SERVICE MANUAL

# MC 9P & MC 10P


NILFISK

# Preface

## This service manual contains detailed description of the main repair work on the MC 9P & MC 10P.

Repair work requires a suitable testing workplace with the necessary water and power supply.

If operating errors are evident, refer the customer to the operating instructions.

A fault in the cleaner can have several causes as described in the section on troubleshooting.

Refer to the illustrated spare parts lists during repairs. They show the assembly position and the sequence in which the individual components should be assembled.

See ”Technical Service Bulletin” (TSB) sheets. They include information on technical

modifications that have been made after this repair manual was printed.

”Technical Service Bulletin” sheets are also valid as a supplement to the spare parts list until publication of a new edition.

Repair manuals and ” Technical Service Bulletin” sheets should be available at the site

where repairs are carried out.

It is not permitted to give them to third parties.

Use original Nilfisk spare parts only.

# Table of Content

# Safety instructions



For your own safety

Repair work should be carried out by persons instructed in electrical installations or by trained electricians only.

MC9-series, MC10-series

Ultra HPW - Mobile - El - CW 400V 3~ 50Hz, 440V 3~ 60Hz, IPX5.

2006/42/EC:

EN 1829-1:2021

EN 1829-2:2008

2014/30/EU:

EN 61000-3-11:2019

EN 61000-3-12:2011

EN 61000-6-2:2019

EN 61000-6-4:2019

2011/65/EU: EN 63000:2018

2000/14/EC - Conformity assessment procedure according to Annex V:

- Measured sound power level: 95-100 dB(A); Guaranteed sound power level: 98- 104 dB(A)

ESD measures (electrostatic discharge)

Take the following ESD precautions before carrying out any repairs to the electronics:

- Touch the earth conductor before repairing the cleaner ( to discharge electrostatic charge from your body ).
- Wear wrist band if necessary.
- Use a conductive floor covering or a conductive table cover.
- Never touch the printed circuit board or electronic components ( always hold on to plastic ).
- Transport electronic components in conductive packaging ( e.g. ESD bag ).

Additionally:

Also see national regulations before using the cleaner, always read the operating instructions and keep them readily available. Only allow the high pressure cleaner to be used by persons who have been trained in its use and who have been explicitly authorized to use it.

## SAFETY INSTRUCTIONS FOR SERVICE TECHNICIANS

Before any repair work is started make sure the power supply to the machine is disconnected from/in the wall socket.

Repair work must be carried out by instructed technicians in electric installations, or by trained electricians.

Check machine safety before start working with the machine:

- Check that machine is connected to the correct power supply based on the machine ID plate.
- Check the power supply cable and plug for visible damages
- Check high pressure hose, couplings and fittings for visible damages
- Check Trigger Gun and lance for visual damages

When lifting heavy components such as pumps, motors etc. it must be considered if it's allowed to lift the weight by hand. If components are too heavy a support tool, e.g., crane must be used to lift the heavy compo nents. Always check the legislation with your local authorities.

Make sure you have the correct tools and special tools available for your repair job.

### Personal Protection Equipment (PPE)

For PPE there are different demands, which are set by local Working Environment Authorities depending on your location.

These demands must be complied with at all times.

However due to the force of the VHPW machines, Nilfisk recommends the PPE mentioned on page 20-21 to be worn by both the VHPW trigger gun operator and the 2nd supporting operator for optimal protection.

Prior to commencing any water blasting work, the area must be barricaded to restrict unauthorized access.

# Safety instructions


Before starting the VHPW

Go to page 22, machine data and look up the VHPW model you are about to use. The info provided there will assist you when reading through this manual.

Prior to beginning work, all equipment must be inspected to ensure that it is in safe working condition.

Safety valve and Unloader valve: Check that tamper evident sealings are unbroken to verify that adjustments are correct.

MC 10P 800/1100 ONLY: Burst disc device: Check that tamper evident sealing on burst disc device is unbroken.

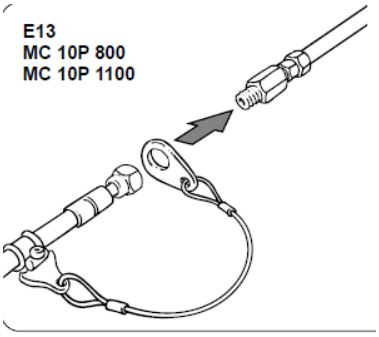
High pressure hose line: Check daily for visual damage.

Do not use high pressure hoses with kinks, compressed areas or other kind of defect to connectors, threads or O-rings. Do not use high pressure hoses if the metal wire layer of the hose is exposed or if the hose has any other defects that can be identified visually.

MC 10P 800/1100 ONLY: Verify that the hose connector safety device in both ends of the hose is correctly secured to the hose and has no damages. (See Page 17 Hose Type guide for info on correct mounting of the connection safety device).

Verify the high pressure hose and the spraying device with accessories is suitable for the maximum operating pressure indicated on Page 17 Hose Type Guide. Replacement hoses must always follow the demands set in Table on Page 17;Hose Type Guide.

Always place the high pressure hose in such a way that vehicles cannot drive over it.



# Safety instructions

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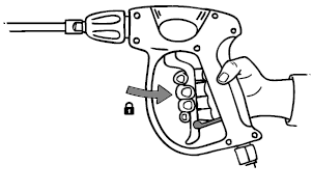
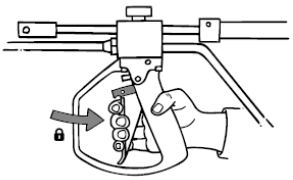


**Spraying device:** Check daily for visual damage that could impair pressure integrity. Handle and store the spraying device in such a way that it will not get large mechanical shock (e.g. falling onto a concrete floor).



MC 10P 800/1100 ONLY:

Inspect the dump gun cartridge assembly after each use and lubricate. Also inspect prior to use if there is doubt about last inspection. Failing to clean or replace cartridge can cause a malfunction. See Page 70-71 Dump gun maintenance" for detailed guidance.

**Nozzle:** Verify that the nozzle size and attachment to nozzle fitting is correct. (See Page 72 Nozzle Type Guide) Verify there is no damage near the nozzle outlet hole.

**Main power cable:** Verify the outer shielding of the cable is intact. Always place the main power cable in such a way that vehicles cannot drive over it.

**Personal Protection Equipment (PPE):** For PPE there are different demands set by local Working Environment Authorities depending on your location. These demands must be complied with at all times. However due to the force of the VHPW machines, Nilfisk recommends the PPE mentioned in Page 20-21 to be worn by both the VHPW trigger gun operator and the 2nd supporting operator for optimal protection.

# Safety instructions



Prior to commencing any water blasting work, the area must be barricaded to restrict unauthorized access.

Blasting Method: We recommend using a 2 operator* blasting method. The role of the 2nd operator is to attend the pump unit and keep close watch on the 1st operator for fatigue.

By using this blasting method the operators can take turns operating the machine. It is not recommended to operate the trigger gun for more than 20 minutes continuously.

* Operators must be trained in:

- How to operate the VHPW and the basic blasting protocol before being allowed to use the VHPW.
- Preparing the VHPW for use.
- Holding the trigger gun correctly for blasting due to recoil force from the trigger gun.
- Understanding of the correct way to operate the VHPW.
- Basic maintenance and troubleshooting.

Guidelines for safe use of the VHPW

Treat the machine as a high-speed cutting tool.

Always follow local legal requirements regarding minimum age for operating a VHPW.

Always use a proper plug and socket specially designed with ground connection. Only connect to an installation with ground connection. A certified electrician shall make the installation. It is strongly recommended that the electric supply to the machine includes a Residual Current Device/GFCI. Always follow local rules regarding RCD/GFCI.

Always keep the VHPW and its accessories in good working condition. Check the machine for defects, especially the insulation on the electric cable. DO NOT start up the machine if there are any defects. Have the machine serviced.

When using the VHPW and its accessories, eye protection must be worn at all times to protect against repelling or ricocheting matters that can cause eye damage.

Ear protection must be worn at all times when using the VHPW to prevent hearing related injures. Noise warning sticker with noise emission value can be found on the machine. Suitable clothing and footwear must be worn while using the VHPW to protect the operator(s). Do not try to clean clothes or footwear with the VHPW trigger gun since this can cause serious damage. See Page 20-21 Personal Protective Equipment (PPE).

Precautions must be made to keep bystanders away from the working range.

DO NOT spray-clean on the VHPW, yourself, others or live animals. The high-pressure jets are capable of causing severe injuries.

While repairing or servicing the equipment and its accessories always make sure the machine is turned off, depressurized and disconnected from the main power supply. Furthermore the lock out/tagout procedure explained in this manual must be performed before repair or service can take place. Only allow trained personnel to operate the machine. Activating the trigger/gun will cause an immediate backwards force. Therefore always hold trigger gun with both hands. When pausing during operation or ending the work task always follow the instruction specified in section G of this manual.

Only use high-pressure hoses, connections and nozzles specified by Nilfisk.

IMPORTANT – Do not use the machine in a possible explosive environment in accordance with EN-50014.

# Safety instructions


WARNING

To prevent accidents from happening, ensure the safety of the person(s) using the equipment and to protect bystanders and nearby placed inventory or machinery, the following safety requirements must be met:

It is not permitted to clean hazardous material (e.g. asbestos) with high pressure, without using proper PPE and equipment.

Persons under the influence of alcohol, drugs or medicine must not operate the machine.

Do not touch the electrical plug and socket with wet hands.

Always unplug power supply when cleaning and maintaining the machine.

Do not use the machine if important parts are damaged – i.e. safety devices, high pressure hoses, spray handle.

The user is obliged to observe all national working environment and working safety regulations concerning “operation of high-pressure washers”.

Do not spray directly onto electrical equipment or on the machine itself with high pressure water. Electrical shock may occur.

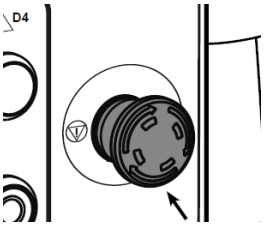
Do not operate the machine with damaged or removed fan cover. Motor will overheat and malfunction. If the VHPW has areas that can get hotter than the limit set by the authorities, these areas will be marked with the following

symbol:

Avoid touching these areas with bare hands before the VHPW has cooled down.


The machine is equipped with the following safety devices:

Emergency stop Button: (Do not use during normal working conditions).




This machine is equipped with an emergency stop on the control panel. When engaged, it will override all other functions and machine operating modes. The objective is to stop the VHPW as quickly as possible without creating additional hazards.

To use the emergency stop function, user need to tap hard on the button. When activated, the high pressure machine will immediately come to a total stop.

To reset the machine, turn the button clockwise to release.

The VHPW will remain in its neutral state.

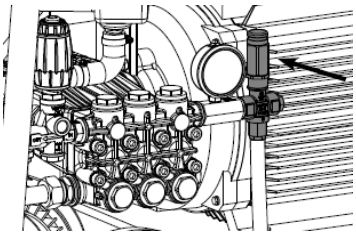
On MC 9P and MC10P 500 residual pressure can be built up in the hose/

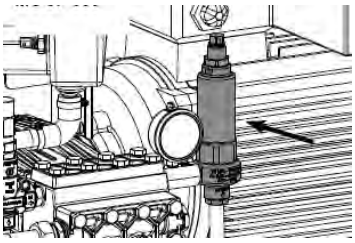
gun. Make sure to release any residual pressure from hose/gun.

To start up the VHPW again, user needs to press the start button again.

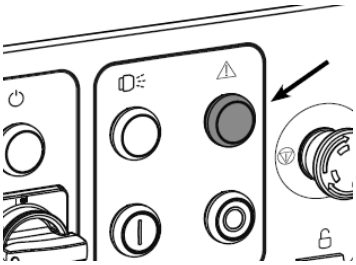
MC 9P & MC 10P 500 ONLY:

**Safety valve:** When the VHPW is over pressurized, the safety valve will start to open and excess water is dumped. The safety valve system is factory set and sealed with a tamper-evident sealing. Breaking the seal and performing unauthorized adjustments to the safety valve system may void the warranty for the VHPW.

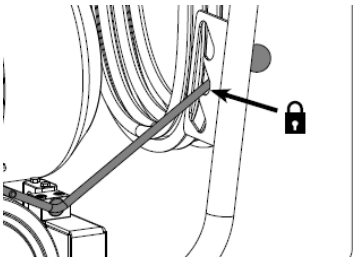




**Overload relay:** The overload relay protects the motor against overloading. When the overload trip, the trip indicator light will come on. When the sensor has cooled sufficiently the trip indicator light will turn off, and the VHPW can be switched on again.



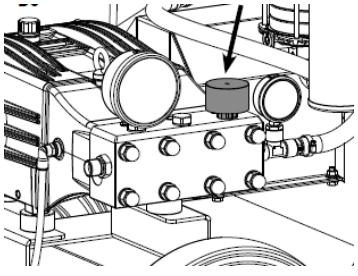
**Wheel brake:** The left rear wheel can be locked in place to prevent the machine from rolling on an inclined surface of no more than 10 degree.



MC 10P 800/1100 ONLY:

**Burst disc:** A burst disc is a safety system designed to protect the VHPW against over pressure. When the VHPW is over pressurized, the burst disc within the burst disc housing will break and excess water is dumped. The burst disc housing is equipped with a protective cover which ensure the dumped water is directed downwards and therefore cannot hit user(s) directly.

Once the burst disc has been broken due to over pressure it must be discarded and replaced with a new one of the same specification. For burst disc specs see Page 68-69 Burst disc specifications.

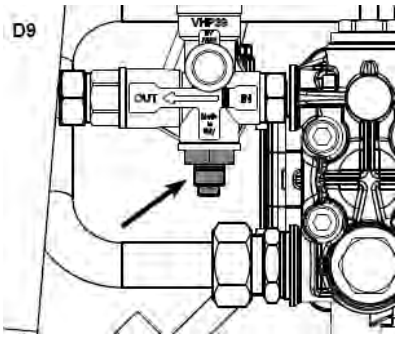


MC 9P & MC 10P 500 ONLY:

Thermal dump valve:

The thermal dump valve protects the pump and LP water line against increased water temperatures when the VHPW is running in bypass mode. When the machine is running in bypass mode and the temperature of the water in the system becomes higher than approx. 60°C, the thermal dump valve will open and dump water. By dumping water from the by-pass system cold water will be drawn into the water system to replace the dumped hot water. Water dump will continue until the water temperature in the system decreases to below approx. 60°C, after which the thermal dump valve will close again. This feature is present on the VHPW to prevent damage to the machine caused by too hot water in the water system. This safety feature is NOT intended to be used as a means to extend bypass time.

Do not let the machine run in bypass for more than 5 minutes.




**Attention!**

Setting up the unit

Operation Information:

The VHPW is rated as IPX5. Parking the machine outdoor will not pose any damage to the machine. Ensure ventilation to the motor is unblocked at all times.

IMPORTANT: ambient temperature should be above 0°C and not higher than 40°C.

Ensure the VHPW always has 1 meter free space on all sides for safe use and maintenance.

Before operating the VHPW make sure to park it on a flat surface with an incline no higher than 10 degrees. If parked on an incline greater than 10 degrees the machine can become unstable and may endanger user(s).

The machine must always be parked with the parking brake engaged.

The VHPW can be connected to a potable water source because it is equipped with a water break tank (WBT).

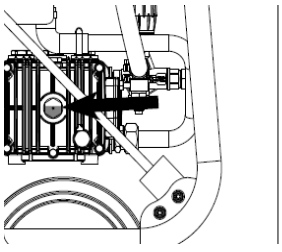
Check that the water supply is able to deliver the required pressure for WBT to fill up.

If the flow of the water supply is very low, the machine can empty the WBT at a higher pace than it is refilled. This will cause the level switch in the bottom of the WBT to engage and the VHPW will turn off. When water level in the WBT reaches a height that will disengage the level sensor, the VHPW can be turned on again.

This machine is designed to work with clean fresh water only. Sea water and chemicals should not be used since this will shorten the lifespan of the pump.

Check the oil level. On level ground, the oil should be above MIN level, when the oil is cold.

See “Technical Data” for oil type info an oil quantity.



MC 9P 350 & 500 + MC 10 500:

Mount the supplied ½" high pressure hose onto the VHPW´s ½" high pressure outlet fitting. Always use 2 wrenches.

Always use the torque values indicated on Page 17 Hose type guide

NOTE: The trigger gun for MC 9P 350 & 500 + MC 10P 500 must not be mounted yet. The procedure for venting the water line and pump from air as described in "Switching on the unit" must be followed prior to mounting the trigger gun.

MC 10P 800 & 1100:

Mount the M24 high pressure hose onto the VHPW´s M24 high pressure outlet fitting. Always use 2 wrenches.

Always use the torque values indicated on Page 17 Hose type guide.

Next, mount the trigger gun (Dump gun) onto the other end of the high pressure hose. Always use 2 wrenches.

Always use the torque values indicated on Page 17 Hose type guide.

Prepare the water supply by attaching a water hose to the low pressure water inlet. Turn on the water supply tab to start filling the water break tank with water. When the tank is full the flow will cut off automatically to prevent overflow.

**Attention!**

Hose mounting/dismounting instruction.

Mounting hose on VHPW high pressure outlet:

Always use two wrenches for this procedure. One for tightening the hex on the hose adaptor and one for holding the VHPW outlet fitting in position.

MC 10P 800/1100 ONLY:

For pressure above 500 bar the high pressure hose must always be secured to the VHPW high pressure outlet with a connector safety device.

A connector safety device is pre-mounted in each end on all hoses compatible with MC 10P 800/1100. See Page 17 Hose type guide, for image of correct mounting of the connector safety device to the HP outlet port.

Mount the hose fitting onto the VHPW HP outlet fitting.

MC 10P 800/1100 ONLY: Place the connector safety device plate in between hose and extension nipple fitting when assembling. Tighten with your fingers.

Place wrench 1 onto the VHPW HP outlet fitting and wrench 2 onto the hose nipple fitting to make a setup where the VHPW HP outlet fitting can be kept in a fixed position during assembly.

Start tightening the hose fitting clockwise with wrench 2 while holding wrench 1 in its starting position. As the resistance grows higher with the tightening of the threads, pay close attention to holding back on wrench 1 so the HP outlet fitting does not get tightened further. Observe that the correct hose fitting torque value is achieved see Page 17 Hose type guide.

For dismounting use the same procedure but with counter clockwise direction for loosening. Always verify that the correct shut down procedure for the VHPW has been followed before disassembly of the hose line.

Connecting two hoses for extension purposes:

Always use two wrenches for this procedure. One for tightening nipple/hose fitting and one for holding back on the other nipple/hose fitting.

MC 10P 800/1100 ONLY:

For pressure above 500 bar—all high pressure hoses must always be secured to each other using connector safety devices. A connector safety device is pre-mounted in each end on all hoses compatible with MC 10P 800/1100. See Page 17 Hose type guide for image of correct mounting of connector safety devices for hose extensions.

Mount the extension nipple fitting onto the hose being extended.

MC 10P 800/1100 ONLY: Place the connector safety device plate in between hose and extension nipple fitting when assembling. Tighten with your fingers.

Place wrench 1 on the extension nipple fitting and wrench 2 on the hose fitting of the hose being extended to make

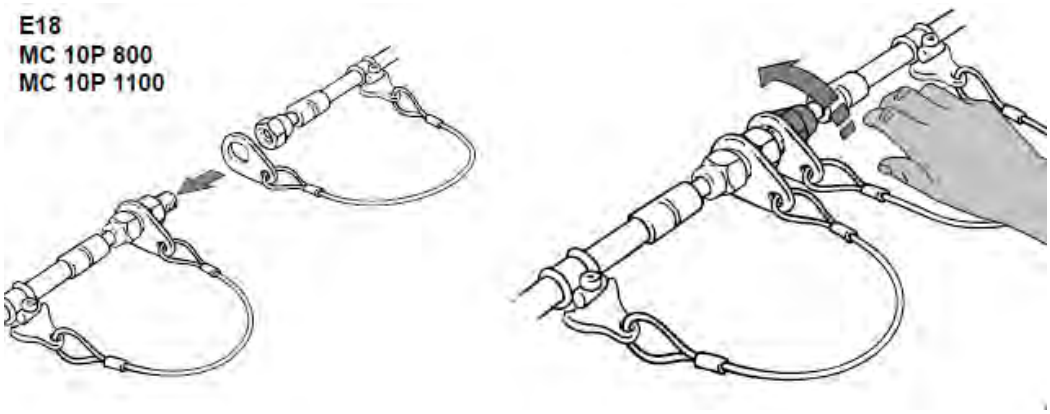
a setup where the extension nipple fitting can be kept in a fixed position during assembly. Tighten with wrench 2

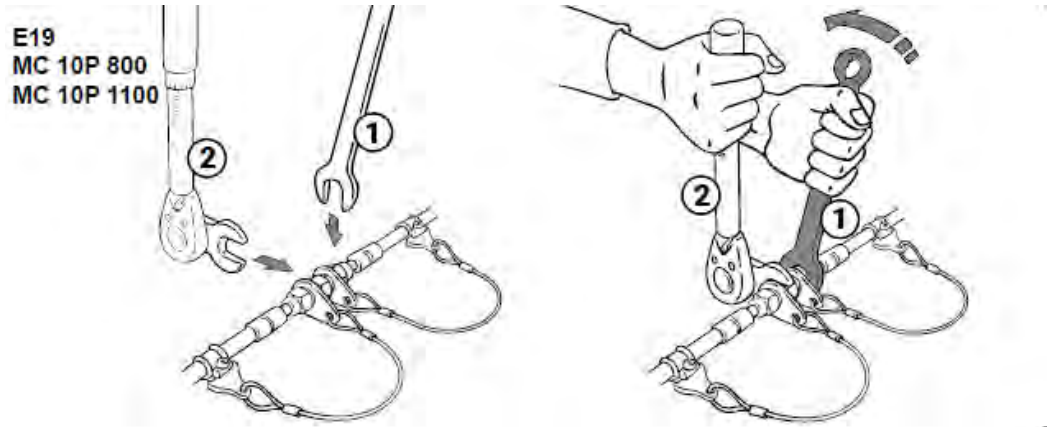
while holding back with wrench 1 to ensure the position of the fitting in wrench 1 remains unchanged. Observe that the correct hose fitting torque value is achieved (See Page 17 Hose type guide)

Mount the extension hose onto the extension nipple fitting.

MC 10P 800/1100 ONLY: Place the connector safety device plate in between extension hose and extension nipple fitting when assembling. Tighten with your fingers. Place wrench 2 on the extension nipple fitting and wrench 1 on the hose fitting of the extension hose to make a setup where the extension nipple fitting can be kept in a fixed position during assembly. Tighten with wrench 1 while holding back with wrench 2 to ensure the position of the fitting in wrench 2 remains unchanged. Observe that the correct hose fitting torque value is achieved (See Page 17 Hose type guide)

For dismounting use the same procedure but with counter clockwise direction for loosening. Always verify that the correct shut down procedure for the VHPW has been followed before disassembly of the hose line.




Any replacement parts for the hose line must comply with EN 1829.

**Attention!**

Do not bend the hose, park equipment on it or squeeze between

doors. Replace the hose if the hose wire is exposed or has other

damages that can be identified visually. Only use original hose

replacements. Read the allowed WP on the hose before using the machine. Always switch off and depressurize the machine before attaching or detaching the hose to the machine.

Switching on the unit

Connect the main power cord to a grounded 3 phase main power supply. Turn on main power.

Turn on the main power isolator switch on the VHPW.

MC 9P 350 & 500 + MC 10 500:

Press the green power button to start the main motor. Ensure the motor turns counter clockwise as indicated by the arrow on the motor fan cover. (View from motor fan end). Rotation direction is only valid for MC 10P 800/1100 due to installed feeder pump.

When the VHPW is powered up, water will start to flow out from the open HP hose end. This is to ensure that the pump is free from air pockets which would cause cavitation and to avoid getting pressurized air into the HP hose on 1st start up, that can cause a puff when the trigger is activated for the first time. Power of the VHPW.

Mount the trigger gun to the open end of the ½" high pressure hose. Always use the procedure for tightening described in Hose mounting and Dismounting and follow the torque value listed on Page 17 Hose type guide

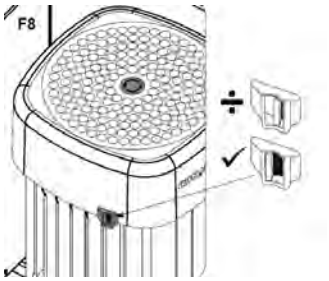
NOTE:

MC 9P 350 has a quick coupling between gun and lance, so here no tools are needed.

MC 10P 800 & 1100:

Turn on the booster pump selector switch.

Make sure the booster pump turns counter clockwise (View from motor fan end of booster pump).




Verify that water inlet pressure measured on the inlet pressure gauge is between 2 and 7 bar.

If pressure falls below 2 Bar, bleed out any air trapped in the water system by unscrewing the bleed screw under the stainless steel filter housing, and tighten back when pressure meets the requirement. If this does not help go to the trouble shooting guide.

Press the green power button to start the main motor.

Ensure the motor turns counter clockwise as indicated by the arrow on the motor fan cover (View from motor fan end). Allow the motor to run for a few seconds for the star delta connection to switch over automatically.

The VHPW is now ready for operation. Get a firm grip with both hands on the trigger gun handle and the secondary handle See page 19. Press the trigger and start blasting.

**After using the unit or before leaving it unattended VHPW machine logout/tagout procedure.**

This procedure is to be used when work is halted due to breaks etc. It establishes lockout on the VHPW to prevent injury to personnel.

All operators shall comply with the procedure. Equipment shall be locked out to protect against accidental or inadvertent operation when such operation could cause injury to personnel.

Do not attempt to operate any switch, valve, or other main switch equipped with a lock.

**Responsibility: The responsibility of this procedure being followed is binding upon all operators.**

All operators shall be instructed in the safety significance of the lockout procedure by a designated individual responsible for this. Each new or transferred affected operator shall also be instructed by the designated individual in the purpose and use of the lockout procedure.

**Sequence of lockout procedure:**

Notify all affected operators that a lockout is required and the reason therefore.

1. If the VHPW is operating, shut it down by pressing the stop button.
2. **MC 10P 800/1100 ONLY:** Turn off the booster pump switch when the motor has come to a full stop.
3. Turn the main isolator switch to the off position.

**WARNING: Release residual pressure in the trigger gun.**

Lock the main isolator switch with a suitable lock to disable the operation of the machine.

Verify the E-box is locked securely and remove keys. The key must be kept with an assigned individual to prevent any unauthorized modification to the machine control settings.

Enable the trigger safety lever on the gun. Verify it in engaged by checking the trigger cannot be activated.

**MC 10P 800/1100 Dump Gun ONLY:**

On the dump gun the trigger safety is built in and therefore the trigger cannot be activated accidentally.

After ensuring that no personnel are exposed and as a check on having disconnected the power sources, operate the main switch, (MC 10 800/110: Booster switch), and push start button to ensure the VHPW will not operate.

**WARNING Return operating controls to neutral position after the test.**

The equipment is now locked out.

**Restoring equipment to normal operation:**

When the VHPW is to be used again at its normal operation, check the area around the machine to ensure no one is exposed. Barricade the area of working zone to prevent people entering. When the area is clear and neutral positions of controls on VHPW is verified, remove all locks. Turn on the main isolator switch, unlock the trigger gun lock and start the normal operating procedure for switching on the VHPW.

# Safety instructions

Machine shut down procedure when work is completed.

Press the red stop button and ensure the motor comes to a complete stop.

MC 10P 800/1100 ONLY: Turn off the booster pump switch when the motor has come to a full stop.

Turn off the main power isolator switch.

Turn off main power outlet and remove VHPW main power plug from the outlet.

WARNING! Release residual pressure in the trigger gun.

Disconnect the trigger gun and hose(s) by following the hose

mounting/dismounting instruction on Page 12 Hose mounting/dismounting instruction.

Carefully store them in a safe place.

IMPORTANT.

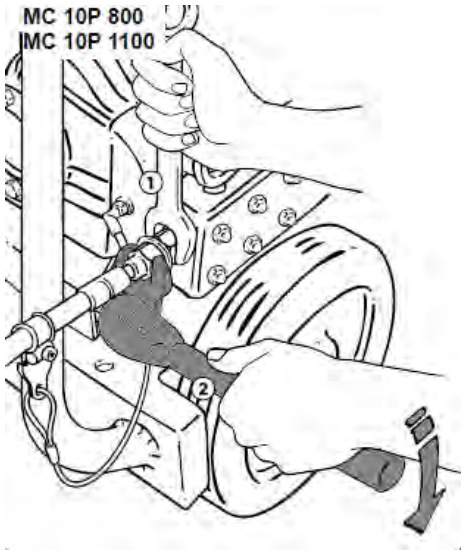
First time using this equipment, read the safety section in the “Instruction For Use” book before operating the equipment.

