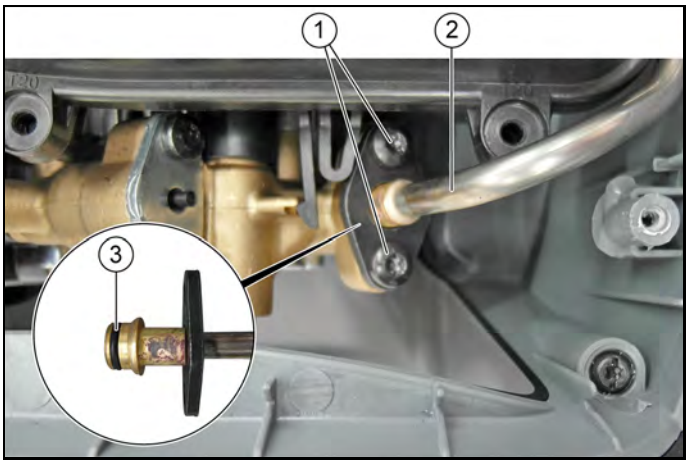
11.4 040 Service activities

Note

Unless otherwise described, installation is performed in reverse order.

11.4.1 Removing/installing the pipeline HD 6/15 MX

- 9.4.1 Opening / closing the cover

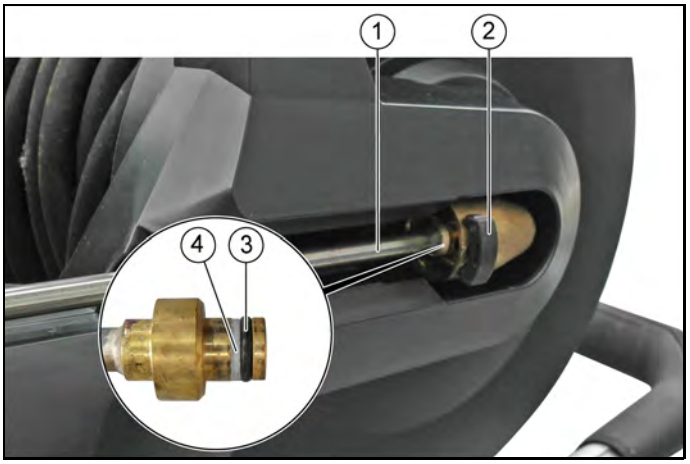


① Screws
② Pipeline
③ O-ring

1. Unscrew the screws.
2. Pull ff the pipeline.

Installation information

Check the O-ring for damage and replace if necessary.



① Pipeline
② Clip
③ O-ring
④ Support ring

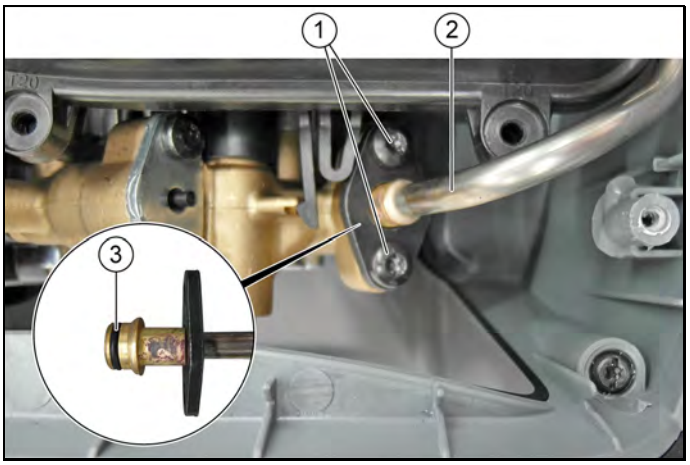
3. Pull out the clip.
4. Pull ff the pipeline.

Installation information

Check the O-ring and support ring for damage and replace if necessary.

11.4.2 Removing/installing the pump head

MX variants only.

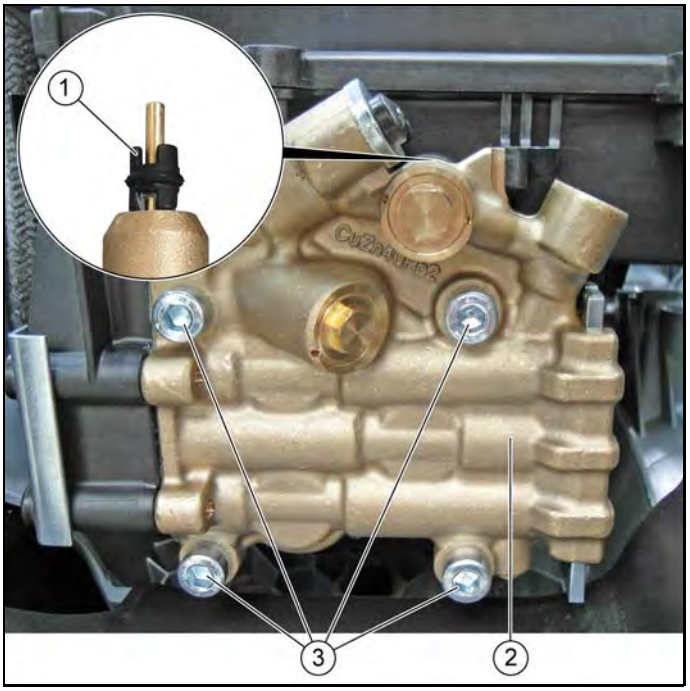


① Screws
② Pipeline
③ O-ring

1. Unscrew the screws.
2. Pull ff the pipeline.

Installation information

Check the O-ring for damage and replace if necessary.



① Seal on pressure switch piston
② Pump head
③ Screws

3. Unscrew the screws.
4. Pull off the pump head.

Installation information

Ensure the correct mounting position of the seal on re-installation.
On installation, tighten the screws in a diagonal sequence to the specified tightening torque.
See Tightening torques.
13.2 Torques
Grease the seal before installation.

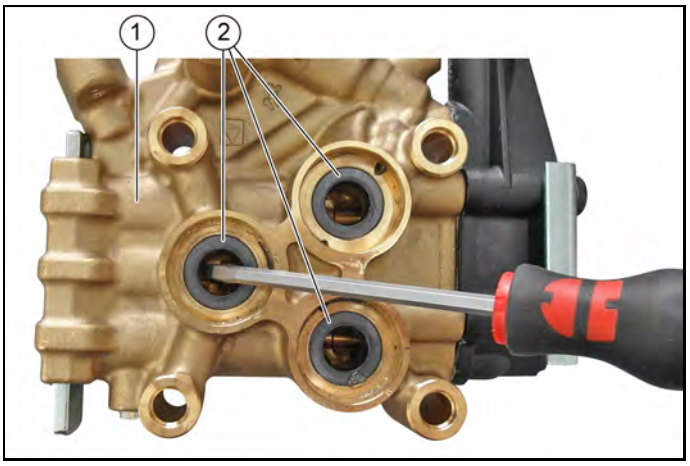
Note

The seal prevents leakage water from penetrating into the electrical box.

	Item number
Silicon grease	6.288-044.0

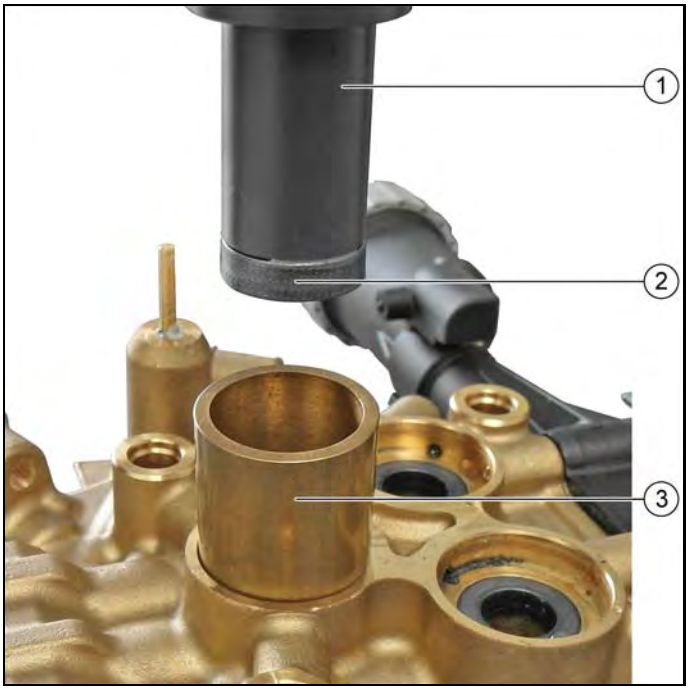
11.4.3 Removing/installing high pressure seals

