HD 25/15-4, HD 20/15-4, HD 16/15-4
Service Manual

1 Preface

Good service work requires extensive and practice-oriented training as well as well-structured training materials.
Hence we offer regular basic and advanced training programmes covering the entire product range for all service engineers.
In addition to this, we also prepare service manuals for important appliances - these can be initially used as instruction guides and later on as reference guides.
Apart from this, we also regular information about product enhancements and their servicing.

If you should require supplements, have corrections or questions regarding this document, please address these citing the following subject to:
international-service@de.kaercher.com

Subject:	***Fall 108234***

The responsible product specialist will take care of your issue.

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2 Safety instructions

2.1 Hazard levels

⚠ ***Danger***
Immediate danger that can cause severe injury or even death.
⚠ ***Warning***
Possible hazardous situation that could lead to severe injury or even death.
Caution
Possible hazardous situation that could lead to mild injury to persons or damage to property.

3 Technical Features

3.1 Validity

This service manual applies to the following appliances:
- HD 25/15-4 (1.367-121.0)
- HD 20/15-4 (1.367-131.0)
- HD 16/15-4 (1.367-105.0)

The procedure for service work is the same for all three models. Device-specific features are emphasized in the text.

3.2 Pump

- 3 piston crankshaft pump
- Stainless steel piston with ceramic sleeves
- Cylinder head made of brass
- Pressure and suction valves made of stainless steel, valve cages made of plastic
- Built-in large water filter protects the pump from contamination. The filter can be easily removed and cleaned
- Oil level can be checked from the outside

3.3 Drive

- 4-pin, air-cooled three-phase motor with 1400 rpm.

3.4 Electrical system

- Automatic safety switch-off after 30 minutes of non-operation
- Winding protection contact
- The pressure switch on the overflow switches the motor contactor
- Soft start increases the motor speed gradually to 1,400 1/min and protects the circuit from overloads when switched on (HD 25/15-4)
- Electronics in spray water protected casing.

3.5 Frame

HD 25/15-4	Stainless steel
HD 20/15-4	Steel, painted
HD 16/15-4	Steel, painted

3.6 Accessories

- Power nozzle, 25° spray angle
- **Dirt grinder**
- High pressure hose, NW 12 15 m (HD 25/15-4 and HD 20/15-4)
- High pressure hose NW 10 15 m (HD 16/15-4)
- Gun EasyPress (HD 16/15-4)
- Gun 300 bar (HD 20/15-4 and HD 25/15-4)

3.7 Attachment sets

Attachment kit	**Order number**
Swivel casters	2.851-042.0
Hose drum	2.440-002.0
Operating hour counter	2.851-066.0
Breakdown-safe tyres	2.851-067.0
Two-jet pipe operation	2.851-064.0
Water filter with enlarged filter surface.	2.851-065.0

4 Parts of the system

The case device offers free access to all components and is therefore easy to service.

4.1 Type and information plates

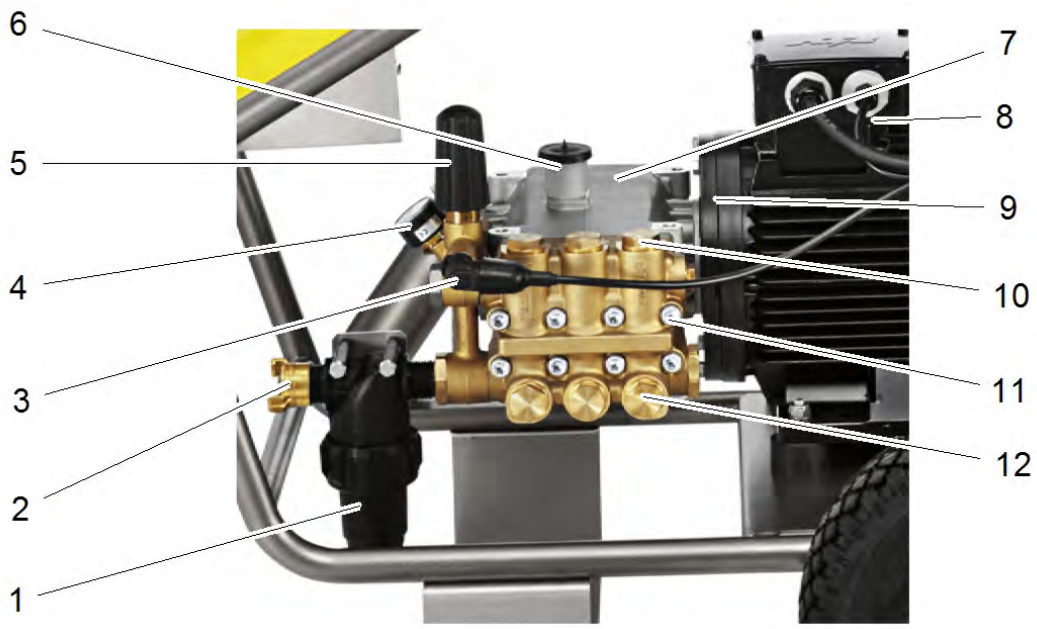
The type and information plates are located:

- on the pump casing (pump specifications)
- in the accessories compartment (tyre pressure, nozzle size and oil types used)
- in the frame (general type plate with plant number)
- on the drive motor (performance data of electric motor)

4.2 Connection view

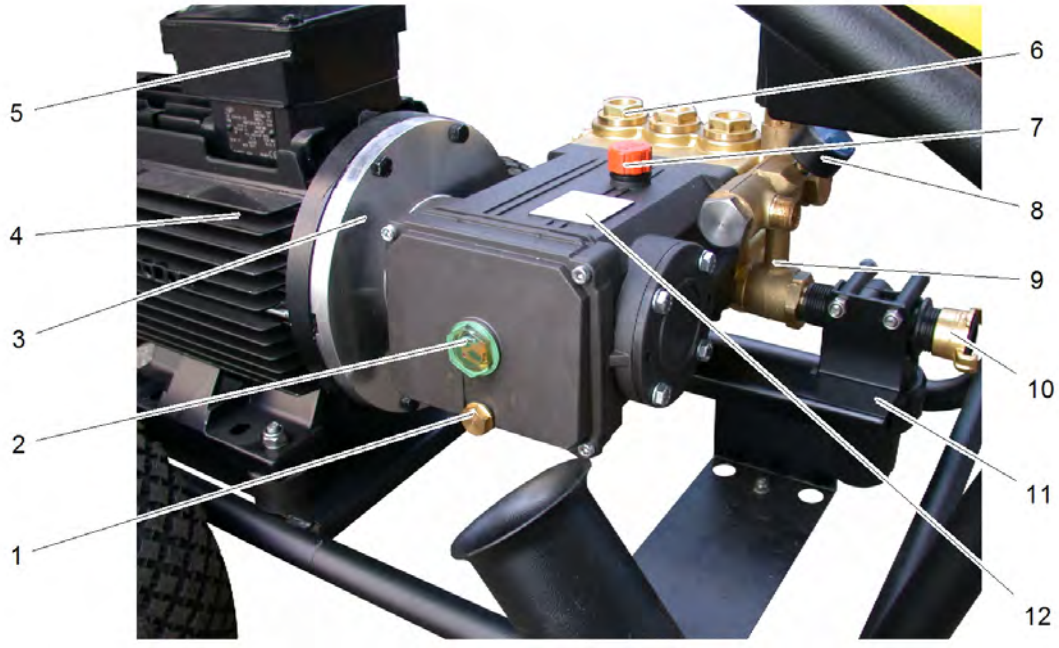
1 Support leg (bow)
2 Water filter
3 Pump
4 Overflow casing and pressure regulation
5 Accessory compartment
6 Strut for crane loading
7 Push handle
8 Appliance electronics (electric box), appliance switch
9 Storage hook for cables and hoses
10 Drive motor connection box
11 Electric motor (drive)
12 Wheel, quick close cap