# High Pressure Hose Fittings & Torque

| | MC 9P 350 | MC 9P 500 | MC 10P 500 | MC 10P 800 | MC 10P 1100 |
|---|---|---|---|---|---|
| Hose compliance* | EN 1829-2 | EN 1829-2 | EN 1829-2 | EN 1829-2 | EN 1829-2 |
| Hose identification* | Hose manufacturer name or ID | Hose manufacturer name or ID | Hose manufacturer name or ID | Hose manufacturer name or ID | Hose manufacturer name or ID |
| Hose manufacturing date* | ddmmyy | ddmmyy | ddmmyy | ddmmyy | ddmmyy |
| Max. hose working pressure (WP)* | 7200 PSI / 500 Bar | 7200 PSI / 500 Bar | 7200 PSI / 500 Bar | 15000 PSI / 1100 Bar | 15000 PSI / 1100 Bar |
| Hose size* | ID ½" or DN 12 | ID ½" or DN 12 | ID ½" or DN 12 | ID ½" or DN 12 | ID ½" or DN 12 |
| Hose fitting (Both ends) | 1/2" BSPP-F SWIVEL | 1/2" BSPP-F SWIVEL | 1/2" BSPP-F SWIVEL | M24 -F SWIVEL | M24 -F SWIVEL |
| Recommended torque value for hose fittings (Nm) | 40-50 Nm | 40-50 Nm | 40-50 Nm | 90-105 Nm | 90-105 Nm |
| HP hose pre-mounted with 2x connector safety devices? | NO | NO | NO | YES | YES |
| Nilfisk hose spare part number | 700550097 | 700550097 | 700550098 | 106404655 | 106404655 |
| Nilfisk connector safety device item number | - | - | - | 106404650 | 106404650 |
| Nilfisk hose extension fitting item number | 106404745 | 106404745 | 106404745 | 106403212 | 106403212 |
| Nilfisk hose sleeve item number | 750mm: 700799097<br>1400mm: 700799107 | 750mm: 700799097<br>1400mm: 700799107 | 750mm: 700799097<br>1400mm: 700799107 | 750mm: 700799097<br>1400mm: 700799107 | 750mm: 700799097<br>1400mm: 700799107 |

Valid for all models

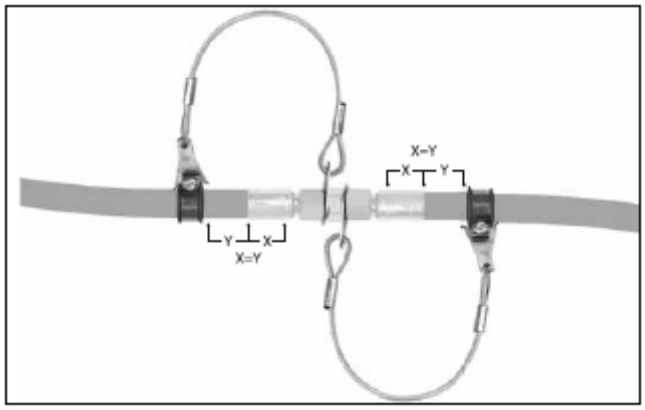
*Info is printed on hose



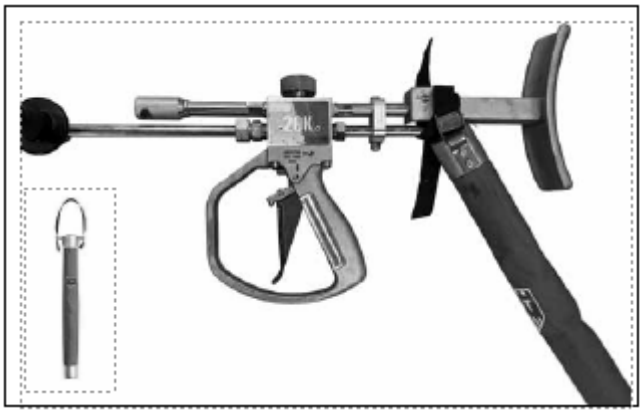

The hose fittings must be tightened with the correct recommended torque.

NOTE: An open spanner for torque wrench is needed.

## SAFETY INSTRUCTIONS FOR MACHINES ABOVE 500 bar




Correct mounting of fitting + 2x connector safety devices when mounting an extension hose.



Note: If desired by the user or demanded by local laws/regulations, the connector safety device can be exchanged to a hose sleeve protection as shown in above image. See Nilfisk VHPW Accessory catalogue for further info on the hose sleeve.

Correct mounting of connector safety device between hose and dump gun.

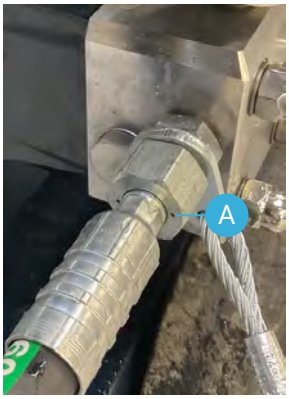
WARNING: Any replacement parts for the hose line must comply with EN 1829-2.

Do not bend the hose, park equipment on it or squeeze between doors. Replace the hose if the hose wire is exposed or has other damages that can identified visually. Only use original hose re-placements. Read the allowed WP on the hose before using the machine. Always switch off and depressurize the machine before attaching or detaching the hose to the machine.


The high pressure hose connector safety device must be mounted correctly. See picture to the left.

X and Y has the same measurements.

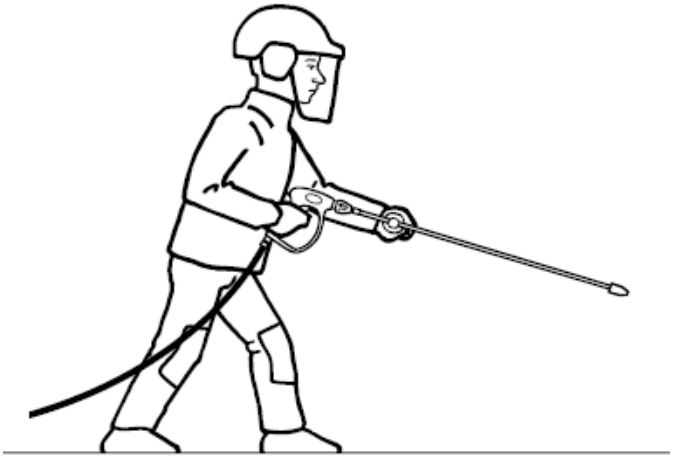
The purpose of the safety device is to catch the hose end, IF the hose is forced out of the hose connector.



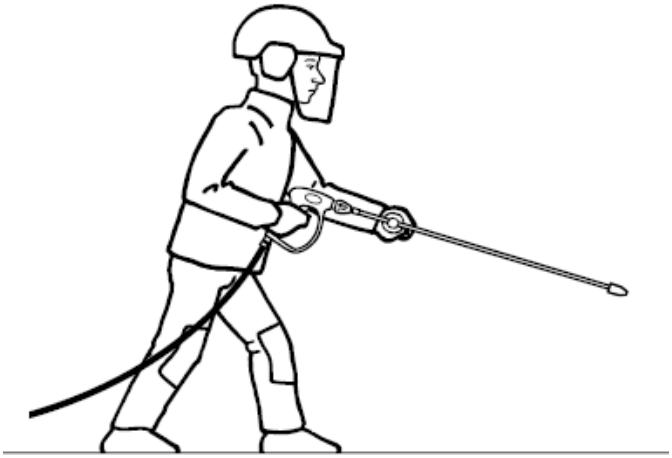

In the hose connection nut are drilled two pressure release holes. If pressure release of the high pressure hose is forgotten prior to disconnecting, these 2 holes will slowly release the pressure.

## Working positions

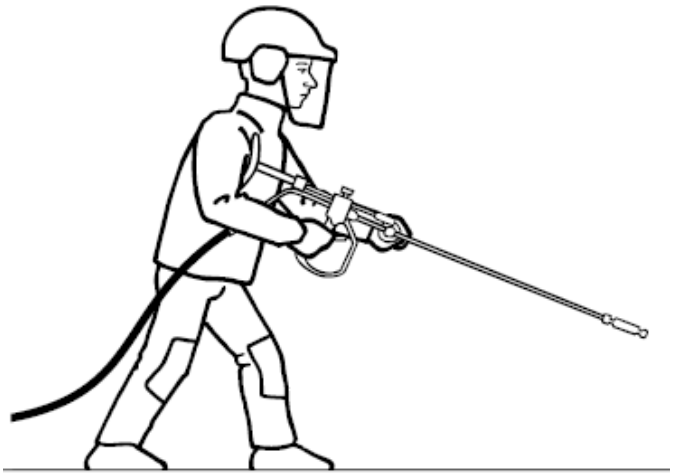
MC 9P 350-500



MC 9P 500



MC 10P 800/1100



Recoil Force

| VHPW item number | VHPW name | Recoil force (N) | Nozzle type | Nozzle size | Shoulder rest |
|---|---|---|---|---|---|
| 107147021 | MC 9P-350/1260 400/3/50 | 93,9 | Fan jet 15° | 1505 | N/A |
| 107147022 | MC 9P-350/1500 440/3/60 | 93,9 | Fan jet 15° | 15045 | N/A |
| 107147024 | MC 9P-500/960 400/3/50 | 84,3 | Fan jet 15° | 1503 | Available as accessory |
| 107147025 | MC 9P-500/960 440/3/60 | 84,3 | 0° jet | 0003 | Available as accessory |
| 107147030 | MC 10P-500/1800 400/3/50 | 158,1 | Fan jet 15° | 15055 | Mandatory. Pre-mounted on trigger gun |
| 107147031 | MC 10P-500/1680 440/3/60 | 147,6 | 0° jet | 0005 | Mandatory. Pre-mounted on trigger gun |
| 107147032 | MC 10P-800/990 400/3/50 | 110 | Fan jet 15° | 15025 | Built into trigger gun |
| 107147033 | MC 10P-800/1170 440/3/60 | 130 | 0° jet | 0003 | Built into trigger gun |
| 107147034 | MC 10P-1100/870 400/3/50 | 108,1 | 0° jet | 0002 | Built into trigger gun |
| 107147035 | MC 10P-1100/900 440/3/60 | 118,1 | 0° jet | 0002 | Built into trigger gun |

In the above table the recoil force for each machine is listed in Newton (N).

Note: The specified recoil force is only valid for the nozzle supplied with the machine at purchase. Info on the supplied nozzle is listed under Nozzle type and Nozzle size.

## SAFETY INSTRUCTIONS FOR MACHINES ABOVE 500 bar

PPE—Personal Protection Equipment

There are several safety precautions for users and service techs that must be fulfilled when working with/on VHP equipment (above 500 bar). A part of that is Personal Protection Equipment—PPE.

Below are the PPE Nilfisk recommend to use and sell as accessories.

JACKET W / HAND PROTECTION  2000 Bar

Comes in size M, L, XL

TROUSERS 2000 Bar

Comes in size M, L, XL

SAFETY HELMET W/EAR MUFF-FACE

SAFETY BALACLAVA


SAFETY GOGGLES

## SAFETY INSTRUCTIONS FOR MACHINES ABOVE 500 bar

PPE—Personal Protection Equipment

There are several safety precautions for users and service techs that must be fulfilled when working with/on VHP equipment (above 500 bar). A part of that is Personal Protection Equipment—PPE.

Below are the PPE Nilfisk recommend to use and sell as accessories.

HAND PROTECTION SET 2000 bar

GAITERS 2000 bar

APRON STANDARD

2000 BAR

Hose Protection

HOSE PROTECTION 36x750 mm

Hose protection 36 x 1400 mm

| Model | | Motor | | Motor speed | Max working pressure | | Flow rate | | Nozzle | Power Connection | Dimensions (Lx-WxH) | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Item number | Name | HP | kW | RPM | Psi | Bar | Gpm | l/min | Type/ size | V/~/Hz/Amp | mm | Kg |
| 107147021 | MC 9P-350/1260 400/3/50 | 24 | 18 | 1460 | 5220 | 360 | 5.55 | 21 | Fan jet 15° / 1505 | 400/3/50/32 | 980 x 500 x 1100 | 245 |
| 107147022 | MC 9P-350/1260 440/3/60 | 24 | 18 | 1760 | 5220 | 360 | 5.55 | 21 | Fan jet 15° / 15045 | 440/3/60/32 | 980 x 500 x 1100 | 245 |
| 107147024 | MC 9P-500/960 400/3/50 | 24 | 18 | 1460 | 7250 | 500 | 4.23 | 16 | Fan jet 15° / 1503 | 400/3/50/32 | 980 x 500 x 1100 | 255 |
| 107147025 | MC 9P-500/960 440/3/60 | 24 | 18 | 1760 | 7250 | 500 | 4.23 | 16 | 0° jet / 0003 | 440/3/60/32 | 980 x 500 x 1100 | 255 |
| 107147030 | MC 10P-500/1800 400/3/50 | 40 | 30 | 1470 | 7250 | 500 | 7.93 | 30 | Fan jet 15° / 15055 | 400/3/50/63 | 1180 x 750 x 1670 | 470 |
| 107147031 | MC 10P-500/1680 440/3/60 | 40 | 30 | 1765 | 7250 | 500 | 7.40 | 28 | 0° jet / 0005 | 440/3/60/63 | 1180 x 750 x 1670 | 470 |
| 107147032 | MC 10P-800/990 400/3/50 | 40 | 30 | 980 | 12470 | 860 | 4.36 | 16,5 | Fan jet 15° / 15025 | 400/3/50/63 | 1180 x 750 x 1670 | 565 |
| 107147033 | MC 10P-800/1170 440/3/60 | 40 | 30 | 1175 | 12470 | 860 | 5.15 | 19,5 | 0° jet / 0003 | 440/3/60/63 | 1180 x 750 x 1670 | 565 |
| 107147034 | MC 10P-1100/870 400/3/50 | 40 | 30 | 980 | 15950 | 1100 | 3.83 | 14,5 | 0° jet / 0002 | 400/3/50/63 | 1180 x 750 x 1670 | 565 |
| 107147035 | MC 10P-1100/900 440/3/60 | 40 | 30 | 1175 | 15950 | 1100 | 3.96 | 15 | 0° jet / 0002 | 440/3/60/63 | 1180 x 750 x 1670 | 565 |

| Item number: 107147021 | | Model: MC 9P-350/1260 400/3/50 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/24/2022 2:40:00 PM<br>Created by: SER<br>Approved on: 6/24/2022 2:40:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147501 | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 330 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 330 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 20.7 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 3 |
| Pump piston type | - | Full Ceramic |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 1.04 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 400V/3ph/50Hz |
| Current @ $V_1$ | A | 26 |
| Current limiter | A | 20 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 1460 |
| Electric diagram item number | - | 106420600 |
| UNIT DATA: | | |
| Nozzle Size | - | 1505 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Gun 360 bar |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 98 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | C 32 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 245 |
| Size - Machine alone | LxWxH (mm) | 1100x500x980 |
| Detergent suction | % (+/-) | - |

# Technical data

B

| Item number: 107147022 | | Model: MC 9P-350/1260 440/3/60 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/27/2022 3:20:00 PM<br>Created by: SER<br>Approved on: 6/27/2022 3:20:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| **Product status: Released** | | **MPU item number: 107147564** | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 350 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 350 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 19.2 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 3 |
| Pump piston type | - | Full Ceramic |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 1.04 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 440V/3ph/60Hz |
| Current @ $V_t$ | A | 24 |
| Current limiter | A | 20 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 1760 |
| Electric diagram item number | - | 106420600 |
| UNIT DATA: | | |
| Nozzle Size | - | 15045 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Gun 360 bar |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 102 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | C 32 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 245 |
| Size - Machine alone | LxWxH (mm) | 1100x500x980 |
| Detergent suction | % (+/-) | - |

| Item number: 107147024 | | Model: MC 9P-500/960 400/3/50 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/24/2022 2:40:00 PM<br>Created by: SER<br>Approved on: 6/24/2022 2:40:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147502 | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 500 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 500 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 15.3 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 3 |
| Pump piston type | - | Full Ceramic |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 1.04 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 400V/3ph/50Hz |
| Current @ $V_1$ | A | 26 |
| Current limiter | A | 20 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 1460 |
| Electric diagram item number | - | 106420600 |
| UNIT DATA: | | |
| Nozzle Size | - | 1503 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Gun 500 bar |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 100 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | C 32 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 255 |
| Size - Machine alone | LxWxH (mm) | 1100x500x980 |
| Detergent suction | % (+/-) | - |

# Technical data

B

| Item number: 107147025 | | Model: MC 9P-500/960 440/3/60 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/27/2022 3:20:00 PM<br>Created by: SER<br>Approved on: 6/27/2022 3:20:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147503 | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 500 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 500 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 15.3 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 3 |
| Pump piston type | - | Full Ceramic |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 1.04 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 440V/3ph/60Hz |
| Current @ $V_1$ | A | 24 |
| Current limiter | A | 20 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 1760 |
| Electric diagram item number | - | 106420600 |
| UNIT DATA: | | |
| Nozzle Size | - | 0003 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Gun 500 bar |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 99 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | C 32 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 255 |
| Size - Machine alone | LxWxH (mm) | 1100x500x980 |
| Detergent suction | % (+/-) | - |

| Item number: 107147030 | | Model: MC 10P-500/1800 400/3/50 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/24/2022 2:40:00 PM<br>Created by: SER<br>Approved on: 6/24/2022 2:40:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| **Product status: Released** | | **MPU item number: 107147505** | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 500 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 500 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 28 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 5 |
| Pump piston type | - | Full Ceramic |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 3.5 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 400V/3ph/50Hz |
| Current @ $V_1$ | A | 49 |
| Current limiter | A | 37 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 1470 |
| Electric diagram item number | - | 106420604 |
| UNIT DATA: | | |
| Nozzle Size | - | 15055 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Gun 500 bar |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 102 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | 63 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 470 |
| Size - Machine alone | LxWxH (mm) | 1670x750x1180 |
| Detergent suction | % (+/-) | - |

| Item number: 107147031 | | Model: MC 10P-500/1680 440/3/60 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/27/2022 3:20:00 PM<br>Created by: SER<br>Approved on: 6/27/2022 3:20:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147507 | |

| Service manual data | | | |
|---|---|---|---|
| PUMP: | | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 500 | |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 500 | |
| Retaining/opening pressure | bar | | |
| Flow $Q_{nom}$ | l/min | 25.5 | |
| Suction height dry | m | 0 | |
| Suction height primed | m | 0 | |
| Pump type | - | VHP | |
| Number of pistons | - | 5 | |
| Pump piston type | - | Full Ceramic | |
| Cylinder stroke | mm | 0 | |
| Pump oil type | - | SAE 15W-40 | |
| Pump oil amount per pump | l | 3.5 | |
| ELECTRIC: | | | |
| Electrical data | V/ph/Hz | 440V/3ph/60Hz | |
| Current @ $V_1$ | A | 44 | |
| Current limiter | A | 37 | |
| High voltage test voltage | V | 1250 | |
| HV insulation resistance min. | MΩ | 1 | |
| Earth circuit resistance max. | Ω | 0.2 | |
| Speed | rpm | 1765 | |
| Electric diagram item number | - | 106420604 | |
| UNIT DATA: | | | |
| Nozzle Size | - | 0005 | |
| Max. inlet temperature (suction) | °C | - | |
| Max. inlet temperature (primed) | °C | 35 | |
| Max. inlet temperature (pressure fed) | °C | 35 | |
| Max. water inlet pressure | bar | 10 | |
| Min. water inlet pressure | bar | 1 | |
| Max. ambient temperature | °C | 40 | |
| Gun Type | - | Gun 500 bar | |
| Lance primary/secondary | - | 1/None | |
| High pressure hose | - | ??? | |
| Sound power typeplate | dBA | 104 | |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 | |
| Cleaning Impact | kg-force | | |
| Fuse size | A | 63 | |
| Protection Class | - | IPX5 | |
| Weight - Machine incl. standard acc. | kg | 470 | |
| Size - Machine alone | LxWxH (mm) | 1670x750x1180 | |
| Detergent suction | % (+/-) | - | |

| Item number: 107147032 | | Model: MC 10P-800/990 400/3/50 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/24/2022 2:40:00 PM<br>Created by: SER<br>Approved on: 6/24/2022 2:40:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147508 | |

| Service manual data | | | | |
|---|---|---|---|---|
| PUMP: | | | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 825 | | |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 825 | | |
| Retaining/opening pressure | bar | | | |
| Flow $Q_{nom}$ | l/min | 16.3 | | |
| Suction height dry | m | 0 | | |
| Suction height primed | m | 0 | | |
| Pump type | - | VHP | | |
| Number of pistons | - | 3 | | |
| Pump piston type | - | Tungsten Carbide | | |
| Cylinder stroke | mm | 0 | | |
| Pump oil type | - | SAE 15W-40 | | |
| Pump oil amount per pump | l | 3.8 | | |
| ELECTRIC: | | | | |
| Electrical data | V/ph/Hz | 400V/3ph/50Hz | | |
| Current @ $V_1$ | A | 45 | | |
| Current limiter | A | 37 | | |
| High voltage test voltage | V | 1250 | | |
| HV insulation resistance min. | MΩ | 1 | | |
| Earth circuit resistance max. | Ω | 0.2 | | |
| Speed | rpm | 980 | | |
| Electric diagram item number | - | 106420606 | | |
| UNIT DATA: | | | | |
| Nozzle Size | - | 15025 | | |
| Max. inlet temperature (suction) | °C | - | | |
| Max. inlet temperature (primed) | °C | 35 | | |
| Max. inlet temperature (pressure fed) | °C | 35 | | |
| Max. water inlet pressure | bar | 10 | | |
| Min. water inlet pressure | bar | 1 | | |
| Max. ambient temperature | °C | 40 | | |
| Gun Type | - | Dump gun 15Kpsi | | |
| Lance primary/secondary | - | 1/None | | |
| High pressure hose | - | ??? | | |
| Sound power typeplate | dBA | 102 | | |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 | | |
| Cleaning Impact | kg-force | | | |
| Fuse size | A | 63 | | |
| Protection Class | - | IPX5 | | |
| Weight - Machine incl. standard acc. | kg | 565 | | |
| Size - Machine alone | LxWxH (mm) | 1670x750x1180 | | |
| Detergent suction | % (+/-) | | - | |

# Technical data

B

| Item number: 107147033 | | Model: MC 10P-800/1170 440/3/60 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/27/2022 3:20:00 PM<br>Created by: SER<br>Approved on: 6/27/2022 3:20:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147506 | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 820 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 820 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 19.6 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 3 |
| Pump piston type | - | Tungsten Carbide |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 3.8 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 440V/3ph/60Hz |
| Current @ $V_1$ | A | 50 |
| Current limiter | A | 37 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 1175 |
| Electric diagram item number | - | 106420606 |
| UNIT DATA: | | |
| Nozzle Size | - | 0003 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Dump gun 15Kpsi |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 104 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | 63 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 565 |
| Size - Machine alone | LxWxH (mm) | 1670x750x1180 |
| Detergent suction | % (+/-) | - |

| Item number: 107147034 | | Model: MC 10P-1100/870 400/3/50 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/24/2022 2:40:00 PM<br>Created by: SER<br>Approved on: 6/24/2022 2:40:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147524 | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 950 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 950 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 14.2 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 3 |
| Pump piston type | - | Tungsten Carbide |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 3.8 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 400V/3ph/50Hz |
| Current @ $V_1$ | A | 50 |
| Current limiter | A | 37 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 980 |
| Electric diagram item number | - | 106420606 |
| UNIT DATA: | | |
| Nozzle Size | - | 0002 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Dump gun 20Kpsi |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 102 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | 63 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 565 |
| Size - Machine alone | LxWxH (mm) | 1670x750x1180 |
| Detergent suction | % (+/-) | - |

| Item number: 107147035 | | Model: MC 10P-1100/900 440/3/60 | |
|---|---|---|---|
| NILFISK | Product line:<br>Customer:<br>Customer item number: -<br>Customer PM: None | Created on: 6/27/2022 3:20:00 PM<br>Created by: SER<br>Approved on: 6/27/2022 3:20:00 PM<br>Approved by: SER | Revised on: 6/24/2022 12:49:00 PM<br>Revised by: None<br>Product status: Released |
| Product status: Released | | MPU item number: 107147509 | |

| Service manual data | | |
|---|---|---|
| PUMP: | | |
| Pressure $p_{pump}$ @ $Q_{nom}$ | bar | 1020 |
| Pressure $p_{gun}$ @ $Q_{nom}$ | bar | 1020 |
| Retaining/opening pressure | bar | |
| Flow $Q_{nom}$ | l/min | 14.7 |
| Suction height dry | m | 0 |
| Suction height primed | m | 0 |
| Pump type | - | VHP |
| Number of pistons | - | 3 |
| Pump piston type | - | Tungsten Carbide |
| Cylinder stroke | mm | 0 |
| Pump oil type | - | SAE 15W-40 |
| Pump oil amount per pump | l | 3.8 |
| ELECTRIC: | | |
| Electrical data | V/ph/Hz | 440V/3ph/60Hz |
| Current @ $V_1$ | A | 50 |
| Current limiter | A | 37 |
| High voltage test voltage | V | 1250 |
| HV insulation resistance min. | MΩ | 1 |
| Earth circuit resistance max. | Ω | 0.2 |
| Speed | rpm | 1175 |
| Electric diagram item number | - | 106420606 |
| UNIT DATA: | | |
| Nozzle Size | - | 0002 |
| Max. inlet temperature (suction) | °C | - |
| Max. inlet temperature (primed) | °C | 35 |
| Max. inlet temperature (pressure fed) | °C | 35 |
| Max. water inlet pressure | bar | 10 |
| Min. water inlet pressure | bar | 1 |
| Max. ambient temperature | °C | 40 |
| Gun Type | - | Dump gun 20Kpsi |
| Lance primary/secondary | - | 1/None |
| High pressure hose | - | ??? |
| Sound power typeplate | dBA | 100 |
| Vibration ISO 5349 Lance 1 | $m/s^2$ | <1,5; +/-1 |
| Cleaning Impact | kg-force | |
| Fuse size | A | 63 |
| Protection Class | - | IPX5 |
| Weight - Machine incl. standard acc. | kg | 565 |
| Size - Machine alone | LxWxH (mm) | 1670x750x1180 |
| Detergent suction | % (+/-) | - |

# Construction — **MC 9P 350**


1. Lifting eye
2. Compartment for HP hose
3. Water inlet connection
4. Water break tank
5. Water inlet filter
6. E-box
7. Unloader
8. Level switch water break tank
9. Safety valve
10. Water outlet connection
11. Manometer
12. Dump valve
13. Pump
14. Drain hose
15. Parking brake

‘

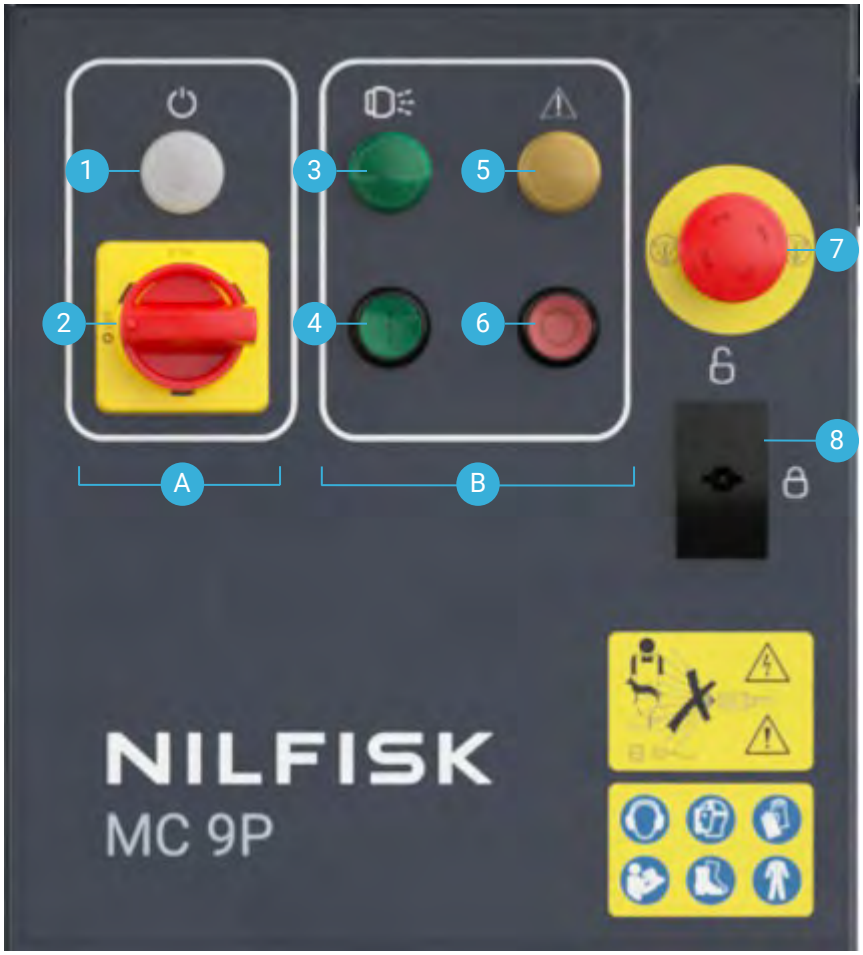

1. Handle
2. Power cable
3. Electric motor
4. E-box electric motor
5. Unloader return hose
6. Water line to pump
7. Pump oil level glass
8. Spray handle
9. Spray lance

# Construction — **MC 9P 500**


1. Lifting eye
2. Compartment for HP hose
3. Water inlet connection
4. Water break tank
5. Water inlet filter
6. E-box
7. Unloader
8. Level switch water break tank
9. Safety valve
10. Water outlet connection
11. Manometer
12. Dump valve
13. Pump
14. Drain hose
15. Parking brake

‘


1. Handle
2. Power cable
3. Electric motor
4. E-box electric motor
5. Unloader return hose
6. Water line to pump
7. Pump oil level glass
8. Spray handle
9. Spray lance




