

Nilfisk

P150.2

P130.2, P150.2 & P160.2 X-TRA



Repair Manual

Nilfisk

A. Safety Precautions

3

B. Technical data

4

C. Structure

5-6

D. Service / Repair

7-23

E. Tools

24

F. Function

25-26

G. Electric diagrams

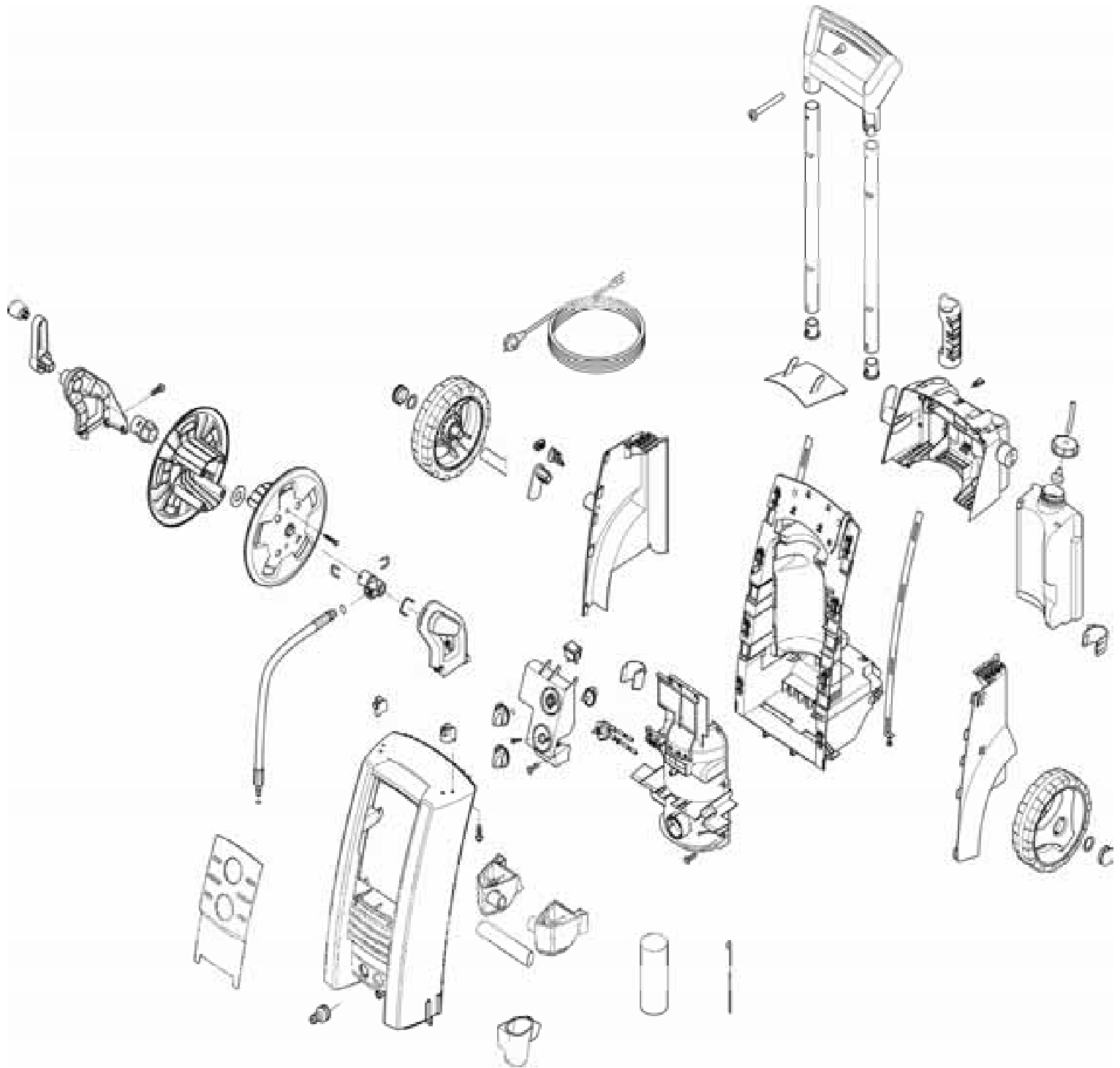
27-28

Warning!