4.3 Pump Detail (HD 25/15-4)



1 Water filter
2 Water inlet
3 **Pressure switch**
4 Manometer
5 Overflow casing, pressure regulation
6 Oil tank
7 Crankshaft housing
8 Drive motor connection box
9 Connecting flange for drive motor - pump
10 Valve screws, pressure side
11 Pump head fastening screws
12 Valve screws, suction side

4.4 Pump Detail (HD 20/15-4 und HD 16/15-4)



1 Oil drain screw
2 Oil sight glass
3 Connecting flange for drive motor - pump
4 Electro motor
5 Drive motor connection box
6 Valve screws, pressure side
7 Oil container plug
8 Manometer
9 Overflow casing, pressure regulation
10 Water inlet
11 Water filter
12 Type plate, pump

4.5 Front view

1 Water filter
2 Water inlet
3 Oil drain screw
4 Oil sight glass
5 High-pressure outlet
6 Accessory compartment

4.6 Rear view

1 Indicator lamp
2 Power switch
3 Intake for hourmeter (option)

4.7 View from the inside

1 Lock detent
2 Accessory compartment
3 Information sign
4 Hinge, storage compartment
5 Cover
6 Lock pin
7 Type plate, appliance

5 Basic settings and service procedures

Service work on the appliance may only be performed by the authorized customer service. If so instructed in the operating instructions, the special tools indicated by KÄRCHER must be used.

⚠ ***Danger***

Danger from electric current and liquids. While working on the appliance, pull the mains plug out of the socket and shut off the water supply

5.1 Cleaning the water filter

➔ Turn the filter cup screws and pull it downwards along with the cup.

The individual parts of the water filter

➔ Check the water filter for contamination, clean if required.

➔ Assemble it back in the reverse sequence.

5.2 Oil change

➔ Unscrew the oil drain screw and collect used oil.

➔ Replace washers of the oil drain screw.

➔ Screw in the oil drain screws and tighten them.

➔ Slowly fill in new oil until the "MAX" marking on the oil sight glass.

5.3 Removal of the crankshaft pump

Drain the oil in a collection basin.

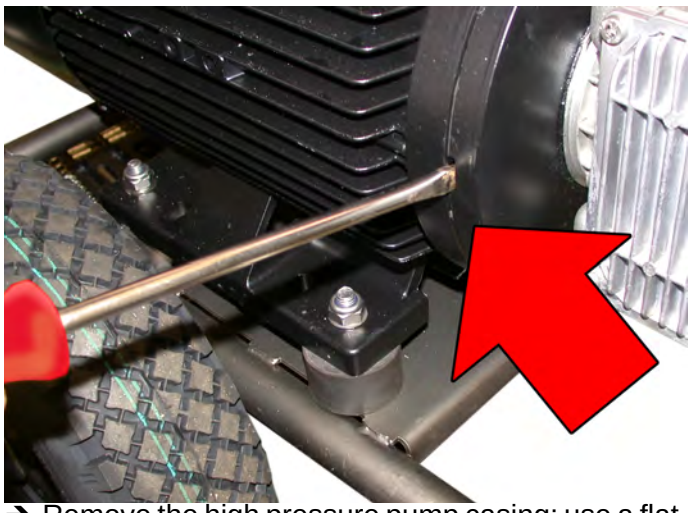
➔ Pull the support bow from the pressure switch.

➔ Remove the pressure switch.

➔ Check the diaphragm, replace if required.

➔ Unscrew the filter cup.

➔ Loosen the screw connection at the motor flange.

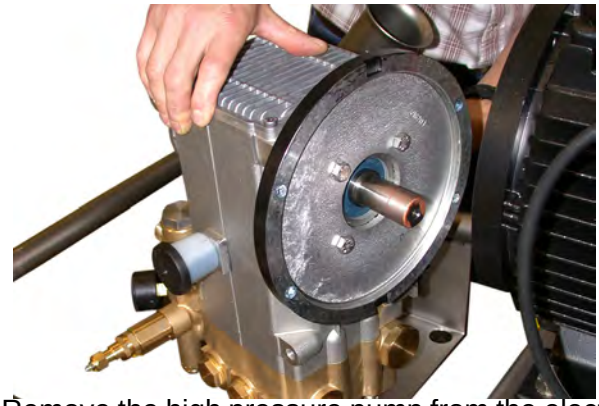


➔ Remove the high pressure pump casing; use a flat screwdriver for this.

➔ Let the high pressure pump tilt down.

Note

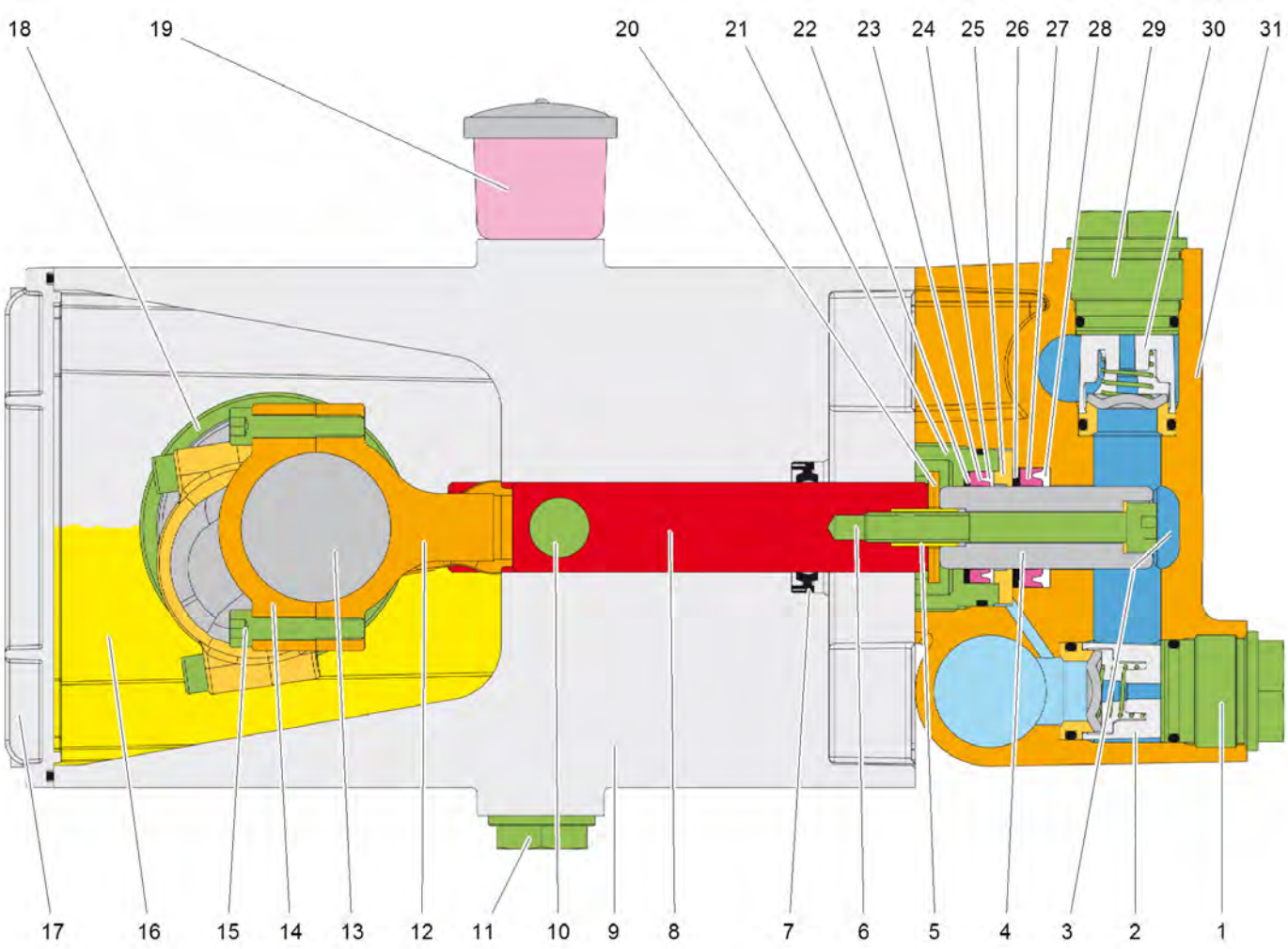
Oil can leak during this tilting process.



