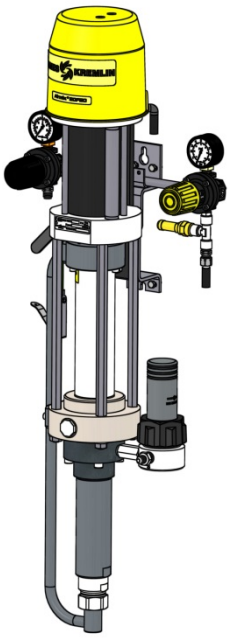


PUMP 20F50 pH

Equipment reference

151772200

User Manual 582156110

2020-11-20

Index C

Translation from the original instructions

SAMES KREMLIN SAS

13 Chemin de Malacher
38240 Meylan

www.sames-kremlin.com

33 (0)4 76 41 60 60

Contents

Evolution table of the document

Recording revisions				
Editor	**Object**	**Revision**	**Date**	**Modified by**
C. HUSSON	Pump, model 20F50 pH	A -	Week 32/2020	B. KHALDI
C. HUSSON – F. SEGUIN	Disassembly / reassembly added	B -	Week 42/2020	-
C. HUSSON	Update	C -	Week 47/2020	C. HUSSON

Dear customer, you have just purchased your new equipment and we thank you for it.

We have taken the utmost care, from design to manufacture, so that this equipment gives you complete satisfaction.

For good use and optimal availability, we invite you to read this manual carefully before using your equipment.

Guarantee

We reserve the right to make any changes or improvements even after receipt of an order without being able to attribute a non-compliance to the descriptions contained in the instruction manuals and selection guides.

Our equipment is checked and tested in our workshops before shipment.

To be valid, any complaint concerning a material will have to be formulated to us in writing within 10 days of the delivery.

SAMES KREMLIN equipment, equipped with its original identification plates, has a one-year warranty or 1800 hours of operation (first term reached) from the date of ex-factory against any defect in material or workmanship which we reserve the right to acknowledge.

The warranty excludes wear parts, deterioration or wear resulting from abnormal or unscheduled use by SAMES KREMLIN, failure to observe instructions for proper operation or lack of maintenance.

The warranty is limited to the repair or exchange of parts returned to our factory and recognized as defective by us and does not cover the listed wear parts.

Any costs resulting from an operating outage can not be charged to us. The costs of return to our workshops are the responsibility of the customer.

An intervention can be carried out on site at the customer's request.

In this case, the transportation and accommodation costs of the technician (s) will remain the responsibility of the applicant.

Any changes made to our equipment without our consent will void the warranty.

Our guarantee is non-transferable, and is limited to the original purchaser.

1 Declaration of Conformity

Refer to the existing declaration delivered with the product.

2 Declaration of incorporation

The manufacturer : SAMES KREMLIN with assets of 12 720 000 Euros

Head office : 13, chemin de Malacher - 38 240 - MEYLAN - FRANCE

Tel. 33 (0)4 76 41 60 60

Herewith declares that the pump, model 20F50 pH, part number :

- 151 772 200,

was carried out by complying with the essential rules of safety and health.

This declaration is present in the pump, model 20F50 pH package.

3 Safety instructions

3.1 Personal safety

Overview

Read all operating instructions and device labels carefully before putting the equipment into service.

Personnel using this equipment must have been trained in its use.

The workshop manager must ensure that the operators have fully understood all the instructions and safety rules of this equipment and other elements and accessories of the installation.

Misuse or operation can cause serious injury. This equipment is for professional use only. It must be used only for the purpose for which it was intended.

Do not modify or transform the equipment. Parts and accessories must only be supplied or approved by SAMES KREMLIN.

The equipment must be checked periodically. Defective or worn parts must be replaced.

Never exceed the maximum working pressures of the equipment components.

Always respect the laws in force regarding security, fire, electricity of the destination country of the equipment.

Only use fluids or solvents that are compatible with the parts in contact with the material (see material manufacturer's technical data sheet).

Meaning of the pictograms

 Danger, general signal (user)	 Danger: high pressure	 Explosive materials	 Danger: Electricity
 Toxic substances	 Corrosive materials	 Harmful or irritating materials	 Danger of pinching, crushing
 Risk of product emanation	 Danger: hot parts or surfaces	 Danger of automatic start, moving parts	 Danger: flammability hazard
 General obligation	 Grounding	 Refer to the manual/instruction leaflet	 Gloves must be worn
 Protective helmet	 Hearing protection	 Mandatory respiratory protection	 Safety footwear
 Protective clothing	 Protective visor	 Wearing of glasses is mandatory	 Material recycling

Security devices

Attention

- ✓ Guards (motor cover, coupling guard, housings, …) are set up for safe use of the equipment.
- ✓ The manufacturer cannot be held responsible for any bodily injury as well as failures and / or damage to the equipment resulting from the destruction, hiding or total or partial removal of the guards.
- ✓ Never exceed the maximum working pressures of the equipment components.

Pressure hazards

Safety requires that a **pressure relief air** shut-off valve must be installed in the pump motor supply system to allow trapped air to escape when the supply is shut off.

Without this precaution, residual air from the motor may cause the motor pump to operate and cause a serious accident.

Also, a **fluid drain valve** must be installed in the fluid system so that the fluid can be drained (after shutting off motor air and decompressing it) before any intervention on the equipment. These valves must remain closed for air and open for the product during the intervention.

Injection hazards

'HIGH PRESSURE' technology requires the utmost care.

Its operation can lead to dangerous leaks. In this case, there is a risk of injecting material into exposed body parts, which can lead to serious injury and amputation:

- ✓ An injection of fluid into the skin or other parts of the body (eyes, fingers …) must be treated urgently by appropriate medical care.
- ✓ Do not look at the gun nozzle when it is under pressure.
- ✓ Never direct the jet to another person.
- ✓ Never try to stop the jet with the body (hands, fingers, …) or with rags or similar.

Fire hazards, explosion, electric arc, static electricity

Incorrect grounding, insufficient ventilation, flames or sparks can cause an explosion or fire that could result in serious injury.

In order to avoid these risks, especially when using pumps, it is imperative:

- ✓ to ground the equipment, the parts to be treated, the cans of products and cleaners,
- ✓ to ensure good ventilation,
- ✓ to keep the working area clean and free of rags, apers, solvents,
- ✓ do not operate electrical switches in the presence of vapors or during removal,
- ✓ to immediately stop the application in the presence of arcs,
- ✓ to store all liquids outside of the working areas.
- ✓ to use material with the highest possible flash point to avoid any risk of formation of flammable gases and vapors (refer to product safety data sheets).
- ✓ to equip the drums with a lid to reduce the diffusion of gases and vapors in the cabin.
- ✓ it is forbidden to pump explosive materials.

Toxic chemicals hazards

Toxic materials or vapors can cause serious injury through contact with the body, in the eyes, under the skin, but also by ingestion or inhalation. It is imperative :

- ✓ to know the type of material used and the dangers it represents,
- ✓ to store the materials to be used in appropriate areas,
- ✓ to contain the material used during the application in a container designed for this purpose,
- ✓ to dispose the materials in accordance with the legislation of the country where the equipment is used,
- ✓ to wear clothing and protection designed for this purpose,
- ✓ to wear goggles, hearing, gloves, shoes, coveralls and respiratory masks.

Attention

The use of halogenated hydrocarbon solvents and products containing these solvents in the presence of aluminum or zinc is prohibited.

Failure to follow these instructions could result in an explosion hazard causing serious injury or death.

3.2 Integrity of the material

Material recommendations

Guards are fitted for safe use of the equipment.

Examples :

- ✓ Motor hood,
- ✓ Housings.

The manufacturer cannot be held responsible in case of:

- ✓ bodily injury,
- ✓ as well as breakdowns and / or damage to equipment resulting from the destruction, hiding or total or partial removal of guards.

Pump

Recommendations for pumps.

- ✓ It is imperative to read the compatibilities of motors and pumps before coupling them together as well as the special safety instructions.
- ✓ These instructions are on the pump instruction manuals.
- ✓ The pneumatic motor is intended to be coupled to a fluid section. Never modify the coupling system.
- ✓ Keep hands away from moving parts.
- ✓ The parts constituting that movement must be kept clean.
- ✓ Before starting up or using the pump unit, read the PRESSURE RELIEF PROCEDURE carefully.
- ✓ Check that the pressure relief and drain air valves are working properly.
- ✓ It is forbidden to operate the pump without its protective motor cover - risk of crushing.
- ✓ It is forbidden to remove the safety valve when the pump is in operation - check the correct functioning of the air regulator and the pressure gauge once a month.
- ✓ Use only genuine SAMES KREMLIN accessories and spare parts designed to withstand the operating pressure of the pump.

Pump feeding phase

- ✓ It is compulsory to wear PPE (goggles + gloves + safety shoes).

Force-feeding cycle

- ✓ The force-feeding cycle must be carried out at a maximum of 1 bar / 14.5 psi on the pressure gauge of the air equipment, keeping the gun open. Progressive manual ascent to the air regulator.

Pump paint phase and pressure gun

- ✓ PPE must be worn during this phase of painting when the pump and the gun are under pressure.
- ✓ Do not look at the gun nozzle when the gun is under pressure.
- ✓ The maximum pressures engraved on the equipments must be strictly adhered to.