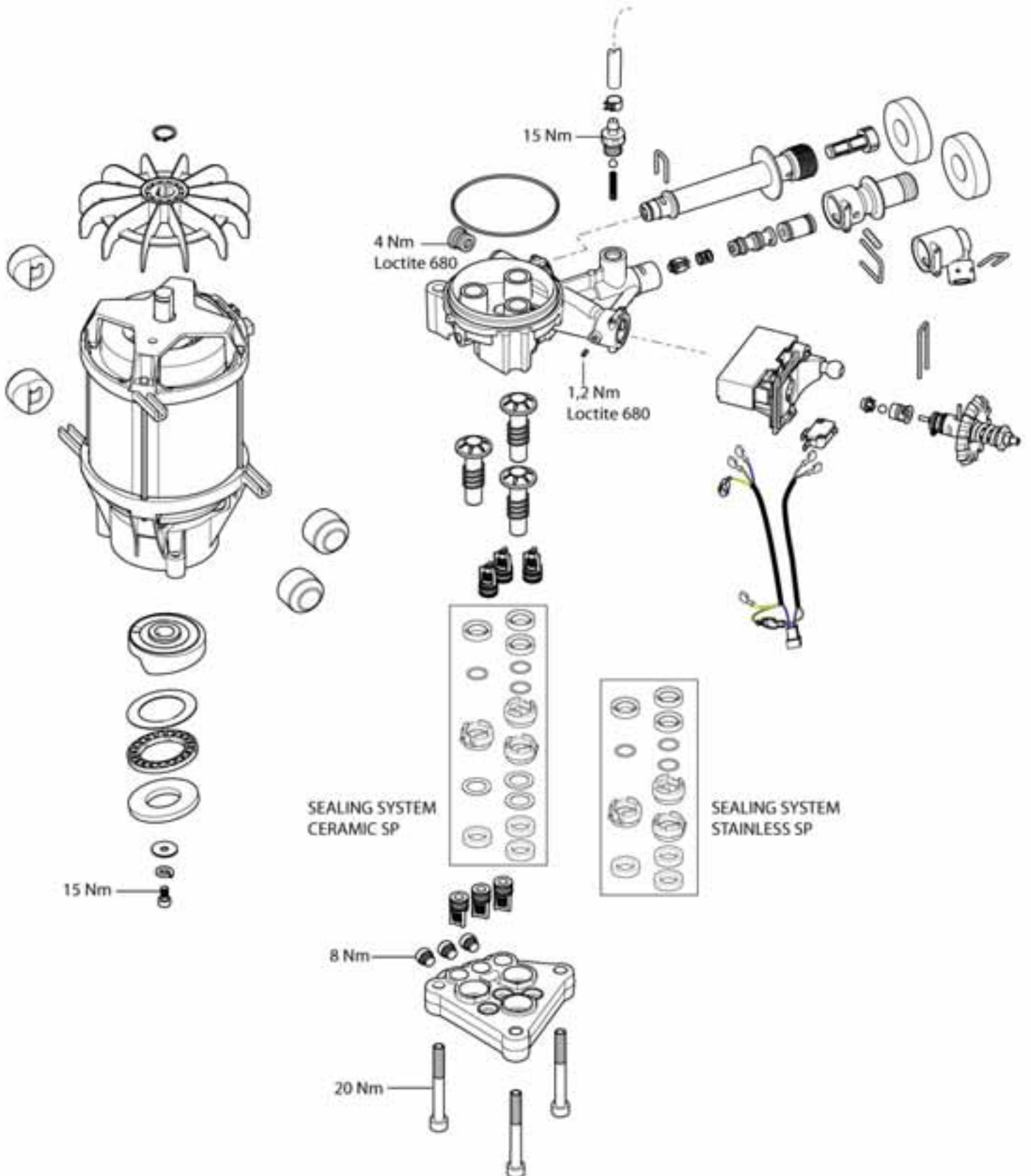
- High pressure jets can be dangerous. Never direct the water jet at persons, animals, live electrical equipment or the machine itself.
- Never try to clean clothes or footwear on yourself or other persons.
- Hold the spray lance firmly with both hands. The spray lance is affected by a thrust of up to 24,1N during operation.
- The operator and anyone in the immediate vicinity of the site of cleaning should take action to protect themselves from being struck by debris dislodged during operation. Wear goggles during operation.
- This appliance has been designed for use with cleaning agents supplied or recommended by the manufacturer. The use of other cleaning agents or chemicals may adversely affect the safety of the appliance.
- Disconnect from electrical power supply before carrying out user maintenance.
- To ensure the appliance safety only use original spare parts from the manufacturer or approved by the manufacturer.
- High pressure hoses, fittings and couplings are important for the safety of the appliance. Only use hoses, fittings and couplings recommended by the manufacturer.
- Do not use the appliance if a supply cord or important parts of appliance are damaged, e.g. safety device, high pressure hose and trigger gun.
- The appliance is only intended for cleaning outdoors.
- Appropriate ear protection must be used.
- Never use the machine in an environment where there could be a danger of explosion. If any doubt arises, please contact the local authorities.
- It is not allowed to clean asbestos containing surfaces with high pressure.
- This high pressure washer must not be used at temperatures below 0°C.
- Never let any persons stay under the product when stored on the wall.

Product segment: Consumer		P160.2 X-TRA	P150.2 P150.2 X-TRA	P130.2 X-TRA
Max pressure	bar	160	150	130
Voltage	V	230	230	230
Frequency	Hz	50	50	50
Rated current	A	14,5	12,6	10
Power consumption	kW	3,3	2,9	2,3
Motor speed	min ⁻¹	2800	2800	2800
Flow rate, HP	l / min.	8,8	8,4	7,2
Pump pressure	bar	135 ±9	126 ±9	102 ±9
Nozzle pressure	bar	114 ±9	105 ±9	82 ±9
Standby pressure	bar	140 ±10	135 ±15	135 ±15
Retaining time	min.	5	5	5
Oil contents	ml	80	80	80
Oil type		BP Bartran HV68	BP Bartran HV68	BP Bartran HV68
Max inlet water temperature	°C	60	60	60
Max inlet water pressure	bar	10	10	10
High pressure hose length	m	15m	10m	15m
Suction height	m	0,5	0,5	0,5
Supply cable length	m	5m	5m	5m
Insulation class (Motor)		F	F	F
Ingress protection class		IPX5	IPX5	IPX5

Cabinet parts overview.



Motor / pump unit overview including assembly torque and glue specification.



Dismounting / mounting of front cabinet.

1. Remove the 2 torx 20 screws from the hose reel (Fig 1)
2. Loosen the 2 torx 20 screws from the bottom of the machine and push them completely in. (Fig 2)

NOTE: No electrical tool allowed to loosen the 2 screws from the bottom, as the thread / slider can be damaged if too high torque is used.

The front cabinet can now be removed.

Note: press cabinet before tightening screw!

Fig. 1**Fig. 2**

Disassembly / assembly of switchbox and motor cover.

1. Remove the torx 20 screw from the cable relief and the torx 20 screw from the electrical box (Fig 1)
2. Remove the motor plug, capacitor plug and earth wire. (Fig 2)

Fig. 1



Fig. 2



Disassembly / assembly of switchbox and motor cover.

1. The capacitor is fixed with cable tie. Marking has to be visible. The cable tie has to be placed as indicated by the arrow (Fig. 1)
2. Cables and wires are mounted as shown (Fig. 2). The earth wire has to be attached as shown and placed around the tube (Fig. 2)

Fig. 1



Fig. 2



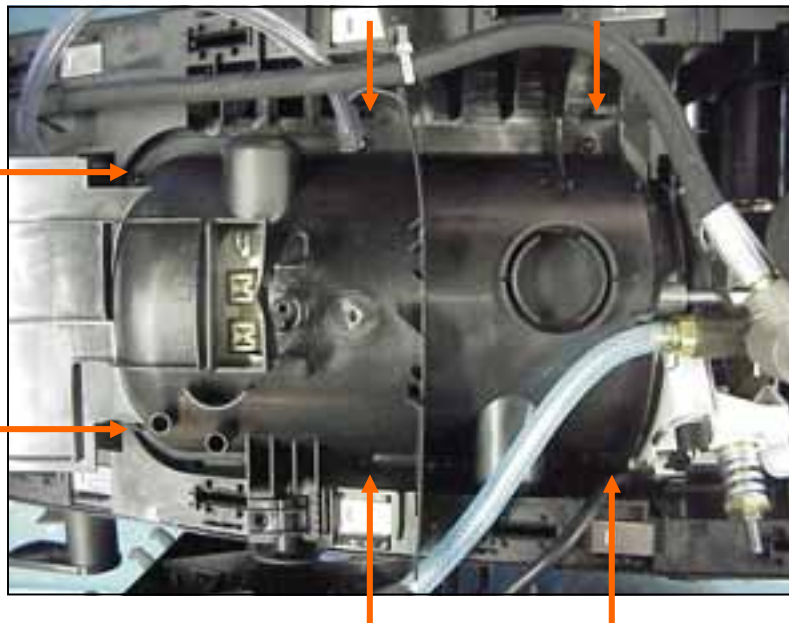
Disassembly / assembly of switchbox and motor cover.