➔ Remove the high pressure pump from the electric motor.

5.4 Removal of the crankshaft pump

5.4.1 Pump diagram



1 Valve screw, suction side, with O-ring
2 Suction valve
3 Disc
4 Piston
5 Guide sleeve
6 Piston screw
7 Oil seal ring
8 Push bar
9 Pump casing
10 Bolt, push bar
11 Oil drain screw
12 Piston rod top
13 Crankshaft
14 Piston rod bottom
15 Piston rod screw
16 Oil bath
17 Crankshaft housing cover, with O-ring
18 Crankshaft bearing (1 x left, 1 x right)
19 Oil fill container
20 Distance-/labyrinth discs
21 Crown nut
22 Disc
23 Low pressure seal
24 Support ring, low pressure seal
25 Brass support disc
26 Disc
27 High pressure seal
28 Support ring, high pressure seal
29 Valve screw, pressure side, with O-ring
30 Pressure valve, with O-ring
31 Cylinder head

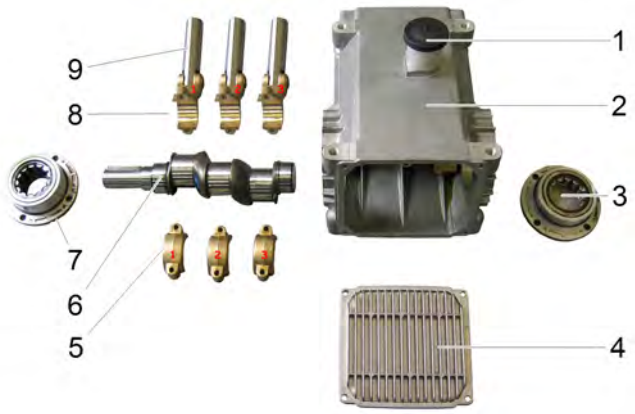
5.4.2 Remove the crank drive

➔ Unscrew the cylinder head. The exact procedure is described in the Chapter "Removing the cylinder head".
➔ Unscrew the pistons from the push rods.
➔ Unscrew the oil drain screw and collect oil.
➔ Remove the crankshaft casing cover.

➔ Mark the piston rod top and bottom. The piston rod tops and bottom must not be mixed up during installation.
➔ Remove the piston screws.
➔ Remove the piston bottoms.

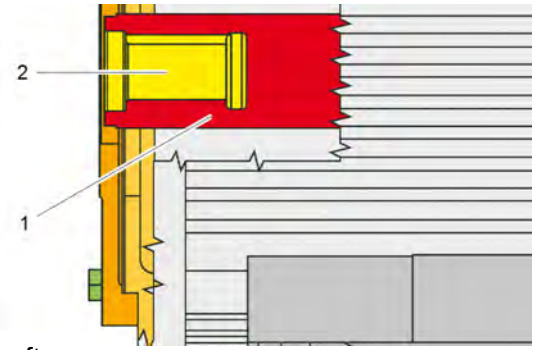
➔ Remove the crankshaft bearing covers and the crankshaft bearings.
➔ Remove the crankshaft from the crankshaft casing.
➔ Pull out the piston with the push rods from the crankshaft casing.

➔ Remove the oil seal rings using a special pliers.



1 Oil fill container
2 Pump casing
3 Crankshaft bearing cover with crankshaft bearing and O-ring
4 Crankshaft casing cover
5 Piston rod bottom parts, marked
6 Crankshaft
7 Crankshaft bearing with flange, O-ring and shaft seal
8 Piston rod top parts, marked
9 Push rods

➔ Assembly in reverse order
➔ Note during assembly:
– Place the new oil seal in water prior to installation.
– Install the oil seal into the piston guide using an installation mandrel (special tool)
– Pay attention to installation position of the seals.



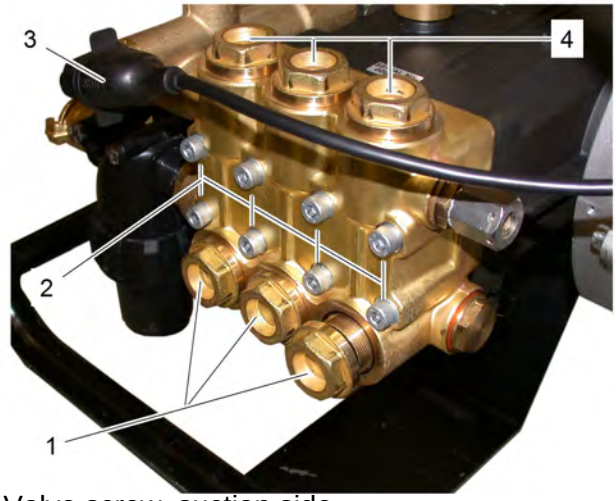
1 Motor shaft
2 Copper paste

– Grease the inside of the motor shaft with copper paste.
– Grease the outside of the crankshaft with copper paste.

Order no. copper paste (100g): 6.869-087.0

5.4.3 Cylinder head, uninstall

➔ Loosen the two fastening screws of the overflow (HD 25/15-4)



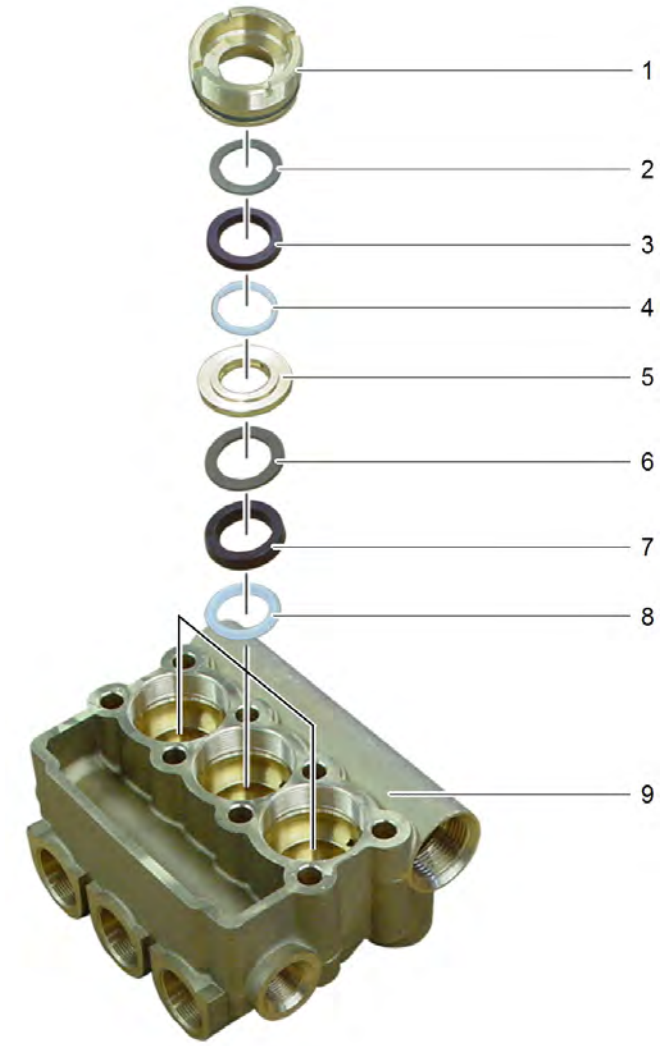
1 Valve screw, suction side
2 Fastening screws
3 **Pressure switch**
4 Valve screw, pressure side

➔ Loosen the fastening screws.

➔ Carefully pull out the cylinder head using both hands.

The removed cylinder head

cross section seal setup, see pump diagram.