Flushing the pump

- ✓ Wearing PPE (goggles + gloves + safety shoes).
- ✓ Do not look at the gun nozzle when the gun is under pressure.
- ✓ Flush at a maximum of 1 bar / 14.5 psi on the air equipment manometer (pressure varies according to the length of the hoses).

Pump defusing

- ✓ Wearing of PPE is mandatory.

Risk of fluid section heating during defusing

- ✓ Risk of overheating of the fluid section in case of defusing.

Ground cable

- ✓ It is mandatory to ground the pump. The rods are conductive.

Hoses

Recommendations for hoses.

- ✓ Keep hoses away from traffic areas, moving parts and hot areas.
- ✓ Never subject hoses to temperatures above 60 ° C / 140° F or below 0 ° C / 32° F.
- ✓ Do not use hoses to pull or move equipment.
- ✓ Tighten all connections as well as the hoses and junction fittings before commissioning the equipment.
- ✓ Check hoses regularly and replace them if damaged.
- ✓ Never exceed the maximum working pressure stated on the hose (MWP).
- ✓ For the assembly of the hoses and the gun: the wearing of PPE is mandatory.
- ✓ Tighten to the stop (Hoses + Gun).

Normal stop

To make a normal stop:

- ✓ Use the air regulator to gradually depressurize the pump.

Emergency shut-off valve

- ✓ The stop valve is an emergency stop valve.
- ✓ This valve must be within easy reach of the operator.

Materials used

Given the diversity of the materials implemented by the users and the impossibility of listing all the characteristics of the chemical substances, their interactions and their evolution over time SAMES KREMLIN cannot be held responsible:

- ✓ poor compatibility of materials in contact,
- ✓ Inherent risks to personnel and the environment,
- ✓ Wear and tear, malfunctions, material or equipment malfunctions, as well as the quality of the finished.

The user shall identify and prevent from potential dangers inherent to the materials used, such as:

- ✓ Toxic vapors.
- ✓ Fire.
- ✓ Explosions.

It will determine the risks of immediate reactions or reactions due to repeated exposures to personnel.

SAMES KREMLIN declines any responsibility, in case of:

- ✓ Physical or mental injury,
- ✓ Direct or indirect material damage due to the use of chemical substances.

4 Environment

The equipment is installed on a horizontal, stable and flat floor (e.g. concrete slab).

Non-movable equipment must be fixed to the ground by suitable mounting devices (spit, screws, bolts, etc.) to ensure its stability during use.

To avoid risks due to static electricity, the equipment and its components must be grounded.

- ✓ **For pumping equipment** (pumps, lifts, chassis, etc.), a 2.5 mm section wire is attached to the equipment. Use this wire to connect the equipment to the general "ground". In the case of severe environments (insufficient mechanical protection of the earthing wire, vibrations, moving equipment, etc.) where damage to the earthing function is likely, the user must replace the 2, 5 mm wire supplied, by a device more suited to its environment (larger wire section, earth braid, fixing by eye lug,…).
- ✓ Have the ground continuity checked by a qualified electrician. If ground continuity is not assured, check terminal, wire and grounding point. Never operate the equipment without first resolving this problem.
- ✓ The gun must be "grounded" through the air hose or fluid hose. When spraying from a gun, the fluid hose must be conductive.
- ✓ The equipments to be painted must also be "grounded" by means of clamps fitted with cables or, if suspended, by means of hooks which must be kept clean permanently.

> **Note: all objects in the work area must also be grounded.**

- ✓ **Do not store** more flammable materials than necessary inside the work area.
- ✓ These materials must be stored in approved, grounded containers.
- ✓ Use only grounded **metal pails** for flushing solvents.
- ✓ **Cardboard and papers are to be banned**. They are very bad conductors, even insulators.

Material markings

Each appliance is fitted with a nameplate bearing the name of the manufacturer, the appliance reference number, important information for the use of the appliance (pressure, power, etc.) and sometimes the pictogram shown opposite.

The equipment is designed and manufactured with high quality materials and components that can be recycled and reused.

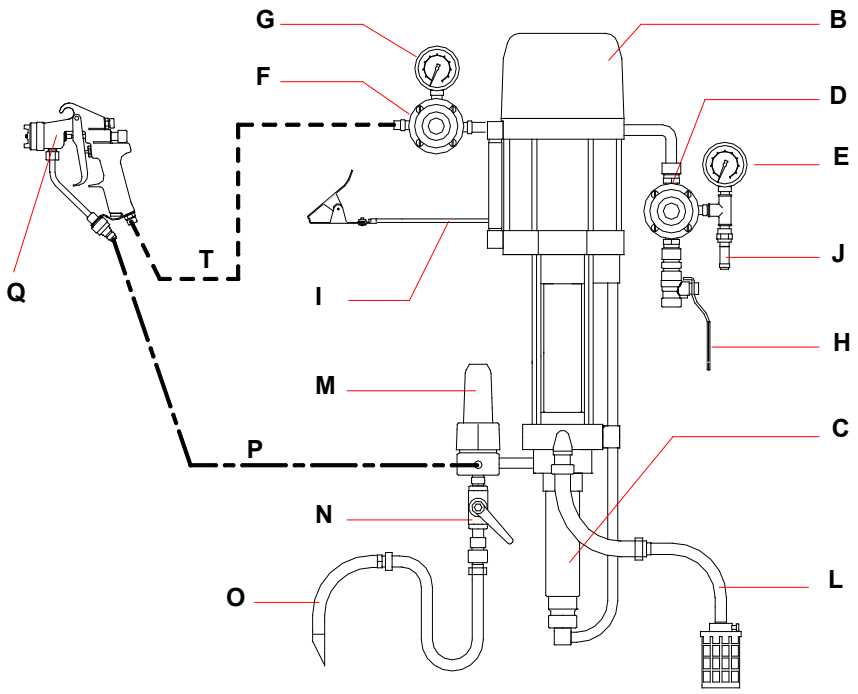
The 2012/19/EU European Directive applies to all devices marked with this logo (crossed-out waste bin). Find out more about the collection systems available for electrical and electronic appliances.

Follow the rules in your locality and **do not dispose of your old appliances with your household waste**. Proper disposal of this old appliance will help prevent negative effects on the environment and human health.

5 Presentation of the material

5.1 Complete system

5.1.1 Visual generic presentation



(Non-contractual visual)

Ind	Description	Ind	Description
A	Pump (B + C)	J	Discharge valve
B	Air motor	L	Suction rod
C	Fluid section	M	Fluid filter
D	'AIR MOTOR' air regulator	N	Drain valve
E	Gauge	O	Drain rod
F	'GUN AIR' air regulator	P	HP fluid hose
G	Gauge	Q	Spray gun
H	Air inlet valve	T	Air hose (static conductor)
I	Ground		

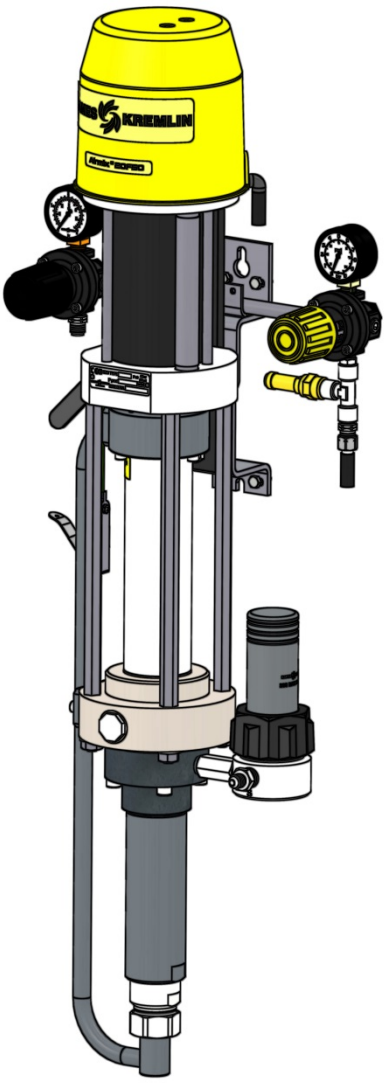
Context of use

The pump, model 20F50 pH is designed to meet the required performance and lifetime requirements:

- ✓ Air operated piston pump (stainless steel) – with a bellows seal fluid packing,
- ✓ Low maintenance and ease of use. Use without lubrication.

5.2 Description of the main elements of the system

Pump, model 20F50 pH

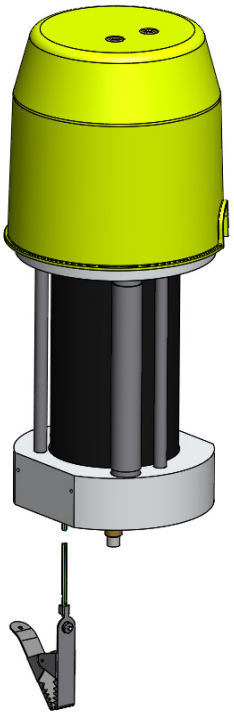


Expected use

The pump is recommended for water-based or solvent-based paints whose viscosity is lower than 1000 mPa/s.