- 11.4.2 Removing/installing the pump head



① Pump head
② High pressure seals

1. Remove the high pressure seals using a screwdriver or valve pliers.



① Installation pin
② High pressure seal
③ Installation sleeve

2. Use the installation pin and installation sleeve for installation.

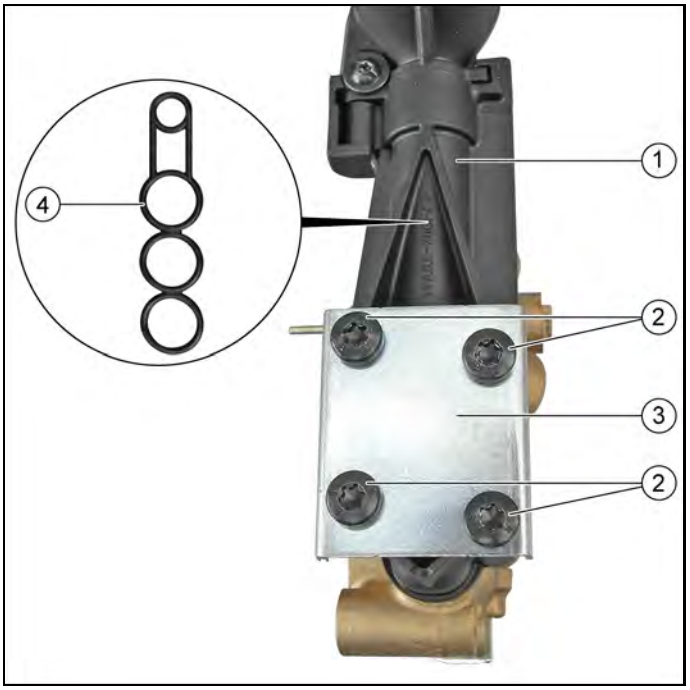
Installation information

Grease before installation.
See special tool.
13.3 Special tool

	Item number
Silicon grease	6.288-044.0
Teflon grease	6.288-079.0

11.4.4 Removing/installing the suction valves HD 6/15 MX

- 11.4.2 Removing/installing the pump head



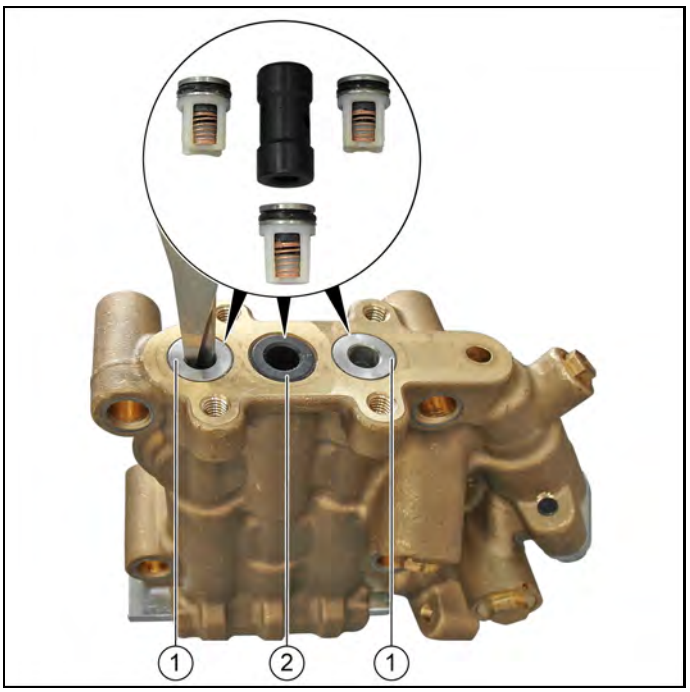
① Suction bridge
② Screws
③ Plate
④ Seal

1. Unscrew the screws.
2. Remove the plate.
3. Remove the suction bridge.

Installation information

Check the seal for damage and replace if necessary.
Grease the seal before installation.

	Item number
Silicon grease	6.288-044.0



① Suction valves
② Sleeve

4. Pull out the sleeve.
5. Pull out the suction valves with valve pliers.

Note

See special tool.
13.3 Special tool

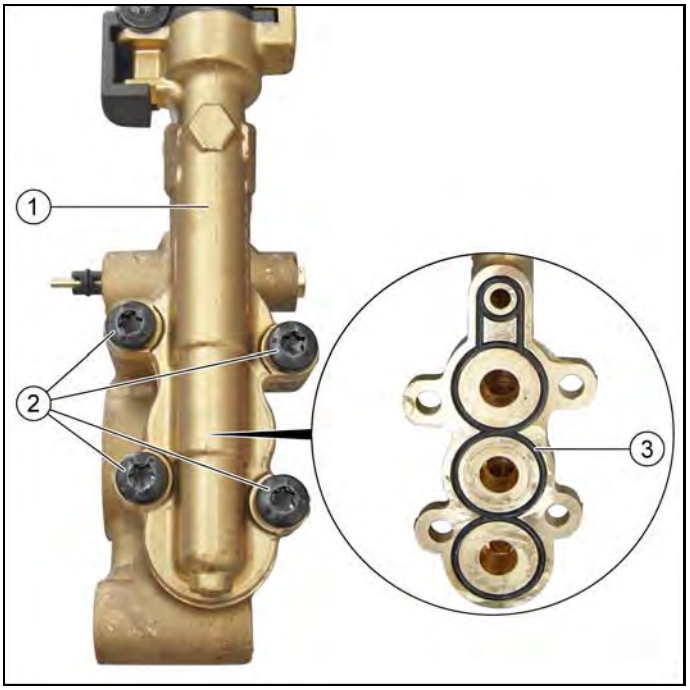
Installation information

Grease the O-rings on the suction valves before installation.

	Item number
Silicon grease	6.288-044.0

11.4.5 Removing/installing the suction valves HD 8/18 M

- 11.4.2 Removing/installing the pump head



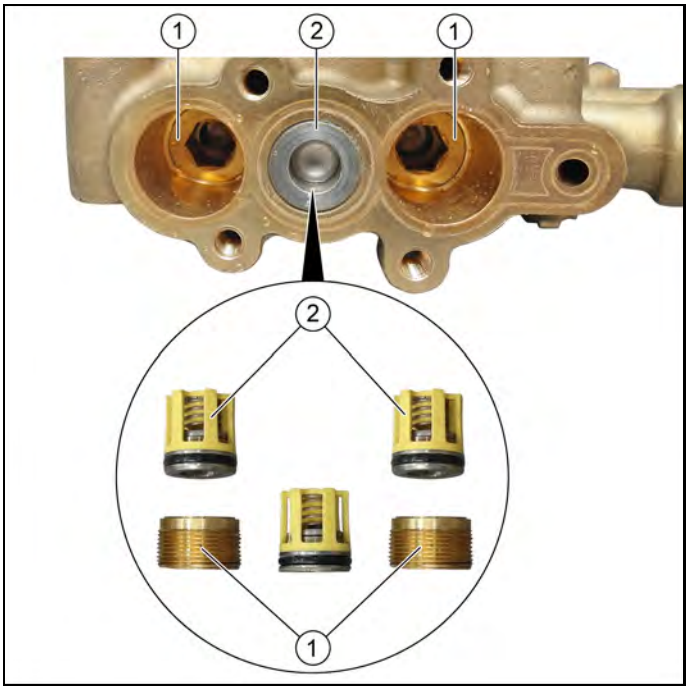
① Suction bridge
② Screws
③ O-ring

1. Unscrew the screws.
2. Remove the suction bridge.

Installation information

Check the O-ring for damage and replace if necessary.
Grease the O-ring before installation.

	Item number
Silicon grease	6.288-044.0



① Screws
② Suction valves

3. Unscrew the screws.
4. Pull out the suction valves with valve pliers.

Note

See special tool.
13.3 Special tool

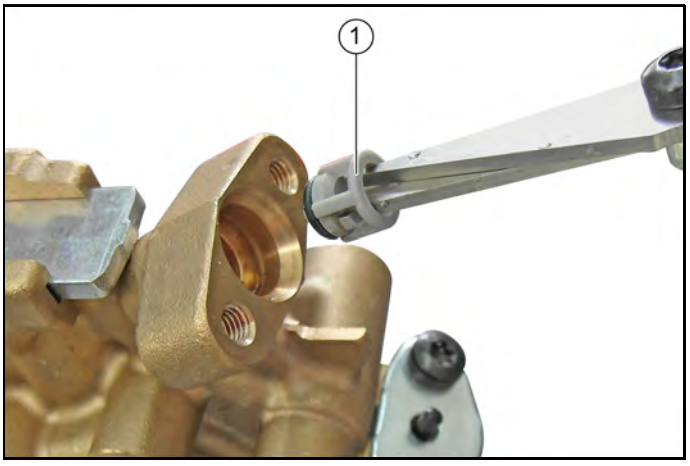
Installation information

Grease the O-rings on the suction valves before installation.

	Item number
Silicon grease	6.288-044.0

11.4.6 Removing/installing the pressure retention valves HD 6/15 MX

- 11.4.1 Removing/installing the pipeline HD 6/15 MX



① Pressure retention valve

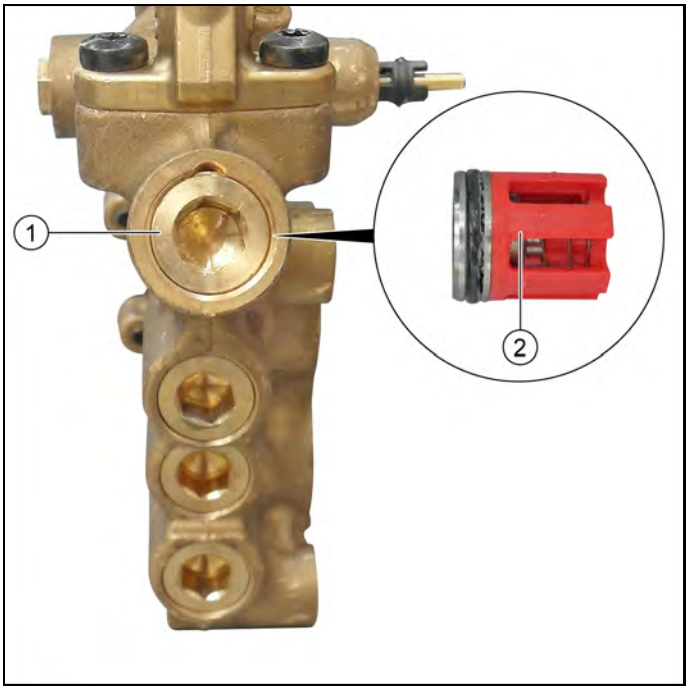
1. Pull out the pressure retention valve with valve pliers.