**A. Main power panel:**

1. Main power control light
2. Main power switch

**B. High pressure pump panel:**

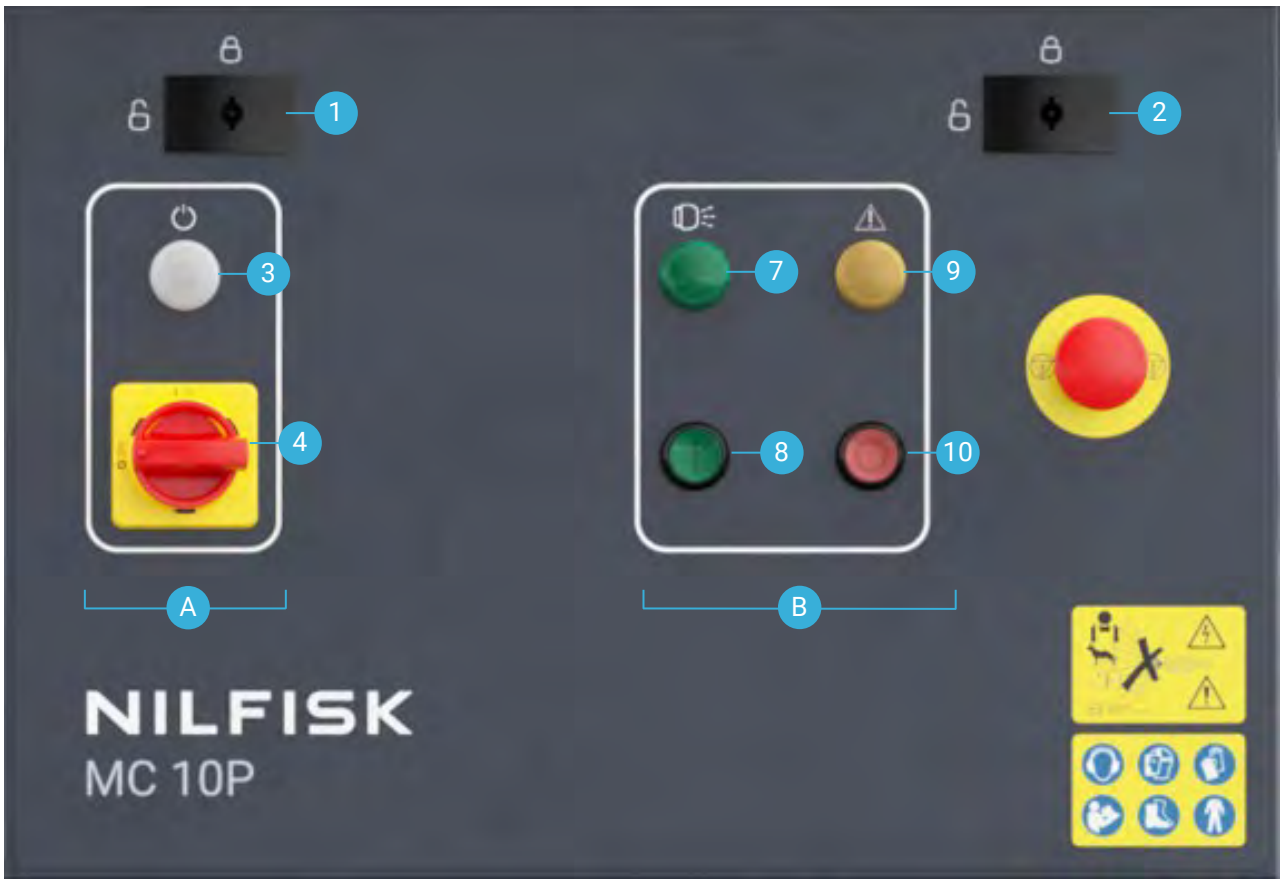
3. Control light pump
4. Start switch—high pressure pump
5. Warning light—Overload relay tripped
6. Stop switch—high pressure pump
7. Emergency stop switch
8. Lock for E-box

# Construction — **MC 10P 500**

C


1. Lifting eye
2. Compartment for HP hose
3. Water inlet connection
4. Water break tank
5. Water inlet filter
6. E-box
7. Water outlet connection
8. Manometer pump
9. Safety valve
10. Pump
11. Parking brake
12. E-box electric motor
13. Unloader return hose
14. Water inlet hose to water break tank


1. Handle
2. Power cable
3. Electric motor
4. Pump oil level glass
5. Spray handle
6. Spray lance
7. Level switch water break tank




1. Lock for E-box
2. Lock for E-box

**A. Main power panel:**

3. Control light Main power
4. Main power switch

**B. High pressure pump panel:**

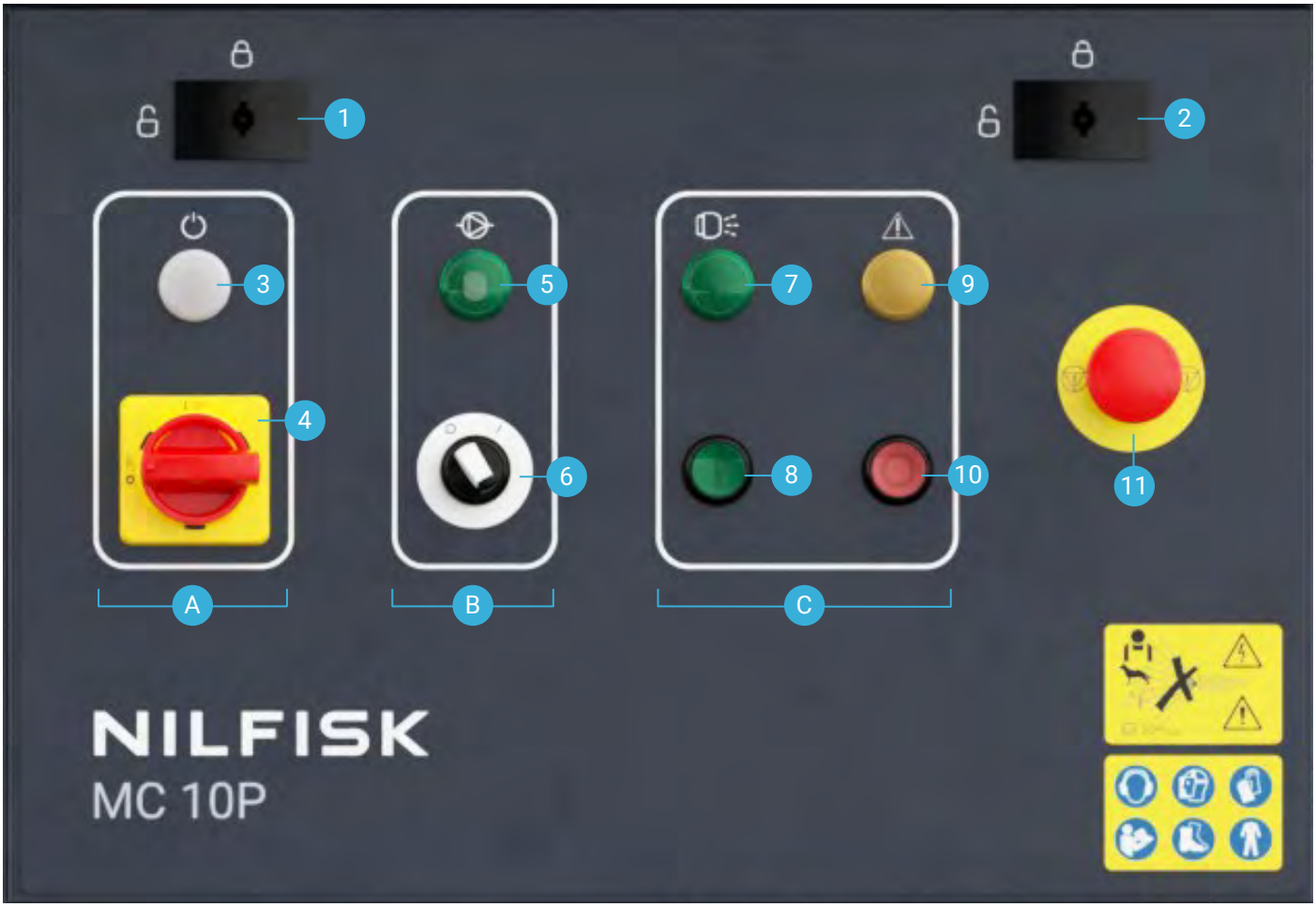
7. Control light pump
8. Start switch—high pressure pump
9. Warning light—Overload relay tripped
10. Stop switch—high pressure pump
11. Emergency stop switch

# Construction — **MC 10P 800/1100**

C


1. Lifting eye
2. Compartment for HP hose
3. Water inlet connection
4. Water break tank
5. Water inlet filter
6. E-box
7. Water outlet connection
8. Manometer pump
9. Manometer water inlet pump
10. Pump
11. Secondary water filter
12. Booster pump
13. Parking brake
14. E-box electric motor
15. Water hose to pump
16. Water hose to water break tank


1. Handle
2. Power cable
3. Electric motor
4. Dump gun
5. Pump oil level glass
6. Spray lance
7. Coupling between motor and pump
8. Level switch water break tank




1. Lock for E-box
2. Lock for E-box

**A. Main power panel:**

3. Control light Main power
4. Main power switch

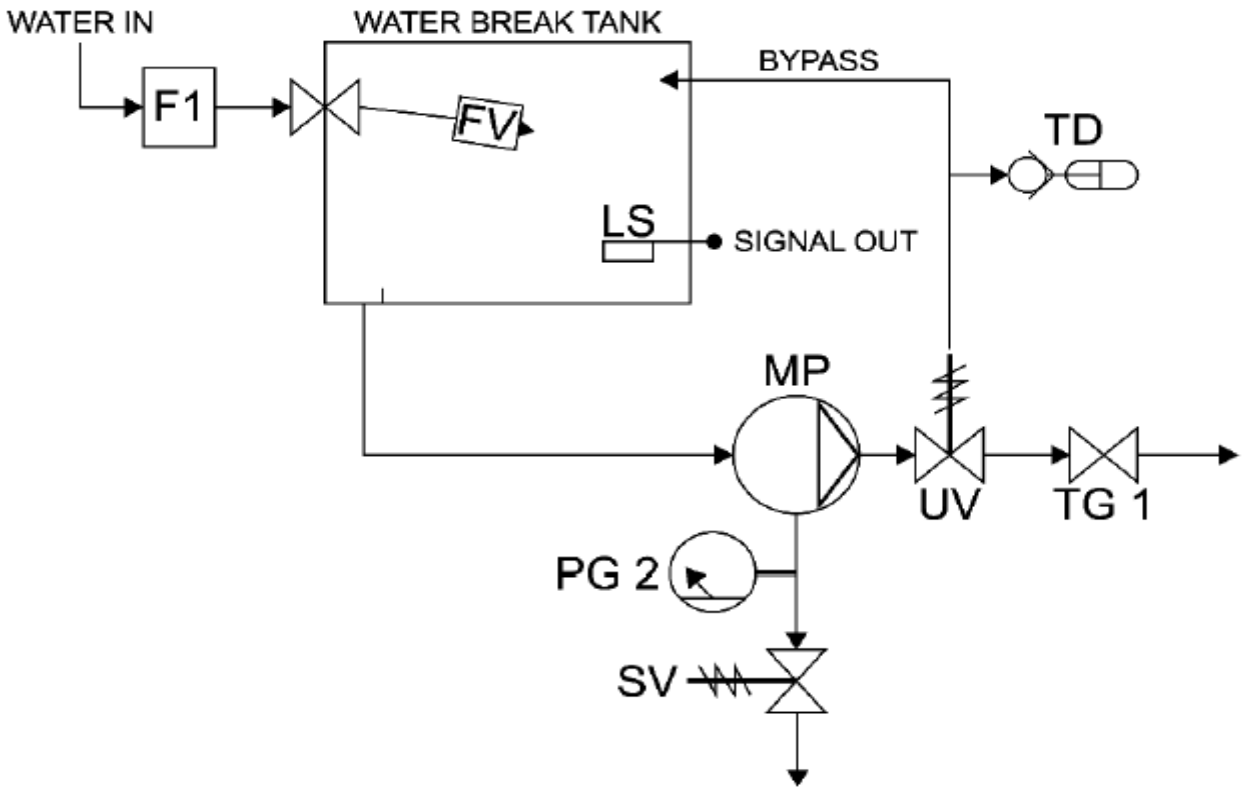
**B. Booster pump panel:**

5. Control light booster pump
6. ON/OFF switch booster pump

**C. High pressure pump panel:**

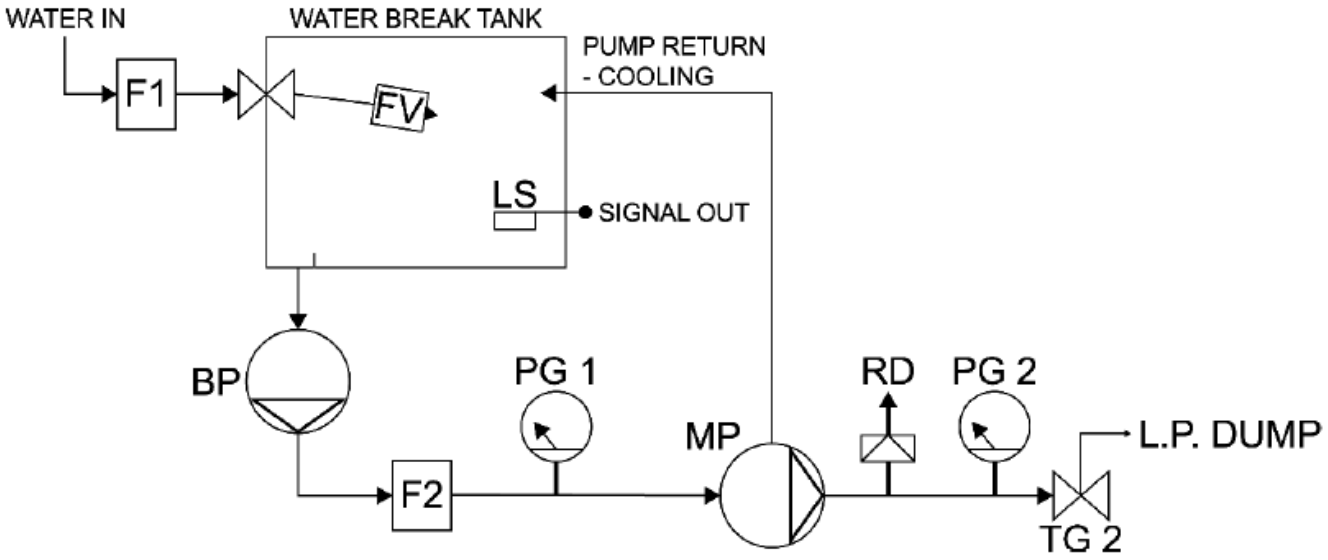
7. Control light pump
8. Start switch—high pressure pump
9. Warning light—Overload relay tripped
10. Stop switch—high pressure pump
11. Emergency stop switch

Machine schematics; MC 9P 350/500 & MC10P 500



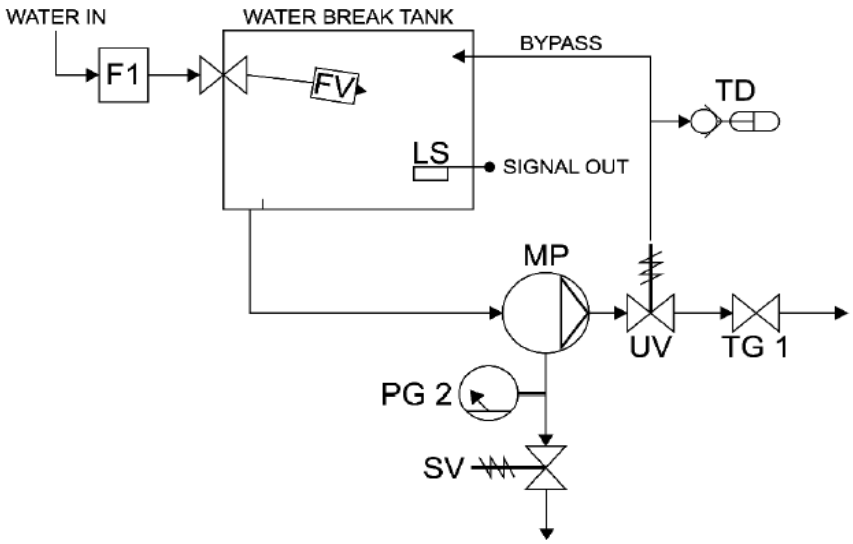

| Symbol | Description | Symbol | Desription |
|---|---|---|---|
| BP | Booster Pump | RD | Burst Disc |
| F1 | Filter—Inlet | SV | Safety Valve |
| F2 | Filter—Mineral | TD | Thermal Dump Valve |
| FV | Float Valve | TG1 | Trigger Gun—Dry Shut Type |
| LS | Level Sensor | TG2 | Trigger Gun—Dump Type |
| MP | Main Pump | UV | Unloader Valve |
| PG1 | Pressure Gauge—Water In-let Pump | | |
| PG2 | Pressure Gauge—Outlet Pump | | |

Machine schematics; MC 10P 800/1100




| Symbol | Description | Symbol | Desription |
|---|---|---|---|
| BP | Booster Pump | RD | Burst Disc |
| F1 | Filter—Inlet | SV | Safety Valve |
| F2 | Filter—Mineral | TD | Thermal Dump Valve |
| FV | Float Valve | TG1 | Trigger Gun—Dry Shut Type |
| LS | Level Sensor | TG2 | Trigger Gun—Dump Type |
| MP | Main Pump | UV | Unloader Valve |
| PG1 | Pressure Gauge—Water In-let Pump | | |
| PG2 | Pressure Gauge—Outlet Pump | | |

## Functional Description MC 9P 350/500 & MC10P 500




BP: The booster pump ensures that the main pump (MP) is supplied with sufficient water flow through the MP water Inlet (2-7 Bar).

F1: The water inlet filter ensures no dirt/debris/foreign objects etc. from the inlet water source can enter the low pressure water line and damage pump and other components. Filer insert is replaceable.

F2: The secondary filter ensures no dirt/debris/foreign objects etc. from the Water Break Tank can enter the low pressure water line and damage pump and other components. This filter has a finer mesh than the F1 filter in-sert, and can therefore collect smaller objects. Filter insert is replaceable.

FV: The float valve turns of the water flow into the water break tank from the inlet when WBT is full.

LS: The level sensor ensures that the VHPW cannot operate without water. If the water level within the WBT be comes too low the sensor sends a signal to the E-box and the VHPW will shut off to prevent damage to the ma chine.

MP: The main pump is a heavy duty crankshaft plunger pump.

PG1: Pressure gauge 1 measures the water pressure on the low pressure water line before entering the main pump.

PG2: Pressure gauge 2 measures the water pressure on the high pressure water line.

RD: The burst disc is a safety system designed to protect the VHPW against over pressure. When the VHPW is over pressurized, the burst disc within the burst disc housing will break and excess water is dumped. The burst disc housing is equipped with a protective cover which ensure the dumped water is directed downwards and therefore cannot hit user(s) directly. Once the burst disc has been broken due to over pressure it must be discarded and replaced with a new one of the same specification.

SV: The safety valve is a safety system designed to protect the VHPW against over pressure. When the VHPW is over pressurized, the safety valve will start to open and excess water is dumped. The setting of the safety valve system is factory set. Incorrect setting may void warranty for the machine.

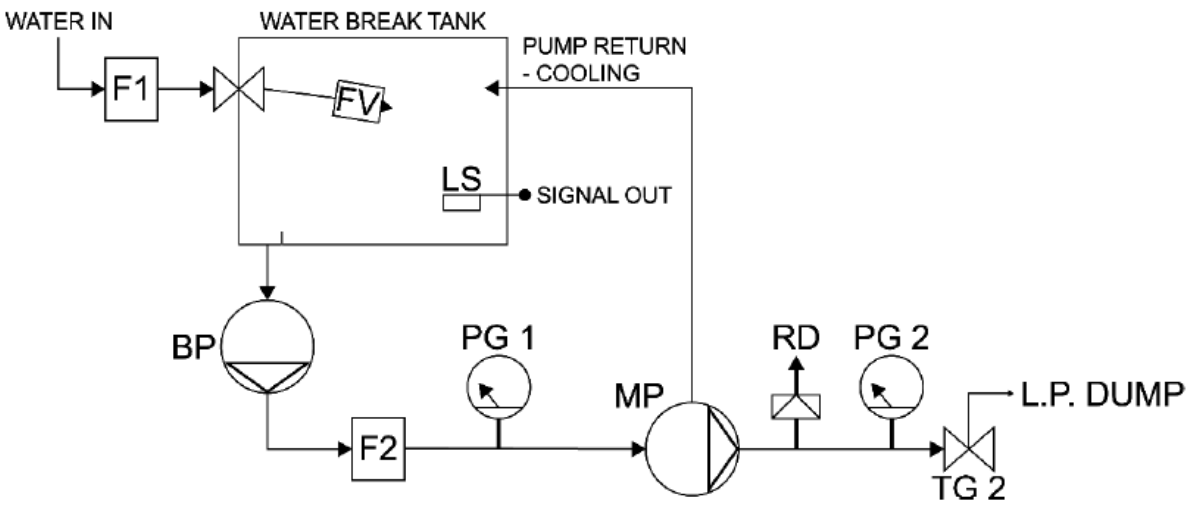
TD: The thermal dump valve protects the pump and LP water line against increased water temperatures when the VHPW is running in bypass mode. This is done by continuously dumping the water to keep the water tempera ture below approx. 60° C.

TG1: Trigger gun 1 is a dry shut off trigger gun type.

TG2: Trigger gun 2 is a is a dump type trigger gun.

UV: The function of the unloader valve is to unload the pressure from the VHPW by sending the water in bypass to the WBT.

## Functional Description MC 10P 800/1100




BP: The booster pump ensures that the main pump (MP) is supplied with sufficient water flow through the MP water Inlet (2-7 Bar).

F1: The water inlet filter ensures no dirt/debris/foreign objects etc. from the inlet water source can enter the low pressure water line and damage pump and other components. Filer insert is replaceable.

F2: The secondary filter ensures no dirt/debris/foreign objects etc. from the Water Break Tank can enter the low pressure water line and damage pump and other components. This filter has a finer mesh than the F1 filter in-sert, and can therefore collect smaller objects. Filter insert is replaceable.

FV: The float valve turns of the water flow into the water break tank from the inlet when WBT is full.

LS: The level sensor ensures that the VHPW cannot operate without water. If the water level within the WBT be comes too low the sensor sends a signal to the E-box and the VHPW will shut off to prevent damage to the ma chine.

MP: The main pump is a heavy duty crankshaft plunger pump.

PG1: Pressure gauge 1 measures the water pressure on the low pressure water line before entering the main pump.

PG2: Pressure gauge 2 measures the water pressure on the high pressure water line.

RD: The burst disc is a safety system designed to protect the VHPW against over pressure. When the VHPW is over pressurized, the burst disc within the burst disc housing will break and excess water is dumped. The burst disc housing is equipped with a protective cover which ensure the dumped water is directed downwards and therefore cannot hit user(s) directly. Once the burst disc has been broken due to over pressure it must be discarded and replaced with a new one of the same specification.

SV: The safety valve is a safety system designed to protect the VHPW against over pressure. When the VHPW is over pressurized, the safety valve will start to open and excess water is dumped. The setting of the safety valve system is factory set. Incorrect setting may void warranty for the machine.

TD: The thermal dump valve protects the pump and LP water line against increased water temperatures when the VHPW is running in bypass mode. This is done by continuously dumping the water to keep the water tempera ture below approx. 60° C.

TG1: Trigger gun 1 is a dry shut off trigger gun type.

TG2: Trigger gun 2 is a is a dump type trigger gun.

UV: The function of the unloader valve is to unload the pressure from the VHPW by sending the water in bypass to the WBT.

# Function

D

## Electric Functional Description MC 9P. Use wiring diagram 106420600

Connect the machine to the correct power supply. Check correct voltage and Hz on machine ID plate.

Before starting the machine make sure the Emergency STOP button is released. (Turn switch handle clock-wise).

Turn the main switch (S1) ON. ON light, H1, will be ON.

T1 transformer is now powered and is delivering 24VAC for the control power to the system. T1 is protected by 3 fuses, F1, F2 & F3.

Starting of motor, Star-Delta connection.

Push the green START button, S5, to start the motor (M1).

Main contactor (CM) and the STAR contactor (CS) will be activated (contactor coils powered with 24VAC) - motor is running.

Timer relay (TD) and AUX2 are now closed and will power the STAR contactor (CS) coil with 24VAC for 4 sec.

After 4 sec. TD will switch over (cut power to CS) to power the DELTA contactor coil with 24VAC through AUX1. AUX contactor on DELTA contactor (terminal 13 & 14) is now closed, and fan (M3) in E-box is pow-ered and running.

Motor thermal switch (F6) must be closed. STOP button (S4) must be closed.

Level switch, B1 in water break tank must be closed to start the motor = water in tank. When level switch is closed there is connection between terminal 1-2, level switch relay (LR) is now powered through terminal 14-13. Also LR terminal 9-5 are closed. If water runs below min. level in tank, B1 opens, LR opens between ter-minal 9-5 (disconnect the control power to contactors), and the motor will stop.

Hour counter (HRM) is ON. Run light (H2) is ON.

If F6 (motor overload) trips connection between 95 & 96 opens which will disconnect the control power for contactor coils. At the same time the connection between 97 & 98 closes, and the failure light (H3) lights up.

# Function

D

## Electric Functional Description MC 10P. Use wiring diagram 106420605

Connect the machine to the correct power supply. Check correct voltage and Hz on machine ID plate.

Before starting the machine make sure the Emergency STOP button is released. (Turn switch handle clock-wise).

Turn the main switch (S1) ON. ON light, H1, will be ON.

T1 transformer is now powered and is delivering 24VAC for the control power to the system. T1 is protected by 3 fuses, F1, F2 & F3.

Starting of motor, Star-Delta connection.

Push the green START button, S5, to start the motor (M1).

Main contactor (CM) and the STAR contactor (CS) will be activated (contactor coils powered with 24VAC) - motor is running.

Timer relay (TD), terminal 55-56, and DELTA contactor (CD) terminal 21-22 are now closed and will power the STAR contactor (CS) coil with 24VAC for 4 sec.

After 4 sec. TD will switch over (cut power to CS) to power the DELTA contactor (CD) coil with 24VAC through AUX terminal 61-62. AUX contactor on DELTA contactor (terminal 13 & 14) is now closed, and fan (M3) in E-box is powered and running.

Motor thermal switch (F6) must be closed. STOP button (S4) must be closed.

Level switch, B1 in water break tank must be closed to start the motor = water in tank. When level switch is closed there is connection between terminal 1-2, level switch relay (LR) is now powered through terminal 14-13. Also LR terminal 9-5 are closed. If water runs below min. level in tank, B1 opens, LR opens between ter-minal 9-5 (disconnect the control power to contactors), and the motor will stop.

Hour counter (HRM) is ON. Run light (H2) is ON.

If F6 (motor overload) trips connection between 95 & 96 opens which will disconnect the control power for contactor coils. At the same time the connection between 97 & 98 closes, and the failure light (H3) lights up.

# Function

D

## Electric Functional Description MC 10P W/Booster pump. Use wiring diagram 106420606

Connect the machine to the correct power supply. Check correct voltage and Hz on machine ID plate.

Before starting the machine make sure the Emergency STOP button is released. (Turn switch handle clock-wise).

Turn the Booter Pump switch (S2) ON.

Turn the main switch (S1) ON. ON light, H1, will be ON.

T1 transformer is now powered and is delivering 24VAC for the control power to the system. T1 is protected by 3 fuses, F1, F2 & F3.

Starting of motor, Star-Delta connection.

Push the green START button, S5, to start the motor (M1).

Main contactor (CM) and the STAR contactor (CS) will be activated (contactor coils powered with 24VAC) - motor is running.

Timer relay (TD), terminal 55-56, and DELTA contactor (CD) terminal 21-22 are now closed and will power the STAR contactor (CS) coil with 24VAC for 4 sec.

After 4 sec. TD will switch over (cut power to CS) to power the DELTA contactor (CD) coil with 24VAC through AUX terminal 61-62. AUX contactor on DELTA contactor (terminal 13 & 14) is now closed, and fan (M3) in E-box is powered and running.

Motor thermal switch (F6) must be closed. STOP button (S4) must be closed.

Level switch, B1 in water break tank must be closed to start the motor = water in tank. When level switch is closed there is connection between terminal 1-2, level switch relay (LR) is now powered through terminal 14-13. Also LR terminal 9-5 are closed. If water runs below min. level in tank, B1 opens, LR opens between ter-minal 9-5 (disconnect the control power to contactors), and the motor will stop.

Hour counter (HRM) is ON. Run light (H2) is ON.

If F6 (motor overload) trips connection between 95 & 96 opens which will disconnect the control power for contactor coils. At the same time the connection between 97 & 98 closes, and the failure light (H3) lights up.

## Resolving "Sticky valves"

### Symptom:

During initial start, water supply and VHPW is turned on but the pump does not deliver water through the high pressure water outlet.

The pump does not prime and is running dry.

### Cause:

This can be caused by the inlet valves inside the pump being stuck. (e.g. pump inactivity or prolonged shipment/ storage).

This phenomenon is called "Sticky salves".