1. Remove the detergent hose from the hose connection (Fig 1)
2. Remove the internal high pressure hose and the 6 torx screws (Fig 2)
3. The motor cover can now be removed and the motor / pump unit can be lifted out of the cabinet.

Fig. 1



Fig. 2



Disassembly / assembly of the pump.

1. Remove the 3 pieces 6mm hex screws (Fig 1)
2. The pump can now be removed.
3. Oil level as shown (80ml—Fig 2)
4. Bearing and bearing disk can be mounted both sides up. (Fig 3)
5. Thin disk directly on wobble disk, the bearing disk and on top the thick disk.

Fig. 1



Fig. 2



Fig. 3



Disassembly / assembly of the pump.

When a failure on bearing parts is observed, it is important that all bad parts and debris from the parts must be removed:

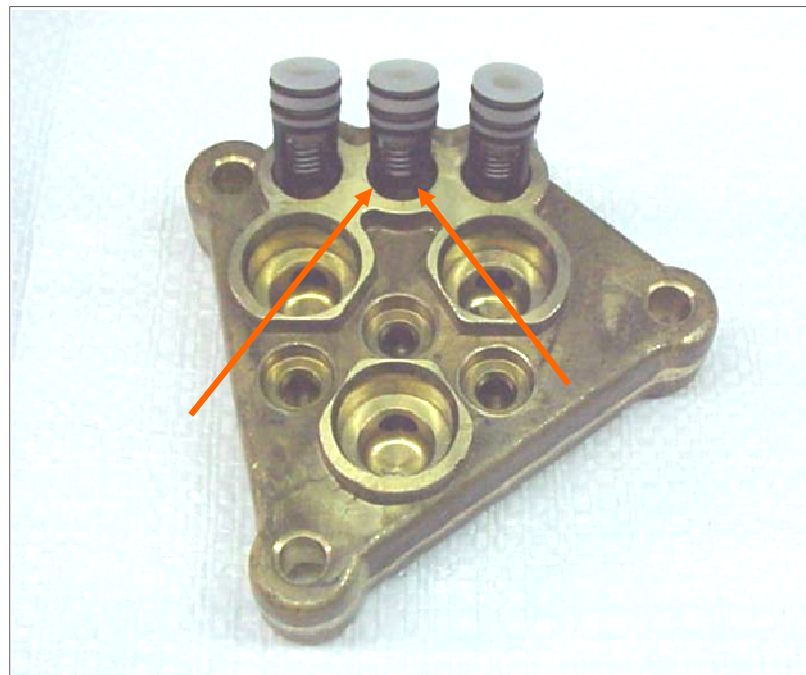
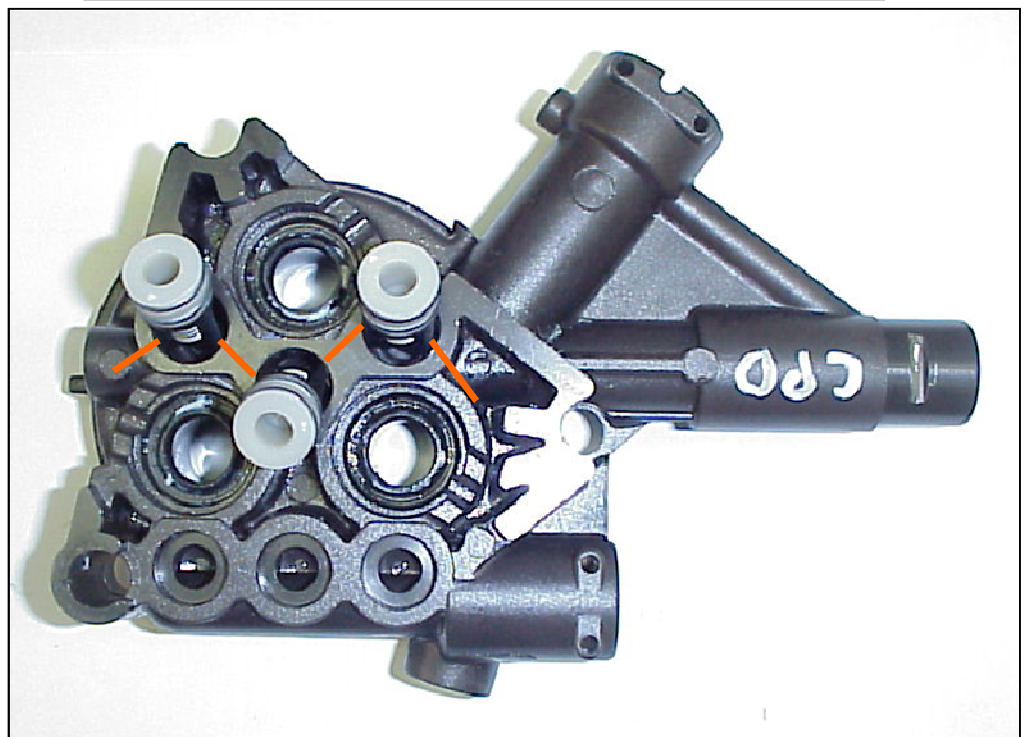
1. Dismount the wobble disc by loosening the screw. (Fig 1)
2. Examine all parts including D-bearing for damages, damaged parts must be replaced.
3. It is very important that the oil must be changed.
4. It is very important that the D-bearing in the motor must be cleaned with compressed air or petrol to clean out parts/dust from the damaged parts, that can have been moved in to the D-bearing.
5. When the D-bearing is cleaned it must be easy to rotate smoothly, without any peek-friction when rotating slowly.
6. All parts must be clean when assembling, applies to both new and reused parts.

Fig. 1

Disassembly / assembly of the pump.

The pump head can be removed from the cylinder block with a screw driver.