Note

See special tool.
13.3 Special tool

11.4.7 Removing/installing the pressure retention valves HD 8/18 M

- 11.4.2 Removing/installing the pump head



① Valve screw
② Pressure retention valve

1. Unscrew the valve screw.
2. Pull out the pressure retention valve with valve pliers.

Note

See special tool.
13.3 Special tool

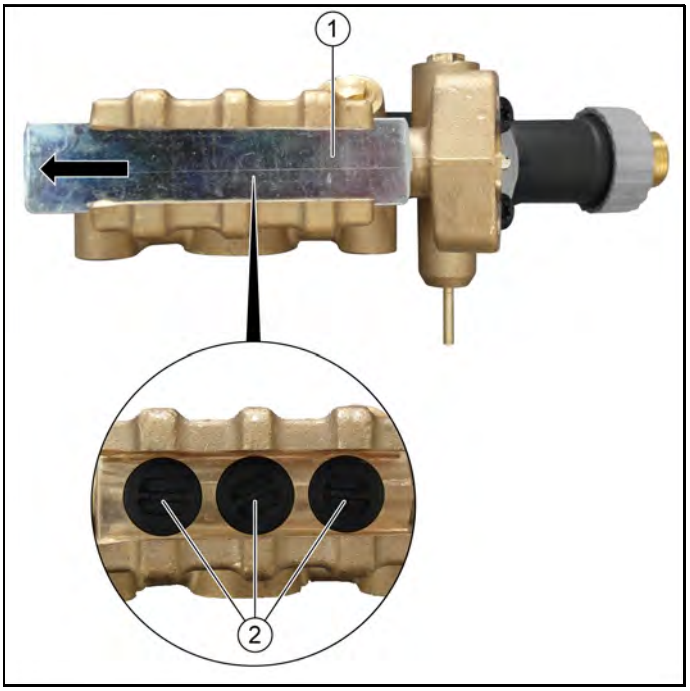
Installation information

Grease the O-ring on the pressure retention valve before installation.

	Item number
Silicon grease	6.288-044.0

11.4.8 Removing/installing the pressure valves HD 6/15 MX

- 11.4.2 Removing/installing the pump head



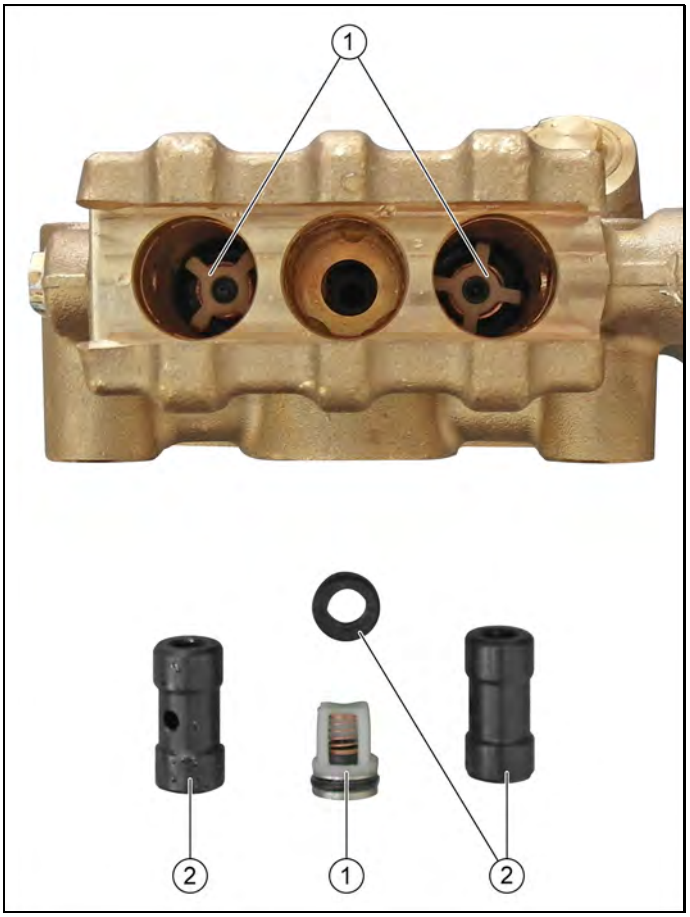
① Retaining plate
② Caps

1. Remove the retaining plate.
2. Pull out the caps using pliers.

Installation information

Grease the O-ring on the caps before installation.

	Item number
Silicon grease	6.288-044.0



① Pressure valves
② Sleeves

3. Remove the sleeves.
4. Pull out the pressure valves with valve pliers.

Note

See special tool.
13.3 Special tool

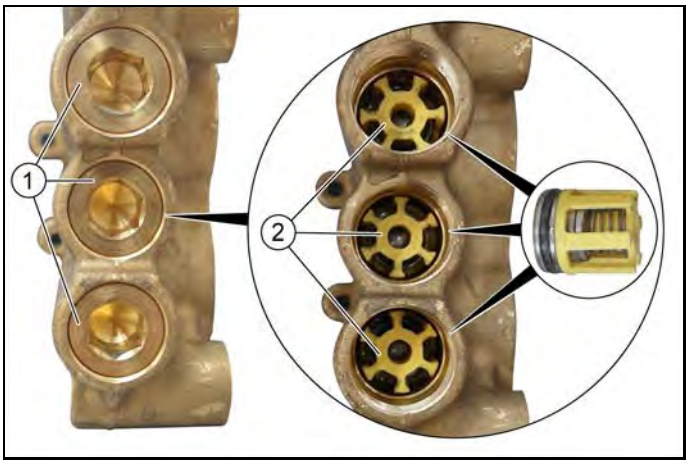
Installation information

Grease the O-ring on the pressure valves before installation.

	Item number
Silicon grease	6.288-044.0

11.4.9 Removing/installing the pressure valves HD 8/18 M

- 11.4.2 Removing/installing the pump head



① Valve screws
② Pressure valves

1. Unscrew the valve screws.
2. Pull out the pressure valves with valve pliers.

Note

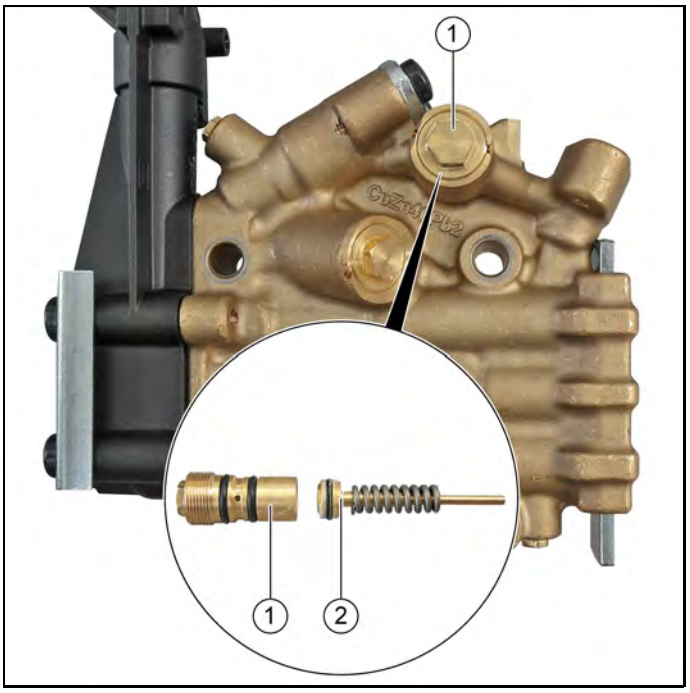
See special tool.
13.3 Special tool

Installation information

Grease the O-ring on the pressure valves before installation.

	Item number
Silicon grease	6.288-044.0

11.4.10Removing/installing the pressure switch



① Sleeve
② Pressure switch piston

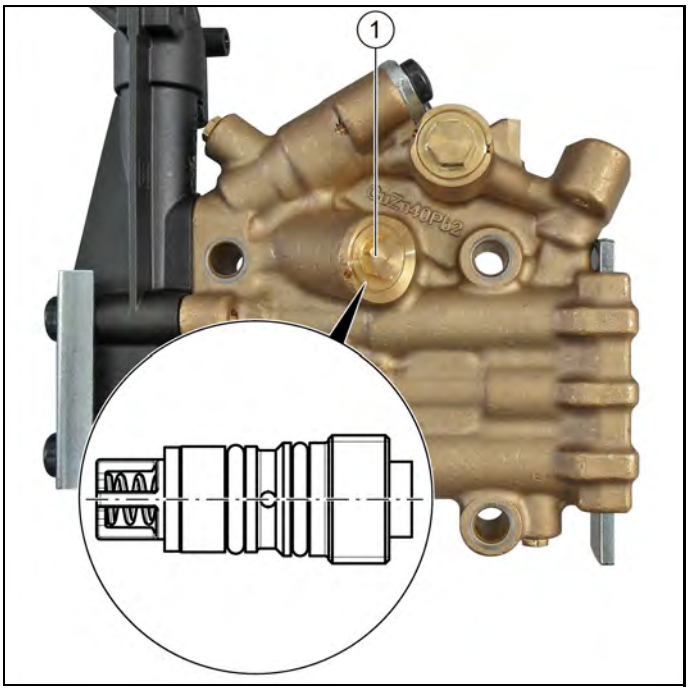
1. Unscrew the sleeve with pressure switch piston.

Installation information

Grease the O-rings before installation.
Replacement pressure switch only as a complete unit.