### Solution:

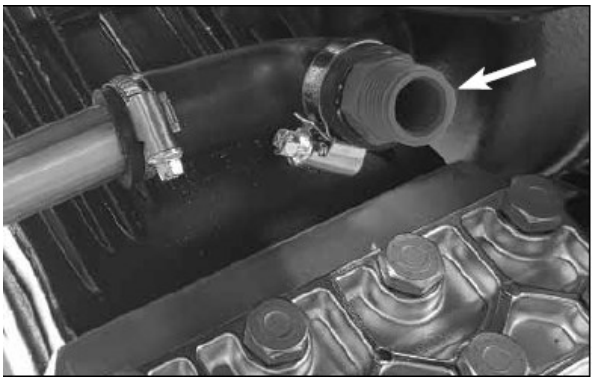
Water supply pressure of 2-5bar can be used to loosen up the valves if connected directly to pump inlet.

### Follow this procedure:

**Step 1:** Loosen the hose clip on the bent rubber angle at the outlet of the WBT and disconnect the two. If WBT is full, water will pour down over the pump.

**Step 2:** Loosen the hose clip securing the bent rubber angle to the steel tube, turn the direction of the rubber angle to point outwards and tighten hose clip again.

**Step 3:** Block the outlet port of the WBT with a short hose and turn hose upwards. Refill WBT so high that the level switch in the WBT will engage – enabling the VHPW to start up again.



**Step 4:** Mount a suitable fitting to the rubber angle and re-locate the water supply hose onto this location. Water supply pressure must be 2-3bar.

**Step 5:** Verify the spraying device is not connected.

**Step 6:** Turn on water supply and VHPW. Let water flow into the inlet port for about 4-5 sec. Once a smooth flow of water is observed from the hose outlet, the sticky valve issue is resolved. Turn off machine, reconnect spraying device by following the mounting procedure in section E and start blasting.

# Troubleshooting

E

| Symptom | Causes and remediations |
|---|---|
| Main switch is turned on; VHPW will not run. | Check power supply connection.<br>Make sure the power plug is inserted correctly.<br>Check if automatic fuse is cut-o . If yes turn on fuse again. |
| Motor is humming; Pump providing no or low pressure | Voltage is too low compared to specifi cation. Check main voltage. Motor phase is missing (For 3 phase application). Check the connection box voltage with a meter.<br>High-pressure pump is blocked. Service required. |
| Pump pressure drops and the VHPW works irregularly | Inlet filter is clogged. Change filter insert or replace entire filter. Water supply pressure is in-sufficient to accommodate pump. |
| VHPW does not reach the proper working pressure when the spray-gun handle is activated. | Nozzle is clogged or worn out. Clean or replace nozzle.<br>Pump seals are worn. Replacement needed.<br>The pump sucks air. Check Low Pressure water pipeline for leaks that can cause suction into the LP pipeline.<br>Bypass valve worn or dirt trapped in valve. Service required. |
| Pump continuously stops and starts when the spray gun trigger is activated | The HP nozzle is clogged. Turn o  VHPW and dismantle the nozzle. Remove dirt or replace nozzle if damaged. |
| VHPW only works with approximately 2/3 of the maximum pressure, and the high-pressure hose is vibrating. | Bypass worn or dirt trapped in valve. Service required.<br>The pump sucks air. Check Low Pressure water pipeline for leaks that can cause suction into the LP pipeline.<br>Inlet water filter is clogged. Change filter insert or replace entire filter. Water supply pressure is in-sufficient to accommodate pump.<br>MC 10P 800/1100 Only Low inlet booster pressure. Check booster pump.<br>Valve flaps are not free of dirt and can therefore not fit tightly and move freely. Service required. |
| High pressure pump exceeds its rated pressure, and safety disc burst (MC 10P 800 & 1100 only), or safety valve dumps water. | Nozzle is clogged. Remove nozzle and clean out debris or replaced. Check machine is operating at the correct frequency. |
| Noise in pump crankcase. | Crankcase or motor bearings worn out. Service required Check oil level. Refill or change oil in crankcase. |
| Noise from the pump | The pump sucks air. Check Low Pressure water pipeline for leaks that can cause suction into the LP pipeline.<br>One or more valve springs are broken or down. Service required<br>Dirt in the valves. Service required |
| Water in the oil/pump crankcase | Worn oil seals. Change seals and replace oil.<br>The O-ring casing is worn out. Replace O-ring.<br>The oil seals are worn out. Service required.<br>High moisture in the air (condensing inside the crankcase). Increase interval |

## Disassembling

Remove the 3 plugs for the pressure valves (on the top), and the 3 plugs for the suction valves (on the side)

Remove the pressure and suction valves with a pair of pliers.

Make sure the O-ring below the valves is removed as well.

Loosen and remove all 8 cylinder head bolts.


Check all the valve plates for free movement (1), by pushing the valve plate up against the spring. Make sure the valve plate moves back by the spring force.

## Disassembling

Knock carefully on the top of the cylinder head in both ends to loosen it from the crankshaft housing/pump pistons.

If needed use a flat screwdriver to further loosen the cylinder head.

Pull the cylinder head the rest of the way by hand.

Dismounting of the water seals is done with special puller which is included in special tool kit: 101221057

Puller and “puller bolt”.

20 mm puller bolt is needed for this 350 bar pump.

When puller bolt and puller is assembled, the puller bolt is pushed into one of the seal holes in the cylinder head.

Remove the water seals and brass rings by pulling hard in the puller.

## Disassembling

Primary and secondary water seals removed. IMPORTANT: make sure the support ring in the bottom of the water seal hole is removed.

Remove the primary water seal from the brass ring. IMPORTANT: DO NOT make any scratches on the inside of the brass ring.

Loosen and dismount the 8 mm nut holding the ceramic piston

Pull out the ceramic piston.

Carefully remove the back-up ring and the O-ring from the piston rod.

Remove the brass washers from the piston rod.

## Assembling

Install brass washer on piston rod.

Grease O-ring with water resistant grease. Install ceramic piston on piston rod.

Primary & secondary water seals and thrust collars.

## Grease all components with water resistant silicone grease

Install back-up ring and O-ring on piston rod. Protect the O-ring from damages from the threads when installing. Here is used a small piece from a post-it block.

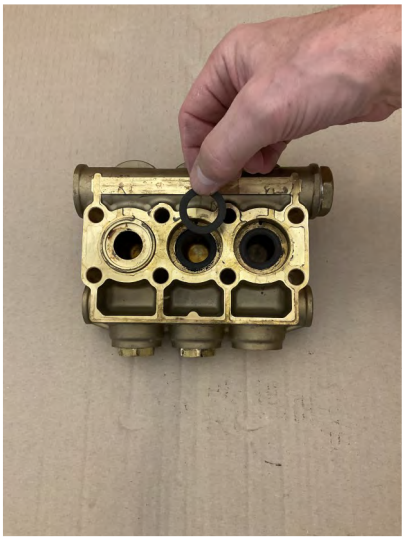
Tighten piston nut with the specified torque.

Install support ring for primary seal

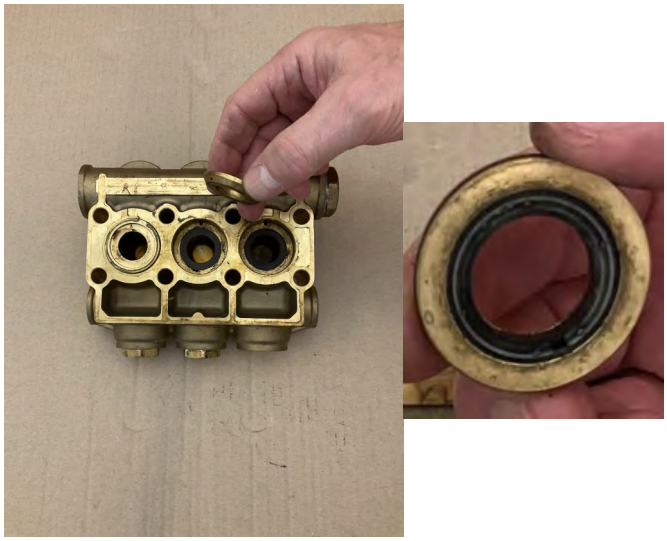
## Assembling


Install primary seal in special tool

Install metal part in cylinder head, and push hard on plastic part to install primary seal in cylinder head.



Install the support ring on top of the just installed primary seal.

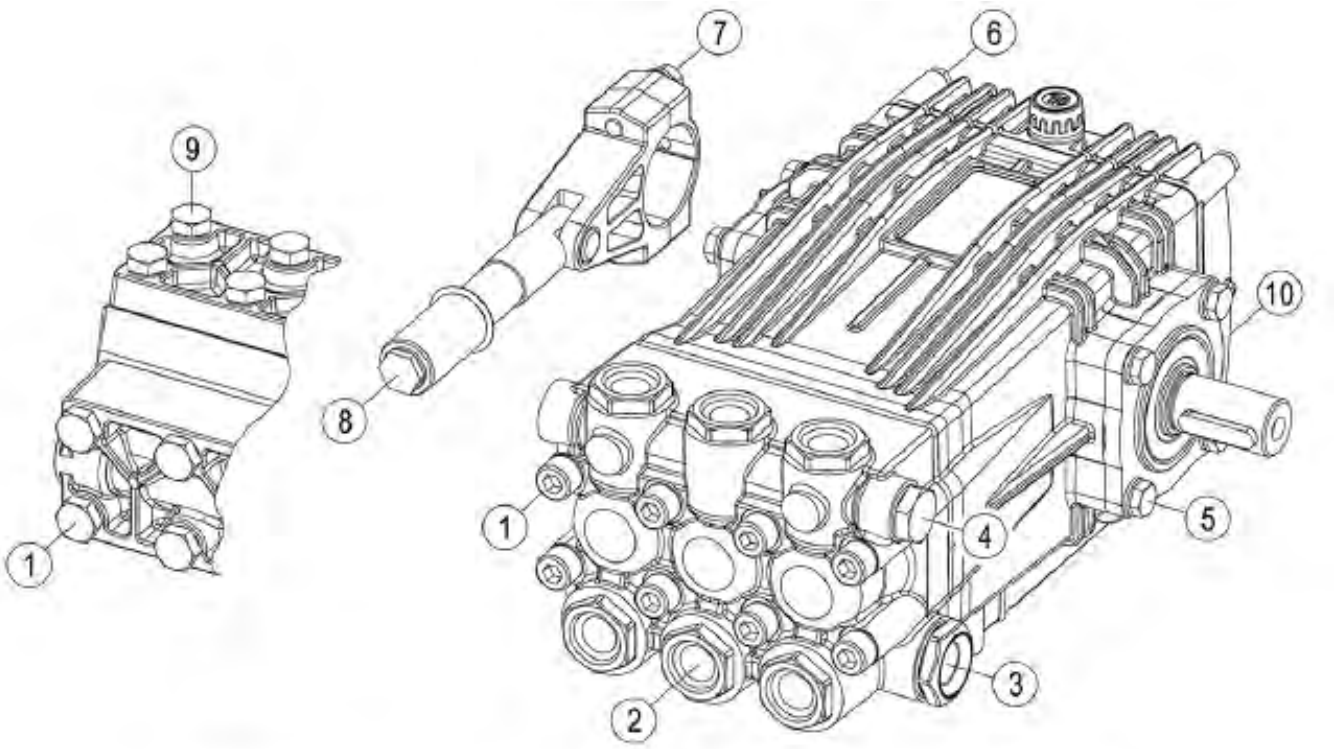


Install the thrust collar with the secondary seal

Install thrust collar by pushing it down with two fingers.

Install the cylinder head and tighten the 8 bolts with the specified torque.

**Torque—pump**




| POS. | DESCRIPTION | NOTE |
|---|---|---|
| 1 | Head Bolts | Loctite® 243<br>- Medium Strenght Treadlocking<br>Color: Blue<br><br>Loctite® 270<br>- High Strenght Treadlocking<br>Color: Green |
| 2 | Valve Caps | |
| 3 | Inlet Cap | |
| 4 | Outlet Cap | |
| 5 | Bearing Flange Bolts | |
| 6 | Rear Cover Bolts | |
| 7 | Connecting Rod Bolts | |
| 8 | Plunger Bolts | |
| 9 | Valve Cover Bolts | |
| 10 | Oil Drain Plug | |

| POS. | PN - PS | | | PK - PKWT | | | B - BK | | | MS - MWT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N•m | *lbf•ft* | Loctite® | N•m | *lbf•ft* | Loctite® | N•m | *lbf•ft* | Loctite® | N•m | *lbf•ft* | Loctite® |
| 1 | 11 | *8* | | 11 | *8* | | 25 | *19* | | 25 | *19* | |
| 2 | 100 | *75* | 243 | 100 | *75* | 243 | 100 | *75* | 243 | 100 | *75* | 243 |
| 3 | 80 | *60* | | 110 | *80* | | 100 | *75* | 243 | 110 | *80* | |
| 4 | 80 | *60* | 243 | 80 | *60* | 243 | 80 | *60* | 243 | 80 | *60* | 243 |
| 5 | 11 | *8* | | 11 | *8* | | 25 | *19* | | 25 | *19* | |
| 6 | 11 | *8* | | 11 | *8* | | 25 | *19* | | 11 | *9* | |
| 7 | - | - | | - | - | | 11 | *9* | 243 | - | - | |
| 8 | 15 | *11* | 270 | 15 | *11* | 270 | 15 | *11* | 270 | 15 | *11* | 270 |
| 10 | 8 | *6* | | 8 | *6* | | 25 | *19* | | 8 | *6* | |

## Disassembling

Remove the M10 bolts, and then remove the Outlet valve cover.

Insert an M6 screw and pull out the outlet valve cap.

Pull out the valve using a set of pliers. Check the valves for damages, replace if needed.

Use an O-ring picker tool to remove the O -ring below the valve.

Loosen and remove the 10 mm bolts, except 2. Now remove the last 2 bolts

Install thrust collar by pushing it down with two fingers.

åInstall thrust collar by pushing it down with two fingers.

Install thrust collar by pushing it down with two fingers.

Remove the last 2 bolts for removing the manifold and pump head.

## Disassembling

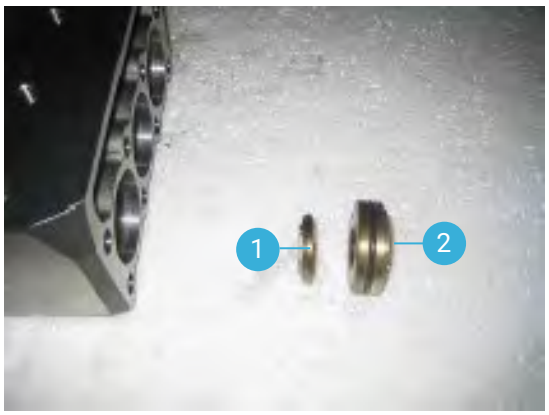
Backside

Front

Push the valve out with a brass mandrel. Be careful not to scratch the inside of the pump head.


Check the valve (1) for damages, and replace if necessary.

Use a finger to pull out the diffuser (2)




Push out the Pressure Ring (1) and the back ring (2) from the back with a brass rod. Be careful not to scratch the inside of the pump head.

Use a screwdriver or pliers to fish out the packing.

Be careful not to scratch the inside of the pump head.

### Disassembling

Disassembled view of pump head & manifold

## Pump assembling

**Lubricate seals and O-rings with waterproof silicone grease.**

Assemble White & Black Packing and insert into pump


Mount the seals and back ring as shown above. Pay attention to the seal sequence from left to right, White (1), black (2), brown (3) and back ring (4).


Insert the Low Pressure Seal into the Pressure Ring.

Pay attention to the orientation, groove (1) facing outwards.


Insert the Pressure Ring (1) into the Pump Head, knock a few time with a mallet to compress the packing below


Turn the Pump Head over and insert the Diffuser (1). Note the orientation.

Insert the valve (2)

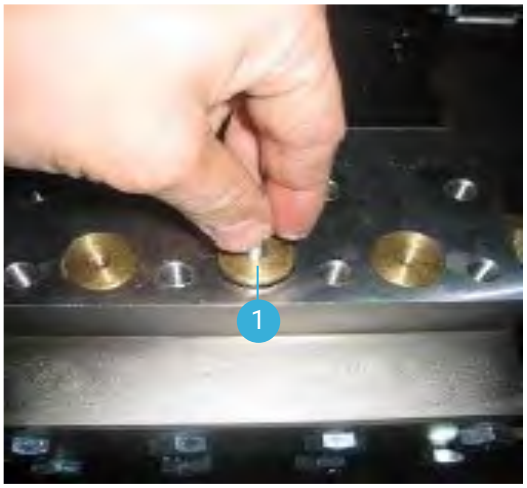
Apply waterproof silicone grease onto the surface of the Plunger.

## Pump assembling


Mount the pump head. Push the pump head until there are no gab (1) between the crankshaft housing and pump head.


Mount the Manifold ensure that the cooling holes (1) are not blocked before assembling. Hand tighten the M10 bolts


Mount the Valve and O-ring into the Pump Head




Mount the valve cap (1). Note the orientation of the valve cap. Threaded hole (1) must be facing up


Mount the pump head. Push the pump head until there are no gab (1) between the crankshaft housing and pump head.

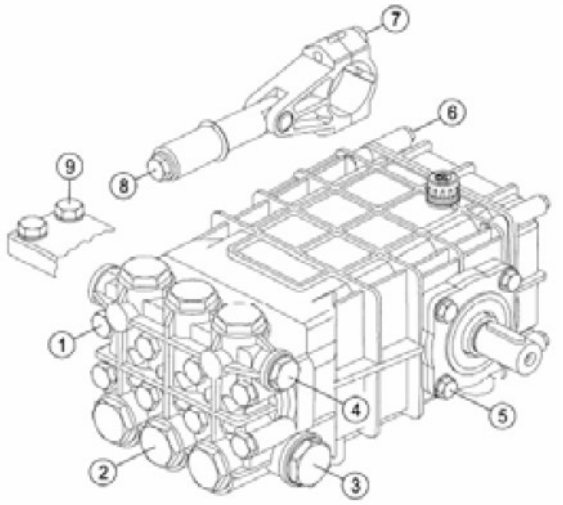

Mount the Manifold ensure that the cooling holes (1) are not blocked before assembling. Hand tighten the M10 bolts

## Pump assembling

Teighten all bolts with the specified torque.

Specifications below.

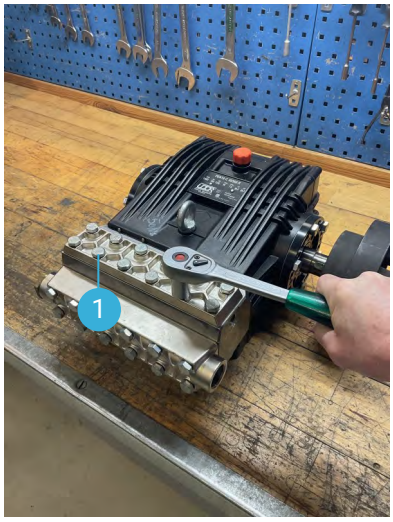
Torque specifications




Torque specifications

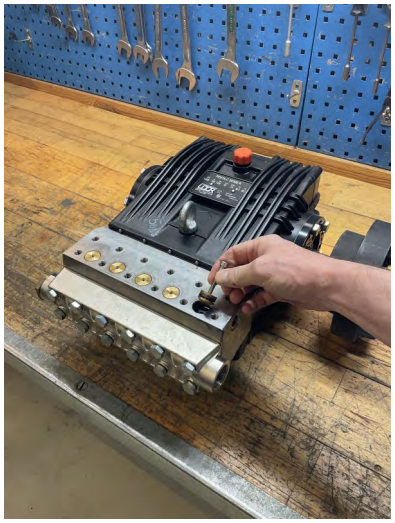
| Pos. | Description | N.m | lb.ft |
|---|---|---|---|
| 1 | Head Bolts | 50 | 37 |
| 2 | Valve Caps | N.A | N.A |
| 3 | Inlet Cap | 140 | 103 |
| 4 | Outlet Cap | 80 | 60 |
| 5 | Bearing Flange Bolts | 25 | 19 |
| 6 | Rear Cover Bolts | 11 | 8 |
| 7 | Connecting Rod Bolts | 30 | 22 |
| 8 | Plunger Bolts | 15 | 11 |
| 9 | Valve Cover Bolts | 30 | 37 |

## Pump disassembling



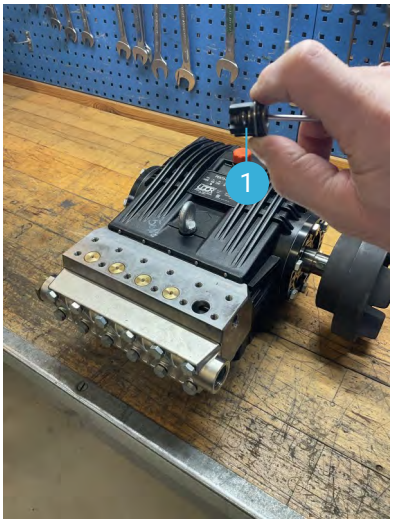

Dismount the 12 cover bolts (1)

Lift off the cover plate

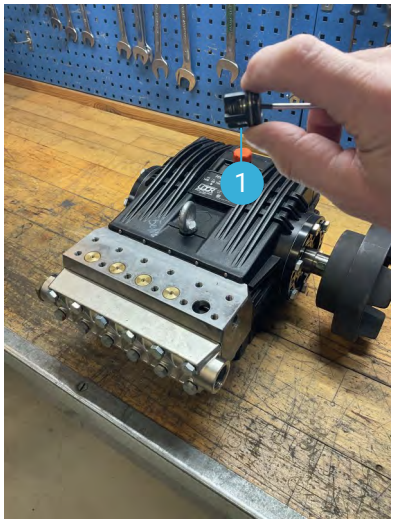


Using a 5 mm bolt, lift up the 5 valve plugs

With a pair of pliers lift up the pressure valve. Make sure you also get the seat O-ring in the bottom removed

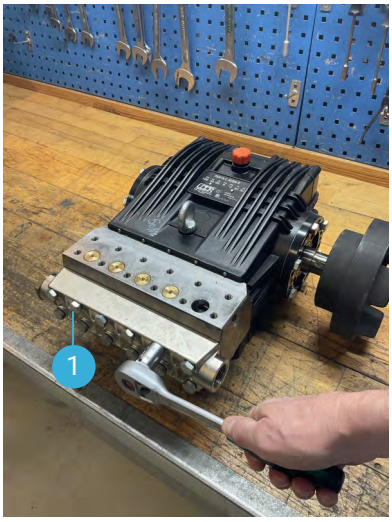



Check the valve opens (1) freely when pressing lightly on the valve plate

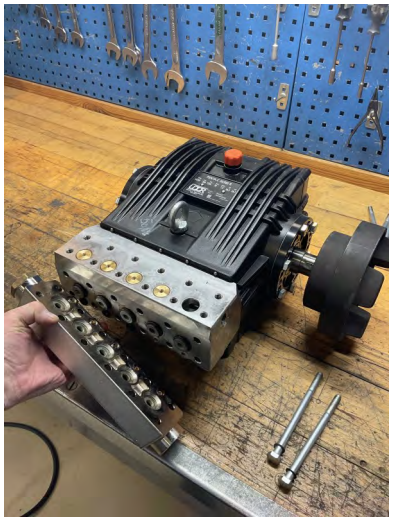



Check valve is closing (1) again when releasing the pressure from the valve plate

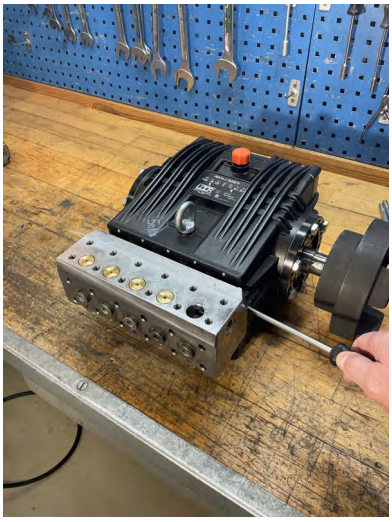
## Pump disassembling



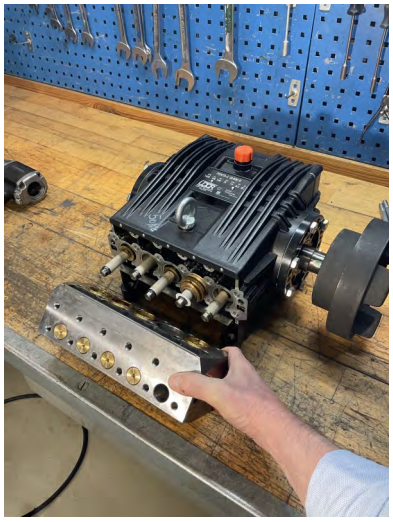

Dismount the 12 manifold bolts (1)



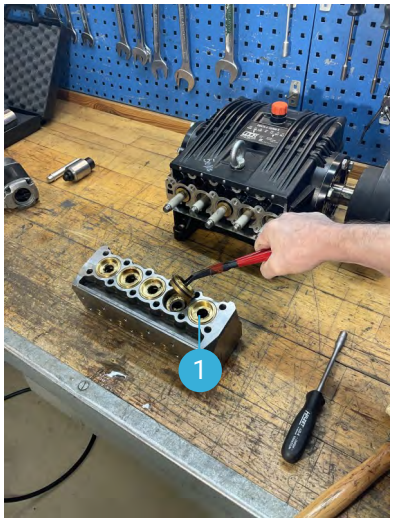
Lift off the manifold.



With one or two flat screw drivers loosen the cylinder head.



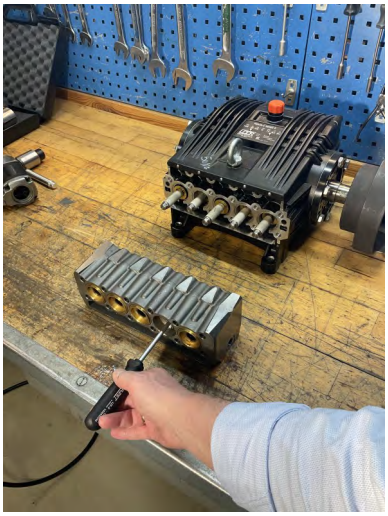
Lift off the cylinder head.




Remove the pressure rings (1) with a reverse pair of pliers

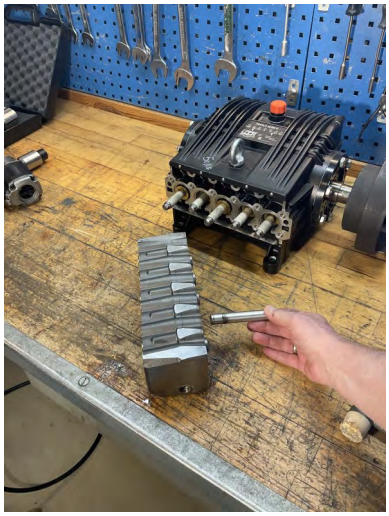
Remove the brass ring, backup ring and the primary seals.

## Pump disassembling



Carefully knock out the suction valves

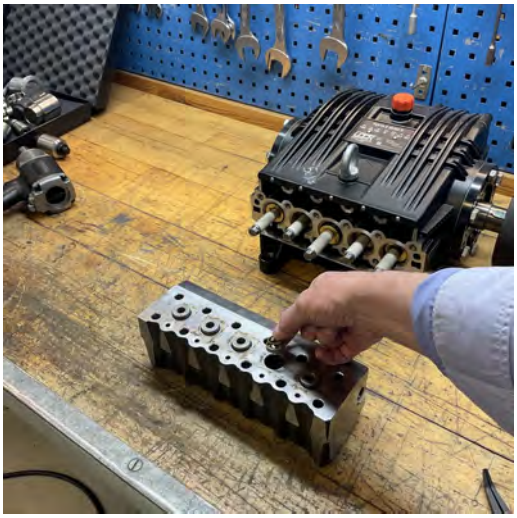
Suction valve dismounted. Remember to remove the spacer below the valve.



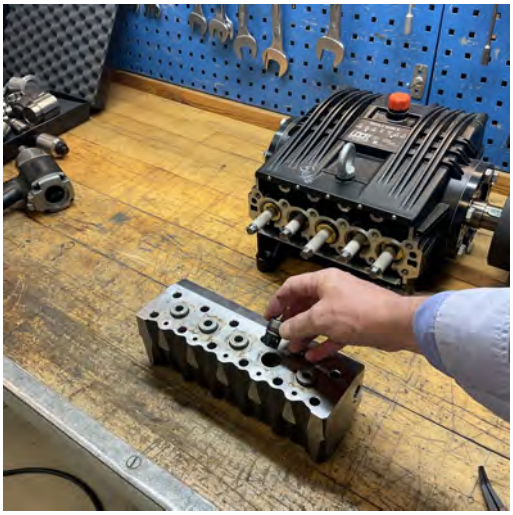
Use the mandrel from special tool kit 101221058, as shown above

Secondary seal dismounted with the use of the special mandrel.