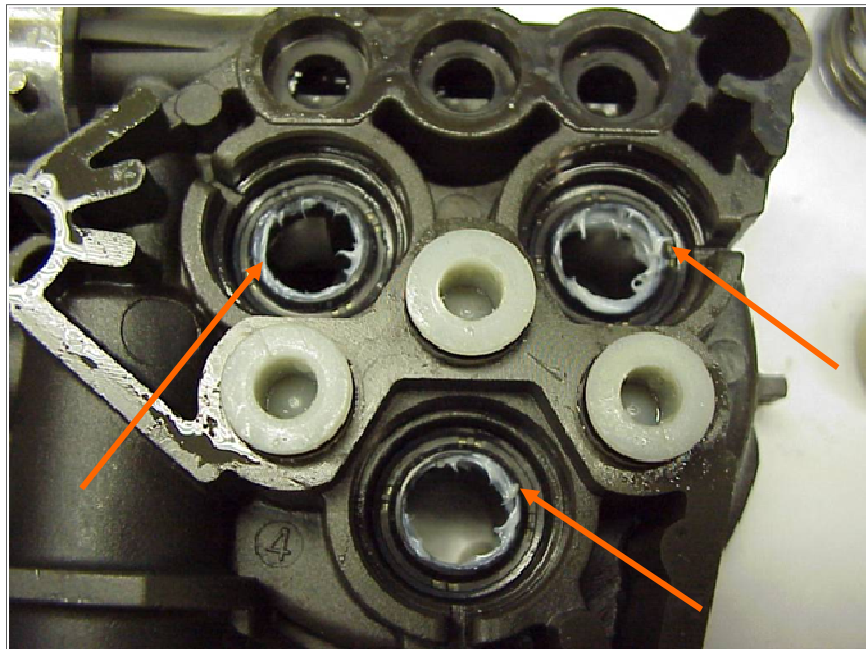
1. For the 3 valves in the cylinder head, orientation as shown on Fig. 1 must be made during the mounting process
2. For the 3 valves in the cylinder block the ribs on the valve body must be oriented as indicated on Fig. 2.

Fig. 1**Fig. 2**

Disassembly / assembly of the pump.

1. After mounting, the oil-seal must be greased, with Silicone grease (Unisilkon) inside $\text{\O}14$ hole. (Fig. 1)
2. After the U-sleeve is mounted correctly inside the cylinder head the U-sleeve must be greased with Silicone grease (Unisilkon) inside $\text{\O}14$ hole where the piston is moving and on the on plane surface of the U-sleeve (Fig. 2)

Note: Additional disk to be placed on top of water sealing if ceramic pistons are used.

Fig. 1**Fig. 2**

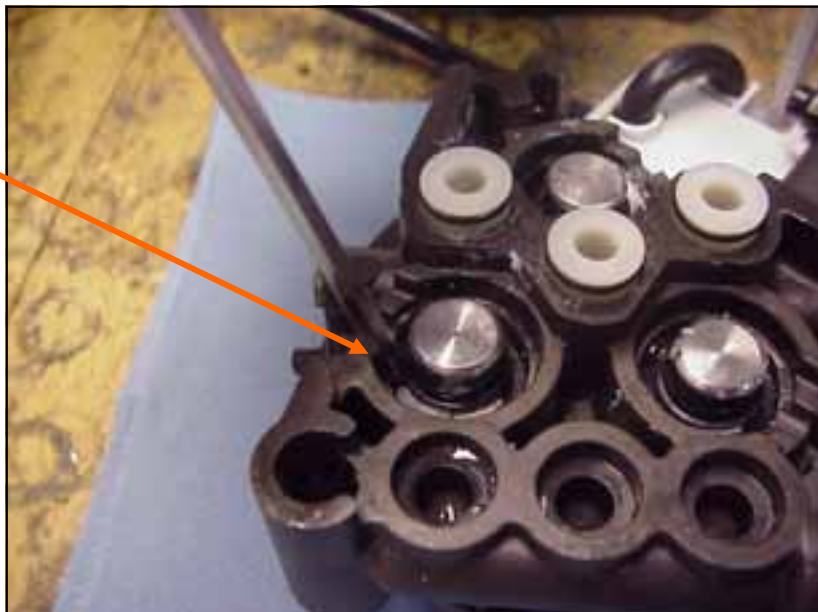
Disassembly / assembly of the pump.

1. Mount the pistons
2. Gently place the o-ring around the pistons (Fig. 1)
3. Position the o-ring directly on top of the oil seal with a flat tool with no sharp edges (Fig. 2).

Fig. 1



Fig. 2



Disassembly / assembly of the pump.

1. Check that the o-ring is correctly placed around the piston.
2. Mount the thrust collar in the groove as shown in fig. 2.

Note: Remember to mount the o-ring around the piston before to mount the thrust collar.

Fig. 1**Fig. 2**

Disassembly of the brass connector (inside the outlet).

1. Use M8 puller 1220103 to dismount the brass connector (Fig 1)
2. The injector can be removed with M6 puller, 31000190 (Fig 2)

Fig. 1

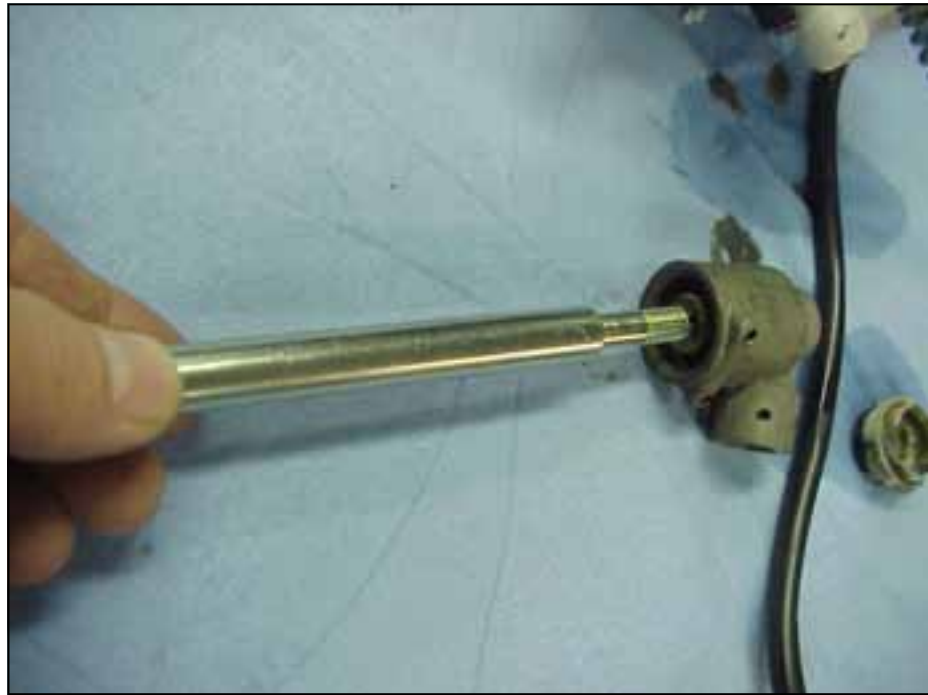


Fig. 2



Disassembly / assembly of start / stop valve.