	Item number
Silicon grease	6.288-044.0
Teflon grease	6.288-079.0

11.4.11Removing/installing the startup valve HD 6/15 MX



① Startup valve

1. Unscrew the startup valve.

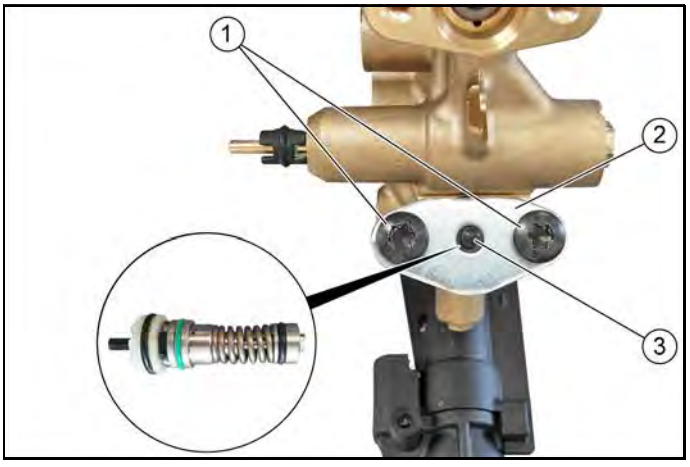
Installation information

Grease the O-rings before installation.
Replacement startup valve only as a complete unit.

	Item number
Silicon grease	6.288-044.0

11.4.12Removing/installing the pressure relief valve HD 6/15 MX

- 9.4.1 Opening / closing the cover



① Screws
② Plate
③ Pressure relief valve

1. Unscrew the screws.
2. Remove the plate.
3. Remove the pressure relief valve.

Installation information

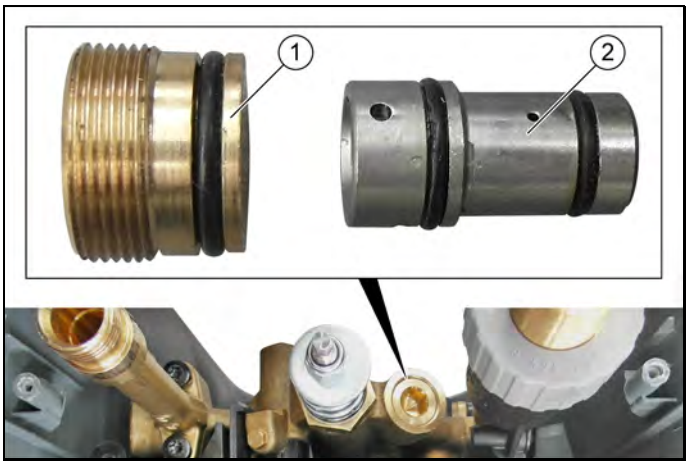
Grease the pressure relief valve before installation.

	Item number
Teflon grease	6.288-079.0

Note

Replacement pressure relief valve only as a complete unit.

11.4.13Removing/installing the pressure relief valve HD 8/18 M



① Valve screw
② Pressure relief valve

1. Unscrew the valve screw.
2. Remove the pressure relief valve.

Installation information

Grease the O-rings before installation.

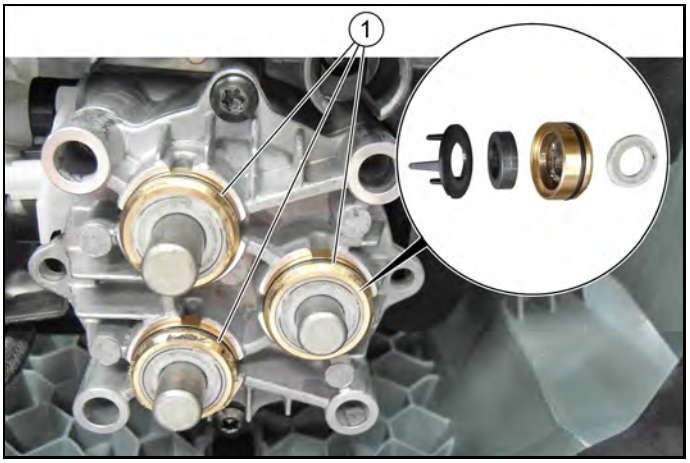
	Item number
Silicon grease	6.288-044.0

Note

Replacement pressure relief valve only as a complete unit.

11.4.14Removing/installing the low pressure seals

- 11.4.2 Removing/installing the pump head



① Low pressure seals

1. Pull off the low pressure seals.

Installation information

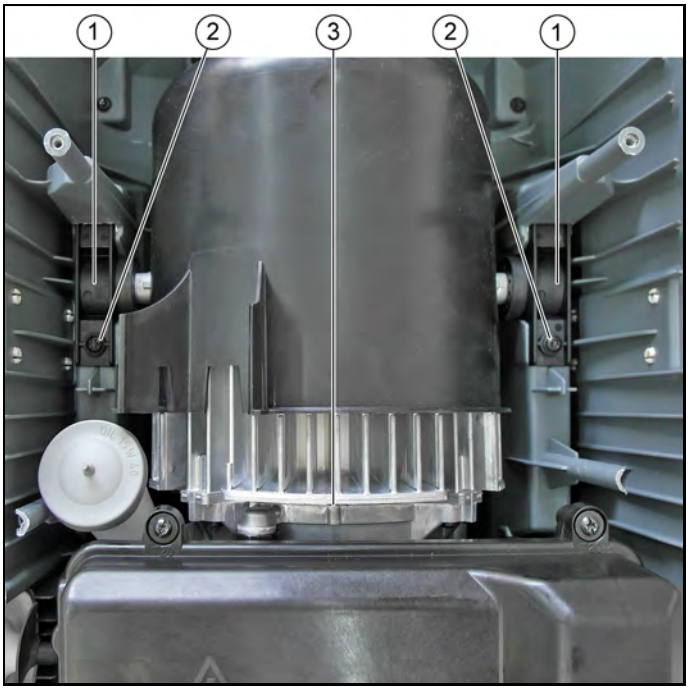
Observe the installation sequence and installation direction.

Grease the low pressure seals before installation.

	Item number
Teflon grease	6.288-079.0

11.4.15Removing/installing the pump set (non-cage variants)

- 9.4.1 Opening / closing the cover
- 11.4.1 Removing/installing the pipeline HD 6/15 MX

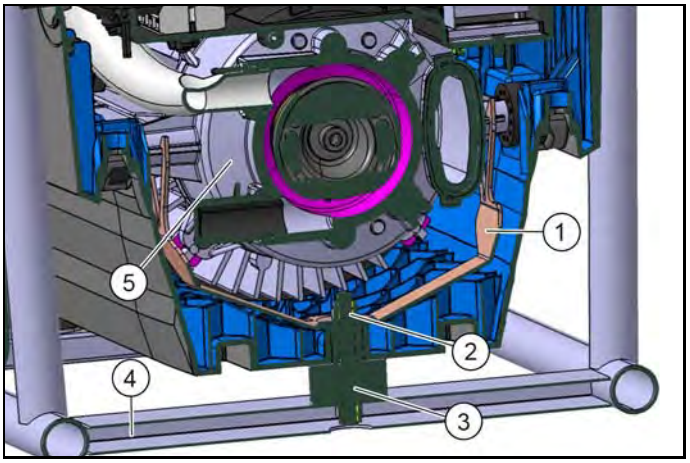


① Holder
② Screws
③ Pump set

1. Unscrew the screws.
2. Remove the holder.
3. Remove the pump set.

11.4.16Removing/installing the pump set (cage variants)

- 9.4.1 Opening / closing the cover
- 11.4.1 Removing/installing the pipeline HD 6/15 MX

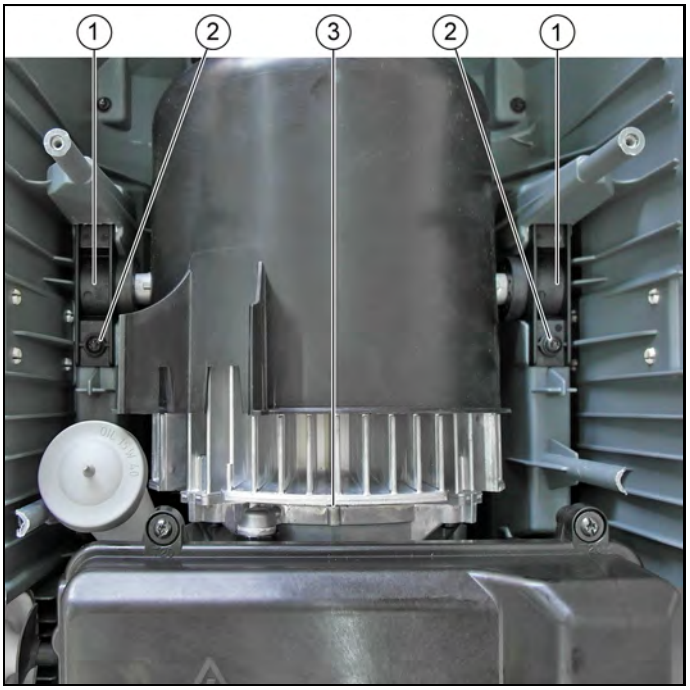


① Retaining plate
② Nut
③ Rubber buffer
④ Frame
⑤ Pump set

1. Lay the device down.
2. Remove the cylinder head.
3. Unscrew the nuts.

Installation information

1 On installation, first place the retaining plate on the rubber buffers ans screw loosely in place with the nuts.
2 Insert the pump set into the housing and allow the retaining plate to latch into place.
3 Tighten the retaining plate nuts.
4 Install the cylinder head and cover.