The pump consists of a motor, model 500-4 and a fluid section, model F50 pH. The wall mounted version has an air equipment and a fluid filter 3/8", model 250 bar / 3625.75 psi.

Motor,
model 500-4 Stroke 100



Expected use

This air motor is intended to be coupled to the fluid section systems recommended by SAMES KREMLIN in order to obtain the ratio and the expected flow rate.

Functional description

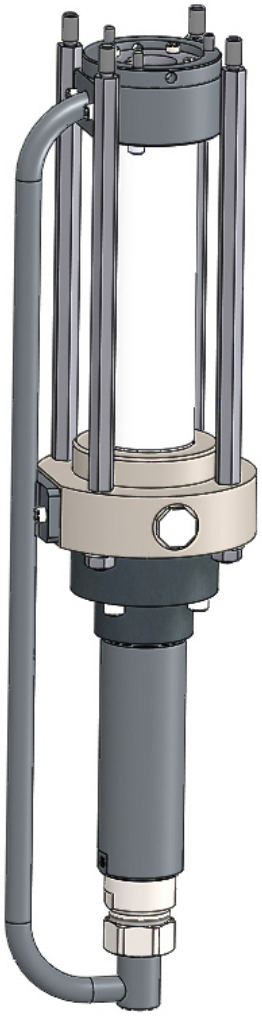
Reciprocating air motor.

Adjustment

The increase of the motor supply air pressure (via the air regulator) leads to an increase of the number of pump piston returns/min (cycles) which leads to a flow rate increase and to an outlet pressure increase of the pumped material.

AIR CONSUMPTION OF THE MOTOR	
Pressure of the motor at 6 bar / 87 psi	
Type	**daN**
500-4	319

Fluid section, model F50 pH

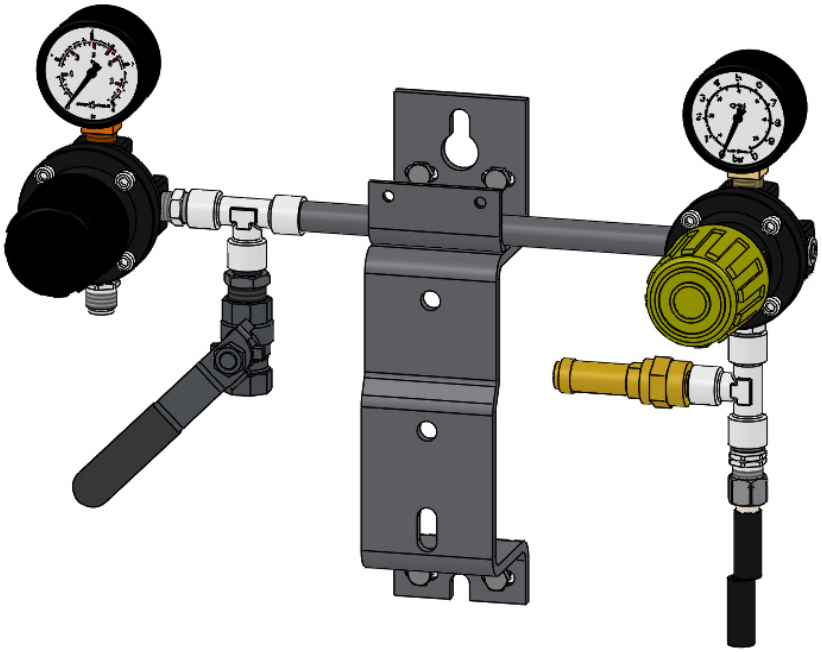


# Part number	Seals kits	Fixed packing		Upper packing	Lower packing
		O-rings (statics)	Bellows		
144 951 090	PTFE + PE	PTFE	PE	PE	PE

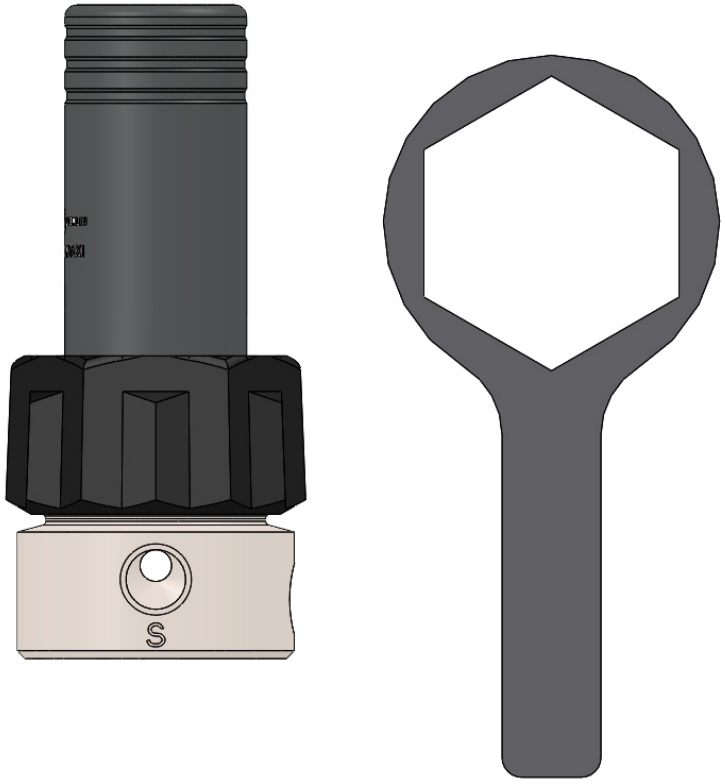
Seats : carbide,

Balls : ceramics.

Air supply assembly



Fluid filter 3/8",
model 250 bar / 3625.75 psi



6 Identification

6.1 Description of the label marking

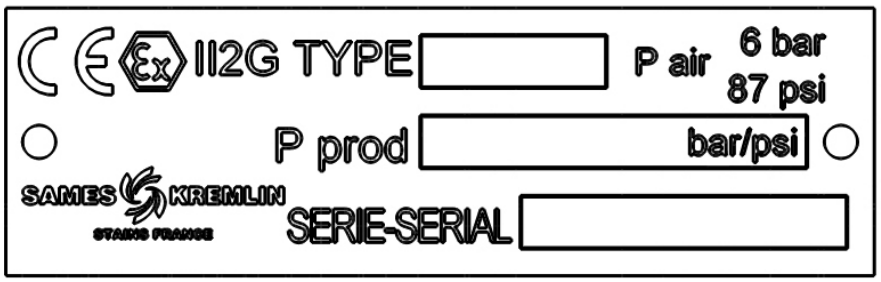
Principles

Paint pumps are designed to be installed in a paint booth.

This equipment complies with the following provisions:

- ✓ ATEX Directive (2014/34 / EU : Ex II 2 G - group II, category 2, gas).

The EU declaration of conformity is included in the packaging of the pump, 20F50 pH.



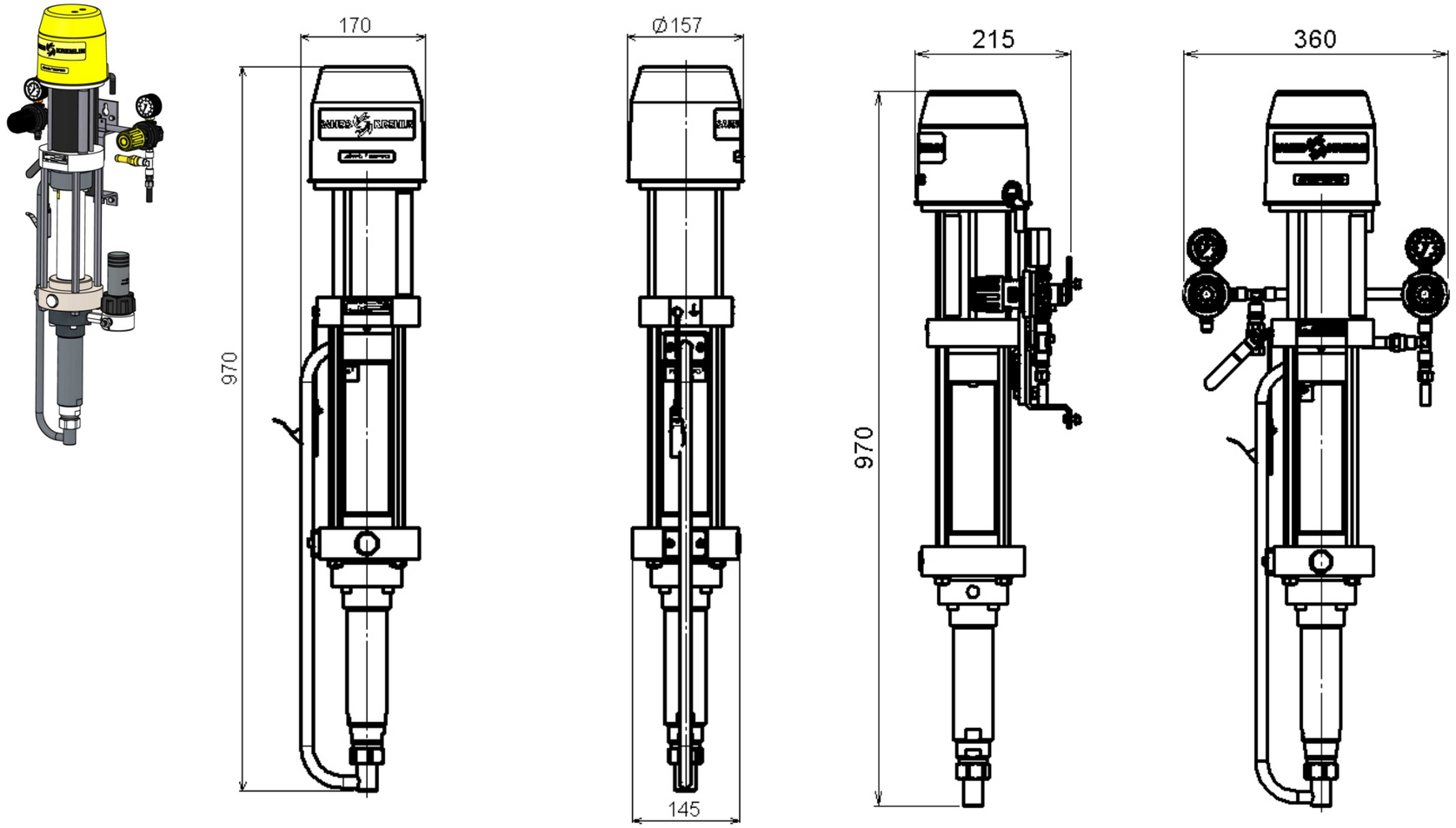
Description	
Sigle SAMES KREMLIN	Manufacturer's identification
CE	**CE :** European conformity
II 2 G	**:** Use in explosive area **II** : group II **2** : category 2 Surface material intended for an environment in which explosive atmospheres due to gases, vapors, mists are likely to occasionally occur during normal operation. **G** : gas
TYPE	Model of the pump
SERIE-SERIAL	Number given by **SAMES KREMLIN.** The first 2 digits indicate the manufacture year.
P prod (BAR/PSI)	Maximum fluid pressure
P air (BAR/PSI)	Maximum air pressure