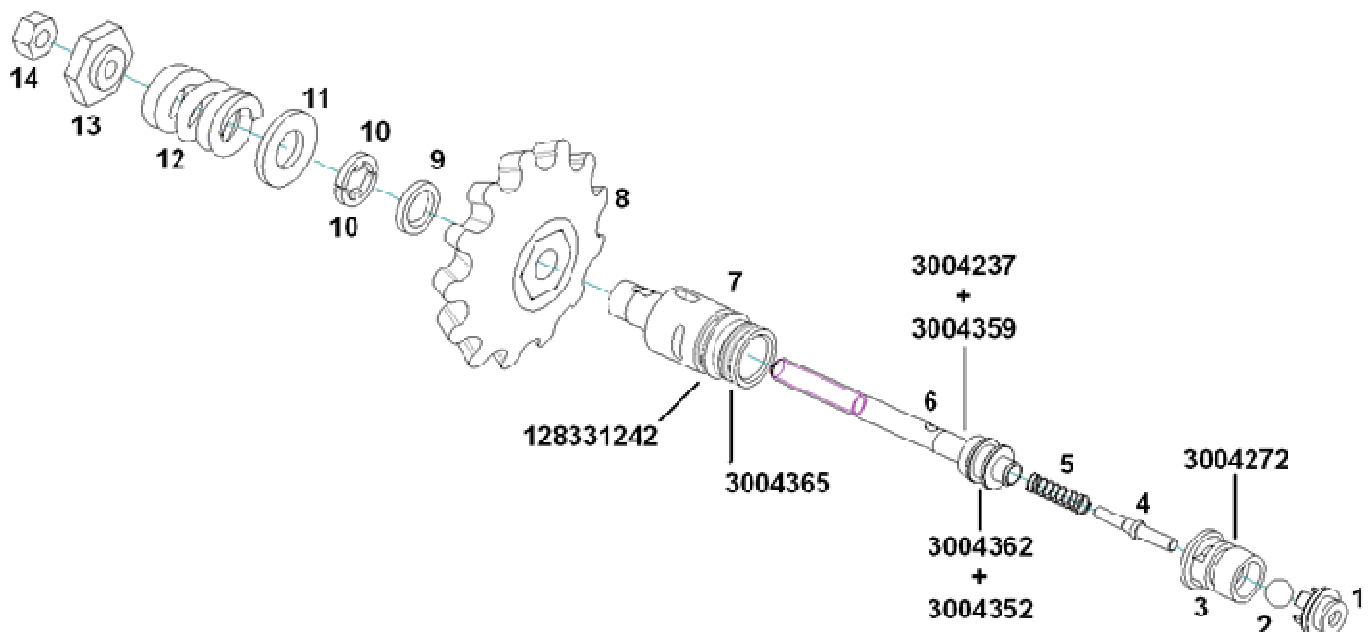
1. Dismount the U-pin (Fig 1)
2. The start / stop valve can now be removed
3. Use the M8 puller, 1220103 to dismount the ball seat (Fig 2)

Note: This operation can be done without removing the motor / pump unit from the cabinet.

Fig. 1**Fig. 2**

Valve adjusting

1. Turn the flow regulation to maximum flow
2. Adjust the spring guide (13) by the following procedure until the test manometer shows a standby pressure according to "Technical data" page 4.
 - A. Adjustment of the standby pressure:
 1. Let the machine be operating at the specified working pressure and flow according to the "Technical data" page 4.
 2. Stop the machine by releasing the trigger and read the standby pressure.
 3. Start the machine again by activating the trigger.
 4. Then adjust the spring guide (13) until the standby pressure is around the nominal value according to the "Technical data" page 4.
 5. Repeat "1" to "4" Until the standby pressure is approximately the nominal value according to the "Technical data" page 4.
 6. Lock the adjustment with the counter nut (14).
3. Activate the trigger for 15 s, and let the machine operate according to data in the "Technical data" page 4.
4. Release the trigger, wait 5 s and read the standby pressure at the test manometer.
5. If necessary, repeat point A (1-6) in order to achieve the specified standby pressure.



Micro switch adjustment

The micro switch system must be adjusted at working pressure according to the “Technical data” Page 4 according to the below procedure to ensure full functionality and lifetime.

1. Turn the flow regulation to maximum flow.
2. The machine must be running high pressure, and flow, according to the specification in the “Technical data” Page 4.
3. Screw the M5 nut on the adjustable key until there is a clearance between key and micro switch (green), which can be felt by moving the arm backwards and forwards, with a light touch from a finger (yellow arrow)

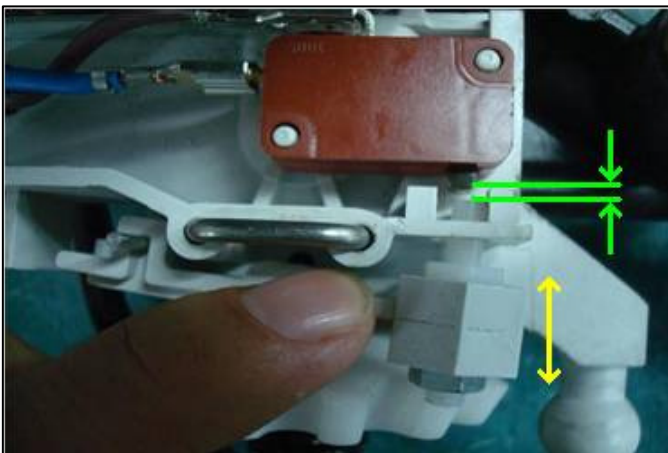


Fig. 1

4. Unscrew the M5 nut (counter-clockwise) carefully, until the key just touches micro switch, the clearance must **only just** disappears = “0 preload and 0 clearance”.
5. Carefully turn the M5 nut $90^{\circ} \pm 30^{\circ}$ clockwise. This will move the key approximately 0.2mm, away from the micro switch.