① Holder
② Screws
③ Pump set

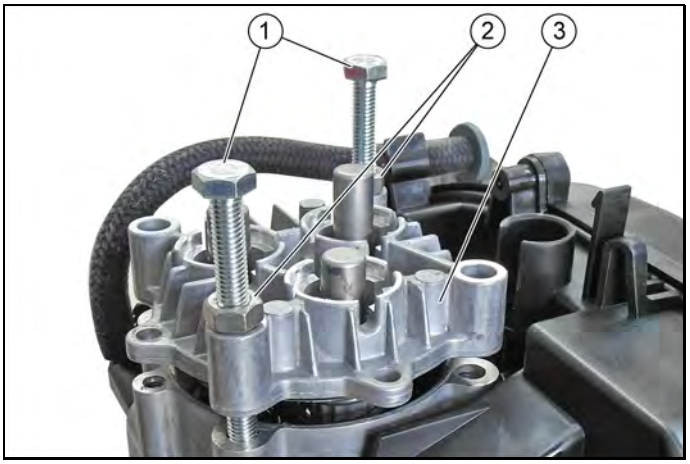
4. Unscrew the screws.
5. Remove the holder.
6. Remove the pump set.

11.4.17Removing/installing the pistons and oil seals

- 11.4.14 Removing/installing the low pressure seals
- 11.4.15 Removing/installing the pump set (non-cage variants)

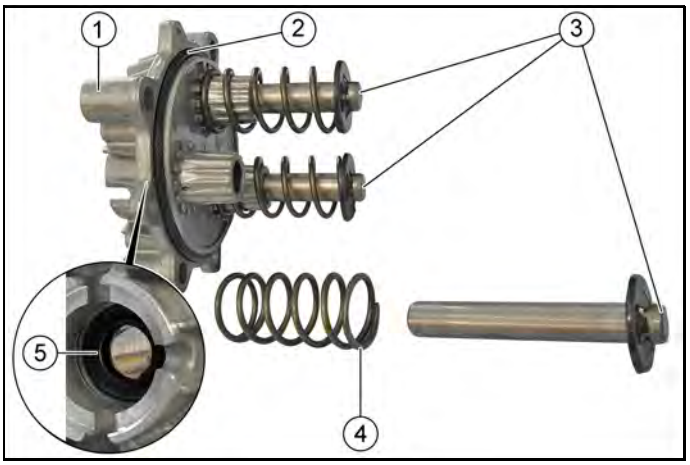
① Auxiliary screws
② Nuts
③ Screws

1. Fit the auxiliary screws with nuts.
   M8x90 auxiliary screws for HD 6/15 MX
   M10x100 auxiliary screws for HD 8/18 M
2. Unscrew the screws.



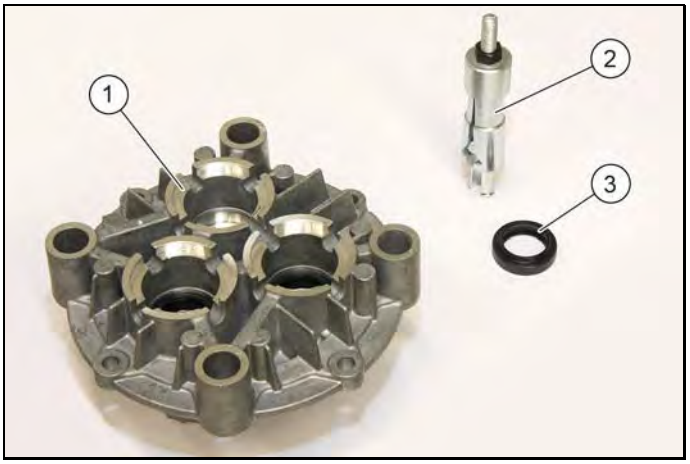
① Auxiliary screws
② Nuts
③ Piston guide

3. Screw the nuts upwards in parallel to evenly release the spring pressure.
4. Remove the piston guide.



① Piston guide
② O-ring
③ Piston
④ Spring
⑤ Oil seals

5. Remove the piston and replace if necessary.

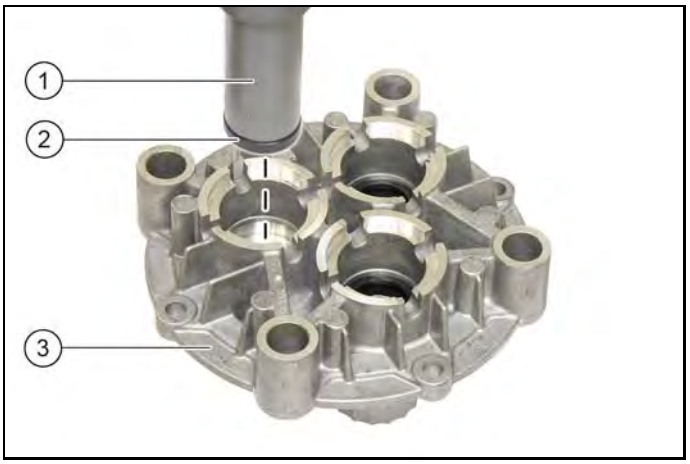


① Piston guide
② Pulling tool
③ Oil seal

6. Remove the oil seals with the pulling tool.

① Oil seal
② Installation pin

7. Fit the new oil seal onto the installation pin (individual lip in the groove in the pin).
   Installation information
   Wet the new oil seal in water before installation.
   Remove all traces of oil and grease from the holes.

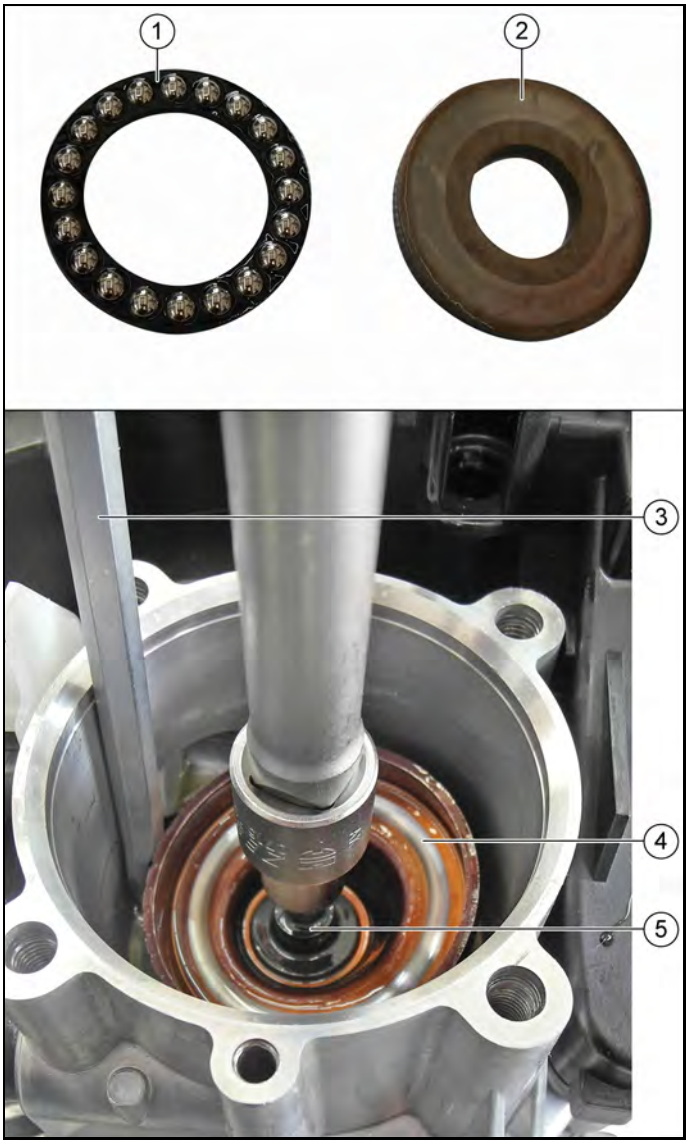


① Installation pin
② Oil seal
③ Piston guide

8. Fit the oil seal in the piston guide using the installation pin and install using a rubber hammer or press.

11.4.18Removing/installing the swash plate for 2-pole motors

- 11.5.1 Draining/replacing the pump oil
- 11.4.15 Removing/installing the pump set (non-cage variants)
- 11.4.17 Removing/installing the pistons and oil seals

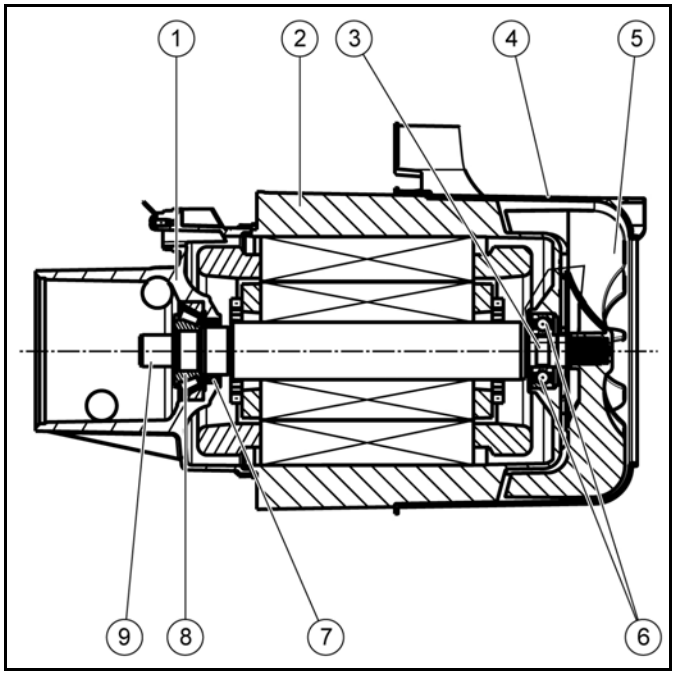


① Ball bearing
② Running disc
③ Screwdriver
④ Swash plate
⑤ Screw

1. Remove the running disc.
2. Remove the ball bearing.
3. Block the swash plate using a screwdriver.
4. Unscrew the screw.
5. Remove the swash plate.