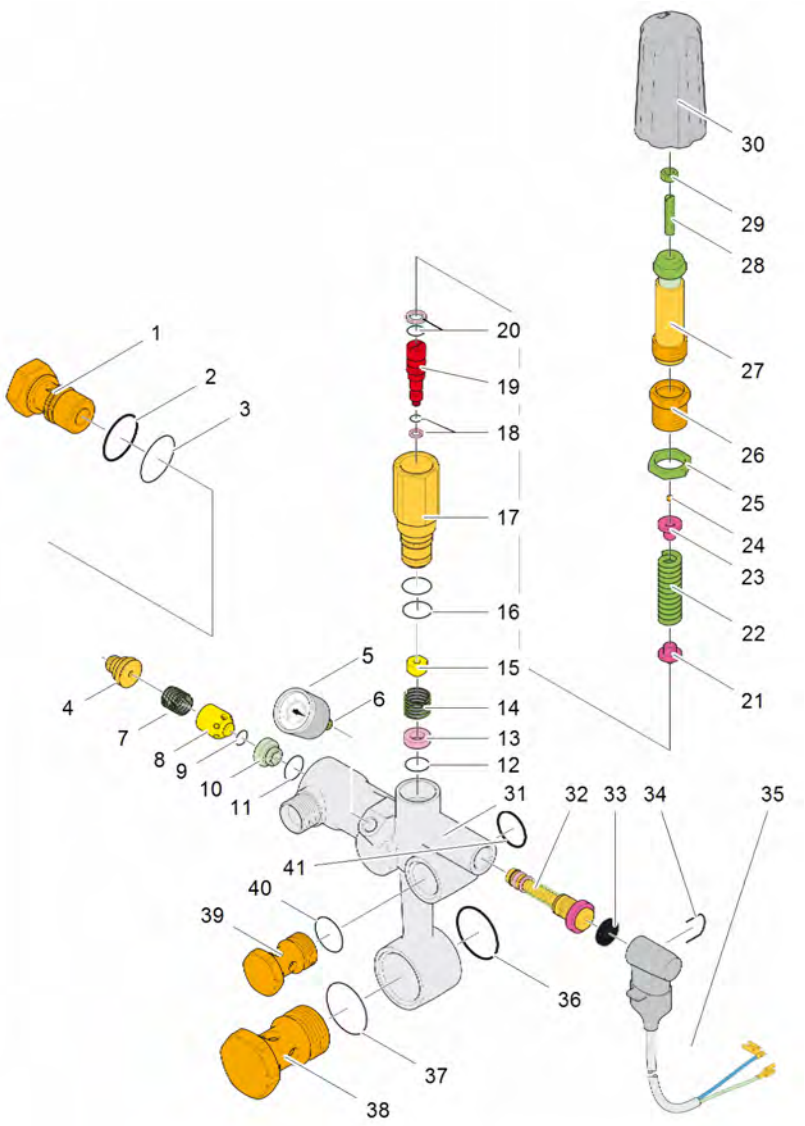
1 Crown nut
2 Disc
3 Low pressure seal
4 Support ring, low pressure seal
5 Support disc, brass
6 Disc
7 High pressure seal
8 Support ring, high pressure seal
9 Cylinder head

➔ Always replace the entire set of seals.
➔ Grease the low and high pressure seals generously with special silicone grease prior to installation.

Order no. silicone grease (100 g): 6.288-079.0

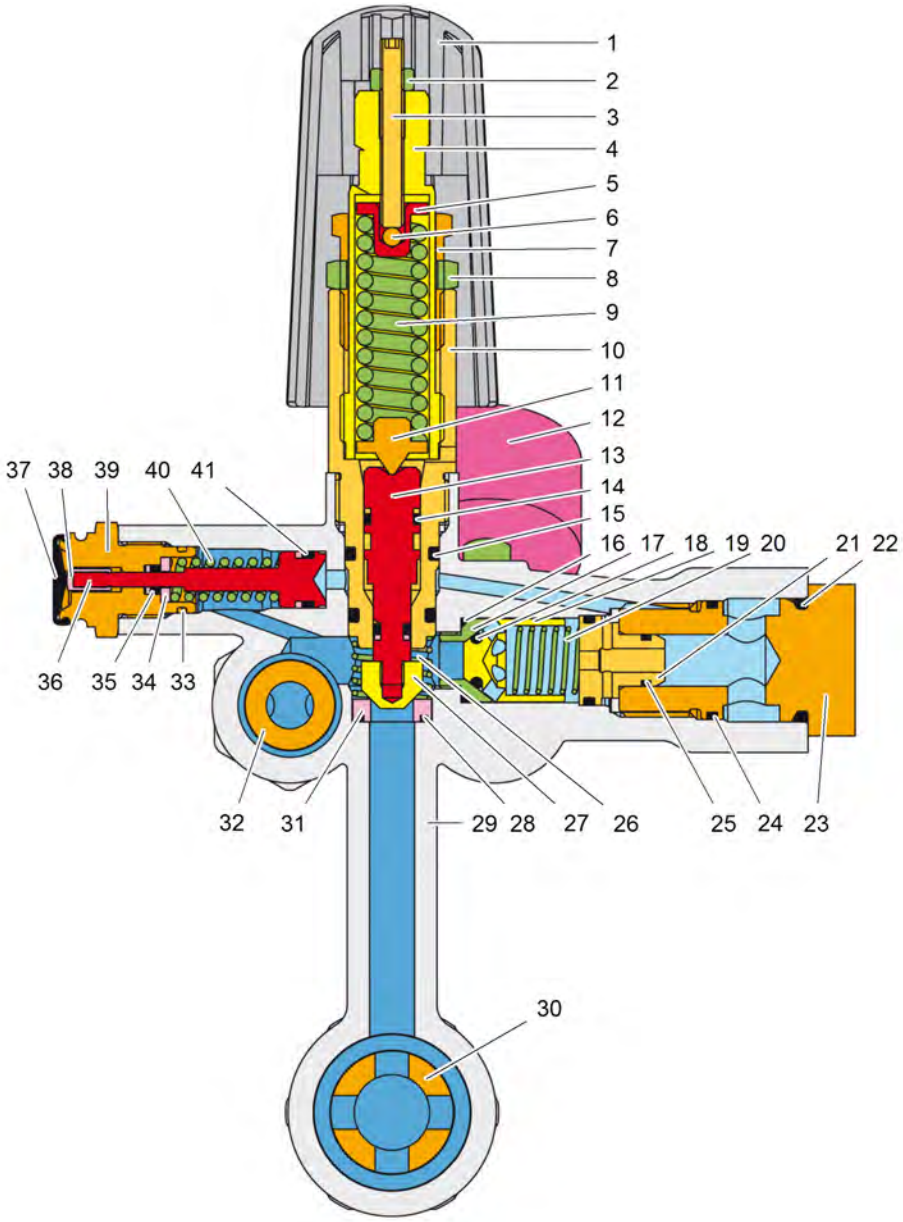
➔ Unscrew the valve screws to remove the valve cages.
➔ Pull the valve cage out with a pliers.

5.4.4 Overflow



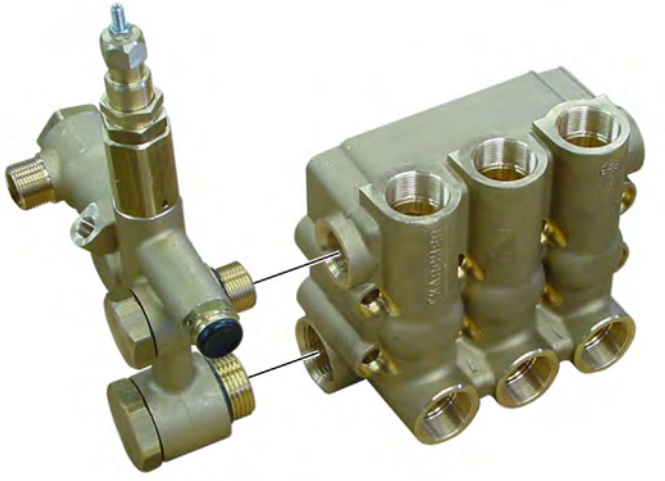
Overflow setup

1 Screw socket
2 O ring
3 O ring
4 Nozzle insert
5 Manometer
6 Screw connections
7 Spring
8 Valve bolt
9 O ring
10 Valve seat
11 O ring
12 O ring
13 Valve seat
14 Spring
15 Valve bolt
16 O ring
17 Housing, overflow valve
18 O ring
19 Control piston
20 O ring
21 Spring plate, bottom
22 Spring
23 Spring plate, top
24 Sphere
25 Lock nut, adjustment screw, low pressure
26 Adjustment screw, low pressure
27 Spindle of the pressure/quantity regulation
28 Adjustment screw, high pressure
29 Lock nut, adjustment screw, high pressure
30 Turning handle
31 Node piece
32 Control piston, pressure switch
33 Membrane seal
34 Support bow, pressure switch
35 **Pressure switch**
36 O ring
37 O ring
38 Hollow screw
39 Hollow screw
40 O ring
41 O ring
42 Manometer