Fig. 2

6. Check that there is a clearance between the key and the micro switch.
7. Apply Loctite 454 on the key end to lock the M5 nut. Then the key adjustment is finished.
8. Check as last point that there still is clearance between the key and micro switch.

Micro switch adjustment (Continued)

Check of data according to “Technical data” Page 4.

After the adjustment the data in the “Technical data” Page 4 must be verified by letting the machine run high pressure for two minutes according to “Technical data” Page 4

Control method of clearance after adjustment:

Check the clearance with your finger:

Check the clearance between key and micro switch (green), which can be felt by moving the arm backwards and forwards, by a light touch guiding movement from your finger (yellow arrow), (When doing this check, the lid will normally be on the micro switch box.)

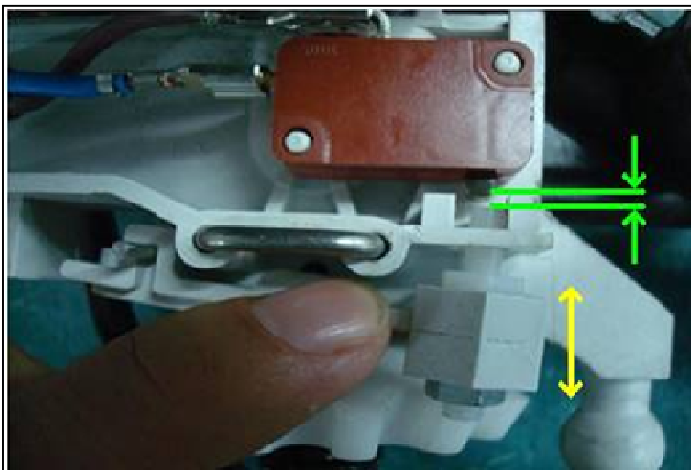


Fig. 1

Fig. 1: To visualize the function inside the micro switch box.

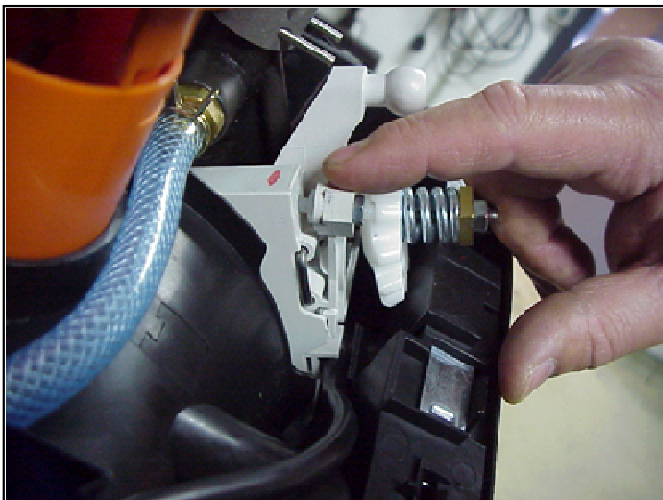


Fig. 2

Fig 2: Check the clearance with your finger.

Change of hose (Hose reel version)

1. The entire nipple item. has to be greased (Fig.1)
2. Placement of the pin (Fig.2)

Fig. 1



Fig. 2

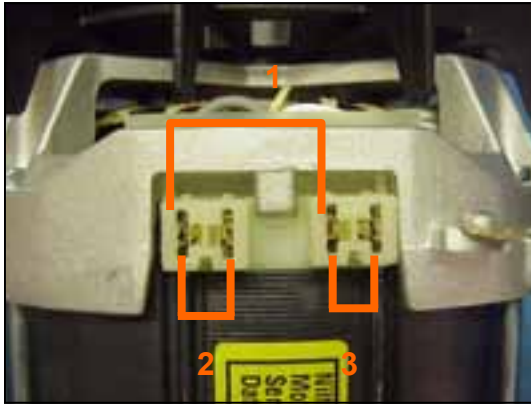


Measuring the resistance of electrical motor.

3,3 kW Motor	
1.	2,6Ω ± 10 %
2.	3,8Ω ± 10 %
3.	1,2Ω ± 10 %

2,9 kW Motor	
1.	2,8Ω ± 10 %
2.	4,1Ω ± 10 %
3.	1,3Ω ± 10 %

2,3 kW Motor	
1.	2,8Ω ± 10 %
2.	4,1Ω ± 10 %
3.	1,3Ω ± 10 %



Recommended oil types:

The wobble disk housing is filled with 80 ml BP Bartran HV68 from the production.

In case of service where the oil must be changed Nilfisk-Advance recommends to use 80 ml BP Bartran HV68 .

Alternative oil types that are allowed:

Shell, Tellus T 68

Exxon, Statoil Univis N 68

Recommended lubrication:

White grease for o-rings, sealing etc.:

Silicone grease (Unisilikon)

DOW CORNING(R) 55 O-RING LUBRICANT

Recommended glue:

Loctite 680, alternatively Loctite 270 or 271 (see page 6)

Loctite 243, alternatively Loctite 245 (to lock the adjustment bolt at the start / stop system)

Loctite 454 on the key end to lock the M5 nut at the micro switch activator arm.

Tools:

Straight (flat) screwdriver (For lock clamps)