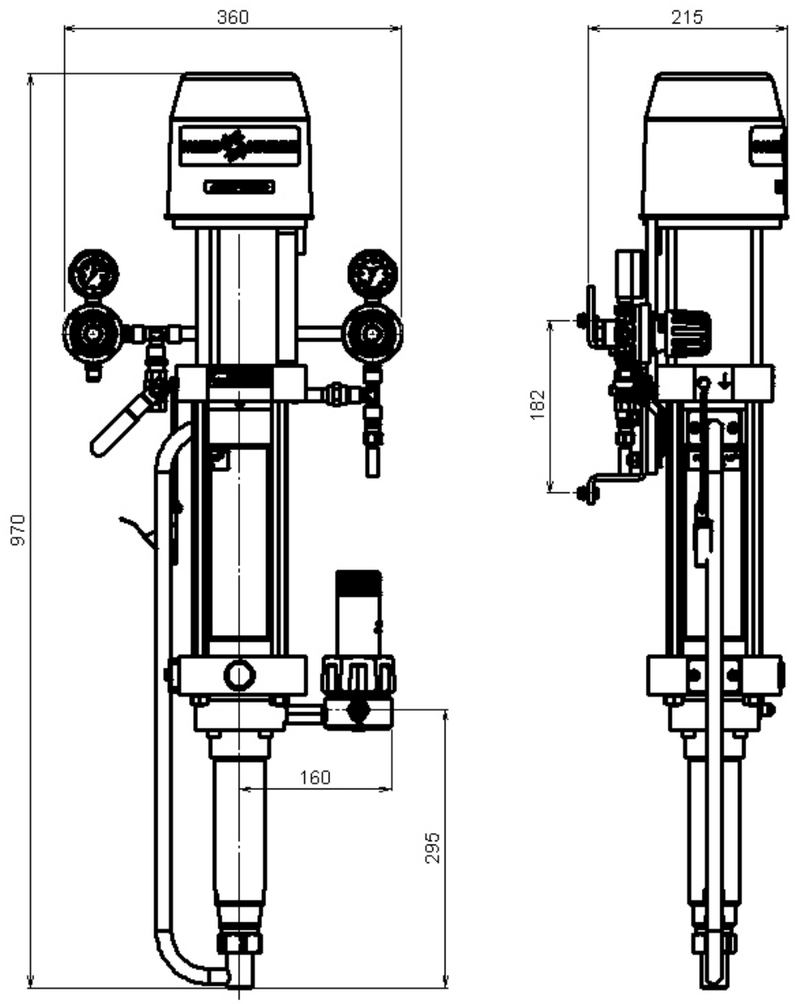
*** Temperature class**

Seals kits	Temperature class	Maximum surface temperature
144 951 090	T3	159.8°C / 318.2°F

7 Equipment plans

Pump, model 20F50 pH (bare pump and wall mounted pump)

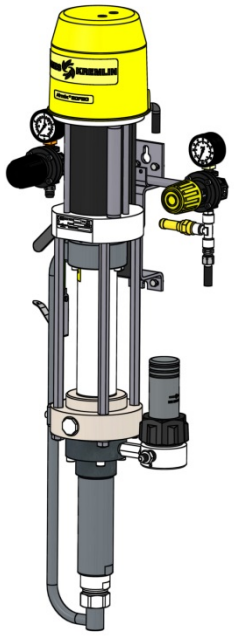



360
215
970
182
160
295

8 Technical features and operating principles

8.1 Technical features

Pump, model 20F50 pH



Theoretical weight

Type of pump, model 20F50 pH	Weight
Wall mounted + suction rod + air supply +filter	24 kg / 52.9 lbs

Theoretical pressure ratio

20/1 - maximum fluid pressure: 120 bar / 1740 psi

Maximum operating temperature

✓ 50° C / 122° F

Weighted sound pressure (LAeq)

✓ 78.9 dBa*

* Test conditions - Noise level :
- Test duration : 30 s,
- Motor air pressure : 6 bar / 87 psi,
- Fluid used : water,
- Flow rate : pump adjusted at 20 cycles/minute.

Connections

Bare pump :

- ✓ Air Inlet : F 1/4" BSP
- ✓ Fluid Inlet : F 1/2 BSP
- ✓ Fluid Outlet : F 3/8 NPS

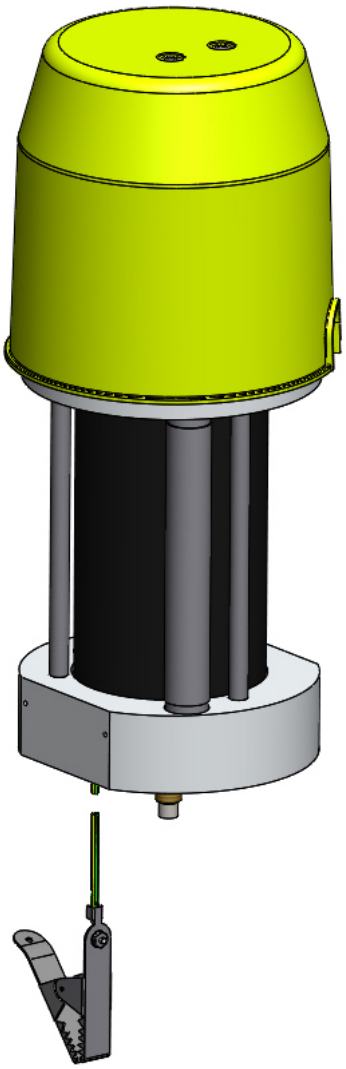
Pump assembly :

- ✓ Air Inlet : F 3/8" G (air supply)
- ✓ Fluid Inlet : M 26 x 125 + suction rod (fitting F 26 x 125)
- ✓ Fluid Outlet : M 1/2 JIC (filter outlet)

Connection hoses

- ✓ Pump air supply hose (minimum Ø for a 5 m / 16.5 ft length : Ø 16 mm iD / 5/8" dia
- ✓ Air hose (between "GUN AIR" regulator and gun) : Ø 7 mm ID / 1/4" dia.
- ✓ AIRMIX fluid hose (between pump fluid outlet and gun) : Ø 4.8 mm ID. / 3.16" dia.

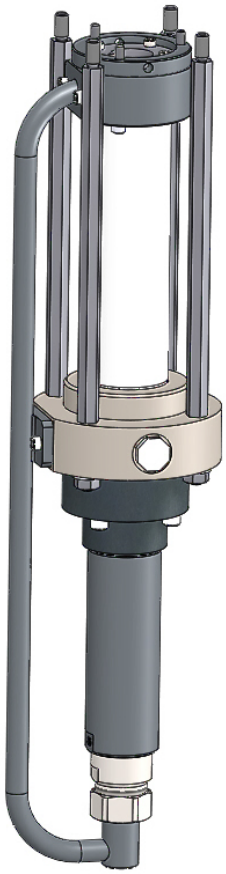
Motor, model 500-4 - STROKE 100



Motor features :

- ✓ 500-4
- ✓ Motor stroke : 100 mm / 4"
- ✓ Motor section : 50 cm² / 7.7 sq.in

Fluid section, model F50 pH



Fluid section features:

- ✓ Flowmax F50 pH
- ✓ Hydraulic section : 2.5 cm² / 0.4 sq.in
- ✓ Fluid volume delivery per cycle : 50 cc / 1.76 oz
- ✓ Number of cycles : 20 per L / 76 per gal
- ✓ Fluid flow rate (30 cycles) : 1.5 L/mn / 0.4 US gal

Sealing gasket :

- ✓ Fixed : PTFE static O-rings and PE bellows,
- ✓ Upper : PE seal,
- ✓ Lower : PE seal.