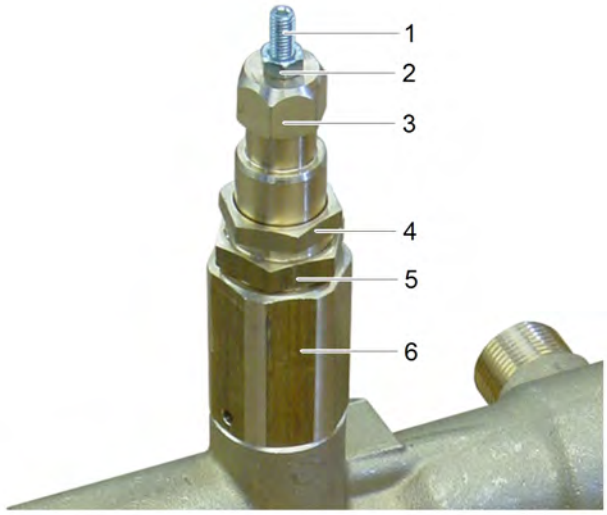
Cross section of the overflow

1 Turning handle
2 Lock nut, adjustment screw, high pressure
3 Adjustment screw, high pressure
4 Spindle, pressure and quantity regulation
5 Spring plate, top
6 Sphere
7 Adjustment screw, low pressure
8 Lock nut, adjustment screw, low pressure
9 Spring
10 Housing, overflow valve
11 Spring plate, bottom
12 Manometer
13 Control piston
14 O ring
15 O ring
16 O ring
17 Valve seat
18 O ring
19 Valve bolt
20 Spring
21 Nozzle insert
22 O ring
23 Screw socket
24 O ring
25 O ring
26 Spring
27 Valve bolt
28 O ring
29 Node piece
30 Hollow screw, suction side
31 Valve seat
32 Hollow screw, pressure side
33 O ring
34 Disc
35 O ring
36 Control piston
37 Membrane seal, pressure switch
38 Protective cover
39 Casing
40 Spring
41 O ring



➔ Loosen both hollow screws at the same time to remove the overflow casing in order not to damage the O-rings.

5.4.5 Regulate the working pressure by means of the rotary know on the gun



1 Adjustment screw, high pressure
2 Lock nut, adjustment screw, high pressure
3 Spindle, pressure and quantity regulation
4 Adjustment screw, low pressure
5 Lock nut, adjustment screw, low pressure
6 Housing, overflow valve

Preparation

➔ Fasten the test manometer to the high-pressure connection.
➔ Connect the high-pressure hose with the servo press hand spray gun to the test manometer.

Setting the maximum working pressure:

➔ Rotate the servo press to the "MIN" position, open the hand spray gun and let the device run.
➔ Turn in the rotary handle of the pressure and quantity regulation until it stops (MAX value).
➔ Pull off the rotary handle.
➔ Loosen the locknut for high pressure.
➔ Turn the adjustment screw high pressure so that the pressure display on the test manometer equals the maximum working pressure in the Chapter "Specifications".
➔ Secure the adjustment screw for high pressure by tightening the locknut.
➔ Seal the adjustment screw for high pressure and the lock nut with locking paint.

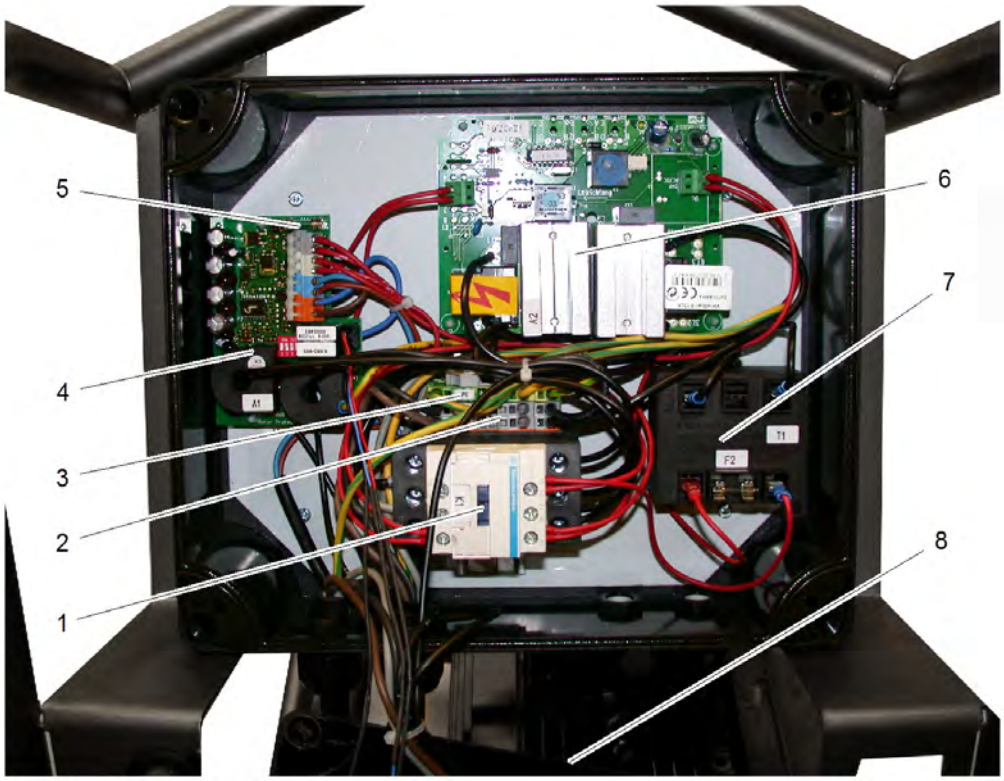
Setting the minimum working pressure:

➔ Install the**new** high pressure nozzle.
➔ Rotate the servo press to the "MAX" position, open the hand spray gun and let the device run.
➔ Pull off the rotary handle.
➔ Loosen the locknut for low pressure.
➔ Turn the adjustment screw low pressure and the spindle for pressure/quantity regulation at the same time, so that the pressure display on the test manometer equals the minimum working pressure in the Chapter "Specifications".
➔ Secure the adjustment screw for low pressure by tightening the locknut.
➔ Seal the adjustment screw for high pressure and the lock nut with locking paint.

5.5 Electrical system

⚠ ***Warning***

When working on the device, please always use the current circuit diagram in Kärcher-Inside.



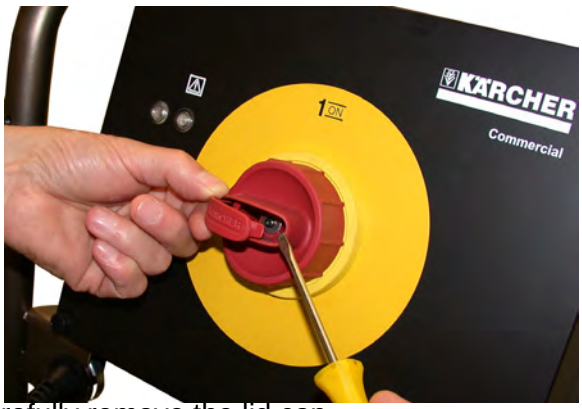
1 Power contactor
2 Terminal strip
3 Terminal strip protective conductor
4 Motor protection electronics
5 Fuse F1 (1.0 AT)
6 Gentle start electronics
7 Control transformer (fuse 2.0 AT)
8 Cover of switchbox

5.5.1 Open the switchbox

➔ Loosen 4 screws and remove the lid of the casing.