Torx 20

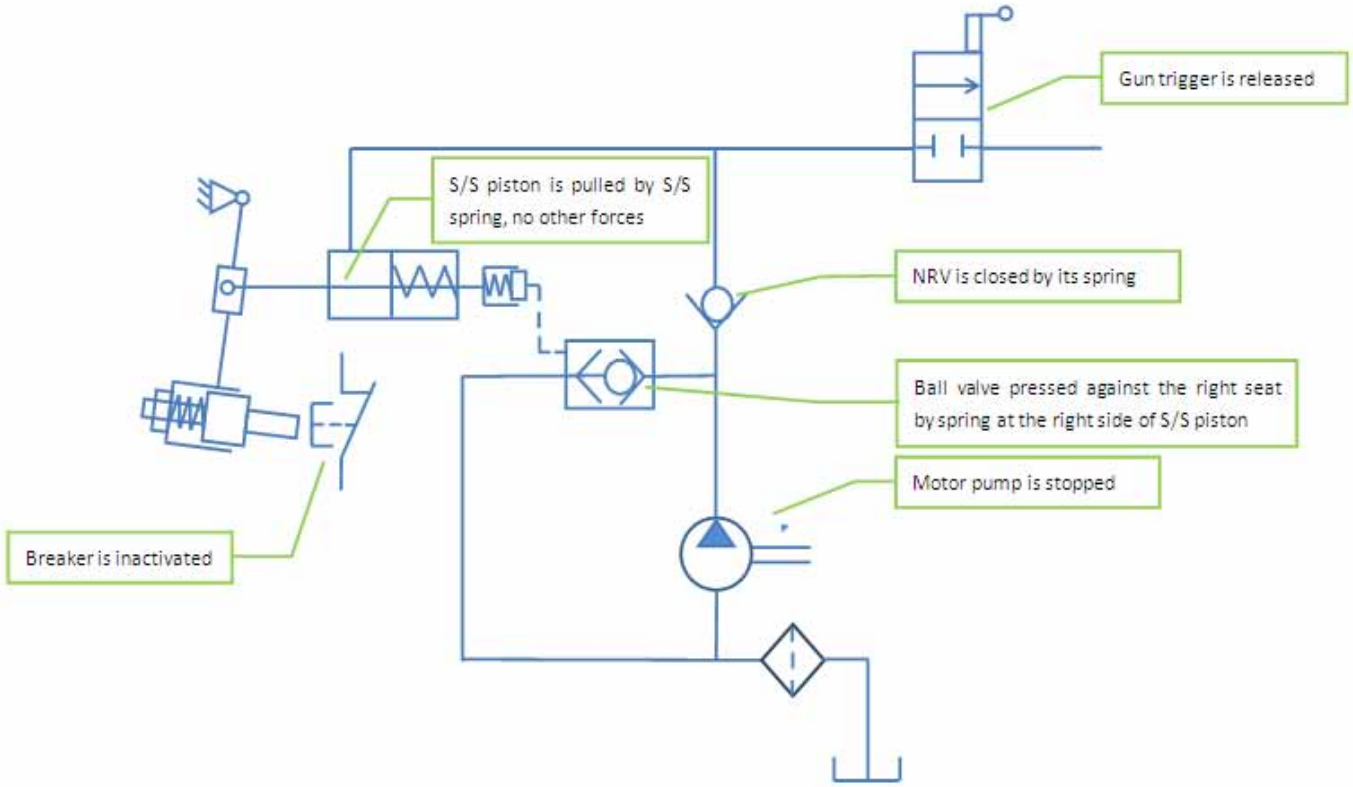
6mm hex wrench

M6 Puller (31000190)

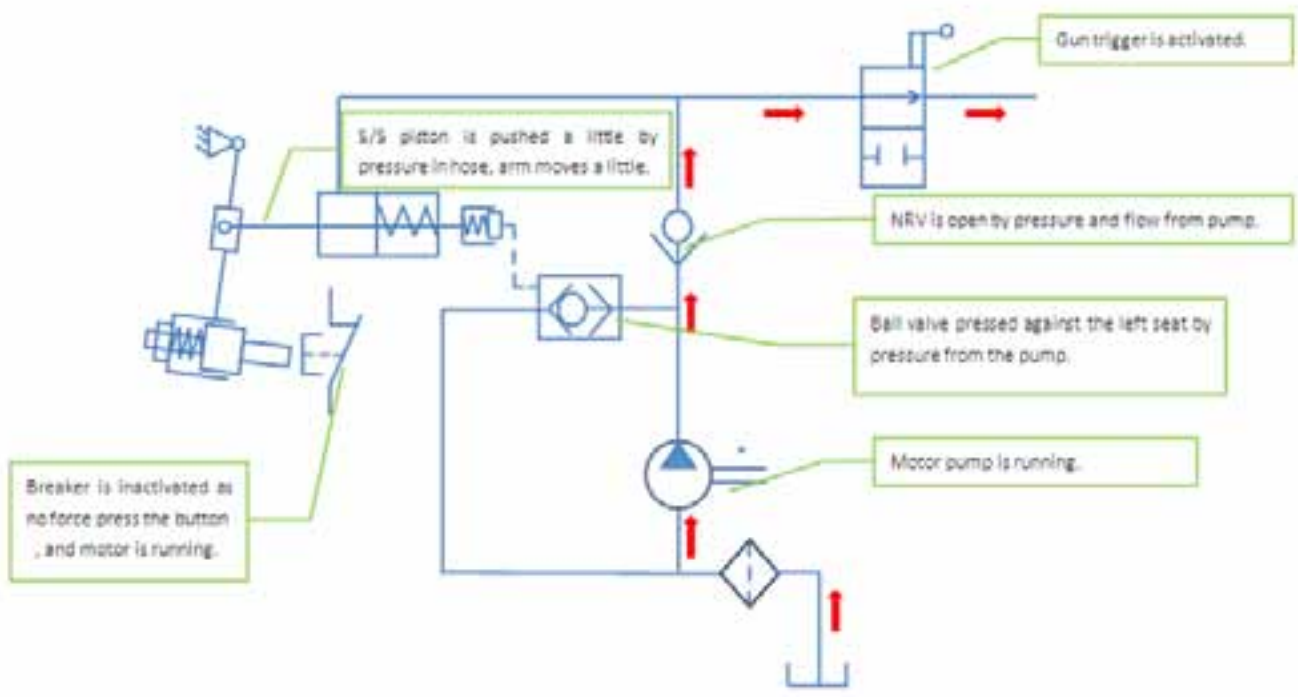
M8 Puller (1220103)