11.4.19Removing/installing the swash plate for 4-pole motors

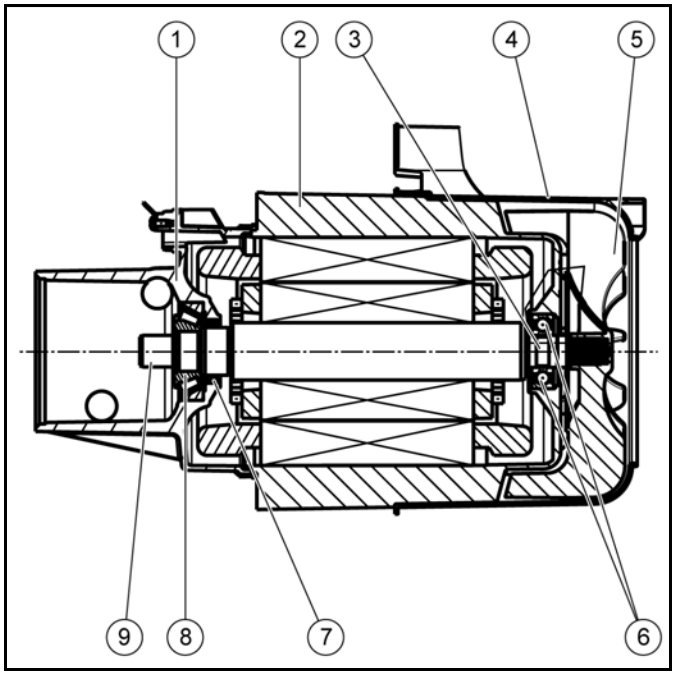
- 11.5.1 Draining/replacing the pump oil
- 11.4.15 Removing/installing the pump set (non-cage variants)
- 11.4.17 Removing/installing the pistons and oil seals

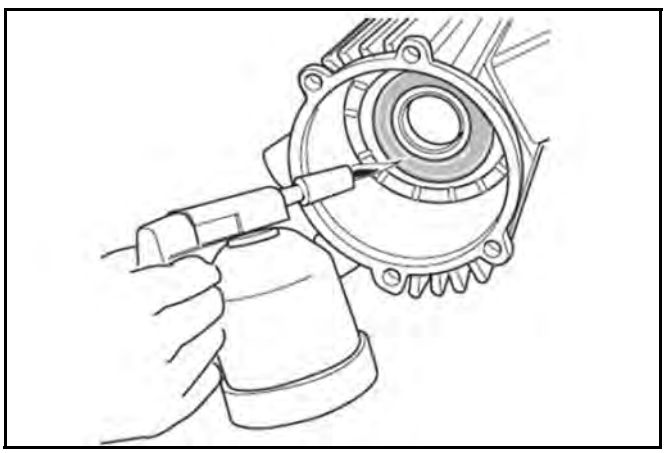


① Bearing plate
② Motor casing
③ Tolerance ring
④ Air guide
⑤ Fan
⑥ Ball bearing (B bearing)
⑦ Radial shaft seal
⑧ Tapered ball bearing (A bearing)
⑨ Motor shaft

1. Remove the fan wheel.
2. Remove the bearing plate with motor shaft.
3. Unscrew the screw on the swash plate.
4. Press out the motor shaft through the swash plate and A bearing.
5. Correctly align and support the parts for pressing in/out.

11.4.20Removing/installing the A bearing, B bearing, radial shaft seal





① Bearing plate
② Motor casing
③ Tolerance ring
④ Air guide
⑤ Fan
⑥ Ball bearing (B bearing)
⑦ Radial shaft seal
⑧ Tapered ball bearing (A bearing)
⑨ Motor shaft

1. Removing/installing the A bearing and radial shaft seal
2. Removing/installing the B bearing

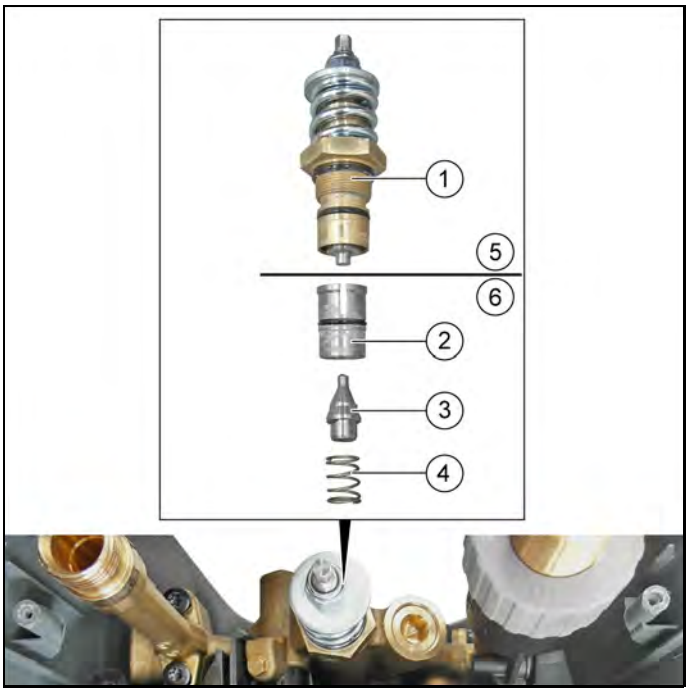
1. Removing/installing the A bearing and radial shaft seal

3. Remove the fan wheel.
4. Remove the bearing plate with motor shaft.
5. Unscrew the screw on the swash plate.
6. Remove or press out the swash plate.
7. Press out the A bearing or heat the bearing plate.
8. Press in a new radial shaft seal.
9. Press in a new A bearing.
10. Press the motor shaft into the A bearing.
11. Correctly align and support the parts for pressing in/out.

2. Removing/installing the B bearing

12. Remove the fan wheel.
13. Remove the bearing plate with motor shaft.
14. Press the B bearing out of the motor casing.
15. Install new B bearing and new tolerance ring.
16. Correctly align and support the parts for pressing in/out.

11.4.21Removing/installing the overflow valve



① Overflow valve
② Valve seat
③ Valve taper
④ Spring
⑤ Spare parts kit
⑥ Spare parts kit

1. Unscrew the overflow valve.
2. Pull out the valve seat with valve pliers.
3. Remove the valve taper and spring.

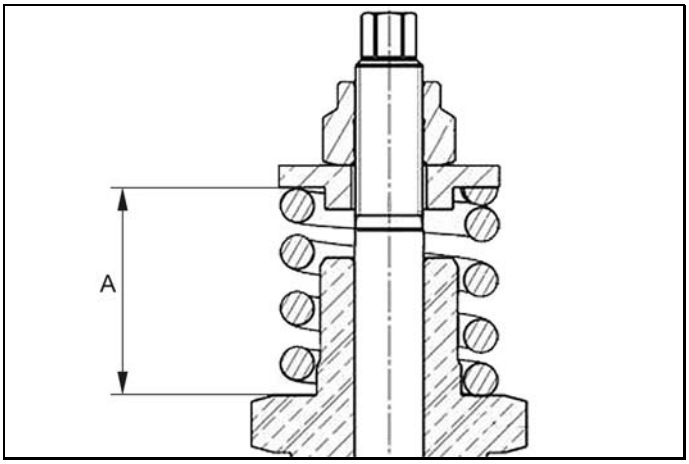
Note

See special tool.
13.3 Special tool

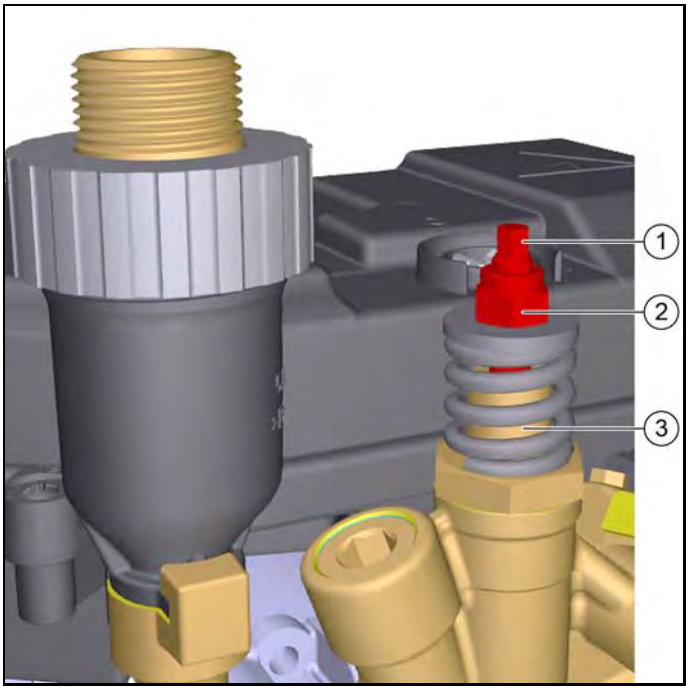
Installation information

Check the parts for wear and replace if necessary.
Always replace spare parts kits 5 and 6 together.
Spare parts sets are only available as complete units.
Grease the moving parts and O-rings before installation.

	Item number
Teflon grease	6.288-079.0



Overflow valve standard setting
A ≥ 24 mm
1 Set the standard setting at the overflow valve.