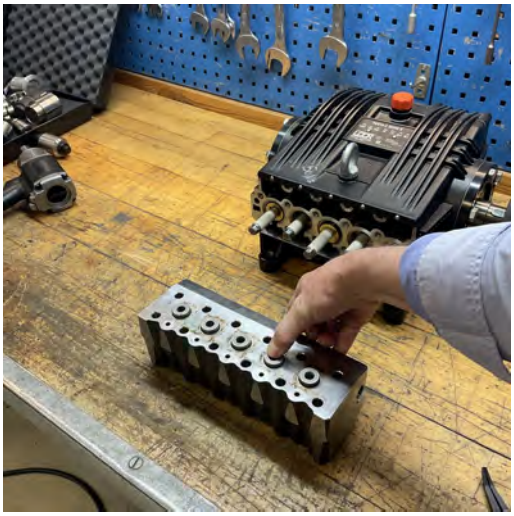
## Pump assembly



Mounting of suction valves. First mount the valve spacer. Pay attention to the positioning of the spacer.



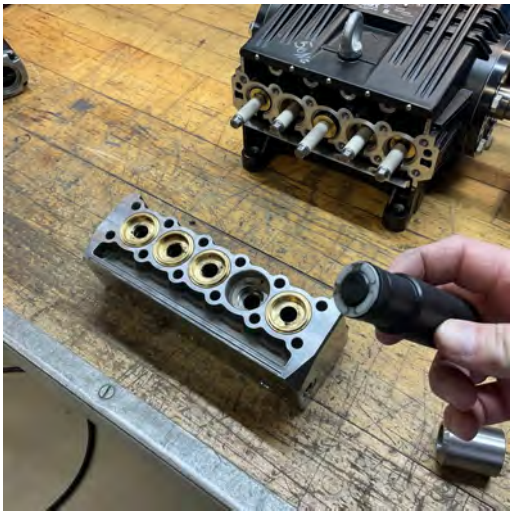
Mount the complete suction valve. Grease O-ring before mounting.



Push the suction valve down by hand.

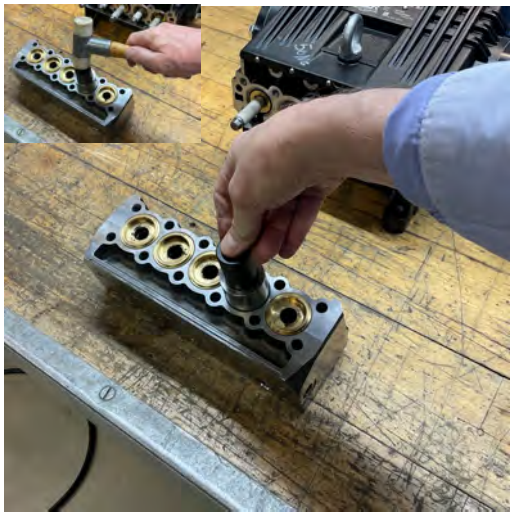
Water seals and bacup rings

Special tool (assembly mandrel) for primary water seal.

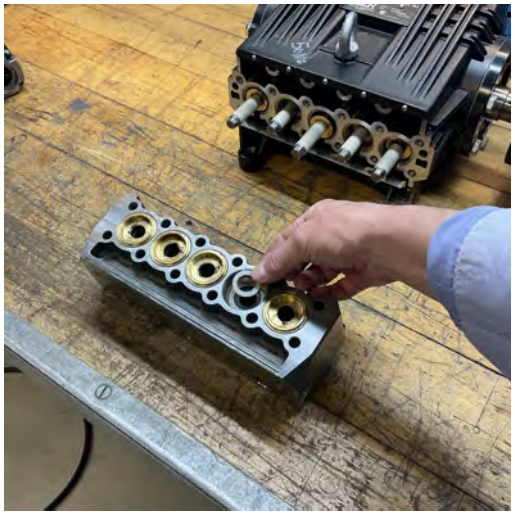


Seal mounted on mandrel

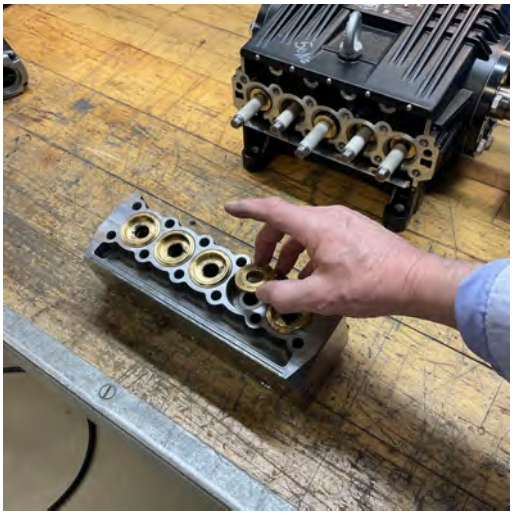
## Pump assembly



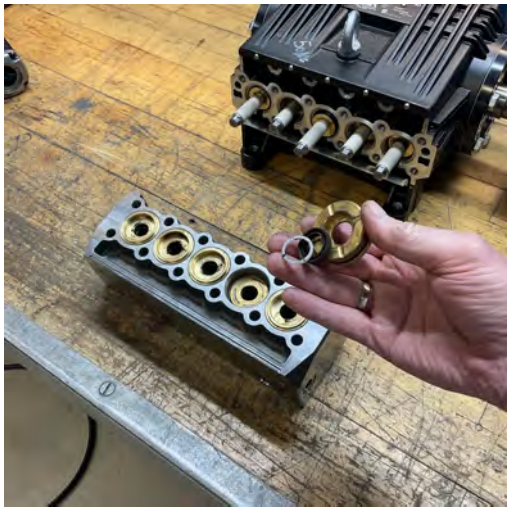
Assembly mandrel correct positioned in cylinder head. Push hard on the mandrel to mount the water seal. If needed knock on the mandrel with a plastic hammer.



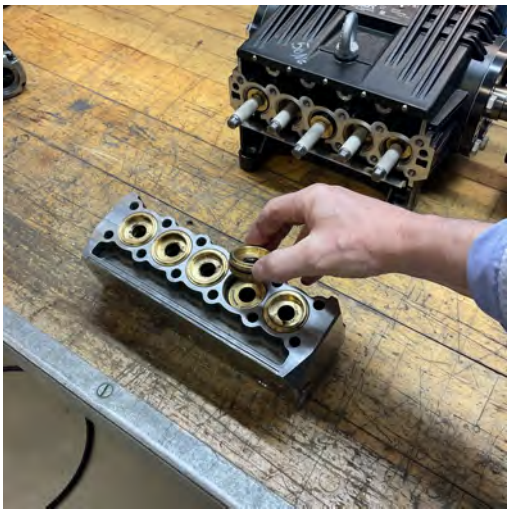
Mount the backup ring on top of the seal.



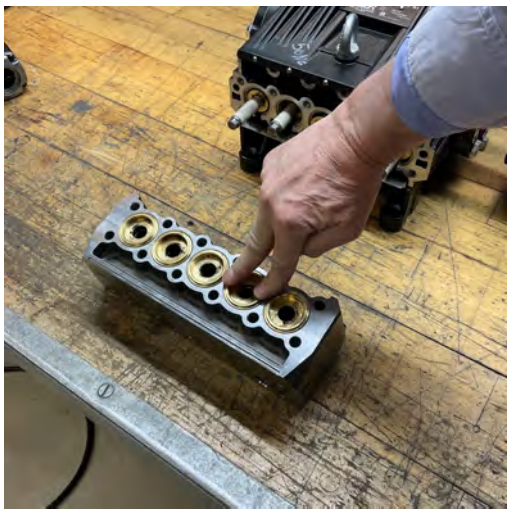
Mount the brass support ring



Secondary water seal position in thrust collar.

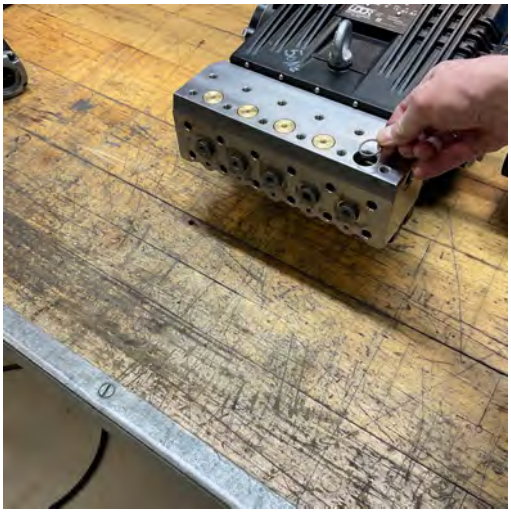


Grease the outside O-ring on the thrust collar, and place it in the hole I the cylinder head.



Push the thrust collar all the way to the bottom of the hole. Make sure all 5 are aligned.

## Pump assembly



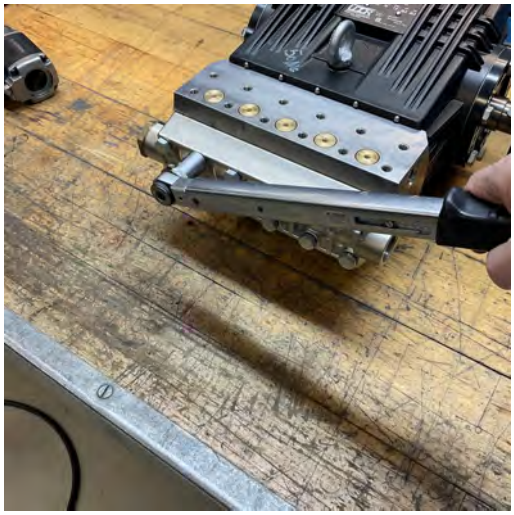
Installing the pressure valves. Remember to first mount the backup ring in the bottom of the hole.

Mount the O-ring on the valve seat and lubricate with grease. Now push the valve all the way to the bottom of the hole.

Grease spacer O-ring, and push the spacer all the way down. A 5 mm bolt can be used.

Grease and mount the O-rings on the suction valve spacers (left picture).

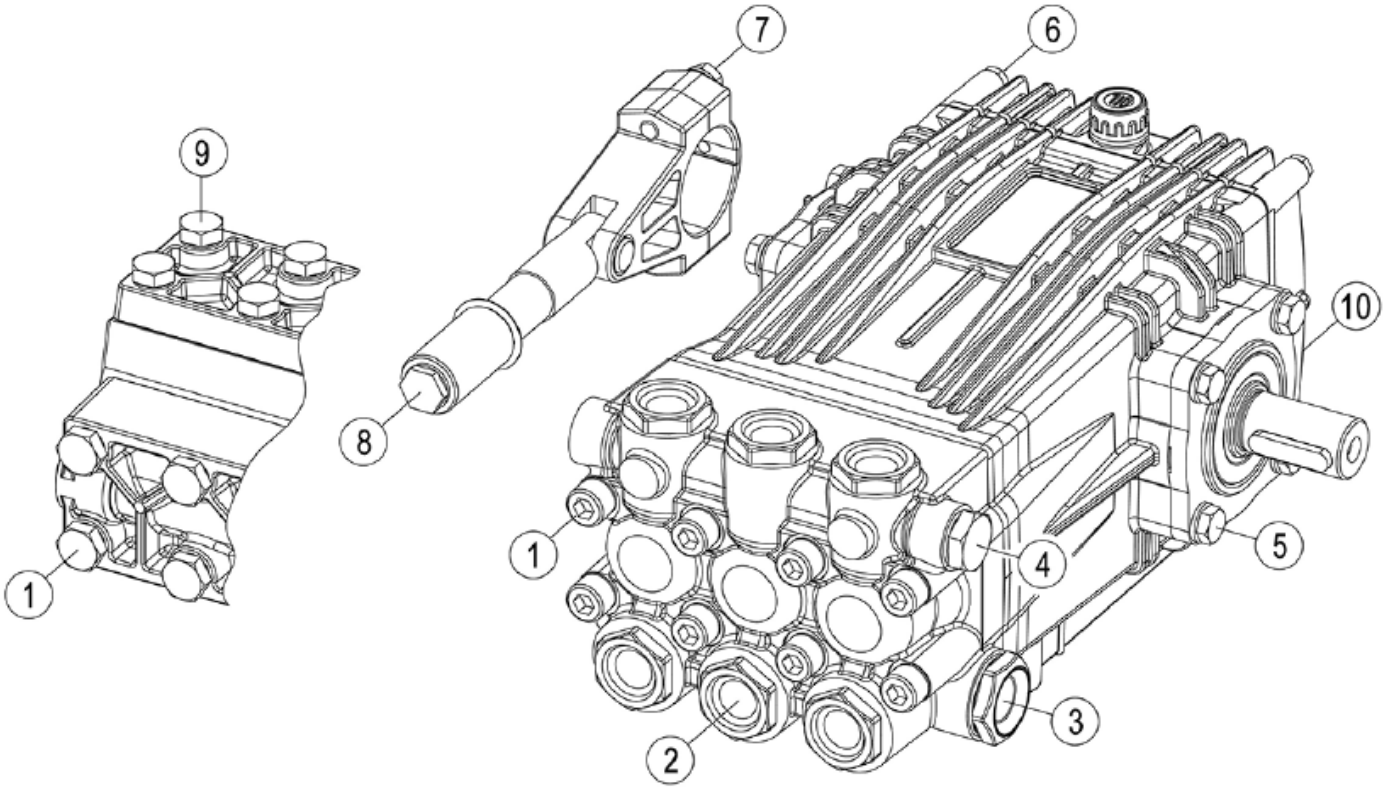
Grease and mount the O-rings in the pressure valve cover (right picture)



Mount the suction manifold and tighten with correct torque. (50Nm)

Mount the pressure valve cover and tighten with correct torque. (50Nm)

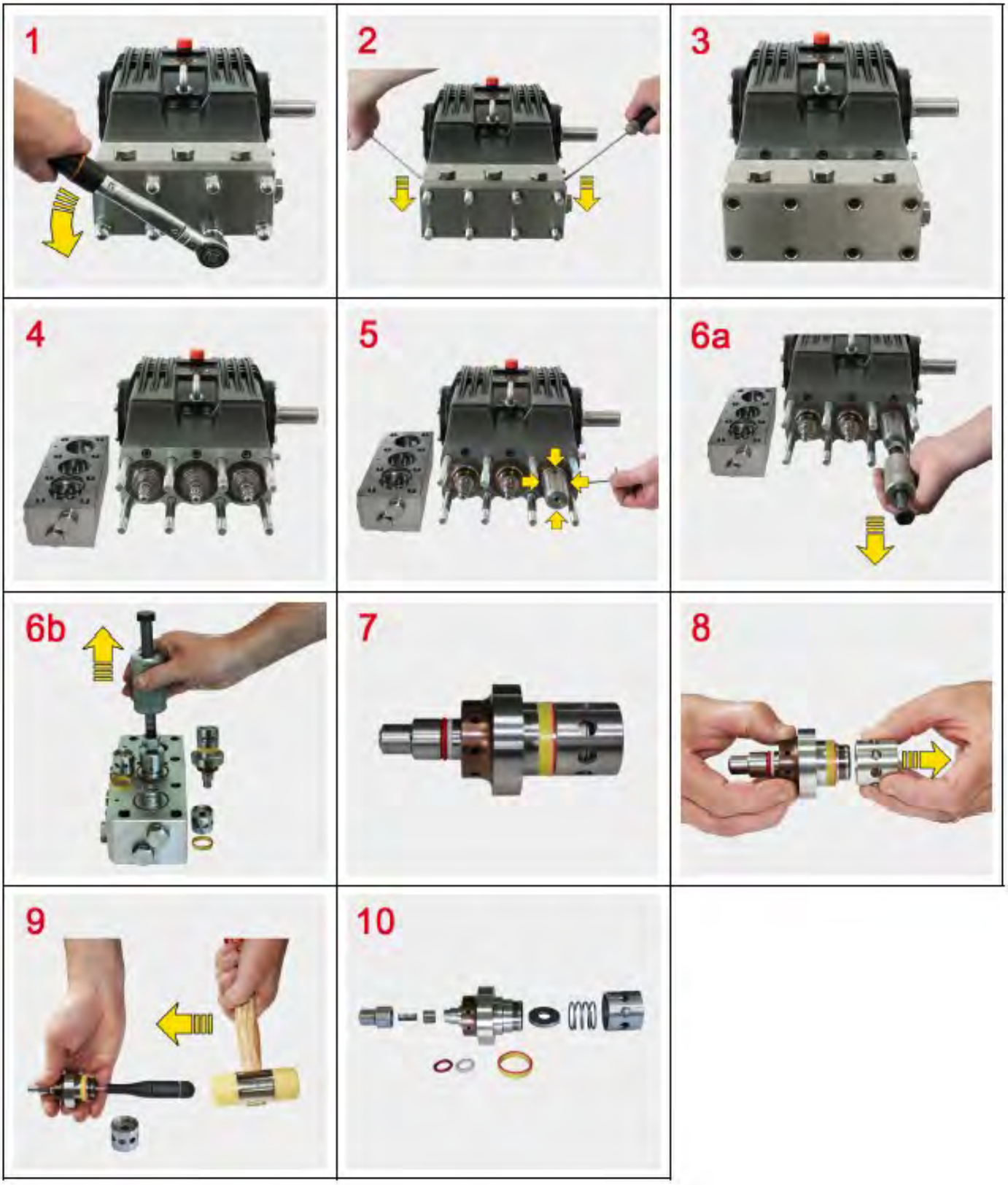
## Pump Torque



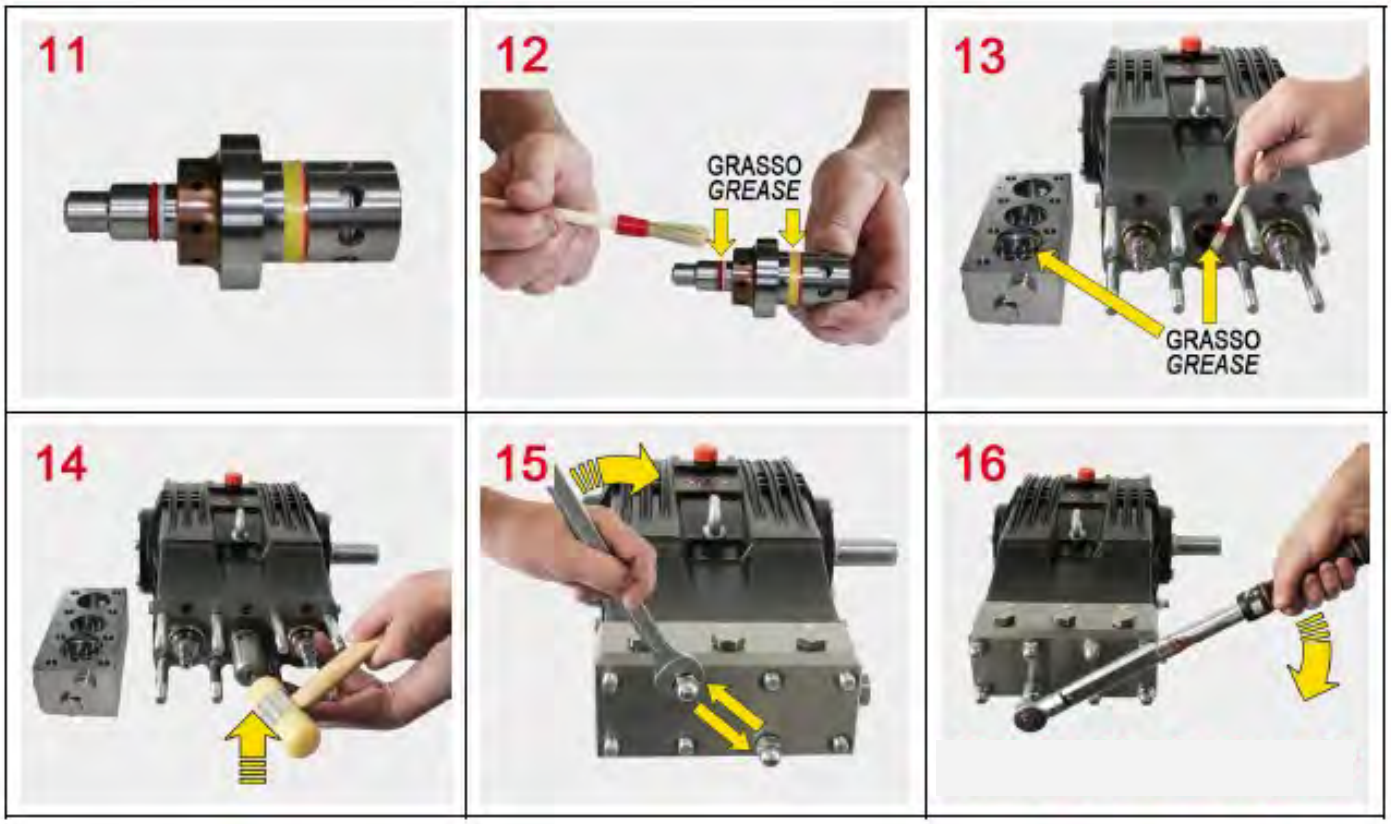

| POS. | N•m | *lbf•ft* | Loctite® |
|---|---|---|---|
| 1 | 50 | *37* | |
| 2 | | | |
| 3 | 180 | *133* | |
| 4 | 80 | *60* | 243 |
| 5 | 50 | *37* | |
| 6 | 11 | *8* | |
| 7 | 30 | *22* | 270 |
| 8 | 15 | *11* | 270 |
| 9 | 50 | *37* | |
| 10 | 11 | *8* | |

| POS. | DESCRIPTION | NOTE |
|---|---|---|
| 1 | Head Bolts | Loctite® 243<br>- Medium Strenght Treadlocking<br>Color: Blue<br><br>Loctite® 270<br>- High Strenght Treadlocking<br>Color: Green |
| 2 | Valve Caps | |
| 3 | Inlet Cap | |
| 4 | Outlet Cap | |
| 5 | Bearing Flange Bolts | |
| 6 | Rear Cover Bolts | |
| 7 | Connecting Rod Bolts | |
| 8 | Plunger Bolts | |
| 9 | Valve Cover Bolts | |
| 10 | Oil Drain Plug | |

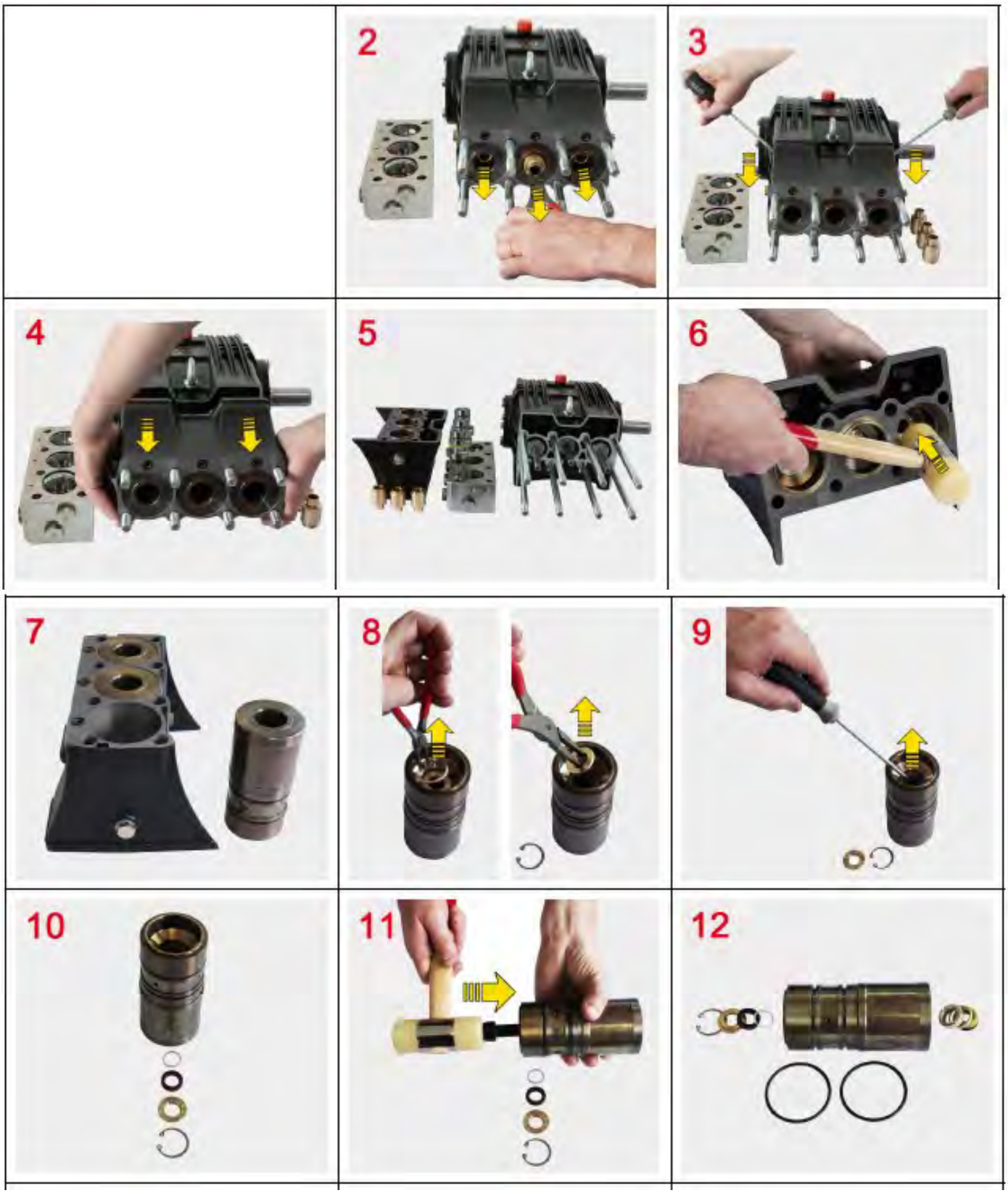
Check or replacement of pressure and suction valves



Check or replacement of pressure and suction valves



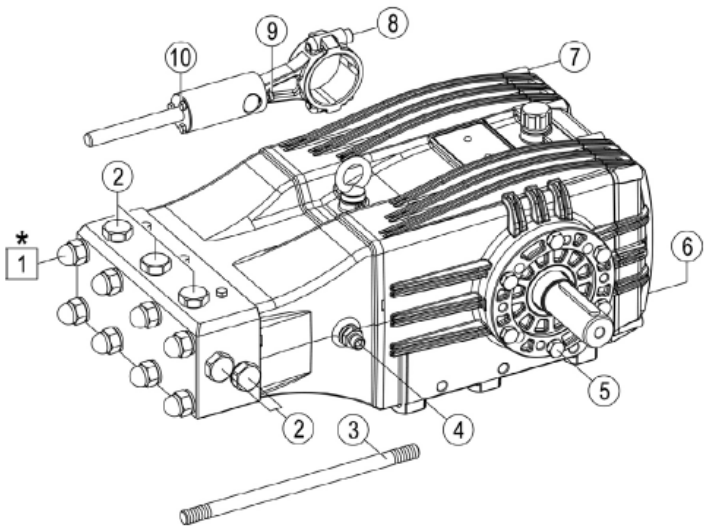
Check or replacement of water seals

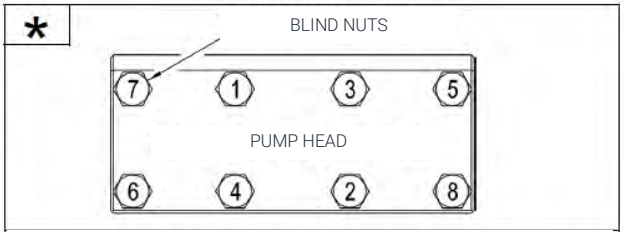


Check or replacement of water seals

## Check or replacement of water seals


## Torque specification




The blind locking nuts on the pump head must be tightened in the following order:

1-2-3-4-1-5-6-7-8-5

First pre-tighten with 70 Nm

| POS. | | DESCRIPTION | Nm | lbf•ft | Loctite | NOTE |
|---|---|---|---|---|---|---|
| 1 | | Head Blind Nuts | 130 | 96 | | Vedi /See ** |
| 2 | | Inlet and Outlet Plugs | 130 | 96 | 243 | |
| 3 | | Stud Bolt | 30 | 22 | 243 | |
| 4 | | "Cooling System" Connector | 50 | 37 | | |
| 5 | | Bearing Flange Bolts | 50 | 37 | | |
| 6 | | Oil Drain Plug | 11 | 8 | | |
| 7 | | Rear Cover Screws | 11 | 8 | | |
| 8 | | Connecting Rod Screws | 25 | 19 | 243 | |
| 9 | | Pin Screws | 6 | 4.5 | 243 | |
| 10 | | Plunger Bolts | 6 | 4.5 | | |

# Service / Repair **MC 10P 800-1100 Motor assembly**

F

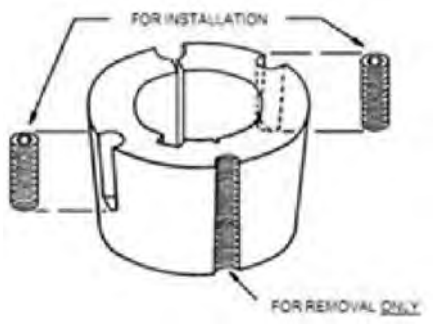
Coupling - Motor side

Push the taper bushing onto the motor shaft. Ensure the taper bushing key slot is aligned with the motor shaft key slot. Depth of the taper bushing is enough for the coupling housing and shaft face to be levelled.

Attach the coupling housing into the taper bushing. Loosely secure the taper bushing by loosely tightening grub screws equally to prevent misalignment.

Apply grease and attach the coupling spacer.