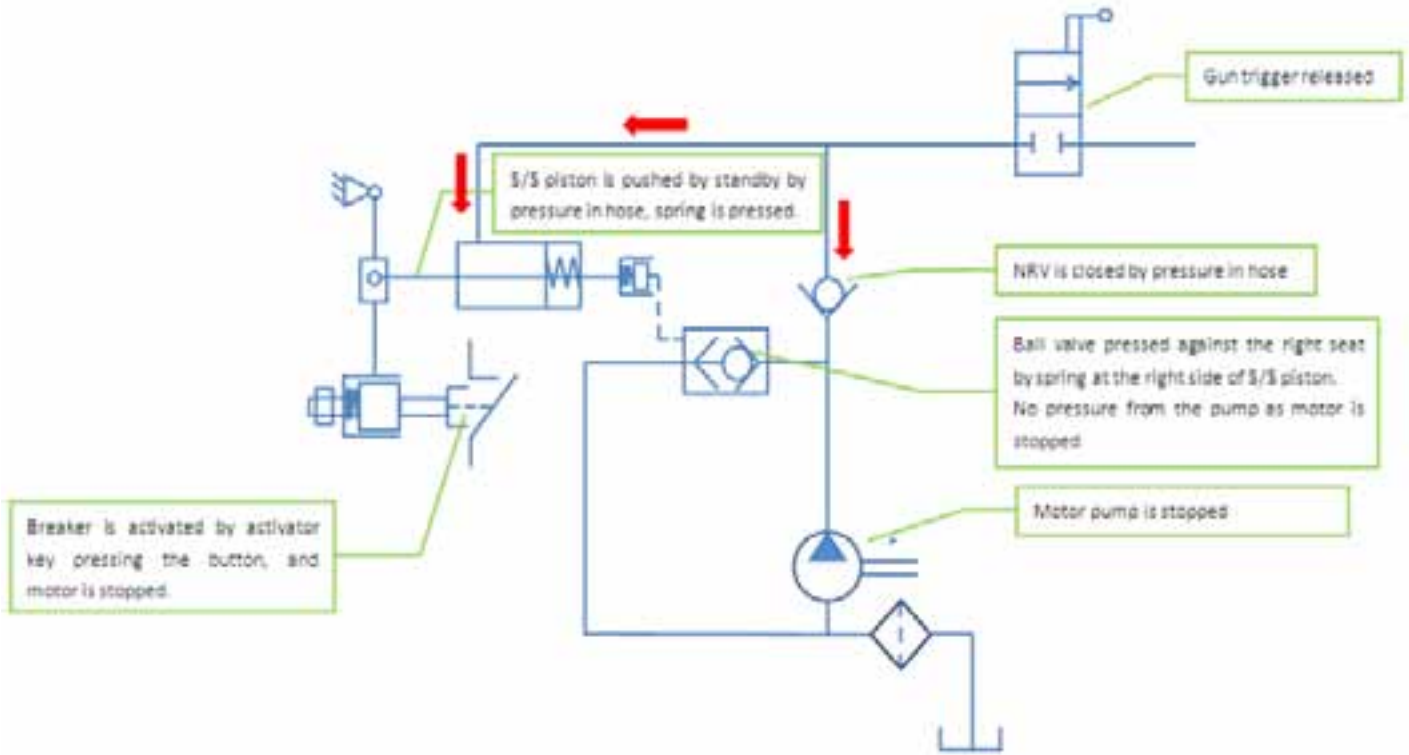
<Machine stopped and outlet hose emptied>



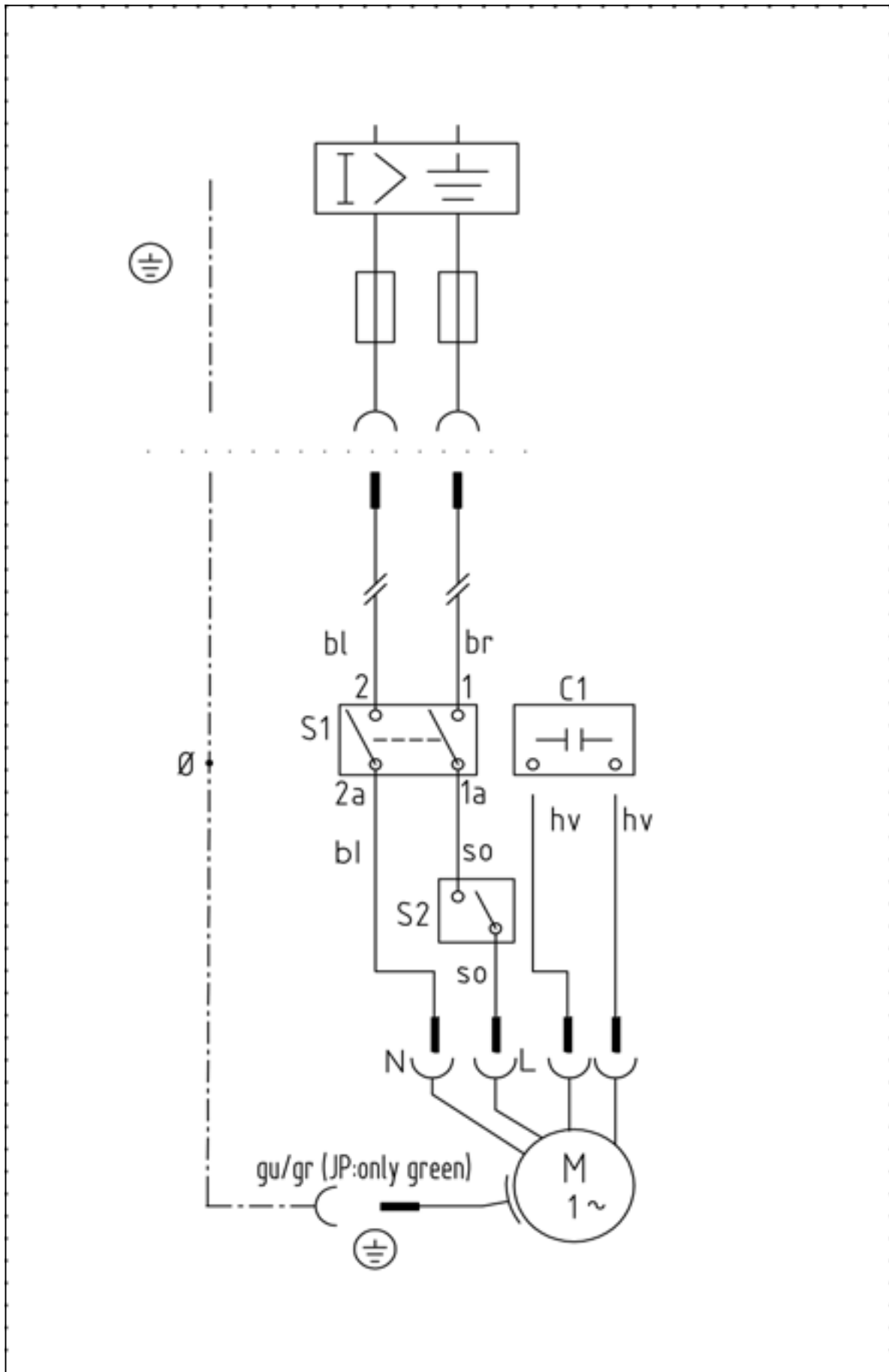
<Machine operation>



<Machine standby>



Wiring diagram



Circuit diagram