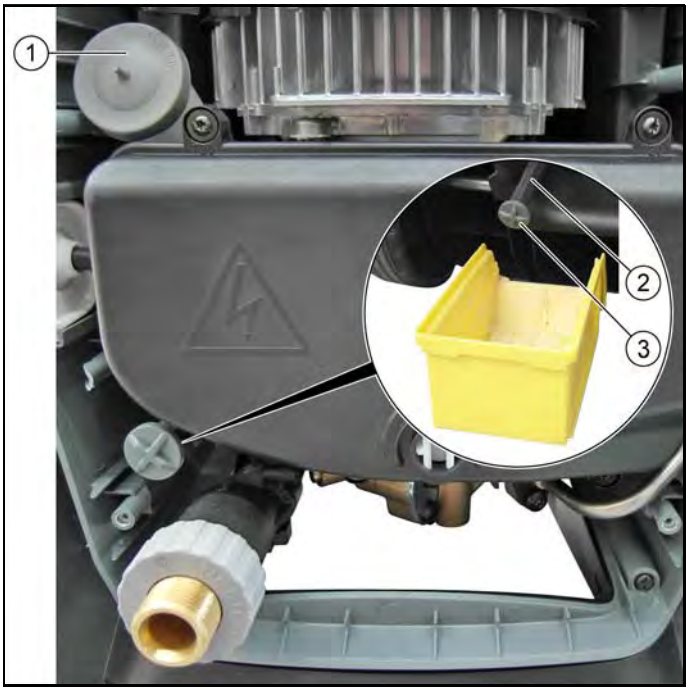


Setting the overflow valve
1 Valve spindle
2 Adjusting nut
3 Overflow valve
1 Fit the test pressure gauge to the device outlet.
2 Start up the device with a new power nozzle and opening servo controller.
3 Counter-hold the valve spindle using a socket wrench.
4 Adjust the pressure using the adjusting nut.
(HD 7/16 M 145-155 bar, HD 8/18 M 165-175 bar)
5 Open and close the gun several times.
6 Check the pressure again.
7 Apply a seal to the adjusting nut.

11.5 050 Service and inspection

11.5.1 Draining/replacing the pump oil

- 9.4.1 Opening / closing the cover



① Oil cap
② Oil drain hose
③ Plugs

1. Lay the device down horizontally.
2. Open the oil cap.
3. Lay out the oil drain hose.
4. Place an oil collection pan underneath.
5. Open the plugs and drain the oil.

Note

Dispose the pump oil in accordance with the environmental regulations.

Do not cut off the breather in the oil cap.

For the oil volume and oil grade, see:
13.1 Technical data

11.6 060 Fault diagnosis

This service group does not have fault diagnosis

11.7 070 Special features / other

This service group does not have any special features.

12 Troubleshooting guide

Device does not start

- Check the power cable for damage.
- Check the mains voltage.
- If the device overheats:
  a Set the power switch to "0".
  b Allow the device to cool for at least 15 minutes.
  c Set the power switch to "1".

Device does not reach required pressure

- Check the size of the nozzle and compare with the required size specified in the "Technical data" section.
- Clean the sieve in the water connection.
- Check the water supply volume and compare with the required volume specified in the "Technical data" section.
- Clean the nozzle.

Pump knocking

- Check the water supply line for leaks.

Detergent dosing volume too low

- Refill the foam nozzle cup.
- Plug a larger gate onto the suction hose.
- Check the suction hose and foam nozzle for detergent deposits. Remove deposits using lukewarm water.

13 Technical documentation

Device no.	Designation	Circuit diagram	Spare parts list	Operating manual
1.150-930.0	HD 6/15 M *EU	0.089-740.0	5.974-555.0	5.967-396.0
1.150-931.0	HD 6/15 MX Plus *EU	0.089-740.0	5.974-947.0	
1.151-930.0	HD 7/17 M *EU	0.089-741.0	5.974-949.0	
1.151-931.0	HD 7/17 MX Plus *EU	0.089-741.0	5.974-950.0	
1.524-930.0	HD 7/14-4 M *EU	0.089-740.0	5.974-951.0	
1.524-931.0	HD 7/14-4 MX Plus *EU	0.089-740.0	5.974-952.0	
1.524-932.0	HD 7/14-4 M Plus *EU	0.089-740.0	-	
1.524-955.0	HD 7/16-4 M *EU	0.089-741.0	5.974-953.0	
1.524-956.0	HD 7/16-4 MX Plus *EU	0.089-741.0	5.974-954.0	
1.524-957.0	HD 7/16-4 M Plus *EU	0.089-741.0	5.977-646.0	
1.524-970.0	HD 8/18-4 M *EU	0.089-741.0	5.974-955.0	
1.524-971.0	HD 8/18-4 MX Plus *EU	0.089-741.0	5.974-857.0	

13.1 Technical data

		HD 6/15 M	HD 7/17 M	HD 7/14-4 M	HD 7/16-4 M	HD 8/18-4 M
Electrical connection						
Mains voltage	V	230	400	230	400	400
Phase	~	1	3	1	3	3
Power frequency	Hz	50	50	50	50	50
Connection output	kW	3.1	4.2	3.4	4.2	4.6
Protection class		IPX5	IPX5	IPX5	IPX5	IPX5
Power protection (slow-blowing)	A	16	16	16	16	16
Extension cable, 30m	mm^2	2.5	2.5	2.5	2.5	2.5
Water connection						
Feed pressure (max.)	MPa	1	1	1	1	1
Input temperature (max.)	°C	60	60	60	60	60
Input amount (min.)	l/min	13	15	15	15	16
Suction height (max.)	m	0.5	0.5	0.5	0.5	0.5
Device performance data						
Nozzle size of standard nozzle	--	033	040	043	042	042
Operating pressure	MPa	15	17	14	16	18
Operating pressure (max.)	MPa	22.5	25.5	21	24	27
Water flow rate	l/min	9.3	11.6	11.5	11.6	12.5
High-pressure gun recoil force	N	28.6	35.5	32.3	34.5	41.8
Dimensions and weights						
Typical operating weight	kg	30	32	39	40	41
Length	mm	455	455	455	455	455
Width	mm	400	400	400	400	400
Height of push handle, bottom, (top)	mm	700 (970)	700 (970)	700 (970)	700 (970)	700 (970)
Oil volume	l	0.25	0.20	0.35	0.35	0.35
Oil type	Type	15W40	15W40	0W40	15W40	15W40
Determined values in acc. with EN 60335-2-xx						
Hand-arm vibration value	m/s^2	2.4	3.0	2.7	2.4	2.3
K uncertainty	m/s^2	0.7	0.8	0.8	0.7	0.7
Sound level	dB(A)	74	79	68	70	75
K uncertainty$_{pA}$	dB(A)	3	3	3	3	3
Sound power level L_{WA} + K uncertainty-$_{WA}$	dB(A)	90	95	84	86	91

Subject to technical modifications.

13.2 Torques

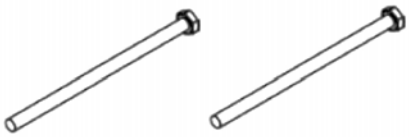
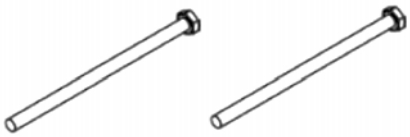
All torques are specified in Nm.

	HD 6/15 M	HD 7/17 M	HD 7/14-4 M	HD 7/16-4 M	HD 8/18-4 M
Cylinder head screws	23 - 27	23 - 27	40 - 45	40 - 45	40 - 45
Pressure switch	20 - 25	20 - 25	20 - 25	20 - 25	20 - 25
Startup valve	20 - 25	20 - 25	-	-	-
Suction bridge	7 - 9	7 - 9	7 - 9	9 - 11	9 - 11
Pressure limiter with pressure relief	6 - 8	6 - 8	6 - 8	-	-
Pressure relief	-	-	-	27 - 32	27 - 32
Overflow valve	-	-	-	40 - 45	40 - 45
M8 cylinder head plugs	7 - 9	7 - 9	7 - 9	7 - 9	7 - 9
Straight thrust guide	5 - 7	5 - 7	5 - 7	5 - 7	5 - 7
Valve screws	-	-	27 - 32	27 - 32	27 - 32
Swash plate	12 - 15	12 - 15	12 - 15	12 - 15	12 - 15
Right/left suction valve	-	-	-	27 - 32	27 - 32
Suction bridge water inlet	4 - 6	4 - 6	4 - 6	4 - 6	4 - 6
Motor bearing plate	5.5 - 7.5	5.5 - 7.5	10 - 13	10 - 13	10 - 13
HD output	6 - 8	6 - 8	6 - 8	6 - 8	6 - 8
Oil tank	3.5 - 5	3.5 - 5	3.5 - 5	3.5 - 5	3.5 - 5