8.2 Operating principle

Pump

The pump consists of:

- ✓ A reciprocating air motor,
- ✓ A fluid section mechanically coupled to the air motor.

The motor is supplied with compressed air by means of the phosphorus knob. The pressure is read on the gauge.

During its reciprocating movement, the motor drives the piston of the fluid section, the paint is drawn and is forced back under pressure. Due to its design, the pressure is always the one read on the gauge x by the pump ratio.

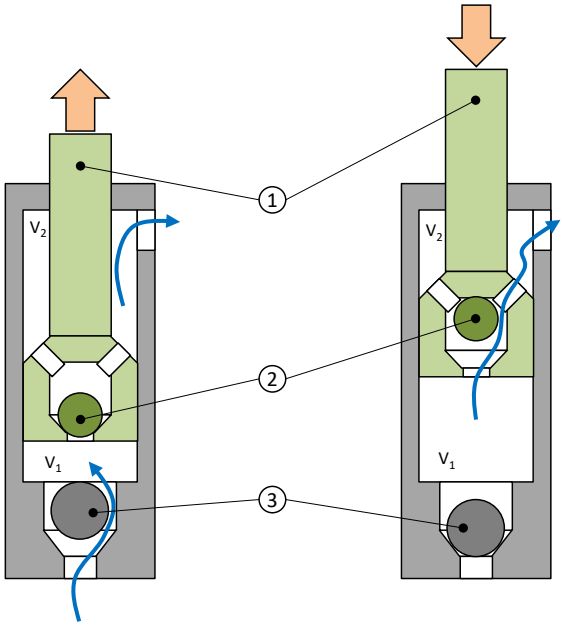
The pump is also supplied with an air regulator with a black knob. It enables to adjust the spray air pressure of the gun.

Therefore,

- ✓ to adjust the fluid flow rate, turn the phosphorus knob.
- ✓ to adjust the spray air, turn the black knob.

The pump is a FLOWMAX® one (with bellows).

Functional description



When the piston (1) goes up, the upper valve (2) closes and the lower valve (3) opens. The piston (1) expels the fluid from the upper chamber (V2) to the outside and sucks the fluid to fill the lower chamber (V1).

When the piston (1) goes down, the upper valve (2) opens and the lower valve (3) closes. The piston (1) compresses the fluid in the lower chamber (V1) and transfers it to the upper chamber (V2). Since the volume of the upper chamber (V2) is half that of the lower chamber (V1), a volume equivalent to the upper chamber (V2) is expelled from the pump.

Attention

The friction caused by the movement of the fluid inside the pump and its accessories as well as those caused by the seals creates static electricity that can cause fire or explosion. It is therefore necessary to connect the fluid section to earth via the motor ground cable (refer to motor instructions for grounding).
Never place your hand on the suction port of the pump. The suction power may cause serious injury.

Motor operation description

SAMES KREMLIN pneumatic motors with straight reciprocating movements operate by compressed air supply. The reversing system is carried out by means of a reversing block.

These pneumatic motors are intended to be coupled to the fluid sections recommended by SAMES KREMLIN in order to obtain the ratio and the expected flow rate.

9 Installation

Pump

The pumps are designed to be installed in a paint booth or outside.

Connections subsets

Motor - fluid section

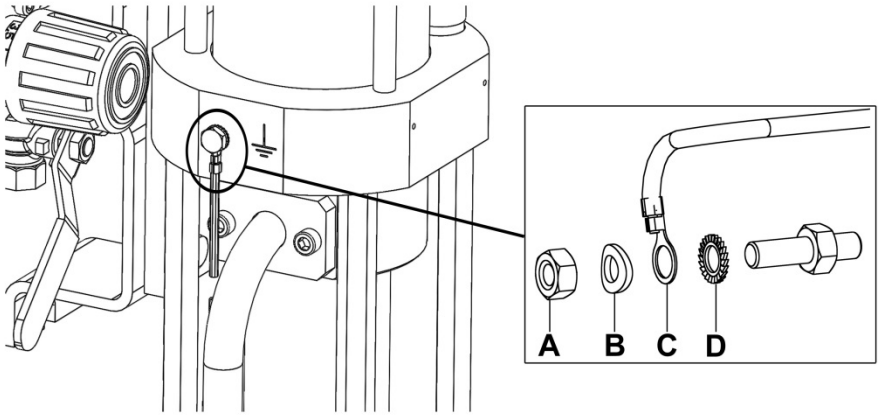
These fluid sections are intended to be coupled to pneumatic motors of compatible stroke.

It is imperative to comply with a motor / fluid section combination provided by SAMES KREMLIN.

Grounding

Coupled with a pneumatic motor, the fluid section will be grounded via the earth cable of this motor.

This ground cable must be connected to a safe and solid ground.



- ✓ Loosen the lock nut (A), remove the washer (B), insert the lug (C) with its ground wire (min. section: 1.5 mm2) between the washer (B) and the washer (D).
- ✓ Retighten the lock nut. Connect the other end of the wire to a real "ground" that complies with the regulations of the country and locality concerned.
- ✓ Have the earth continuity checked by a qualified electrician.

- ✓ If earth continuity is not assured, check terminal, wire, bracket, and grounding point.
- ✓ Never operate the pump without having solved this problem.

Connection to compressed air supply

Adjust the pressure at the air regulator.

For correct operation and a long duration life of the motor, the supply air must be filtered and not lubricated (see § Maintenance).

- ✓ It is imperative to install a **pressure relief valve** after the air regulator and as close as possible to the motor inlet in order to follow the decompression procedure (See § Operating problems).
- ✓ The motor air supply hose must have an inside diameter of at least 16 mm / 5/8".
- ✓ The motor is tested before shipping. Nevertheless, before coupling the motor to the fluid section, it is necessary to operate it under vacuum at a maximum pressure of 1 bar / 14.5 psi for a few minutes.

Proceed as follows:

- ✓ Couple the motor with the fluid section,
- ✓ Connect the main air supply to the motor.

9.1 Storage

Pump

Place the equipment away from moisture after closing the various air inlets and various openings (plugs).

Storage before installation:

- ✓ Storage ambient temperature: from 0 ° C / 32 ° F to +50 ° C / 122 ° F.
- ✓ Protect the unit against dust, water runoff, moisture and shocks.

Storage after installation:

- ✓ Protect the unit against dust, water runoff, moisture and shocks.

9.2 Handling

Pump

Pumps and fluid sections of significant weight and size must be handled with appropriate means.

10 Start up

Pump

Pumps are tested in our workshops with lubricant.

Prior to start-up, this lubricant must be removed by flushing with a suitable solvent.

At the end of the day, flush with a suitable solvent.

It is advisable to stop the fluid section in the "low inversion" position in order to prevent the product from catching on the piston rod.

Motor

Motors are tested before shipping.

Nevertheless, before coupling the motor to a pump, it is necessary to operate it under vacuum at a maximum pressure of 1 bar / 14.5 psi for a few minutes.

Proceed as follows:

- ✓ Couple the motor with the fluid section,
- ✓ Connect the main air supply to the motor.
- ✓ Adjust the pressure at the air regulator.

11 Use of the equipment

11.1 User settings

Pump

Before starting up, connect the pump to the ground.

Attention

The pump is a FLOWMAX® one :

- **Fluid section filling pressure : maximum 2 bar / 29 psi,**
- **WARNING : Do not create overpressure,**
- **Never operate the pump when an isolating gate on the supply circuit (upstream from the fluid section) is shut because it will damage the bellows,**
- **Do not install a fluid regulator on the supply circuit or any device that could perform as a non-return valve.**

Motor

A relief-valve (setting : 6.5 bar / 94 psi) is fitted on the pump air motor – thus protecting this one from an overpressure which could damage it.

11.2 Safety in production

Guards (motor cover, coupling guard, housings, ...) are set up for safe use of the equipment.

The manufacturer cannot be held responsible in case of bodily injury as well as breakdowns and / or damage of the material resulting from the destruction, hiding or total or partial removal of guards.

11.3 Diagnostic help / Troubleshooting guide

Troubleshooting

Before any intervention on a pump, it is imperative to carry out a general procedure of decompression and drain.

In order to avoid the risk of personal injury, product injections, injuries caused by moving parts or arcing, it is essential to follow the following procedure before any intervention during system shutdown, assembly, cleaning or changing the nozzle.

- ✓ Lock the guns (valve, tap, etc.) to OFF.
- ✓ Shut off the oil supply via the pressure relief valve to remove residual air from the motor.
- ✓ Unlock the gun (valve, tap ...).
- ✓ Bring the gun (valve, tap ...) to a metal bucket to collect the fluid. Hold it against the wall of this bucket to avoid interrupting the continuity of the earthing (use the wire with stirrup to put the metal bucket to earth).
- ✓ Open the gun (valve, tap) to drain the network.
- ✓ Lock the gun (valve, tap) to OFF.
- ✓ Open the pump drain valve and collect the fluid in a well-grounded metal bucket.
- ✓ Leave that drain valve open during the whole period of the operation.