Tighten with 22 Nm

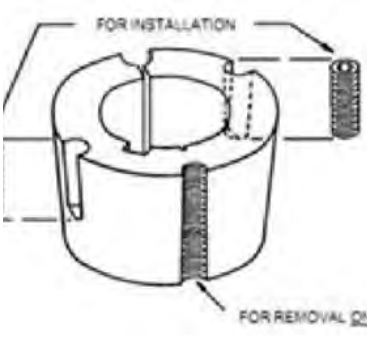


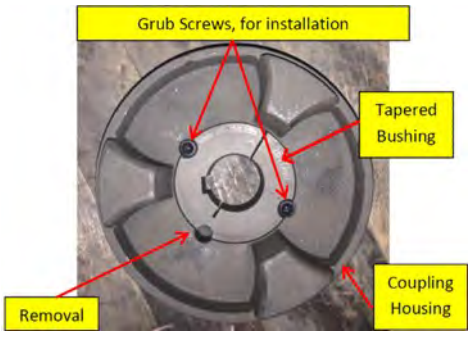

Coupling - Motor side

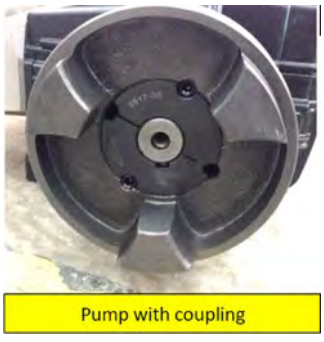
Push the taper bushing onto the pump shaft; ensure the taper bushing key slot is aligned with the pump shaft key slot. Ensure the depth of the taper bushing is enough for the coupling housing and shaft face to be levelled.

Secure the installation slot grub screws ensure to tighten the grub screws equally to prevent any misalignment.

Tighten with 22 Nm



## Align MPU / mount pump

Lift the pump onto the frame,

MC10-500 direct onto the frame

MC-800/MC-1100 spacer between frame

Mount flat washer, spring washer on bolt (x4) and loosely tighten so pump still can be aligned/adjusted.

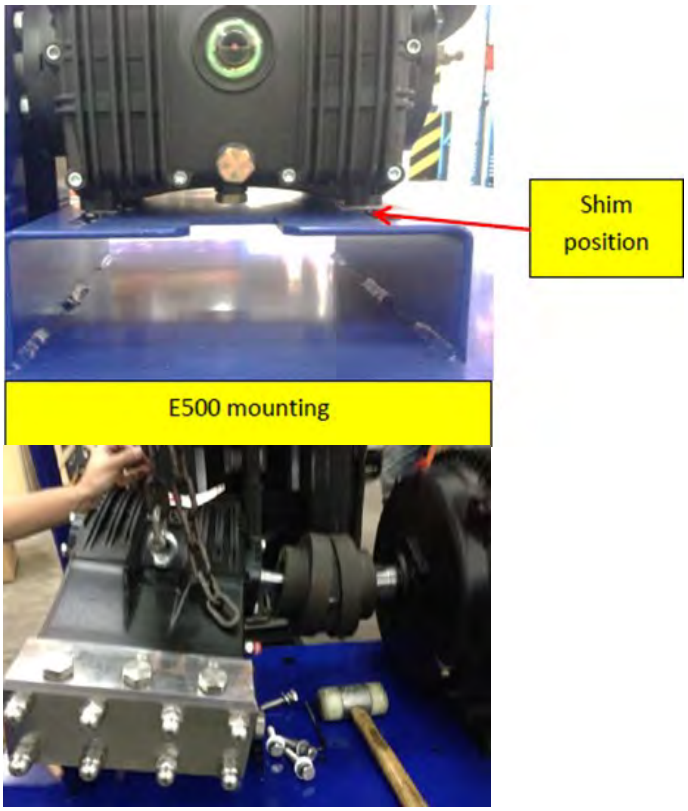
Shim pump where necessary. Alignment tolerances:

Angular = 1°

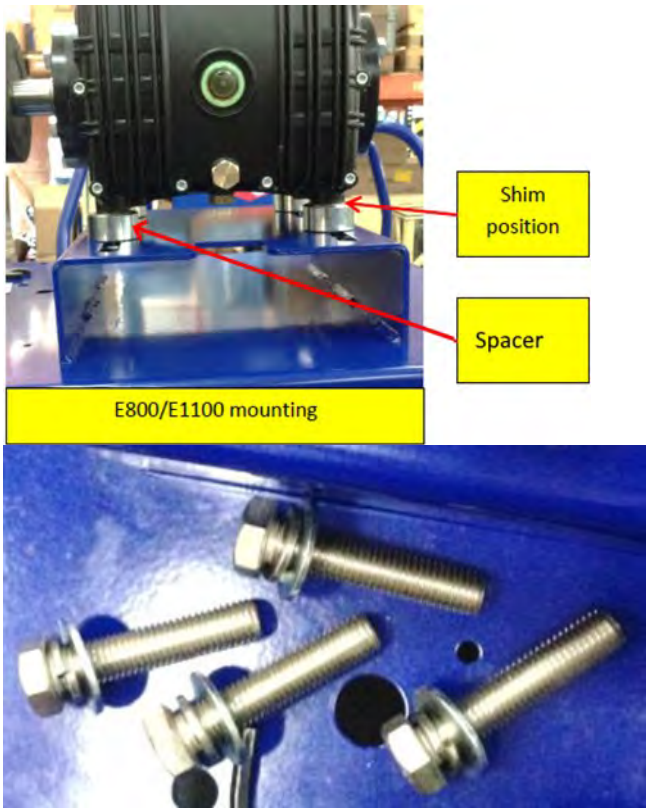
Parallel = 0.4mm

Axial = 1.1mm

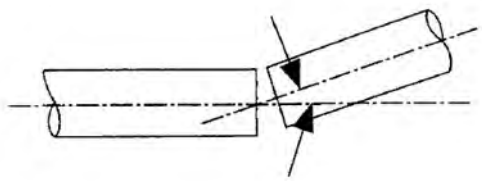
When coupling is aligned, tighten the 4x bolts with specified torque—55 Nm



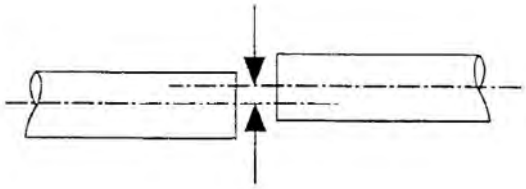


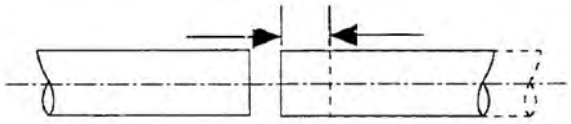
Align MPU / mount pump



**ANGULAR MISALIGNMENT** – shafts are at an angle to one another



**PARALLEL MISALIGNMENT** – shafts are in line angularly and parallel to each other, but are off-set radially.



**AXIAL MISALIGNMENT** – refers to errors in the axial spacing of coupling hubs/flanges, but also includes appplicational "end float" where shafts move axially increasing or decreasing the distance between shaft ends.

Shim used to correct any height misalignment

Available shim thickness, 0.5mm, 1mm and 2mm

### Cartridge assembly spare parts

In below table it is indicated which machines have a dump gun. Also the Nilfisk cartridge assembly spare part numbers are provided.

| VHPW item number | VHPW name | Trigger gun type | Dump gun max. working pressure (psi/Bar) | Vilfisk cartridge assembly spare part number |
|---|---|---|---|---|
| 107147032 | MC 10P-800/990 400/3/50 | Dump gun | 15Kpsi / 1034 Bar | 700551616 |
| 107147033 | MC 10P-800/1170 440/3/60 | Dump gun | 15Kpsi / 1034 Bar | 700551616 |
| 107147034 | MC 10P-1100/870 400/3/50 | Dump gun | 20Kpsi / 1378 Bar | 700551618 |
| 107147035 | MC 10P-1100/900 440/3/60 | Dump gun | 20Kpsi / 1378 Bar | 700551618 |

## ATTENTION!

Always replace the cartridge if it has visible damages. Only use original cartridge replacements. Always switch off and de-pressurize the machine before dismounting the cartridge assembly

### Dump gun maintenance

The most important part of the maintenance of the dump gun is to keep it clean and free of corrosion and any contaminants, which could cause a malfunction.
After each use of the dump gun the cartridge assembly must be unmounted and inspected. Thoroughly wash the internal chambers of the gun with clean water. Also wash the cartridge and inspect it for signs of wear or damage, paying particular attention to the seating surface of the valve. As the valve wears it will show small cuts in the metal where the high pressure water is bypassing. If this problem is found, the whole cartridge assembly must be replaced. Lightly lubricate o-rings and seals and reassemble. Wipe the outer surface of the gun to remove any signs of dirt or product blowback. Always finish by lubricating trigger and safety latch pivot points with a light oil.

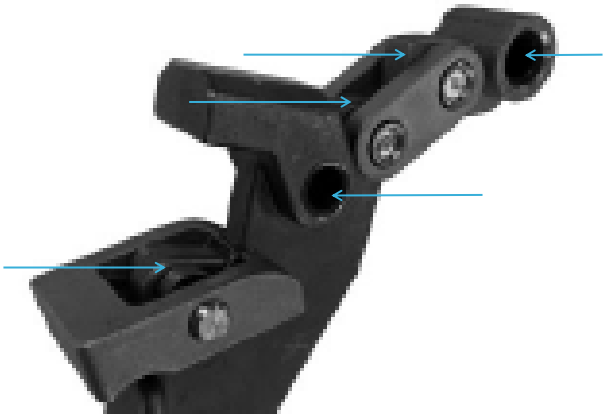
### How to remove the cartridge assembly

Using only your hand, unscrew the “Handi Change” cartridge nut located on the top of the gun block in a counter clockwise direction.

Pull up the cartridge assembly to remove it from its chamber inside the gun block.

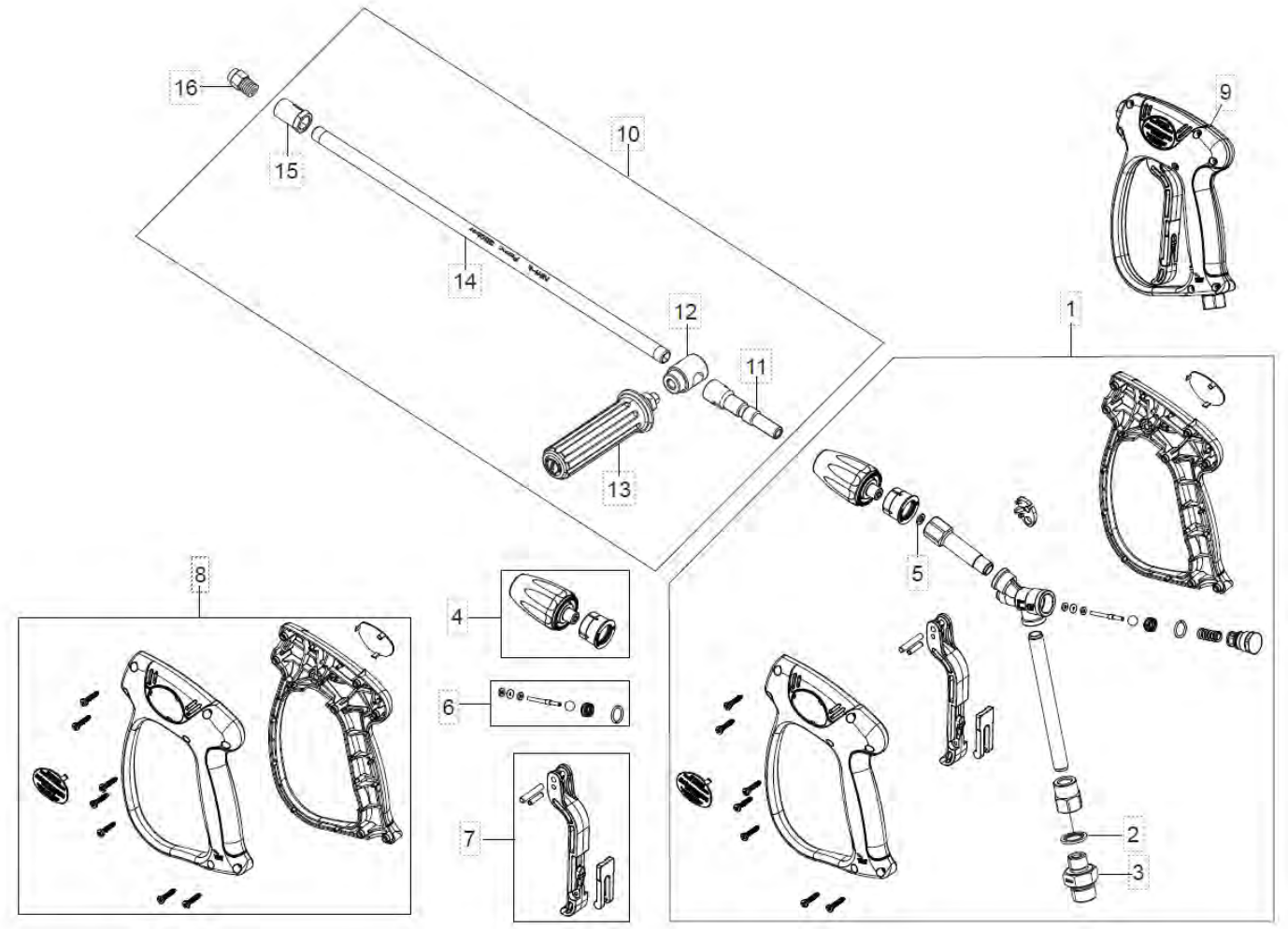
Using only your fingers, snap the cartridge assembly sideways out of the retaining groove at the lower end of the cartridge nut. Lubricate o-rings and seals.
To assemble simply reverse the proces.


After re-assembly of the cartridge – the trigger must be dismounted for lubrication.
Use a mandrel to punch out the pins from the side shown in above picture. (Note: Verify you are driving out the pins from the correct side by ensuring the text “Drive pin out this side” is NOT present).



Lubricate the trigger in the indicated areas with a light oil.

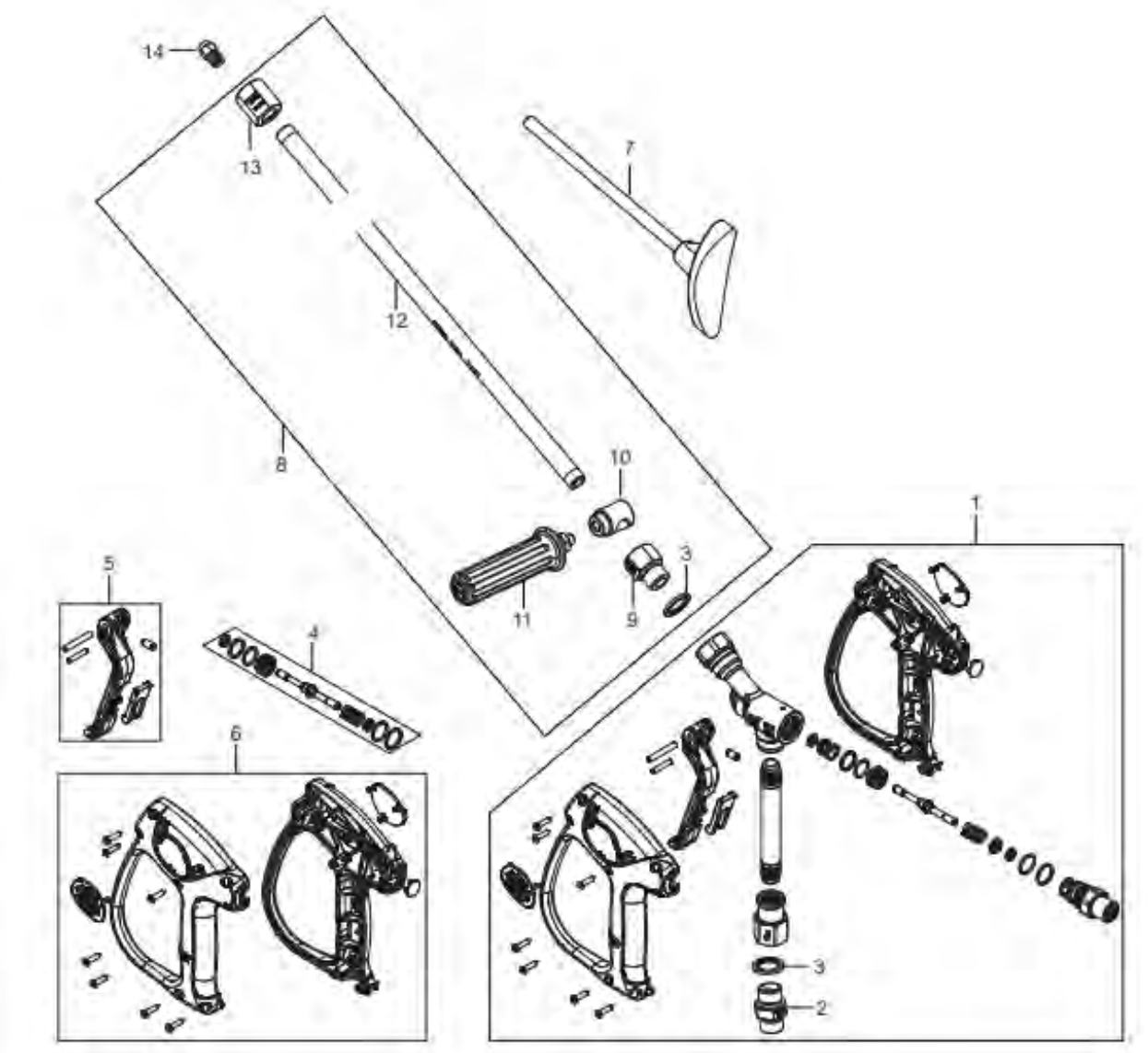

Insert and re-mount the trigger into the trigger gun from the oppo-site side of the trigger gun (Note: Verify you are inserting the pins from correct side by ensuring the text “Drive pin out this side” is present)
Also verify that the knurling of the pins are in the correct end of the pin when driving in the pin again.




| No. | Part No. | Qty. | Description | Part Note |
|---|---|---|---|---|
| 1 | 106404651 | 1 | VHP SPRAYGUN 350BAR W/QUICK CONNECT ACC | |
| 3 | 107148039 | 1 | NIPPLE HOSE 60 D 1/2 INCH- 3/8 BSPP | |
| 2 | 107148152 | 1 | DOWTY SEAL 3/8C 80SH | |
| 4 | 106408390 | 1 | QUICK COUPLING G 1/4M BRASS | |
| 5 | 106408387 | 1 | WASHER 6.5X11.4X1.5 MM CU | |
| 6 | 106408383 | 1 | REPAIR KIT GASKETS ML955 | |
| 7 | 106408384 | 1 | REP. KIT TRIGGER ML955 SAFETY LOCKER RED | |
| 8 | 106408385 | 1 | REPAIR KIT ML955 SCREW SHELLS | |
| 9 | 106408386 | 1 | SPRAY GUN G3/8F | |
| 10 | 106404652 | 1 | VHP LANCE 350BAR W/QUICK CONNECT ACC | |
| 11 | 107148105 | 1 | NIPPLE AR4/TECOMEC FOR QUICK COUPLING | |
| 12 | 107148106 | 1 | ADAPTOR | |
| 13 | 700550073 | 1 | SIDE HANDLE | |
| 14 | 107148107 | 1 | LANCE PIPE 360 BAR | |
| 15 | 107148108 | 1 | BUSHING 1/4"BSP FOR LANCE/NOZZLE | |
| 16 | 700550056 | 1 | NOZZLE 1505 1/4C BSPT S.S. | [1] |
| 16 | 700550015 | 1 | NOZZLE 15045 1/4C BSPT S.S. | [2] |

Part Notes:

[1] - 50 Hz
[2] - 60 Hz




| No. | Part No. | Qty. | Description | Part Note |
|---|---|---|---|---|
| 1 | 106404653 | 1 | VHP SPRAYGUN 500BAR 1/2BSPP-M"-1/2 F ACC | |
| 2 | 107148044 | 1 | NIPPLE HOSE 60° 1/2" - 1/2" BSPP-M | |
| 3 | 107148145 | 1 | DOWTY SEAL 1/2C 80SH | |
| 4 | 107147560 | 1 | REPAIR KIT | |
| 5 | 107147561 | 1 | REPAIR KIT TRIGGER | |
| 6 | 106408388 | 1 | REPAIR KIT SHELLS | |
| 7 | 106404580 | 1 | SHOULDER REST VHP SPRAY GUN 500BAR ACC | [1] |
| 8 | 106404654 | 1 | VHP LANCE 500BAR W3/8" BSPF CONNECT ACC | |
| 9 | 107148109 | 1 | ADAPTOR 1/2C BSPP M - 3/8C BSP | |
| 10 | 700550107 | 1 | FRAME FOR HANDLE BRASS | |
| 11 | 107148153 | 1 | SIDE HANDLE | |
| 12 | 107148111 | 1 | LANCE PIPE 500 BAR | |
| 13 | 107148110 | 1 | FITTING FOR NOZZLE 3/8C BSPP-F | |
| 14 | 700550389 | 1 | NOZZLE 1503 1/4C BSPT S.S. | [2] |
| 14 | 700550051 | 1 | NOZZLE 0003 1/4 BSPT S.S. | [3] |
| 14 | 700550057 | 1 | NOZZLE 15055 1/4C BSPT S.S | [4] |
| 14 | 700550053 | 1 | NOZZLE 0005 1/4C BSPT S.S. | [5] |

Part Notes:

[1] - MC10 500
[2] - MC9 500 50 Hz
[3] - MC9 500 60 Hz
[4] - MC10 500 50 Hz
[5] - MC10 500 60 Hz

In this table it is specified which nozzle is supplied with your machine at purchase along with the Nilfisk spare part number for replacement purposes.
If you wish to mount another nozzle on the lance pipe we recommend to purchase an original Nilfisk accessory nozzle that fits your VHPW.

| VHPW item number | VHPW name | Nozzle type | Nozzle size | Nilfisk spare part number |
|---|---|---|---|---|
| 107147021 | MC 9P-350/1260 400/3/50 | Fan jet 15° | 1505 | 700550056 |
| 107147022 | MC 9P-350/1500 440/3/60 | Fan jet 15° | 15045 | 700550015 |
| 107147024 | MC 9P-500/960 400/3/50 | Fan jet 15° | 1503 | 700550389 |
| 107147025 | MC 9P-500/960 440/3/60 | 0° jet | 0003 | 700550051 |
| 107147030 | MC 10P-500/1800 400/3/50 | Fan jet 15° | 15055 | 700550057 |
| 107147031 | MC 10P-500/1680 440/3/60 | 0° jet | 0005 | 700550053 |
| 107147032 | MC 10P-800/990 400/3/50 | Fan jet 15° | 15025 | 700550952 |
| 107147033 | MC 10P-800/1170 440/3/60 | 0° jet | 0003 | 700550051 |
| 107147034 | MC 10P-1100/870 400/3/50 | 0° jet | 0002 | 106404656 |
| 107147035 | MC 10P-1100/900 440/3/60 | 0° jet | 0002 | 106404656 |

**WARNING:** Any replacement parts for the hose line must comply with EN 1829.
Always replace the nozzle if it has damages that can be identified visually. Only use original nozzle replacements. Always switch off and depressurize the machine before attaching or detaching a nozzle to the lance pipe. Always make sure that adaptor between lance pipe and nozzle is NOT loosened when exchanging nozzle.

# Service / Repair **MC 10P Burst disc**

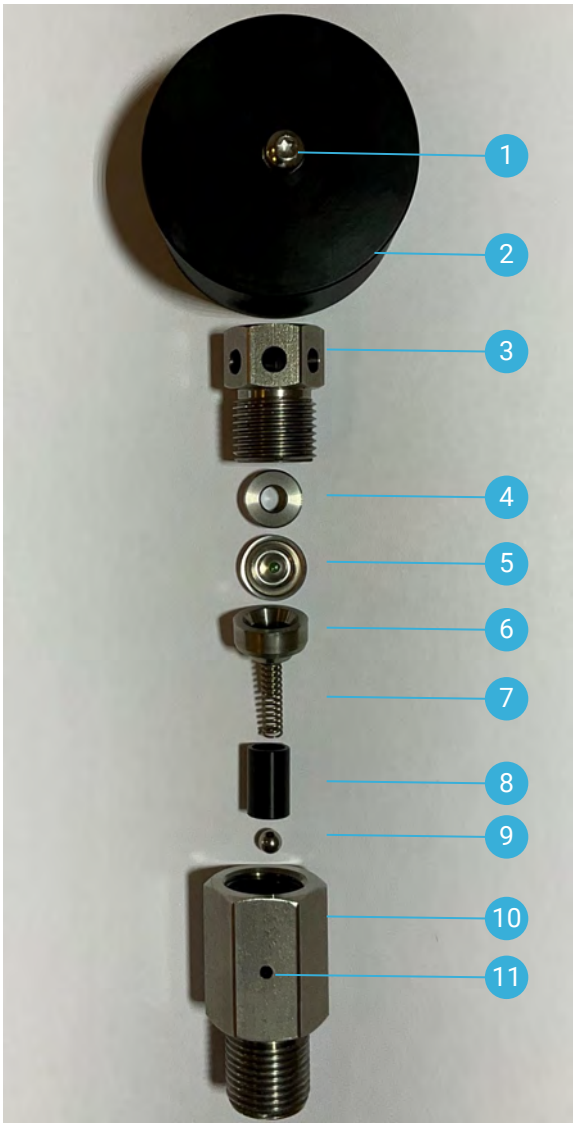
F

In the table below is specified which burst disc kit should be used when a burst disc has been triggered and needs to be replaced. A burst disc kit consists of a burst disc, spring, ball, a name plate, and a wire for fixing the name plate to the burst disc housing.

| WHPW item number | WHPW name | Nilfisk burst disc kit, spare part number |
|---|---|---|
| 107147032 | MC 10P-800/990 400/3/50 | 107144022 |
| 107147033 | MC 10P-800/1170 440/3/60 | 107144022 |
| 107147034 | MC 10P-1100/870 400/3/50 | 107144023 |
| 107147035 | MC 10P-1100/900 440/3/60 | 107144023 |

**WARNING:**

When replacing the burst disc always follow the torque value indicated on the name plate and remember to mount the drainage cup for safe discharge. Instruction for replacement is included with the burst disc kit.




Functional description

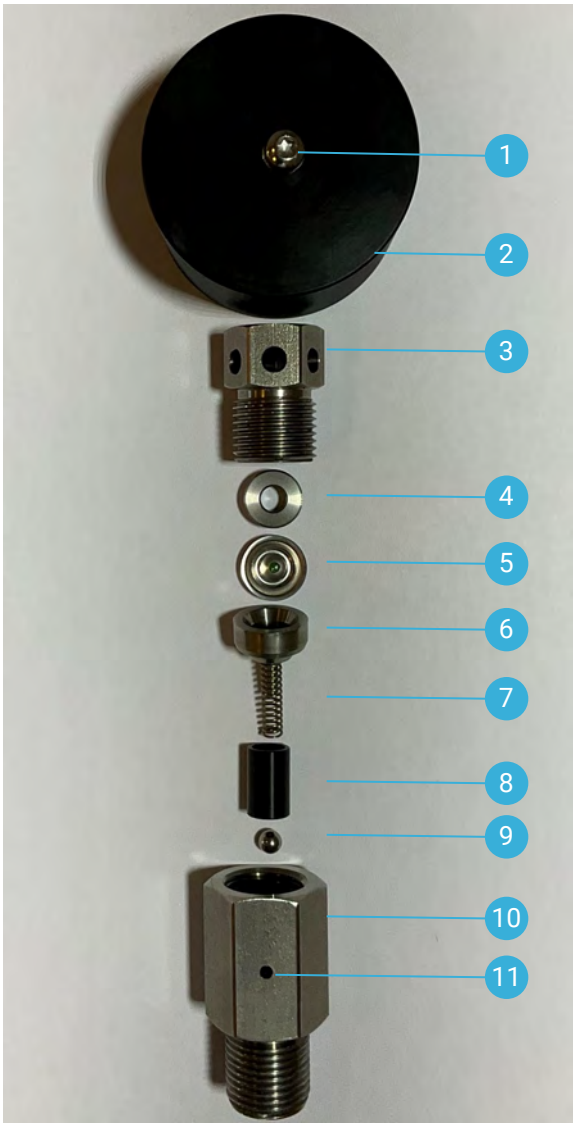
When starting the pump and running with full pressure out of the HP nozzle, the ball (9) is pushing up against the spring (7) and lifted from its seat.
The water cannot pass the seat for burst disc (6), because of the bust disc (5).
When continuing at full pressure the ball (9) will be pushed back into its seat because there is the same pressure on both side of the ball (9) - so the spring (7) will move the ball (9) back to its seat.
The small hole in the side of the housing (11) is to indicate a leak between burst disc seat (6) and housing (10) or ball (9)/ housing (10)

1. Screw and washer for top cover.
2. Top cover
3. Top fitting
4. Washer, support
5. Burst disc
6. Seat f. burst disc
7. Spring
8. Spring guide
9. Ball, stainless steel
10. Fitting, bottom (Housing)
11. Burst hole to outside

REPAIR INSTRUCTIONS NEXT PAGE

Burst disc on 800 bar MC 10

Burst disc on 1100 bar MC 10




1. Screw and washer for top cover.
2. Top cover
3. Top fitting
4. Washer, support
5. Burst disc
6. Seat f. burst disc
7. Spring
8. Spring guide
9. Ball, stainless steel
10. Fitting, bottom (Housing)
11. Burst hole to outside

The burst disc is a safety component.