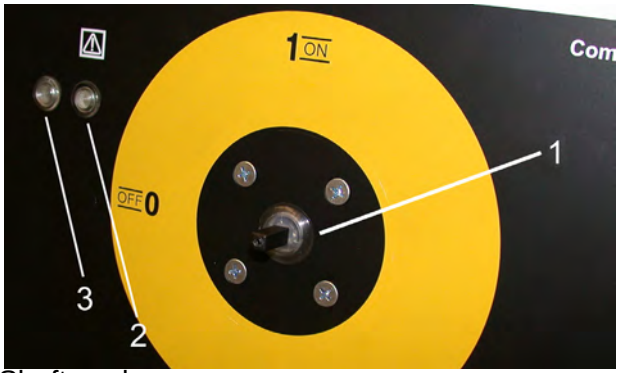
➔ Carefully pull the indicator lamp out of the socket in the lid and place the lid on the side.

5.5.2 Remove the appliance switch rotary knob



➔ Carefully remove the lid cap

➔ Loosen the screw on the shaft and remove the knob



1 Shaft seal
2 Indicator lamp
3 Indicator lamp (no function)

➔ The resistance to spray water is ensured by a seal on the shaft.
➔ Loosen the 4 fastening screws.
➔ Disconnect the cable connections.
➔ Remove the appliance switch.
➔ Assemble it back in the reverse sequence.

5.5.3 Motor protection electronics

1 Protective conductor connection
2 Measuring coil
3 DIP switch
4 Measuring coil
5 Fuse 1.0 AT
6 Terminal strips
7 Indicator lamp connection

The electronics can only be replaced as one complete unit. Prior to the replacement, check the cable connections, connected components and fuses. Connect power supply and control wires according to the circuit plan.

5.5.4 Functional description of the motor protection electronics:

Position of the DIP switches:

Switch	Position	Meaning
1	OFF	1-phase appliance
2	ON	Trailing time 30 seconds
3	ON	Leak detection
4	ON	Switch off after 30 minutes of continuous operation / pause.

Display of the indicator lamp:

Blinking	**Colour**	Meaning
--	Green	Operation, voltage present, no faults
Duration	Green	30 minutes of continuous operation, continuous pause
1x	Red	Leak in the system
2x	Red	Winding protection contact was triggered
3x	Red	Over or under voltage, current asymmetry
4x	Red	Overcurrent

Switch-off after 30 minutes of continuous operation or continuous break:
- Indicator lamp is blinking green
- Machine switches off and locks up, if there is no signal change from the pressure switch after another 30 minutes.
- A signal change will restart the time.
- DIP switch 4: OFF = without switch-off, ON = with switch-off.

Leak
- 1 blink red.
- Switch-off and locking of the machine after 10 short starts (less than 2 seconds) due to a leak.
- DIP switch 3: OFF = without switch-off, ON = with switch-off.

Winding protection contact
- blinks red twice:
- Switch-off and locking of the machine, if the winding protection contact opens.

Over or under voltage, current asymmetry
- blinks red thrice:
- Switch-off and locking of the machine in case the secondary voltage of the control transformer is less than 17 volts AC (under voltage).
- Switch-off and locking of the machine in case the secondary voltage of the control transformer is more than 37 volts AC (over voltage).
- Switch-off and locking of the machine in case of a current difference on the transformers of more than 10 A for two seconds.

Overcurrent
- Switch-off and locking of the machine in case of an over voltage of 42 A on one of the transformers.

One-phase operation
- DIP switch 1: ON = one-phase appliance, OFF = three-phase appliance.
- In the one-phase appliance, only one transformer is used.

Operation with gentle start

- In appliances with gentle start, the trailing must be active.
- When the pressure switch is opened, the pump will shut off with a 30 second delay.
- DIP switch 2: ON = trailing active, OFF = trailing off

➔ Switch the appliance off and back on to delete a fault display.

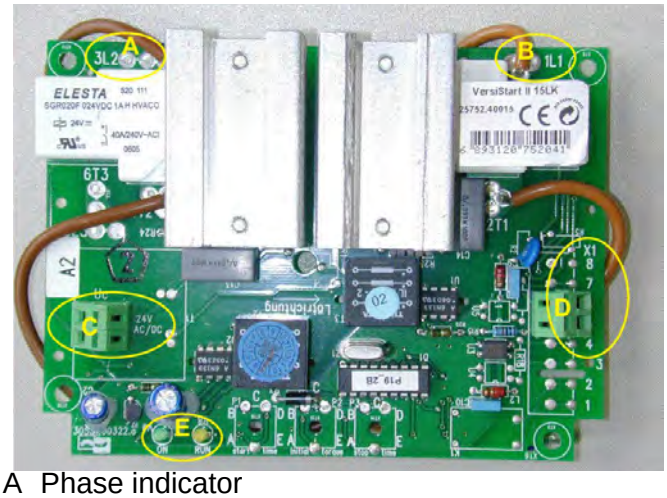
5.5.5 Simple function test of the motor protection electronics without appliance

➔ Connect the indicator lamp.
➔ Use a wire jumper on terminals 3 + 4.
➔ Use a wire jumper on terminals 5 + 6.
➔ Connect a contactor coil to terminals 7 + 8.
➔ Connect voltage (24V~) to terminals 9 + 10.
➔ Switch on the voltage supply.

The contactor must react the indicator lamp must glow green.

5.5.6 Gentle start electronics

The appliance is equipped with gentle start electronics.
Soft start increases the motor speed gradually to 1,400 1/min and protects the circuit from overloads when switched on
The electronics can only be replaced as one complete unit. Prior to the replacement, check the cable connections, connected components and fuses.



A Phase indicator
B Phase indicator
C Voltage supply 24V
D Connection release
E Display "On" lights up for voltage supply of 24V, display "Run" lights up after the motor has been started.

Possible reasons for malfunctions of the gentle start electronics:

- Overvoltage of the voltage supply (more than 27V)
- Multiple motor starts per minute (30 seconds of trailing control of the motor protection electronics is not active).
- Corrosion and/or moisture in the components.

5.5.7 Simple function test of the gentle start electronics inside the appliance

➔ Check whether both phases are present.
➔ Check if the voltage supply (24V~) is present.
➔ Jump the release on X1 5/6 (D top of image).
➔ LED "RUN" on the circuit board lights up after 1 - 2 seconds.

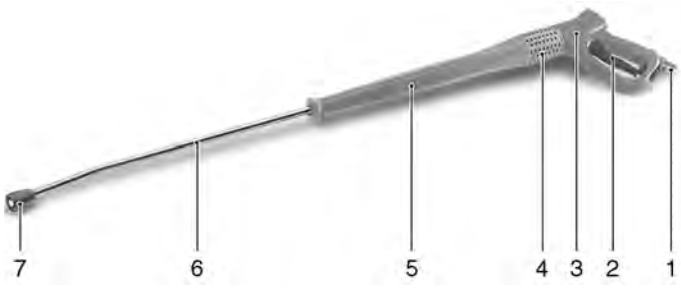
5.5.8 Replacing the mains cable

1 Fastener
2 Disc

➔ Pull out the safety bow of the traction relief.
➔ Loosen the disc.
➔ Take out the traction relief from the holder.
➔ Disconnect the mains cable.
➔ Assemble it back in the reverse sequence.
➔ The disc must be under the safety bow.

5.6 Gun and spray pipe HD 20/15-4 and 20/15-4

The illustration might differ from the gun on your model, however, the procedure is still the same.