Check the conformity of the wiring before intervention.

Ice formation

When the compressed air is exhausted, the sudden drop in pressure causes the air temperature to drop below 0 ° C / 32 ° F. Any liquid or water vapour then turns to ice.

Higher air pressures pack high amounts of air and water vapor in each cycle and create more expansion and ice. Higher cycle rates also build up the ice and lower the motor temperature faster.

Warm humid climates can produce high levels of icing because of the higher humidity levels. Low ambient temperatures near 0 ° C / 32 ° F make it easier for the motor parts to drop below freezing.

To minimize ice build-up:

- Lower the dew point of the compressed air. Use a refrigerated air dryer, coalescing filter, or desiccant filter to lower the water vapor content of the air.
- Raise the compressed air temperature. Warmer air going in helps the motor parts stay above 0 ° C / 32 ° F. Compressed air, especially at these volumes, is warm when compressed. Keep the air warm or stay close to the compressor to reduce ice formation.

11.4 Possible symptoms of faults / Causes of faults / Remedy to be applied - fast operation

Attention

Before any intervention, it is imperative to follow the decompression procedure and the safety instructions.

- **Shut off the air supply with the pressure relief valve in order to evacuate residual air from the motor,**
- **Depressurize the fluid network by opening the drain valve of the pump or of the gun.**

Defaults	Possible causes	Remedies
The pump does not start	Incorrect air supply	Check the pump air supply.
The pump does not work or stops	The fluid is cured, dried in the pump	Clean the pump, change the parts if necessary.
	Broken part (s) in the pump	Remove, check, replace.
	Frosting of the motor	Defrost and lubricate using oil.
	Outlet fluid hose is blocked	Change the hose.
Priming trouble	Spray gun shut off	Make sure the spray gun is fully opened and air is evacuated through this one.
	Air is always coming out from the spray gun	Check air intake at the fitting or at the suction rod.
	Air does not come out from the spray gun	Check the pump valves. If a valve is stuck by dry paint, it can be unstuck without disassembling it. Blow air pressure directly in the suction rod.
The pump at stop, the piston carries on going down	Exhaust valve or mobile packing worn or incorrectly mounted	Check and replace the parts.
	Plug or drain valve not tightened	

Defaults	Possible causes	Remedies
The pump at stop, the piston carries on going up	Suction valve worn or incorrectly mounted	Check and replace the parts.
	Plug or drain valve not tightened	
The pump does not reverse	Spring of the air motor reversing block damaged or worn	Check and replace the spring of the reversing block.
	Lack of lubrication of the reversing block	Lubricate the reversing block with HP 150 oil.
	No pilot air	Check if there is pilot air.
Leakage of fluid at the bottom of the air motor	Bellows damaged	Check bellows; replace if necessary.
The pump does not deliver enough pressure	Insufficient air pressure (valve insufficiently open, air leak,…)	Check; adjust.
	Insufficient air inlet on the motor or outlet clogged	Check filter and mounting.
	Hose not correct	Replace hose.
	Head piston seals worn	Check mounting and replace seals.
The pump operates but irregular flow	Air inlet in the suction circuit	Check mounting, state of the parts, tightening of the parts and seals. Replace if necessary.
	Valves clogged on the seat, incorrectly mounted or worn	Check the valves, clean them and change them if necessary.
	Muffler clogged up	Clean or change.
Fluid leakage from pump body	Wrong tightening of the cylinder	Check the cylinder and the seals. Replace parts if necessary.
	Seals damaged, worn or missing	
The piston goes down quickly (single effect operation)	Wrong feeding of the pump	Check the use parameters of the accessories suction rod pressure,…). They can be not adapted or clogged.
	Suction valve worn	Check and replace the suction valve.
	A foreign product obstructs the suction valve	Check and clean.
	Piston seals or seals incorrecty mounted or damaged	Check the mounting; change the seals if necessary.

Defaults	Possible causes	Remedies
The piston goes up quickly	Exhaust valve worn or damaged	Check and replace the exhaust valve.
	A foreign product obstructs the exhaust valve	Check and clean.
	Piston seals or seals incorrecty mounted or damaged	Check the mounting; change the seals if necessary.
The piston goes up and down at different speeds	Valves, piston seals or cylinder worn	Replace the parts.
	Seals incorrectly mounted or damaged	Check the mounting; change the seals if necessary.
Abnormal operating after racing or too extreme temperature	Piston seals too tight, damaged	Check mounting, reduce pumping race. Replace parts if necessary.
Material flow rate drop	Leakage during the exhaust	Check the piston seals; replace them if necessary.
	Internal parts of the motor failing	Check the operating of the motor.
	Defective coupling	Check the coupling.
	Defective filter	Check the filter.
	Clogging of the filter element	Clean the filter element. Change it if necessary.
Spraying trouble	Defective spray gun	Refer to spray gun instruction manual.

12 Maintenance

12.1 Preventive Maintenance Plan

Attention

Before any intervention, it is imperative to follow the decompression procedure and the safety instructions.

During a long duration shutdown, stop the pump when the piston is in the down position.

Pump

Make sure that the pump is clean and in good condition to increase equipment working life.

Make sure that the suction strainer is clean and in good condition. Regularly clean it and change it if necessary.

Flush the pump as often as necessary, specially when spraying pigment-filled material.

Attention

Whatever the case, when stopping the pump, always leave it filled with fluid.

For a short duration shutdown, if the flushing has not been carried out, leave the pump filled with fluid.

For a long duration shutdown, after flushing the fluid, leave the pump filled with solvent.

Motor

Attention

The motor is subject to the ATEX directive and must not be modified under any circumstances.

Failure to comply with this recommendation negates our responsibility.

The motor is designed to keep maintenance to a minimum (with a filtered air supply).

It is advisable to provide preventive maintenance after 12 months of operation. SAMES KREMLIN recommends changing the motor muffler foams every year.

Check:

- The clogging of the air filter,
- The absence of air leaks,
- The absence of breaks in the air hoses,
- The correct snapping of the connections / hoses,
- The general condition of the supply hoses (rubber, crimping), regulators and manometers,
- The tightening of the components.
- The condition of the muffler.
- The mounting of the hood.
- The correct operation of the safety valve.
- The state of the decompression valve.

Fluid section

Daily

- Detect leaks at connections.
- Check the condition of the hoses.
- Clean the piston of the pump. Do not let the fluid dry on it.
- Manoeuver all the valves of the installation.
- Clean the site and the environment.

Once a month

Check that the air regulator and pressure gauge are working properly.

Every year

- Disassemble the fluid section fully.
- Clean all parts. Install new seals when reassembling the pump (see replacement seal kit).
- Put grease on the piston and inside the cylinder, to avoid damaging the seals.
- Fit new parts if necessary.

Spray gun

Comply with the usual instructions of spray gun servicing (refer to spray gun instruction manual).

Filter

The pump is mounted with a filter at the fluid outlet. Comply with the usual instructions of filter servicing.

- You must clean regularly the filter element to prevent from the material clogging.

Instruction	Designation	Part number
PTFE grease	PTFE grease (10 ml / 0.34 oz)	560.440.101
Isoflex grease	Box of grease (1 Kg / 2.2 lbs)	560.440.003
Anti-seize grease	Box of grease (450 gr / 1lb)	560.420.005
Medium strength Aneorobic Pipe sealant	Loctite 5772 (50 ml / 1.7 oz)	554.180.015

This maintenance consists of replacing parts with cuts or wear and cleaning organs with compatible products without using abrasive materials that could damage them.

The O-rings are mounted with special "pneumatic" grease.

Make sure that none of them get damaged; cutting one of them may cause the motor to malfunction.

12.2 Preventive maintenance

It is recommended to schedule a routine maintenance after a set number of hours of operation.

This is defined by the user's maintenance department and is based on the product, the work rate and the usual pressure.

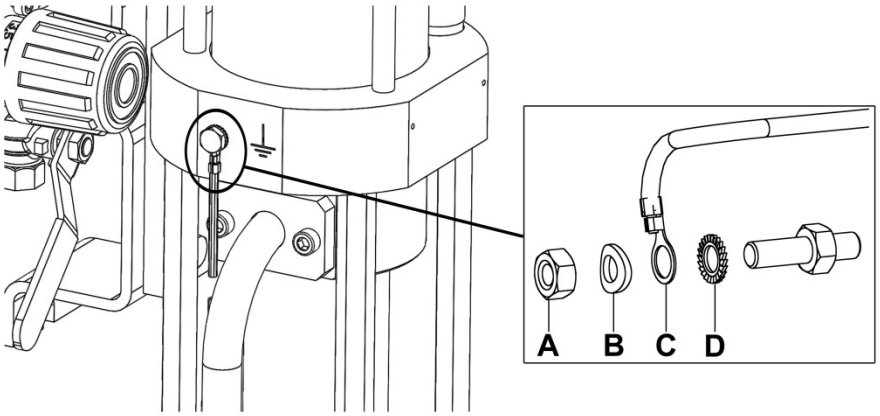
Be aware of the disassembly / reassembly of the pump and spare parts.