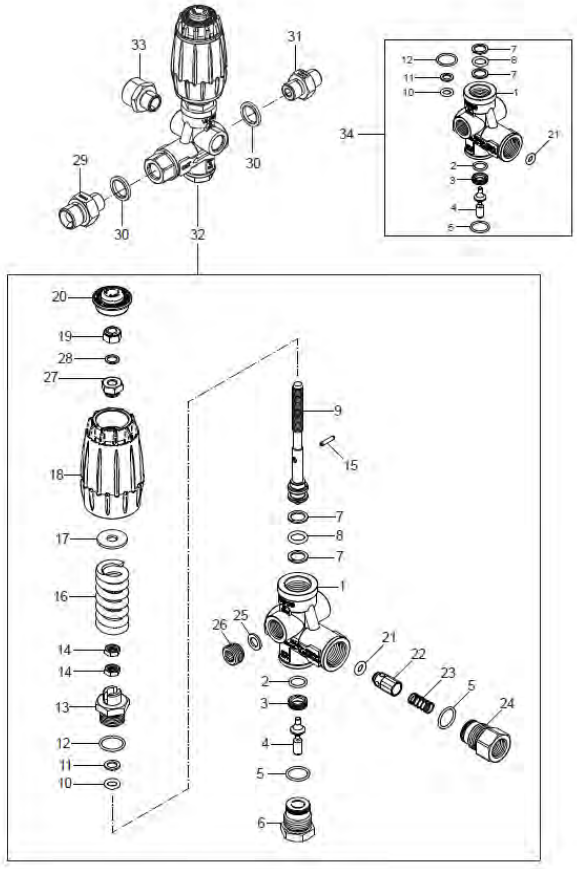
The burst disc will open, by braking the disc (5), if the pressure for whatever reason increases above the setting of the burst disc.

Burst disc settings:

800 bar pump: 1000 bar burst pressure

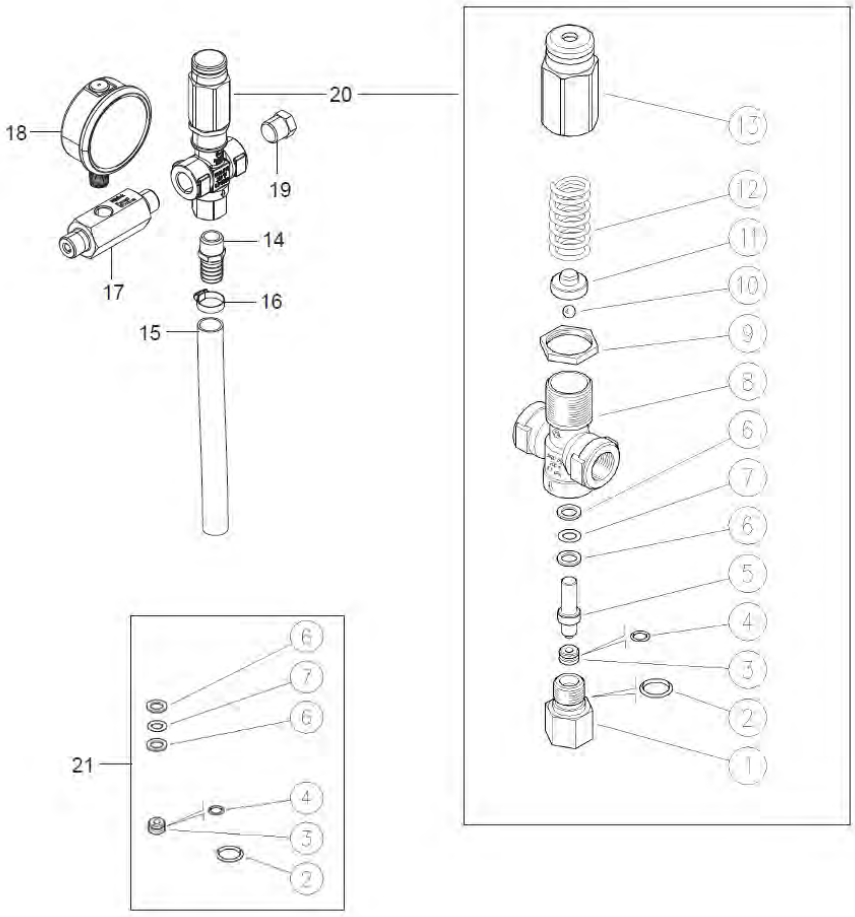
1000 bar pump: 1240 bar burst pressure


Bursted disc (1) to the right.



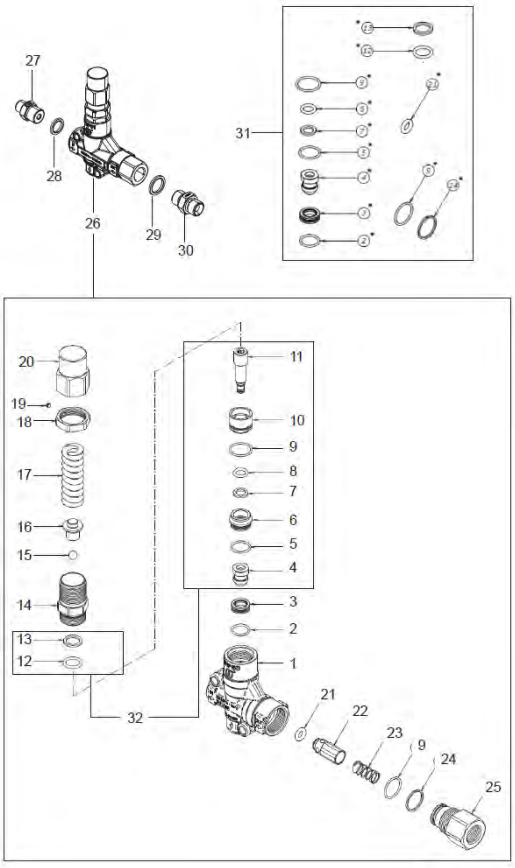

Every 500 working hours (approximately 12500 cycles of the system), check and lubricate the seals with water resistant grease.

Every 1000 working hours (approximately 25000 cycles of the system), check for wear of the seals and internal parts and, if necessary, replace with original parts. lubricate seals and parts with water resistant grease.

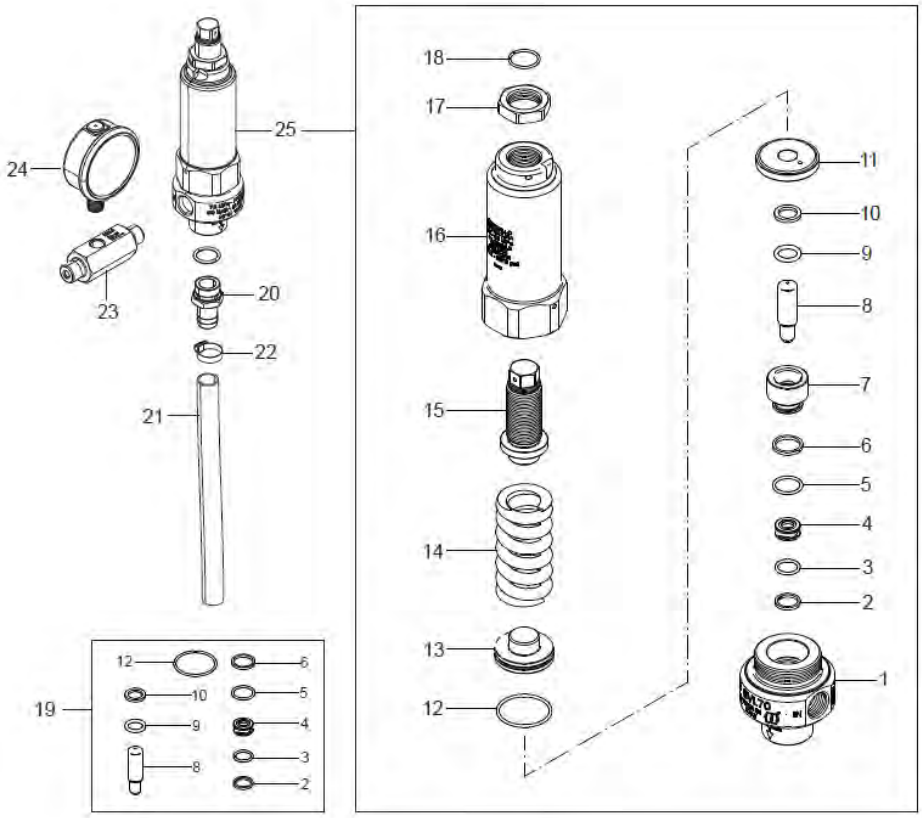

Every 400 working hours (approximately 10000 cycles of the system), check and lubricate the seals with water resistant grease.

Every 800 working hours (approximately 20000 working cycles of the system), control the wear of the seals and internal parts and, if necessary, replace with original parts. lubricate seals and parts with water resistant grease.


Every 500 working hours (approximately 12500 cycles of the system), check and lubricate the seals with water resistant grease.

Every 1000 working hours (approximately 25000 cycles of the system), check for wear of the seals and internal parts and, if necessary, replace with original parts. lubricate seals and parts with water resistant grease.





Every 500 working hours (approximately 12500 cycles of the system), check and lubricate the seals with water resistant grease.

Every 1000 working hours (approximately 25000 cycles of the system), check for wear of the seals and internal parts and, if necessary, replace with original parts. lubricate seals and parts with water resistant grease.

| Regular Service. Period as indicated | Each use | 1st 50 hrs | Every 500 hrs | When needed |
|---|---|---|---|---|
| Check pump oil level | ● | | | |
| Change pump oil<br>Recommended oil: See “Specifications”<br>Usage: See “Specifications” | | ● | ● | |
| Check water inlet filter. Clean or replace cartridge if needed | ● | | | ● |
| MC 10P 800/1100 ONLY:<br>Check booster pump filter.<br>Clean or replace cartridge if needed | ● | | | ● |
| Check for air bubbles inside hose and pump. | ● | | | ● |
| MC 10P 800/1100 ONLY: | ● | | | ● |
| MC 10P 800/1100 ONLY: Remove dump gun cartridge assembly after each use, clean, lubricate and reassemble or replace cartridge if needed.<br>(See Table 8 for detailed instruction) | ● | | | ● |
| MC 10P 800/1100 ONLY: Remove dump gun trigger after each use. Lubricate and reassemble. | ● | | | ● |
| Clean motor fan (to ensure sufficient airflow).<br>Do NOT operate the machine with damaged fan cover or fan cover removed! | | | ● | ● |
| MC 10P 800/1100 ONLY: Clean booster pump motor fan (to ensure sufficient airflow).<br>Do NOT operate the machine with damaged fan cover or fan | | | ● | ● |

**Ordinary Maintenance**
The following maintenance must be carried out for each 500 (*400) hours of VHPW operation. This maintenance must be performed by a trained service technician only.

| | MC 9P 350 | MC 9P 500 | MC 10P 500 | MC 10P 800 | MC 10P 1100 |
|---|---|---|---|---|---|
| **Unloader:** Check and lubricate seals with waterproof grease. | ● | ✶● | ✶● | N/A | N/A |
| **Safety valve:** Check and lubricate seals with waterproof grease. | ✶● | ● | ● | N/A | N/A |
| **Trigger gun** (Dry shut off type): Check and lubricate seals with waterproof grease | ● | ● | ● | N/A | N/A |

**Extraordinary Maintenance**
The following maintenance must be carried out for each 1000 (*800) hours of VHPW operation. This maintenance must be performed by a trained service technician only.

| | MC 9P 350 | MC 9P 500 | MC 10P 500 | MC 10P 800 | MC 10P 1100 |
|---|---|---|---|---|---|
| **Unloader:** Check wear of internal components and replace if dam-aged. Lubricate seals with waterproof grease. | ● | ✶● | ✶● | N/A | N/A |
| **Safety valve:** Check wear of internal components and replace if dam-aged. Lubricate seals with waterproof grease. | ✶● | ● | ● | N/A | N/A |
| **Trigger gun** (Dry shut off type):: Check wear of internal components and replace if dam-aged. Lubricate seals with waterproof grease. | ● | ● | ● | N/A | N/A |
| **Main pump:** Replace valves and piston seal rings. | ● | ● | ● | ● | ● |
| **Motor for pump.** Grease the 2 grease points with Lithium grease ✶✶**every 5000 hours** | | | ✶✶● | ✶✶● | ✶✶● |


Motor for pump—grease points (1)

# Oil type alternatives:

Use OIL type SAE 15W-40 or equivalent.

Here are some recommended types of oil:

| BRAND | TYPE |
|---|---|
| AGIP: | F.1 Super motor oil 15W-40 |
| BP: | Vanellus C 15W-40 |
| CASTROL: | GTX 15W-40 |
| ESSO: | Uniflo 15W-40 |
| MOBIL: | Super M 15W-40 |
| SHELL: | Rimula R4 15W-40 / Helix Super 15W40 |
| TOTAL: | Rubia 15W-40 / Quartz 5000 15W-40 |

MC 9P - 350 bar Maintenance

| **MC 9P - 350 bar MAINTENANCE SCHEDULE** | | | Est. Rep Time |
|---|---|---|---|
| Activity | **400 hrs** | **800 hrs** | |
| Check oil level in pump | x | x | |
| Change Pump Oil **(First change after 50 hours)** | x | x | 0.25 |
| Check oil for impurities. If metal particles in oil, disassemble pump and check bearings. Replace if needed | x | x | |
| Replace primary and secondary water seals | | x | 0.5 |
| Replace pressure and suction valves | | x | 0.5 |
| Check and lubricate seals in unloader, replace seals if needed | x | x | 0.25 |
| Check and lubricate seals in safety valve, replace if needed | x | | 0.25 |
| Replace non-return valve components | | x | 0.25 |
| Trigger gun ( dry shut off type). Check seals - replace if needed. Lubricate with waterproof grease. | x | x | 0.25 |
| **PERFORM PUMP ADJUSTMENTS ACCORDING TO DATA SHEET, AND CHECK PUMP FOR WATER & OIL LEAKS** | x | x | 0.25 |
| **ELECTRIC CHECK** | | | |
| Check power supply cable and plug for visible damages | x | x | 0.25 |
| Check wire connections in E-box - retighten all connections in E-box | x | x | |
| Check wires/cables on the motor for visual damage, retighten all connections. | x | x | 0.25 |
| **VARIOUS CHECK POINTS** | | | |
| Check water inlet connections for leaks and re-tighten connections | x | x | 0.25 |
| Check water outlet connections for leaks and re-tighten connections with correct torque. | x | x | |
| Check float valve in Water Break Tank for tightness, replace if needed | x | x | |
| Check and clean water inlet filter, replace if needed | x | x | |
| **ACCESSORY CHECK** | | | |
| Check lance for leaks and defects, replace if needed | x | x | 0.5 |
| Check nozzle(s) for wear and defects, replace if needed | x | x | |
| Check high pressure hose for damage and leaks, replace if needed.<br>Make sure high pressure hose specifications stamped on high pressure hose are according to the product the hose is used on. | x | x | |

**MAX. 35°C warm inlet water must be used.**

MC 9P - 500 bar Maintenance

| MC 9P - 500 bar MAINTENANCE SCHEDULE | | | Est. Rep Time |
|---|---|---|---|
| Activity | 400 hrs | 800 hrs | |
| Check oil level in pump | x | x | |
| Change Pump Oil **(First change after 50 hours)** | x | x | 0.25 |
| Check oil for impurities. If metal particles in oil, disassemble pump and check bearings. Replace if needed | x | x | |
| Replace primary and secondary water seals | | x | 0.5 |
| Replace pressure and suction valves | | x | 0.5 |
| Check and lubricate seals in unloader, replace seals if needed | x | x | 0.25 |
| Check and lubricate seals in safety valve, replace if needed | x | x | 0.25 |
| Replace non-return valve components | | x | 0.25 |
| Trigger gun ( dry shut off type). Check seals - replace if needed. Lubricate with waterproof grease. | x | x | 0.25 |
| **PERFORM PUMP ADJUSTMENTS ACCORDING TO DATA SHEET, AND CHECK PUMP FOR WATER & OIL LEAKS** | x | x | 0.25 |
| **ELECTRIC CHECK** | | | |
| Check power supply cable and plug for visible damages | x | x | 0.25 |
| Check wire connections in E-box - retighten all connections in E-box | x | x | |
| Check wires/cables on the motor for visual damage, retighten all connections. | x | x | 0.25 |
| **VARIOUS CHECK POINTS** | | | |
| Check water inlet connections for leaks and re-tighten connections | x | x | 0.25 |
| Check water outlet connections for leaks and re-tighten connections with correct torque. | x | x | |
| Check float valve in Water Break Tank for tightness, replace if needed | x | x | |
| Check and clean water inlet filter, replace if needed | x | x | |
| **ACCESSORY CHECK** | | | 0.5 |
| Check lance for leaks and defects, replace if needed | x | x | |
| Check nozzle(s) for wear and defects, replace if needed | x | x | |
| Check high pressure hose for damage and leaks, replace if needed.<br>Make sure high pressure hose specifications stamped on high pressure hose are according to the product the hose is used on. | x | x | |

**MAX. 35°C warm inlet water must be used.**

MC 10P - 500 bar Maintenance

| **MC 10P - 500 bar MAINTENANCE SCHEDULE** | | | Est. Rep Time |
|---|---|---|---|
| Activity | **400 hrs** | **800 hrs** | |
| Check oil level in pump | x | x | |
| Change Pump Oil **(First change after 50 hours)** | x | x | 0.25 |
| Check oil for impurities. If metal particles in oil, disassemble pump and check bearings. Replace if needed | x | x | |
| Replace primary and secondary water seals | | x | 0.5 |
| Replace pressure and suction valves | | x | 0.5 |
| Check and lubricate seals in unloader, replace seals if needed | x | x | 0.25 |
| Check and lubricate seals in safety valve, replace if needed | x | x | 0.25 |
| Replace non-return valve components | | x | 0.25 |
| Trigger gun ( dry shut off type). Check seals - replace if needed. Lubricate with waterproof grease. | x | x | 0.25 |
| **PERFORM PUMP ADJUSTMENTS ACCORDING TO DATA SHEET, AND CHECK PUMP FOR WATER & OIL LEAKS** | x | x | 0.25 |
| **ELECTRIC CHECK** | | | |
| Check power supply cable and plug for visible damages | x | x | 0.25 |
| Check wire connections in E-box - retighten all connections in E-box | x | x | |
| Check wires/cables on the motor for visual damage, retighten all connections. | x | x | 0.25 |
| Motor grease points - 2 push on each grease point **every 5000 hours** | | | |
| **VARIOUS CHECK POINTS** | | | |
| Check water inlet connections for leaks and re-tighten connections | x | x | 0.25 |
| Check water outlet connections for leaks and re-tighten connections with correct torque. | x | x | |
| Check float valve in Water Break Tank for tightness, replace if needed | x | x | |
| Check and clean water inlet filter, replace if needed | x | x | |
| **ACCESSORY CHECK** | | | |
| Check lance for leaks and defects, replace if needed | x | x | 0.5 |
| Check nozzle(s) for wear and defects, replace if needed | x | x | |
| Check high pressure hose for damage and leaks, replace if needed.<br>Make sure high pressure hose specifications stamped on high pressure hose are according to the product the hose is used on. | x | x | |

**MAX. 35°C warm inlet water must be used.**

MC 10P - 800 bar Maintenance

| **MC 10P - 800 bar MAINTENANCE SCHEDULE** | | | Est. Rep Time |
|---|---|---|---|
| Activity | **400 hrs** | **800 hrs** | |
| Check oil level in pump | x | x | |
| Change Pump Oil **(First change after 50 hours)** | x | x | 0.25 |
| Check oil for impurities. If metal particles in oil, disassemble pump and check bearings. Replace if needed | x | x | |
| Replace primary and secondary water seals | | x | 0.5 |
| Replace pressure and suction valves | | x | 0.5 |
| Check that Burst disc is not leaking. Replace rep. kit if needed | | | |
| **PERFORM PUMP ADJUSTMENTS ACCORDING TO DATA SHEET, AND CHECK PUMP FOR WATER & OIL LEAKS** | x | x | 0.25 |
| **ELECTRIC CHECK** | | | |
| Check power supply cable and plug for visible damages | x | x | 0.25 |
| Check wire connections in E-box - retighten all connections in E-box | x | x | |
| Check wires/cables on the motor for visual damage, retighten all connections. | x | x | 0.25 |
| Motor grease points - 2 push on each grease point **every 5000 hours** | | | |
| **VARIOUS CHECK POINTS** | | | |
| Check water inlet connections for leaks and re-tighten connections | x | x | 0.25 |
| Check water outlet connections for leaks and re-tighten connections with correct torque. | x | x | |
| Check float valve in Water Break Tank for tightness, replace if needed | x | x | |
| Check and clean the Booster pump filter, replace if needed | x | x | |
| Check and clean water inlet filter, replace if needed | x | x | |
| **ACCESSORY CHECK** | | | |
| Check Dump Gun for defects and lubricate the cartridge w/water proof silikone grease | x | x | 0.5 |
| Check lance for leaks and defects, replace if needed | x | x | |
| Check nozzle(s) for wear and defects, replace if needed | x | x | |
| Check high pressure hose for damage and leaks, replace if needed.<br>Make sure high pressure hose specifications stamped on high pressure hose are according to the product the hose is used on. | x | x | |

**MAX. 35°C warm inlet water must be used.**

MC 10P - 1100 bar Maintenance

| **MC 10P - 1100 bar MAINTENANCE SCHEDULE** | | | Est. Rep Time |
|---|---|---|---|
| Activity | **400 hrs** | **800 hrs** | |
| Check oil level in pump | x | x | |
| Change Pump Oil **(First change after 50 hours)** | x | x | 0.25 |
| Check oil for impurities. If metal particles in oil, disassemble pump and check bearings. Replace if needed | x | x | |
| Replace primary and secondary water seals | | x | 0.5 |
| Replace pressure and suction valves | | x | 0.5 |
| Check that Burst disc is not leaking. Replace rep. kit if needed | x | x | |
| **PERFORM PUMP ADJUSTMENTS ACCORDING TO DATA SHEET, AND CHECK PUMP FOR WATER & OIL LEAKS** | x | x | 0.25 |
| **ELECTRIC CHECK** | | | |
| Check power supply cable and plug for visible damages | x | x | 0.25 |
| Check wire connections in E-box - retighten all connections in E-box | x | x | |
| Check wires/cables on the motor for visual damage, retighten all connections. | x | x | 0.25 |
| Motor grease points - 2 push on each grease point **every 5000 hours** | | | |
| **VARIOUS CHECK POINTS** | | | |
| Check water inlet connections for leaks and re-tighten connections | x | x | 0.25 |
| Check water outlet connections for leaks and re-tighten connections with correct torque. | x | x | |
| Check float valve in Water Break Tank for tightness, replace if needed | x | x | |
| Check and clean the Booster pump filter, replace if needed | x | x | |
| Check and clean water inlet filter, replace if needed | x | x | |
| **ACCESSORY CHECK** | | | |
| Check Dump Gun for defects and lubricate the cartridge w/water proof silikone grease | x | x | 0.5 |
| Check lance for leaks and defects, replace if needed | x | x | |
| Check nozzle(s) for wear and defects, replace if needed | x | x | |
| Check high pressure hose for damage and leaks, replace if needed.<br>Make sure high pressure hose specifications stamped on high pressure hose are according to the product the hose is used on. | x | x | |

**MAX. 35°C warm inlet water must be used.**

# Adjustment / Test  Unloader adjustment 350 bar

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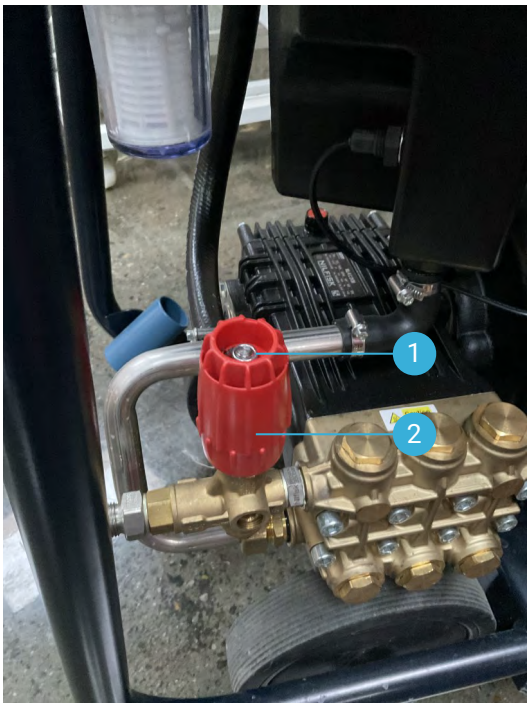
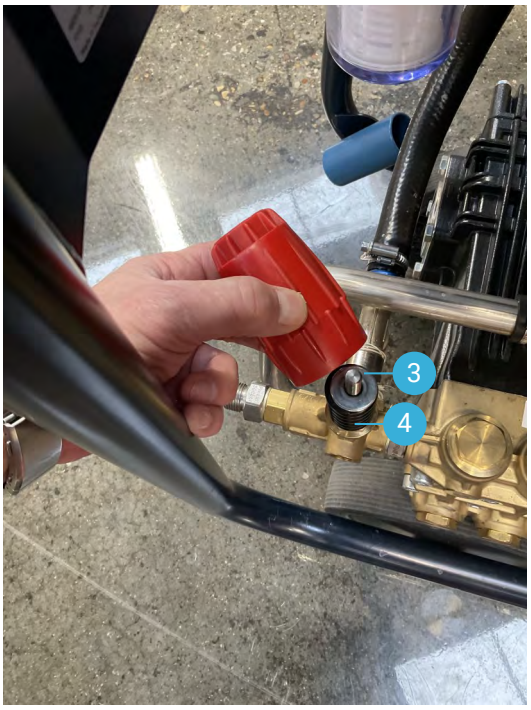
**Always use the test manometer when adjusting unloaders and safety valves.**

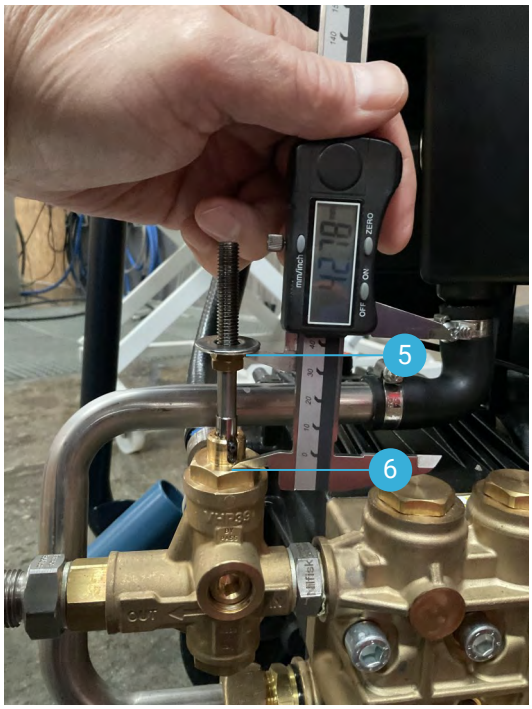
Adjustment method MC9-350:

Part 1 adjustment: Set maximum adjustment pressure for the unloader to 350-360bar



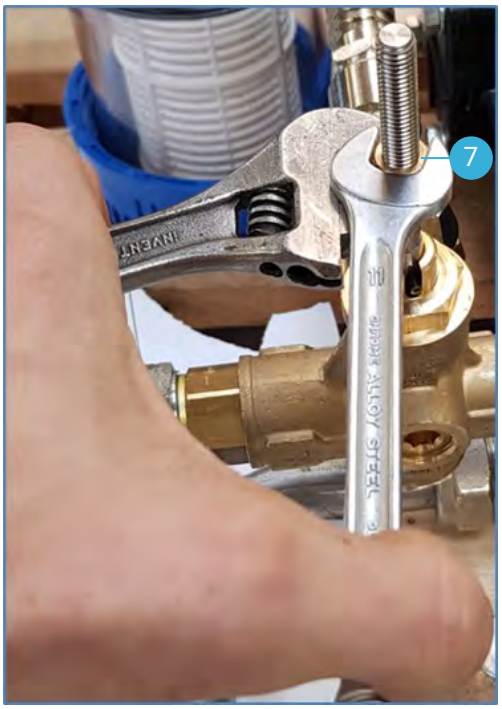




STEP 1 – Remove nut (1), handle (2), washer (3) and spring (4)




STEP 2 – Adjust the distance between lower side of washer (5) and pos. (6) to 42,8 mm

Loosen counter nut, adjust and tighten counter not again (7)




STEP 3 – Tighten counter nut (7)

# Adjustment / Test  Unloader adjustment 350 bar

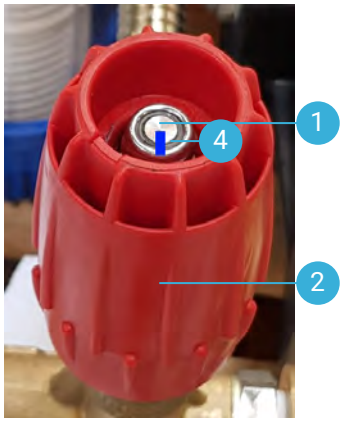
G

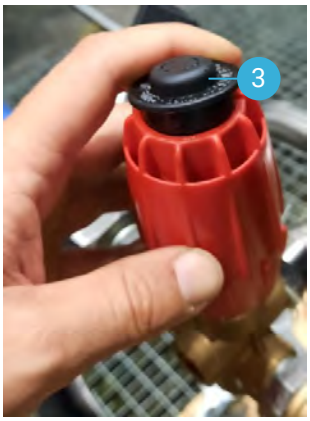
Re-assemble the unloader. Install spring, washer, handle and the counter nut

Tighten then 8mm nut (1) so top of nut is level with end of threads. Install the black cap (3) on top of the handle

Turn the handle (2) clockwise all the way to its stop by hand. With correct nozzle installed in the lance check, using your test manometer, you have a max. pressure of 350-360 bar.