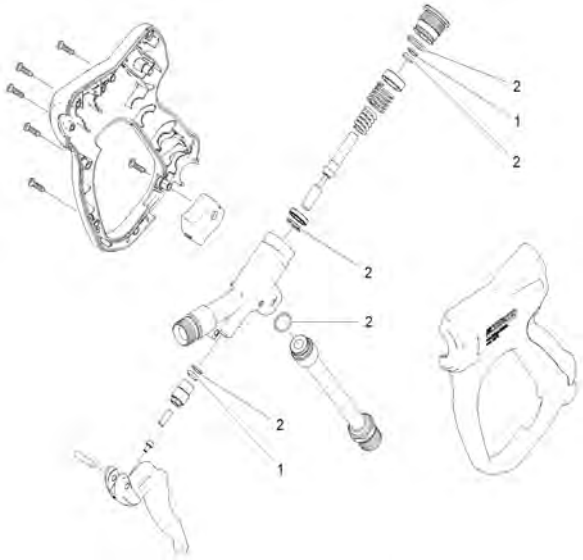


1 Connection of high pressure hose
2 Hand lever
3 Gun
4 Power press regulator
5 Hand guide
6 Spray pipe (stainless steel)
7 Nozzle

5.6.1 Disassemble hand spray gun

The hand spray gun can be disassembled to replace seals or wear parts.

Hand-spray gun



The individual parts of the hand spray gun. Part numbers, see DISIS.

1 Support ring
2 O ring

➔ Unscrew all fastening screws.

➔ Remove the half of the handle shell.

The open gun, trigger lock removed.

➔ Remove the lever; press out the pin on the joint.

➔ Unscrew the locking screw; use a 12 mm hexagon socket wrench.

➔ Pull the pin out toward the front.

➔ Press the piston out from the front. Make sure that the springs do not jump out.

The removed piston with springs and seal set

➔ Adhere to the sequence of the seal set and the springs when assembling.

➔ The seal set includes an O-ring 14x1,5-NBR 70.

➔ Open the screw connection.

➔ Replace the support ring and the O-ring.

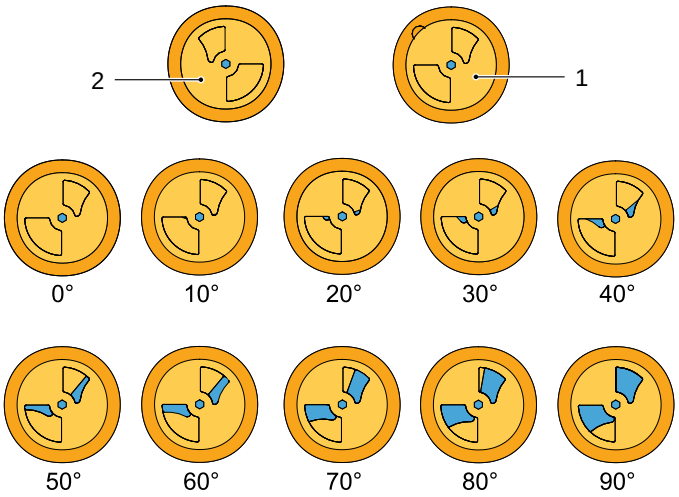
➔ During the assembly, ensure the correct installation sequence of the O-ring and the support ring.

Note

Grease all O-rings with Ontropeen (part number: 6.288-088.0 5 grams, 6.288-079.0 100 grams). Fill the hollow spaces with grease.

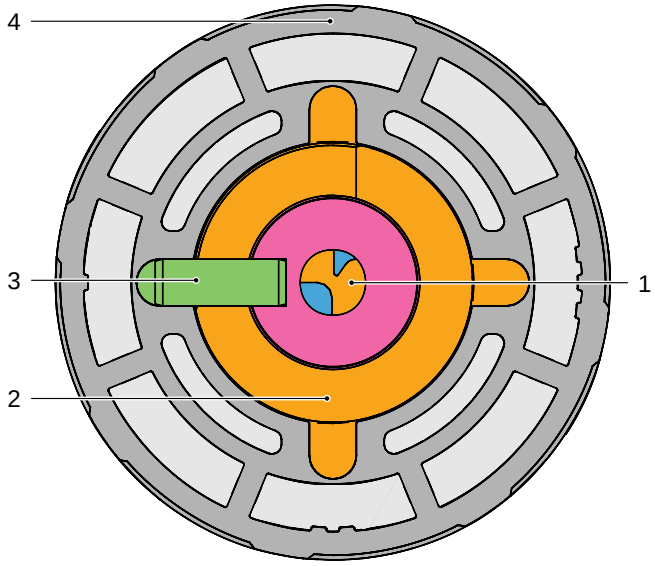
➔ Reassemble the hand spray gun in the reverse sequence.

5.6.2 Adjustments on the power press regulator



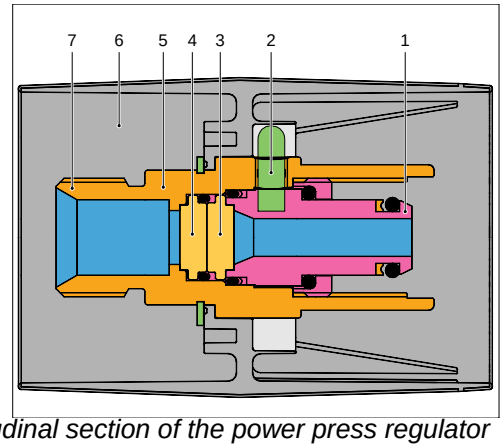
1 Ceramic disc on spray pipe side
2 Ceramic disc on gun side

The ceramic disc on the gun side is rigidly connected to the gun connection. The ceramic disc on the spray pipe side is connected to the regulator and therefore adjustable.
Offset holes in the ceramic discs can adjust the flow volume when rotating the discs. This illustration shows the two overlapping ceramic discs and the water flow (blue) with different opening angles (from 0° to 90°).
With the minimal setting, the water flows through a small hose in the middle of the ceramic discs.



Cross section of the power press regulator (gun side)

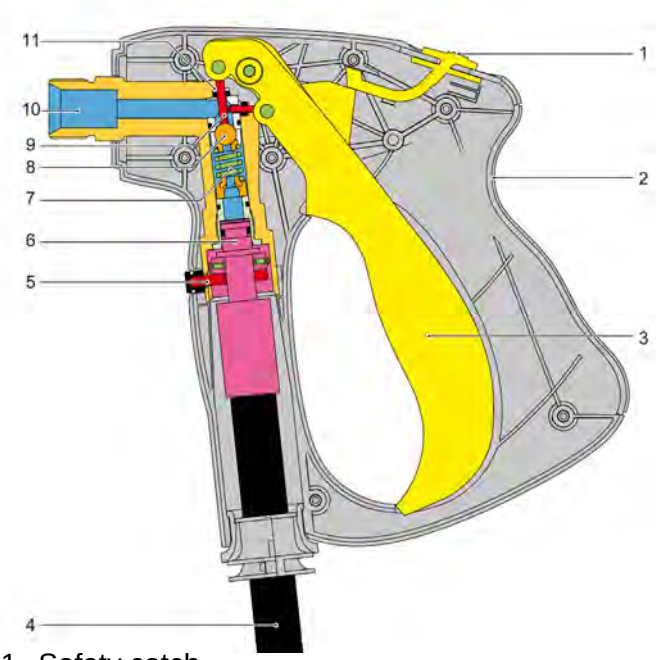
1 Ceramic disc on gun side
2 Casing of rotating regulator
3 Connecting pin
4 Handle of rotary regulator



Longitudinal section of the power press regulator

1 Gun connection
2 Connecting pin
3 Ceramic disc on gun side
4 Ceramic disc on spray pipe side
5 Casing of rotating regulator
6 Handle of rotary regulator
7 Spray pipe connection

5.7 Gun HP 16/15-4



1 Safety catch
2 Halves of the handle shell
3 Lever
4 High pressure hose
5 Safety pin
6 coupling
7 Spring
8 Valve ball
9 Piston
10 Spray pipe connection
11 O-rings/support ring

When this lever is actuated, the valve ball is pressed against the spring toward the bottom by the piston. The node piece is completely replaced during the repair procedure.

5.8 Changing Wheels

➔ Remove the quick connect with pliers. The quick connect cannot be reused.

➔ Remove the wheel, watch for the spacer.
➔ Grease the axle with silicone.

➔ Install the quick connect with the proper installation aid and a rubber mallet.