13 Disassembly / Re-assembly

Attention

Before any intervention, it is imperative to follow the pressure relief procedure and the safety instructions.

13.1 Disassembly of the grounding cable



- Hold the grounding terminal with a 10 mm wrench and unscrew the lock nut (A) with the other key.
- Manually remove the washers (B and D) and the lug (C) with its grounding wire.

Tools needed

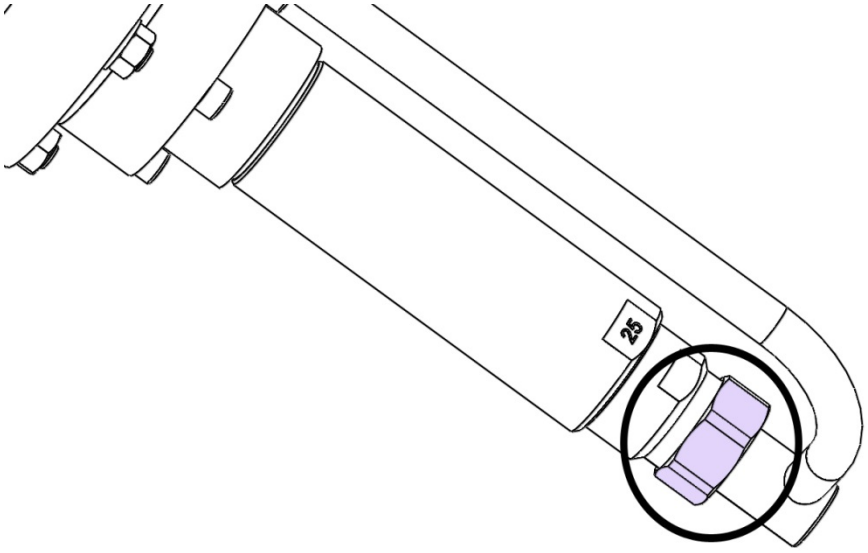
10 x2

Preliminary operations

Option

- ✓ If the pump is fitted with an air assembly :
  - Shut off the air inlet by means of the valve.
- ✓ Unscrew the air supply hose with an appropriate wrench blocking the air inlet fitting with an other appropriate wrench.

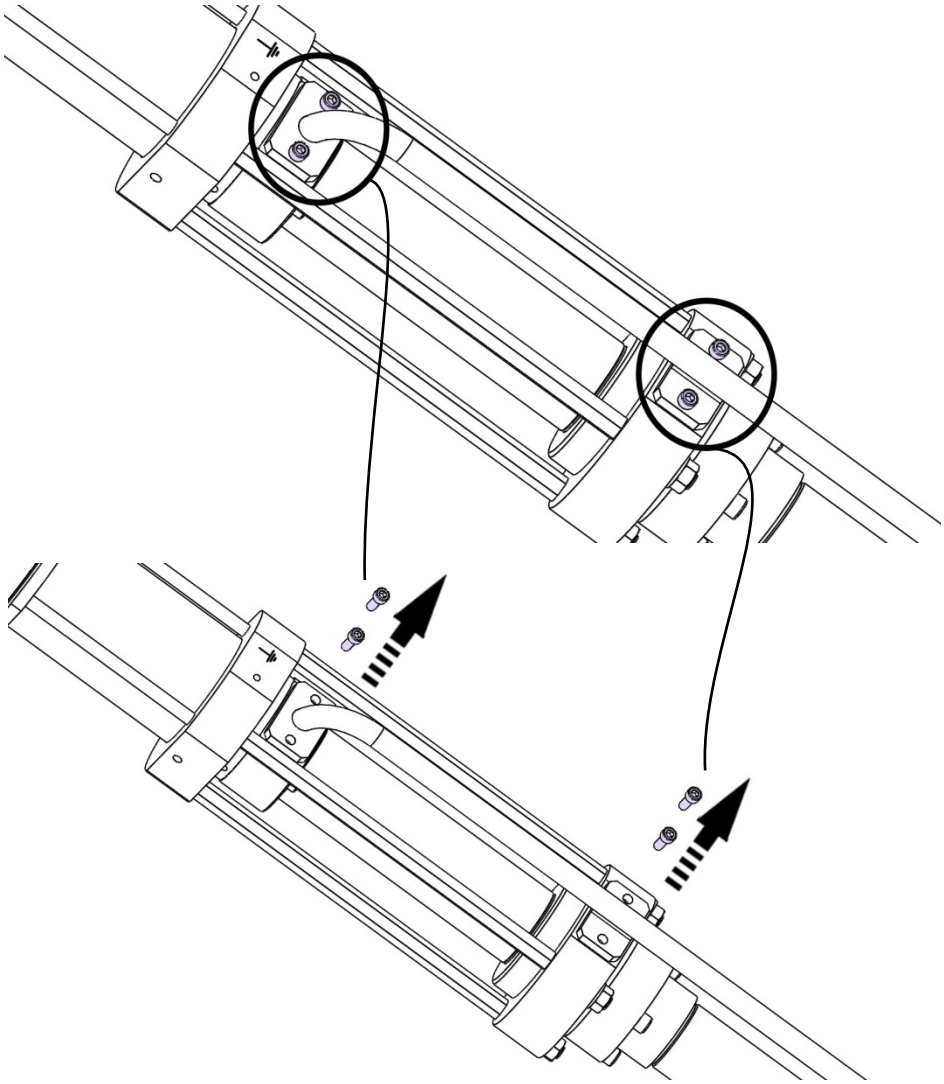
13.2 Decoupling / Coupling of motor and fluid section



✓ Unscrew the hexagonal nut on the fluid section first with a 41 mm open-end wrench and then manually.

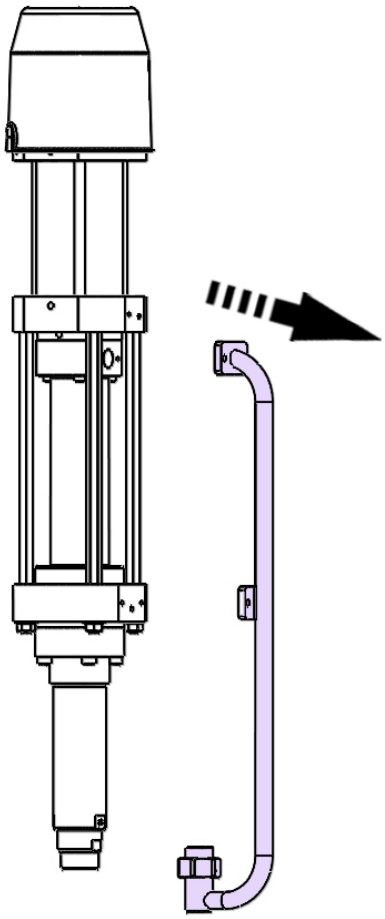
Tools needed

41

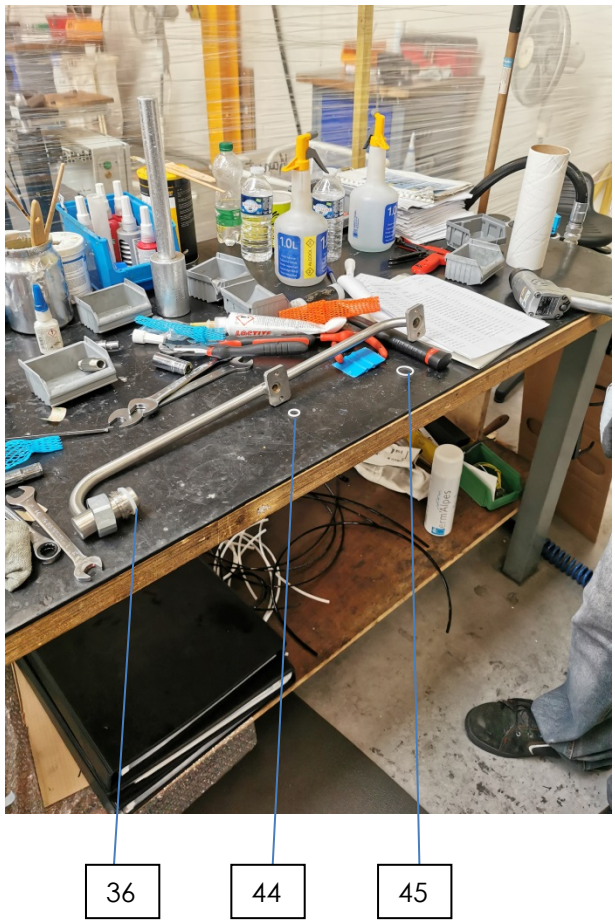


✓ Unscrew the 4 M 6 x 6 SHC screws from the fluid tube (47) using a 5 mm Allen wrench.