After adjustments always secure the settings by locking lacquer (4) or similar.



## SAFETY VALVE ADJUSTMENT

STEP 1.

Tighten unloader and safety valve till reach 350bar without water drops coming from safety valve. The pressure is worked up to 350bar by alternately tightening unloader valve and safety valve. Check that the maximum pressure adjustment of unloader is in range 350-360bar(part 1 adjustment page 95).

STEP 2.

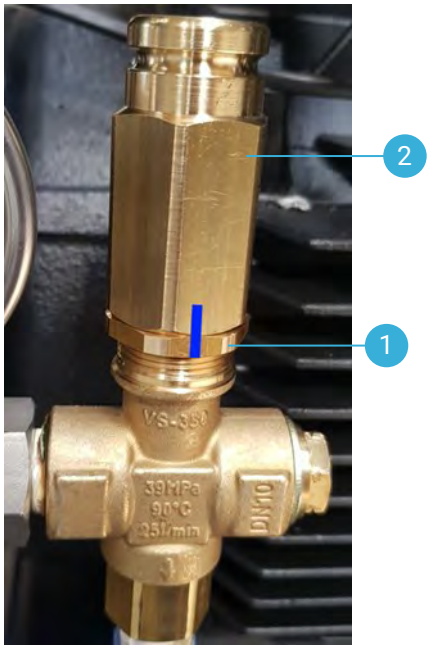
Loosen the counter nut (1). Loosen the spring tension by slowly turning adjustment fitting (2) counter clockwise until safety valve leaks a little bit—few drops of water dripping out of the safety valve bottom.

STEP 3.

Now again tighten the safety valve to the point where the dripping stops + additional turn 1 clockwise. Safety valve is now adjusted correctly. Tighten the counter nut (1) on the safety valve.

STEP 4.

Check that you have the correct working pressure according to the data sheet for your model in section “B”




Safety valve

# Adjustment / Test  Unloader/safety adjustment 500 bar

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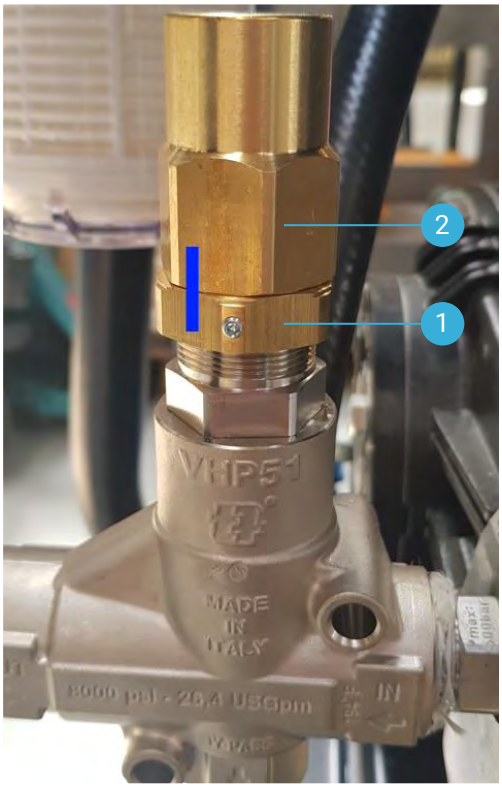
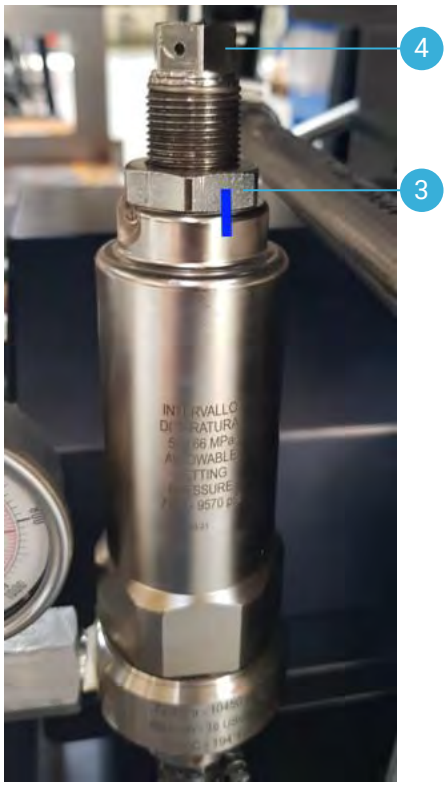



Unloader valve




Safety valve

STEP 1.

Tighten unloader and safety valve till reach 500bar without water dripping from safety valve bottom. The pressure is worked up to 500bar by alternately tightening unloader valve and safety valve.

STEP 2.

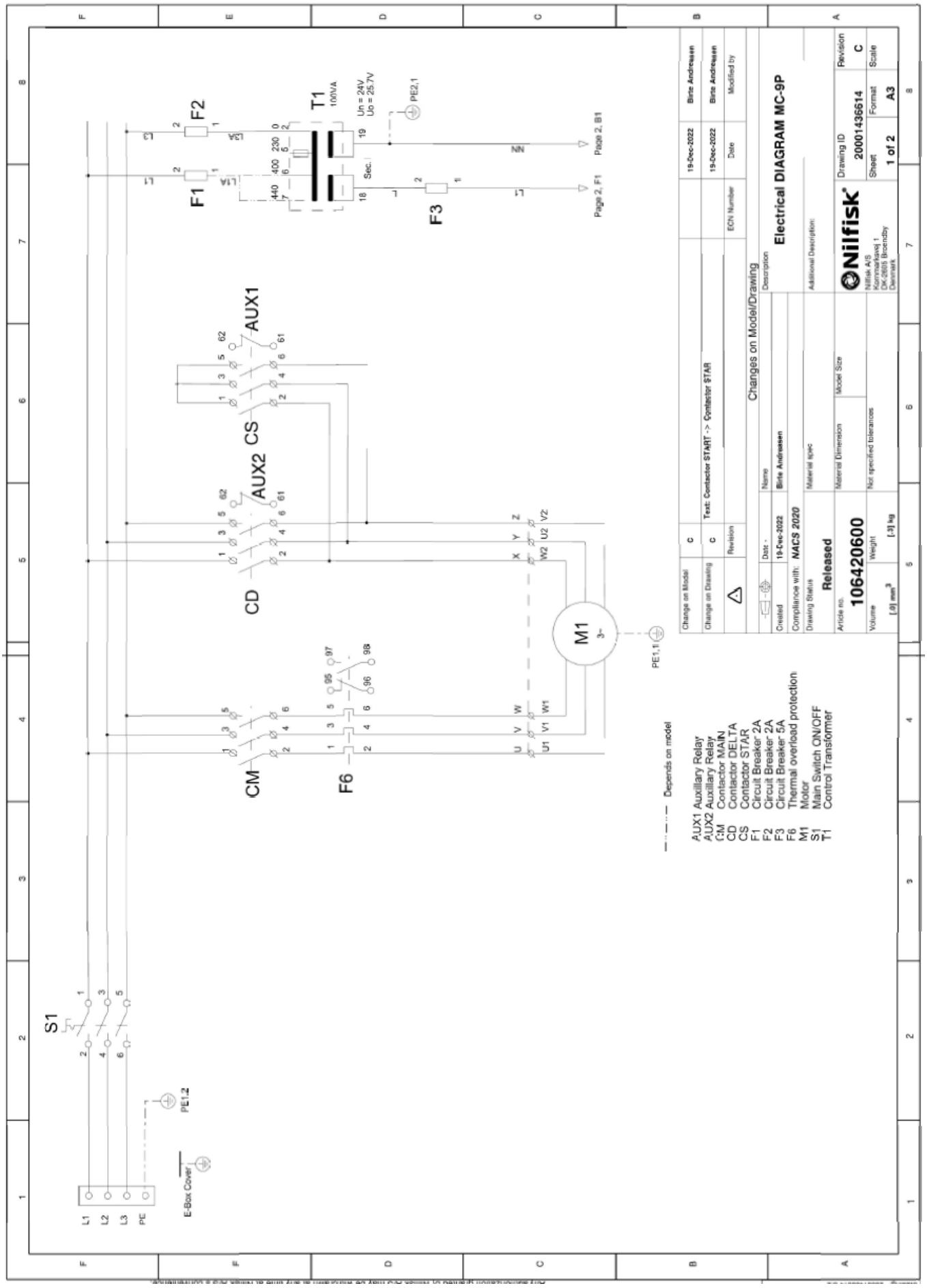
Loosen the safety valve till little leakage/dripping

STEP 3.

Now again tighten the safety valve till the point of just stop dripping + additional turn 1 round. Tighten the lock nut on the unloader and safety valve. Unloader and Safety valve is now finish adjusted.

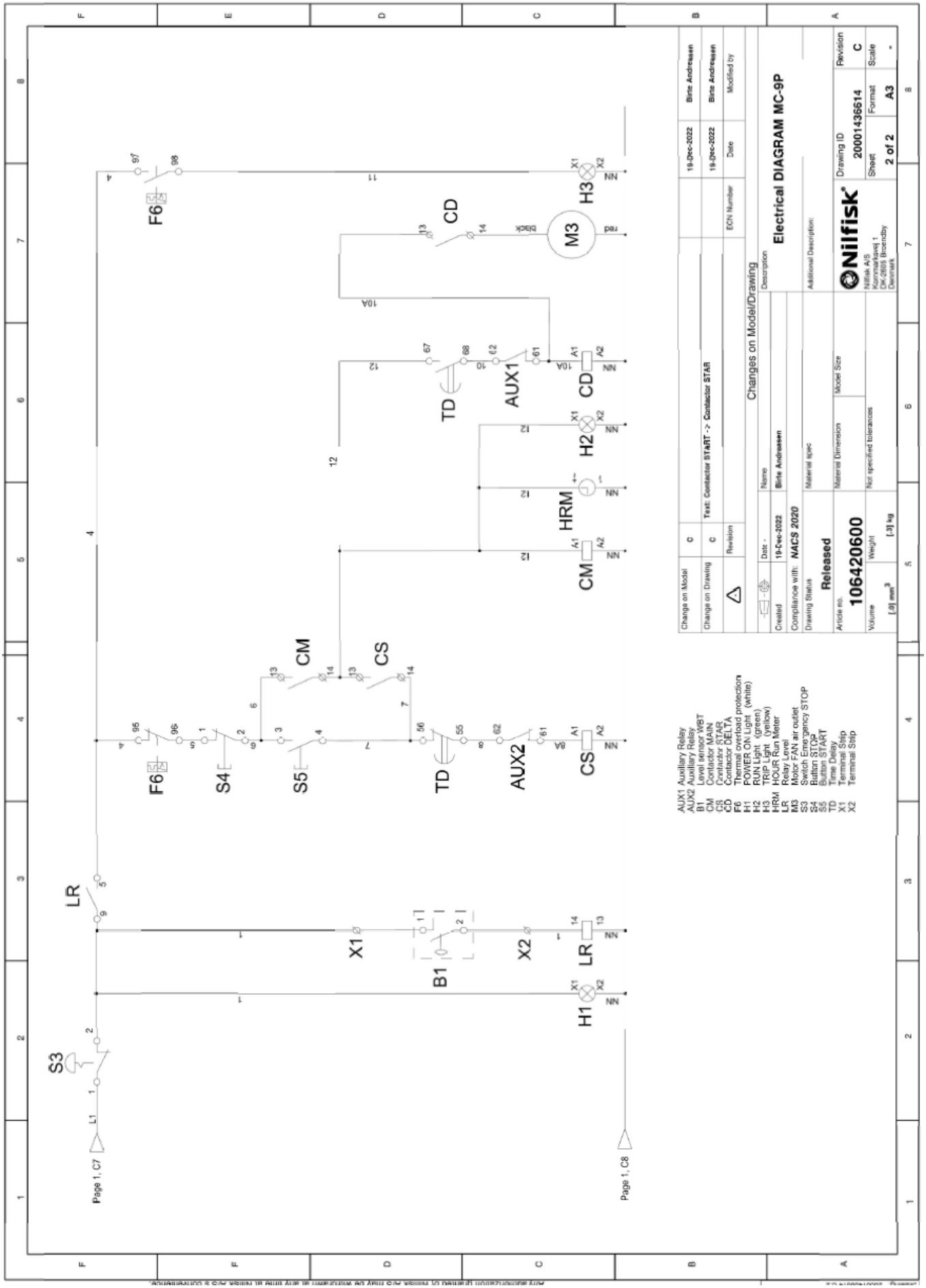
# Wiring diagrams

MC 9P 106420600_P1



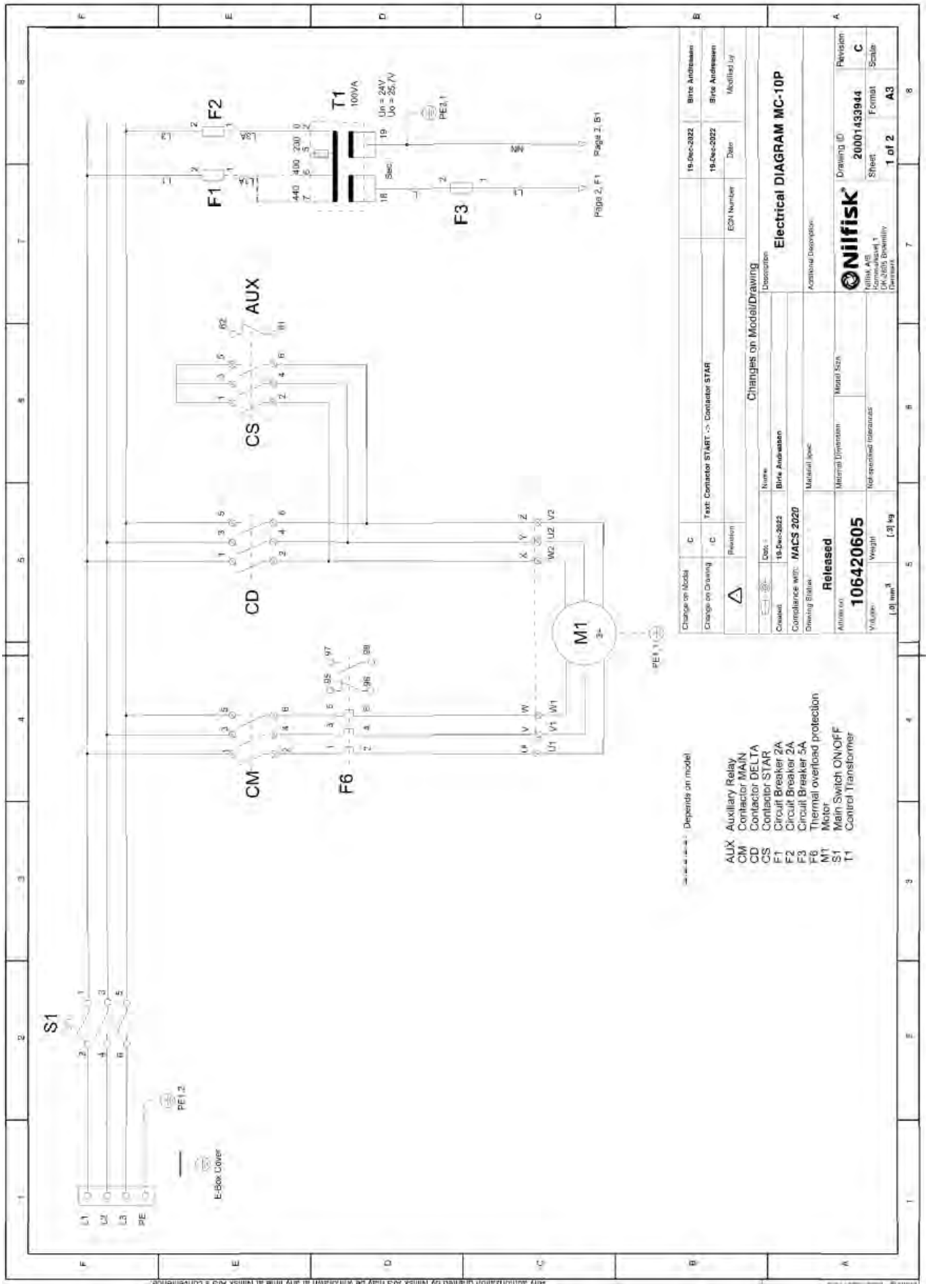
# Wiring diagrams

MC 9P 106420600_P2

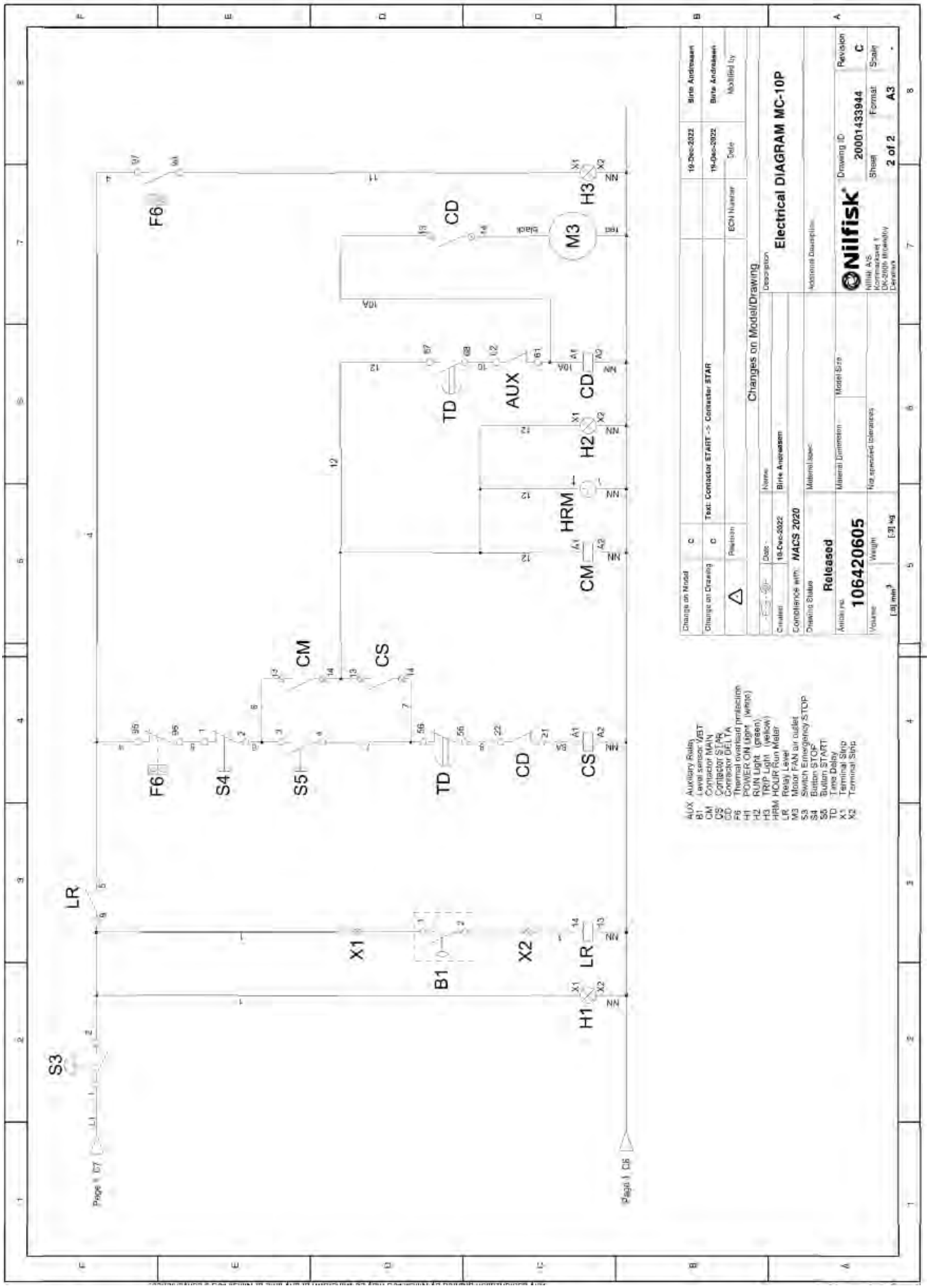


# Wiring diagrams

MC 10P 106420605_P1

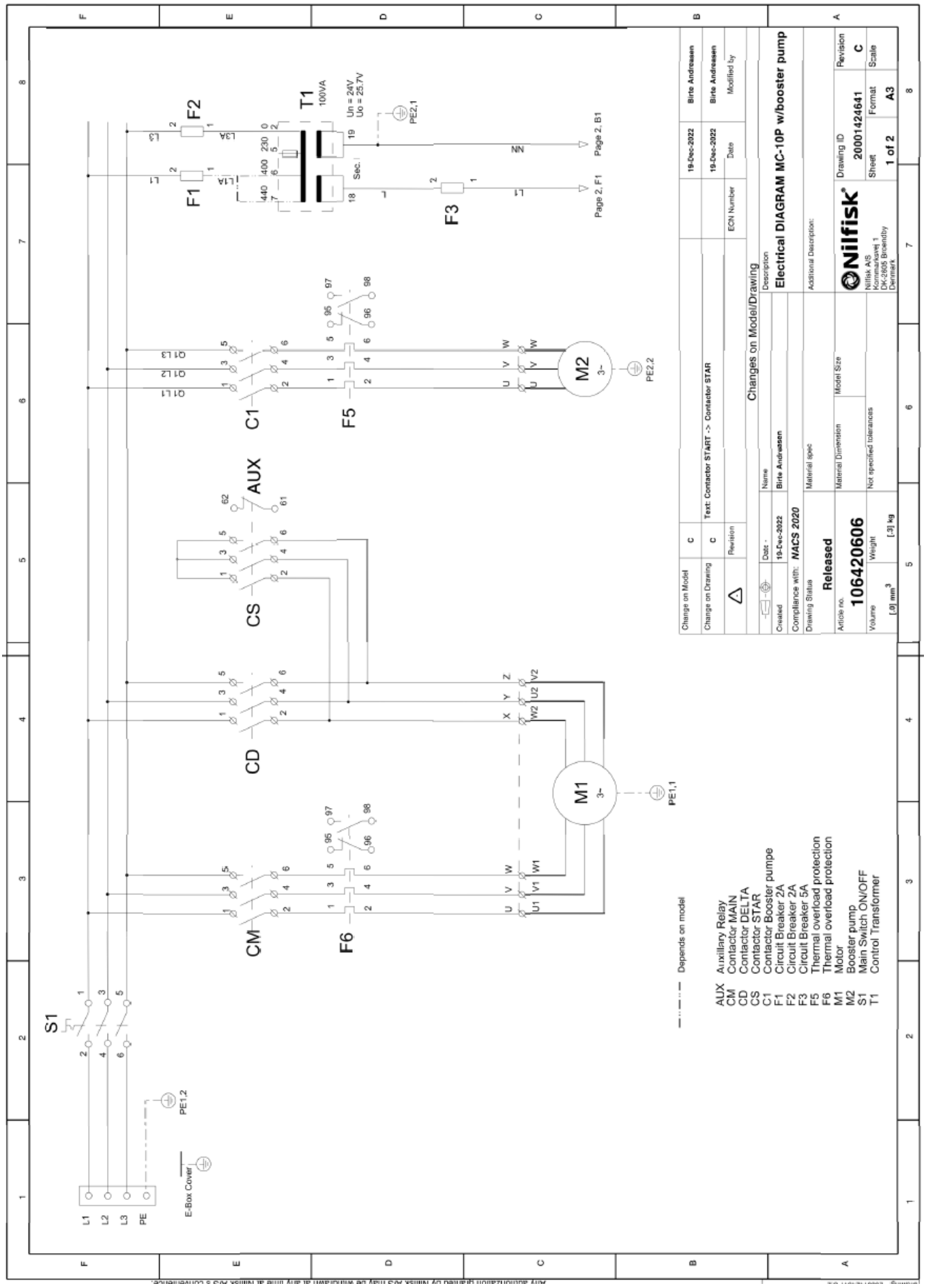


MC 10P 106420605_P2



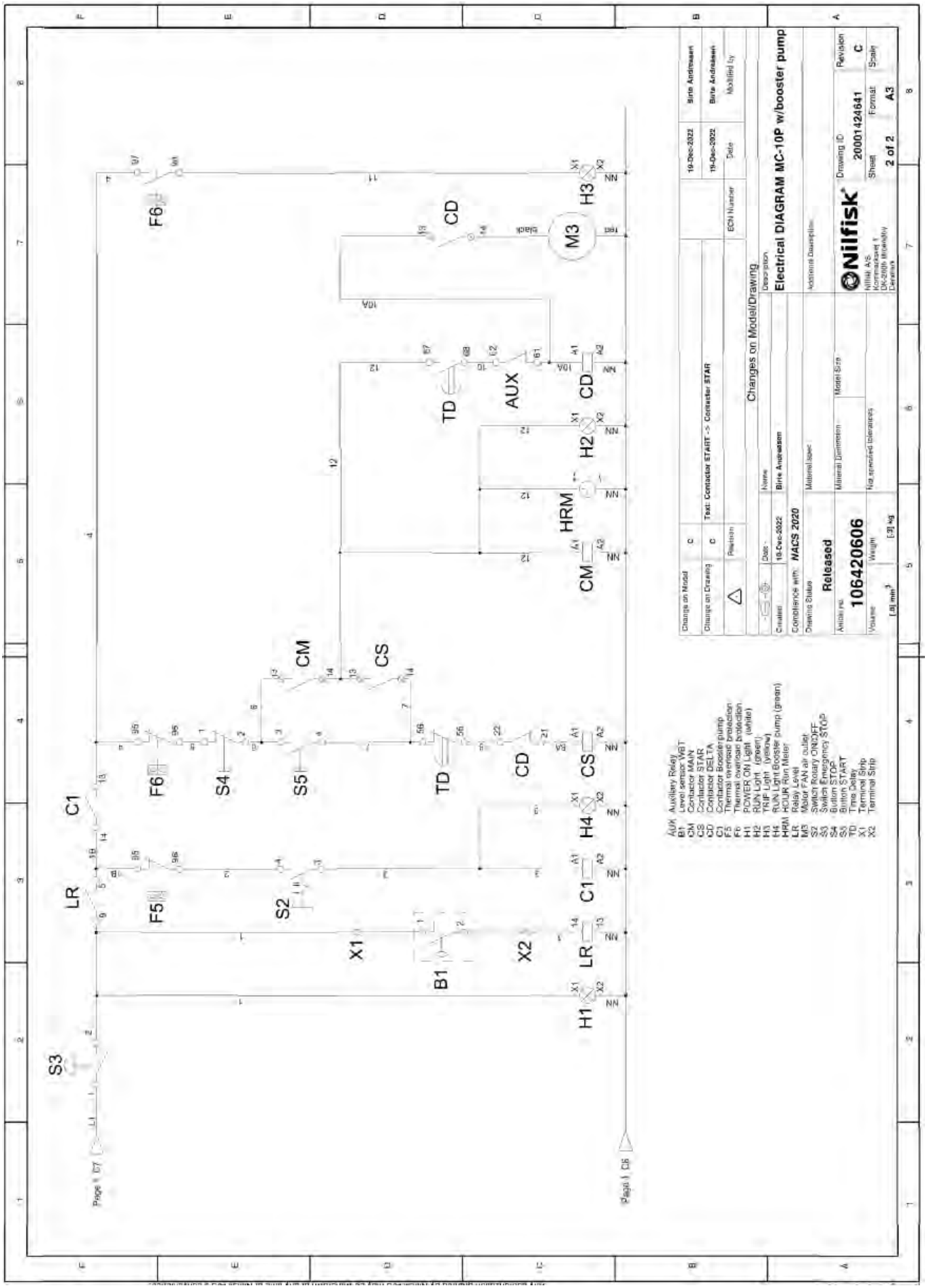
# Wiring diagrams

MC 10P_w_BoosterPump 106420606_P1



# Wiring diagrams

MC 10P_w_BoosterPump 106420606_P2



# Special tools / Spare parts

I

| Part Number | Description | Remarks |
|---|---|---|
| 101221057 | Service tool MC9 CK/NIL-K | Pump tools for MC 9P 350 bar |
| 101221058 | Service tool MC9-10 NIL-H/CH & NIL-A/Penta | Pump tools for MC 9P—10P 500 bar |
| 101221059 | Service tool MC10 NIL-Y/VY | Pump tools for MC 10P 800/1100 bar |
| 101221060 | Calibrated MC10 800-1100 pressure gauge | Test Manometer MC 10P 800/1100 bar |
| 101221061 | Calibrated MC9-10 350-500 pressure gauge | Test Manometer MC 9P-10P 350-500 bar |
| 101221062 | Loctite 243 | For various pump connections |
| N/A | Tamper proof sealant | Loctite 7400 can be used |