6 Troubleshooting

6.1 Appliance is not running

– No power
➔ Check whether the voltage indicated on the type plate corresponds to the voltage of the socket.
➔ Check the mains connection cable for damages.
– Indicator lamp is blinking green
➔ Operational readiness period has expired. Switch on/off the appliance again.
– The water shortage fuse (option) was triggered due to low water inlet pressure.
The indicator lamp "lack of water" will illuminate.
➔ Check water inlet pressure, minimum value see "Specifications".
Turn the device switch to "0" and turn on again to restart the system.
– Motor overloaded/ over-heated or electrical circuit breaker or winding protection switch has got released.
➔ Switch off appliance and let it cool down. Remove the cause of the problem. Turn on the appliance again.

6.2 Indicator lamp

The indicator lamps display the operating states (green) and interruptions (red).
Reset:
➔ Set the appliance switch to "0".
➔ Wait for a while.
➔ Set the appliance switch to "I".

6.2.1 Operating status display

■ Continuous green:
– The appliance is now ready for operation.
■ 1x blinking green:
– Operational readiness has expired after 30 minutes.
– The appliance has switched off after 30 minutes of continuous operation (safety if the high pressure hose bursts).

6.2.2 Fault indication

■ Continuous red light:
– Electrical problems in appliance
➔ Pull out the mains plug.
➔ Call Customer Service.
■ 1x blinking red:
– High pressure side is leaky
➔ Check high pressure hose, hose connections and hand spray gun for leaks.
■ 2x blinking red:
– Engine overload/overheat
➔ Set the appliance switch to "0".
➔ Allow device to cool down.
➔ Set the appliance switch to "I".
– Water pressure is too low
➔ Ensure adequate water line pressure.
■ 3x blinking red:
– Fault in the voltage supply
➔ Check main connections and mains fuse.
■ 4x blinking red:
– Power consumption is too high
➔ Call Customer Service.

6.3 Device is not building up pressure

– Wrong nozzle
➔ Check nozzle for correct size (see technical specifications).
– Flushed the nozzle.
➔ Clean/ replace nozzle.
– Filter is dirty.
➔ Clean filter at the water connection.
Unscrew the filter casing, remove the filter, clean it and replace it.
– Air within the system
➔ Appliance ventilation:
Unscrew the nozzle. Switch on the appliance and let it run until the water exiting from the spray pipe is bubble-free. Switch off the appliance and fit the nozzle again.
– Pipe inlets to pump are leaky or blocked
➔ Check all supply lines to the pump for leaks or blockages.

6.4 High pressure side is leaky

➔ 3 drops per minute are permitted and can come out from the lower side of the appliance.

6.5 High pressure pump is vibrating

➔ Check all supply lines to the high-pressure pump for leaks or blockages.
➔ Appliance ventilation:
Unscrew the nozzle. Switch on the appliance and let it run until the water exiting from the spray pipe is bubble-free. Switch off the appliance and fit the nozzle again.

7 Technical specifications

Type		HD 25/15-4	HD 20/15-4	HD 16/15-4
Power connection				
Voltage	V	400	400	400
Current type	Hz	3~50	3~50	3~50
Connection output	kW	13	11,5	9,5
Current pickup, full load (after 1 minutes)	A	<25	<21	<16
Mains fuse (slow-blow)	A	25	25	16
Maximum allowed net impedance	Ohm	(0,072+j0,045)	(0,072+j0,045)	(0,072+j0,045)
Water connection				
Max. feed temperature	°C	60	60	60
Min. feed volume	l/h (l/min)	3000 (50)	2500 (42)	2000 (34
Inlet hose length (min.)	m	7,5	7,5	7,5
Inlet hose diameter (min.)	Inch	3/4	3/4	3/4
Suck height from open container (20 °C)	m	0,5	0,5	0,5
Performance data				
Working pressure (appliance manometer)	MPa (bar)	3...15 (30...150)	3...15 (30...150)	3...15 (30...150)
Servopress pressure (manometer on the appliance outlet)	MPa (bar)	14,8 (148)	15 (150)	15,3 (153)
Max. permissible pressure	MPa (bar)	19,5 (195)	19,5 (195)	19,5 (195)
Water flow rate	l/h (l/min)	>2320 (>39)	>1900 (>32)	>1520 (>25)
Nozzle size	--	155	125	100
Recoil force of trigger gun	N	120	96	77
Noise emission				
Sound pressure level (EN 60704-1)	dB(A)	76	80	79
Guaranteed sound power level (2000/14/EC)	dB(A)	93	93	98
Machine vibrations	Vibration total value (ISO 5349)			
Hand spraygun	m/s^2	3,2	3,2	1,7
Spray lance	m/s^2	6,4	6,4	2,8
Fuel				
Oil quantity - pump	l	1,3	1,3	1,3
Oil type - pipe		SAE 90	SAE 15W40	SAE 15W40
Dimensions and weights				
Length x width x height	mm	957 x 686 x 1080		
Weight without accessories	kg	119		
Air pressure of wheels	MPa (bar)	0,25 (2,5)		

7.1 Technical Documentation

Appliance type	**Order number**	**Circuit diagram**	**operating instructions**	**Spare parts list**
HD 25/15-4 Cage	1.367-121.0	0.089-091.0	5.963-304.0	5.971-040.0
HD 20/15-4 Cage	1.367-131.0	0.089-091.0	5.963-304.0	5.971-077.0
HD 16/15-4 Cage	1.367-105.0	0.089-091.0	5.963-304.0	5.971-077.0

8 Circuit diagram

The status of the attached circuit diagram represents the creation date of the service manual. This circuit diagram is not updated. When working on the device, please always use the current circuit diagram in Kärcher-Inside.

9 Special tools

Special tool HP 25/15-4 and 20/15-4, piston diameter 25 mm	**Order number**
Pliers to remove the rings and seats	4.901-062.0
Inner driver, diameter 14.5 to 18.5 mm	6.815-013.0
Installation mandrel, high and low pressure seal	6.815-211.0
Installation sleeve, high pressure seal	6.815-214.0
Installation mandrel, oil seal	6.815-223.0
Insertion tool, crown wrench	6.815-209.0

Special tool HP 20/15-4, piston diameter 25 mm	**Order number**
Pliers to remove the rings and seats	4.901-062.0
Inner driver, diameter 14.5 to 18.5 mm	6.815-013.0
Installation mandrel, high and low pressure seal	6.815-257.0
Installation sleeve, high pressure seal	6.815-256.0
Installation mandrel, oil seal	6.815-258.0

Special tool HP 16/15-4, piston diameter 22mm	**Order number**
Pliers to remove the rings and seats	4.901-062.0
Inner driver, diameter 14.5 to 18.5 mm	6.815-013.0
Installation mandrel, high and low pressure seal	6.815-257.0
Installation sleeve, high pressure seal	6.815-256.0
Installation mandrel, oil seal	6.815-258.0

10 Tightening torques

10.1 HD 25/15-4

Gear cover	5 Nm
Hollow screws on cylinder head	50 Nm
Crown nut	50 Nm
Valve screws	50 Nm
Cylinder head screws	40 Nm
Piston screws	20 Nm
Oil drain screw	40 Nm
Crankshaft bearing cover screws	18-22 Nm
Piston rod screws	18-22 Nm

10.2 HD 20/15-4

Gear cover	11 Nm
Hollow screws on cylinder head	50 Nm
Valve screws	200 Nm
Cylinder head screws	40 Nm
Piston screws	15 Nm
Oil drain screw	40 Nm
Crankshaft bearing cover screws	25 Nm
Piston rod screws	18-22 Nm

10.3 HD 16/15-4

Gear cover	11 Nm
Hollow screws on cylinder head	50 Nm
Valve screws	200 Nm
Cylinder head screws	40 Nm
Piston screws	15 Nm
Oil drain screw	40 Nm
Crankshaft bearing cover screws	25 Nm
Piston rod screws	18-22 Nm

11 Oil grades

HD 25/15-4	SAE 90
HD 20/15-4	SAE 15W40
HD 16/15-4	SAE 15W40