HD-M Cage Frame/retaining plate rubber buffer	4 - 8

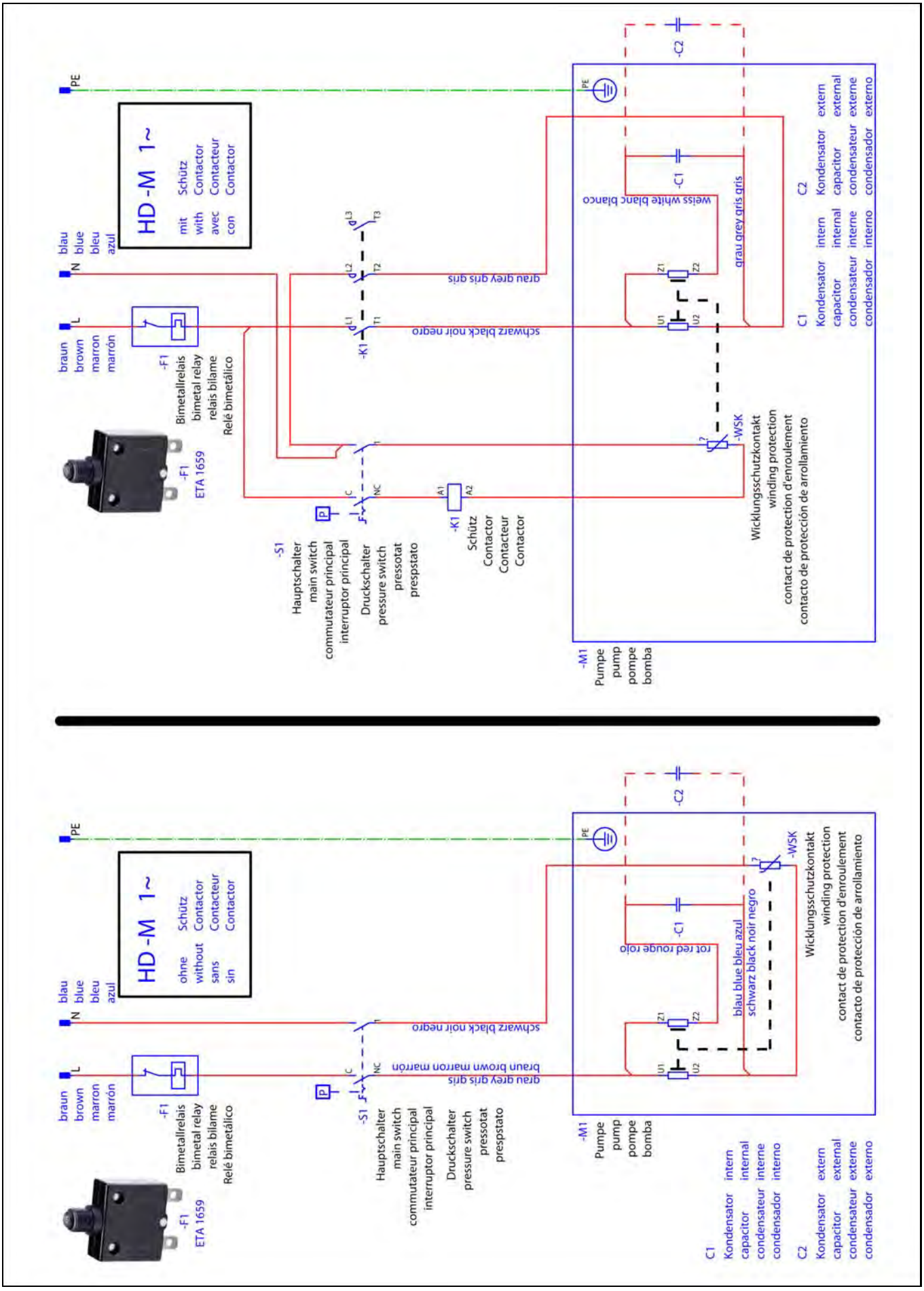
13.3 Special tool

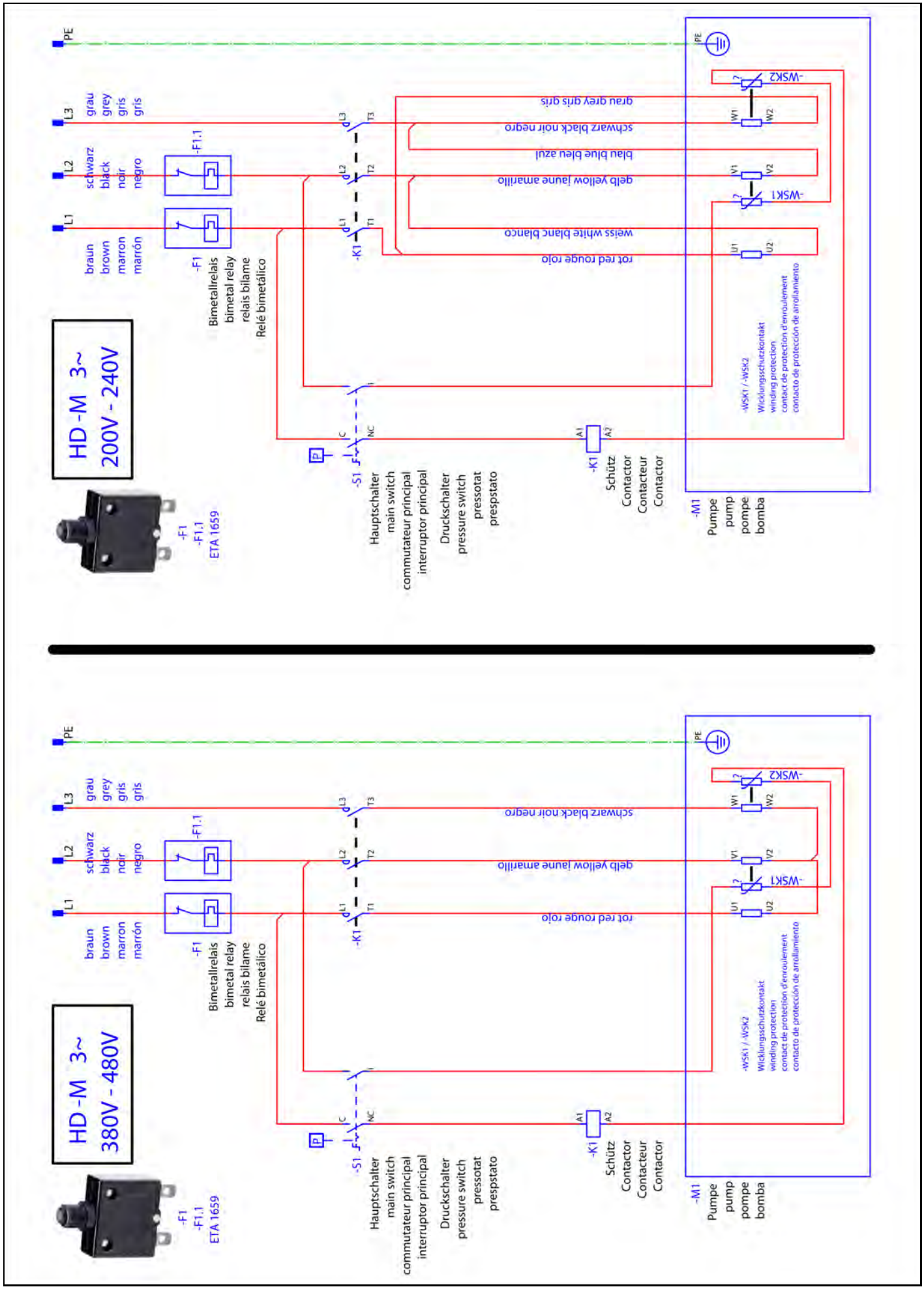
			
Multimeter for measuring voltage, current and resistance	6.803-022.0	Valve pliers for removing valve seats, sleeves, bushes etc.	4.901-062.0
			
Stop valve, allows continuous opening and closing of the flow, connection M22x1.5 Standard on both sides	4.580-034.0 Additional adapter for EasyLock TR thread	Test pressure gauge, 0 to 250 bar, connection M22x1.5 Standard on both sides	4.742-025.0 Additional adapter for EasyLock TR thread
HD 6/15 M Piston (D = 12 mm) 		HD 7/17 M Piston (D = 14 mm) 	
Installation pin High pressure seal installation sleeve Low pressure seal installation sleeve	5.901-141.0 5.901-181.0 5.901-143.0	Installation pin High pressure seal installation sleeve Low pressure seal installation sleeve	5.901-124.0 5.901-123.0 5.901-xxx.0

HD 6/14 M, HD 7/14 M, HD 7/16 M, HD 8/18 M Piston (D = 18 mm) 			
Installation pin High pressure seal installation sleeve Low pressure seal installation sleeve	5.901-062.0 5.901-118.0 5.901-218.0	Stop valve/test pressure gauge on TR device (Adapter 6)	4.111-034.0
			
Stop valve/test pressure gauge on high pressure hose (Adapter 2)	4.111-030.0	Stop valve/test pressure gauge on high pressure hose TR MX devices (Adapter 1)	4.111-029.0
			
Hose reel adapter	6.391-522.0	Pipeline adapter	4.421-739.3
HD 6/15 M 		HD 8/18 M 	
Auxiliary screws with continuous M8x100 thread	7.304-454.0	Auxiliary screws with continuous M10x100 thread	7.304-532.0
M8 nuts	7.311-004.0	M10 nuts	7.311-006.0

13.4 Circuit diagram

Please always call up the current circuit diagram in DISIS
when working on the device.




HD-M 3~
200V - 240V
HD-M 3~
380V - 480V
PE
L3
grau
grey
gris
gris
L2
schwarz
black
noir
negro
L1
braun
brown
marron
marrón
-F1
Bimetallrelais
bimetal relay
relais bilame
Relé bimetálico
-F1.1
-F1
-F1.1
ETA 1659
-K1
-S1
Hauptschalter
main switch
commutateur principal
interruptor principal
Druckschalter
pressure switch
pressostat
presptato
Schütz
Contactor
Contacteur
Contactor
-M1
Pumpe
pump
pompe
bomba
-WSK1
-WSK2
Wicklungsschutzkontakt
winding protection
contact de protection d'enroulement
contacto de protección de arrollamiento
-WSK1 / -WSK2
grau grey gris gris
schwarz black noir negro
blau blue bleu azul
gelb yellow jaune amarillo
weiss white blanc blanco
rot red rouge rojo