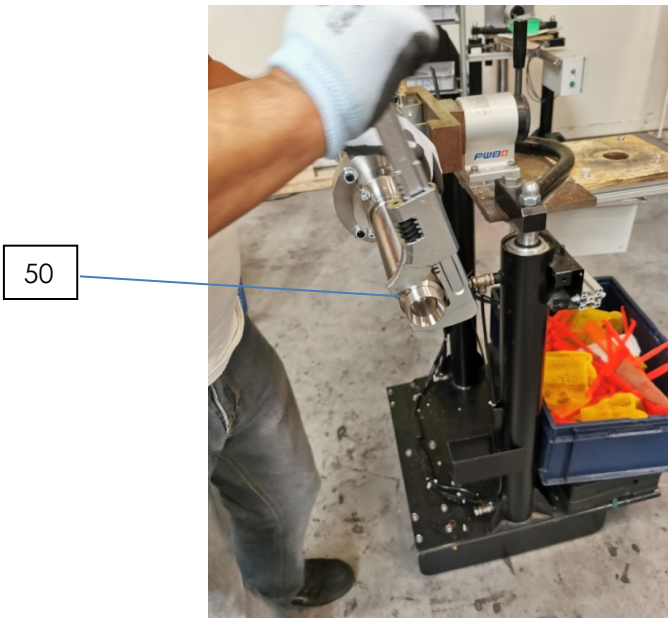
Tools needed **5**



✓ Remove the fluid tube (47) and the nut.



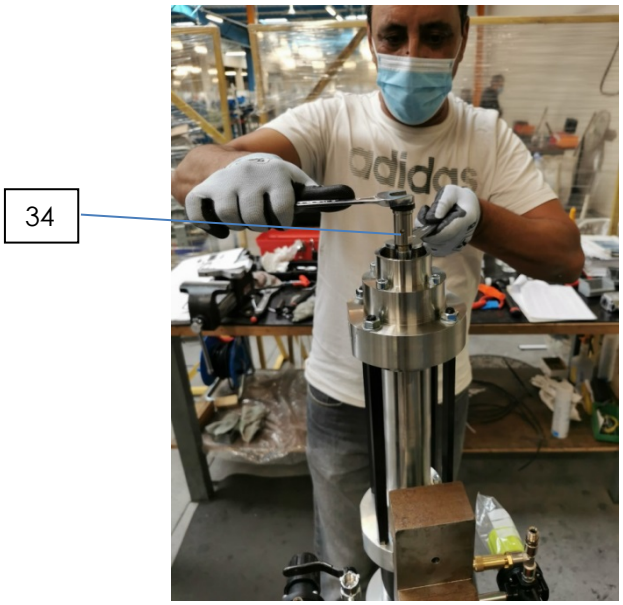
✓ Remove and replace the seals (36, 44 and 45).



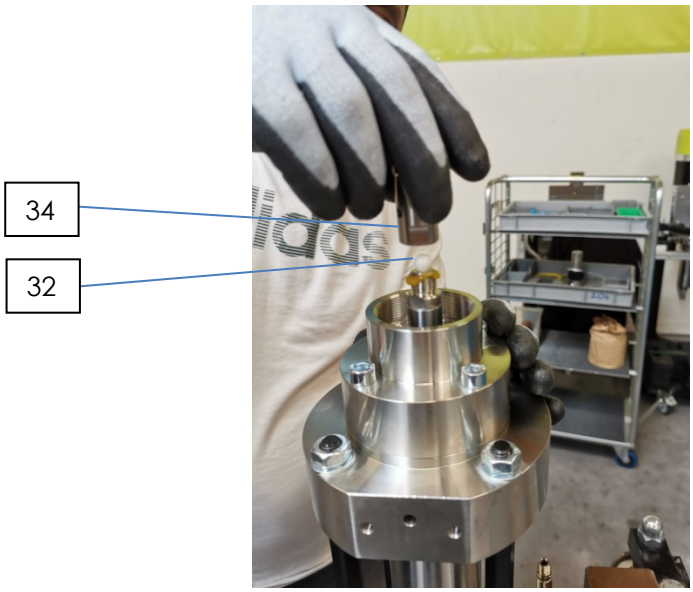
✓ Unscrew the suction valve (50) with a 41 mm wrench.

✓ Unscrew the cylinder (27) with a 50 mm wrench.

Tools needed **41**  **50** 



✓ Unscrew the exhaust valve (34) with an 18 mm open-end wrench and lock the piston with a 16 mm wrench.

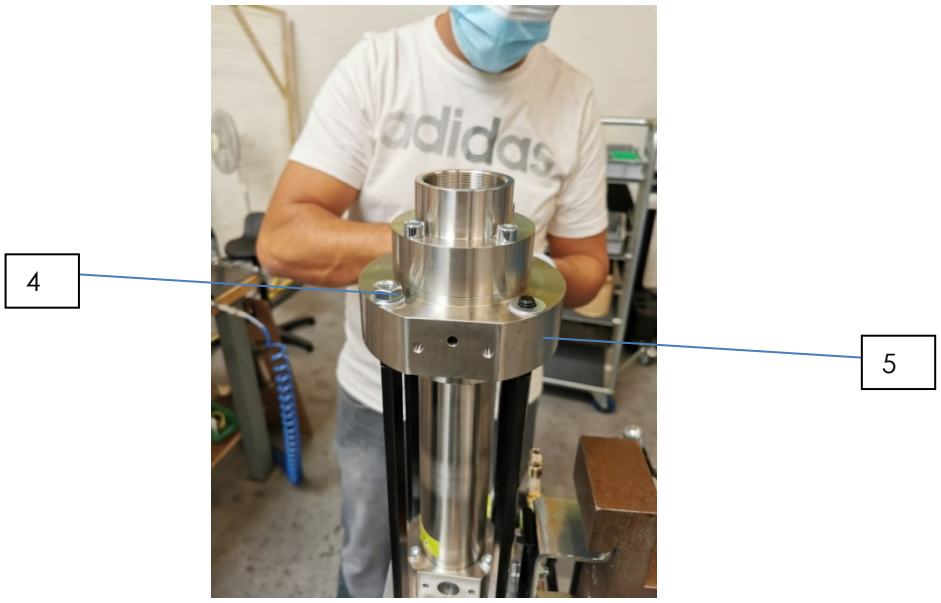


✓ Remove the exhaust valve (34) and the ball (32).

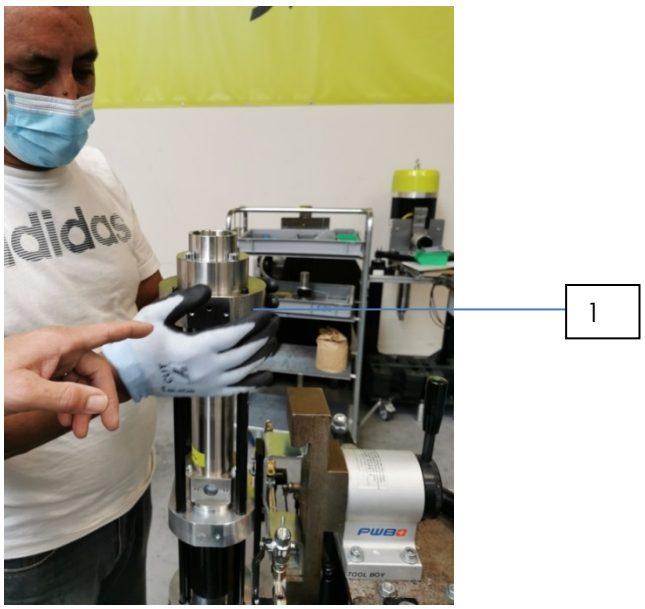
Tools needed

16 

18 



- ✓ Unscrew and remove the 4 nuts (4) using a 17 mm socket wrench.
- ✓ Remove the washers (5).



- ✓ Remove the suction flange (1).

Tools needed

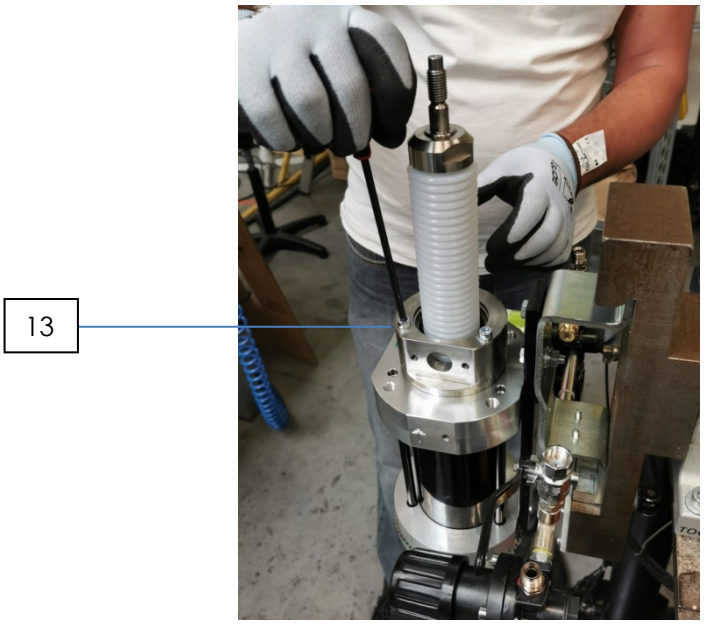
17

✓ Unscrew the 4 tie rods (3) using a 14 mm open-end wrench.

✓ Unscrew the piston (24) by positioning a 15 mm open-end wrench on the flat surfaces of the piston and an11 mm open-end wrench on the flat surfaces of the intermediate piston (11).

Tools needed

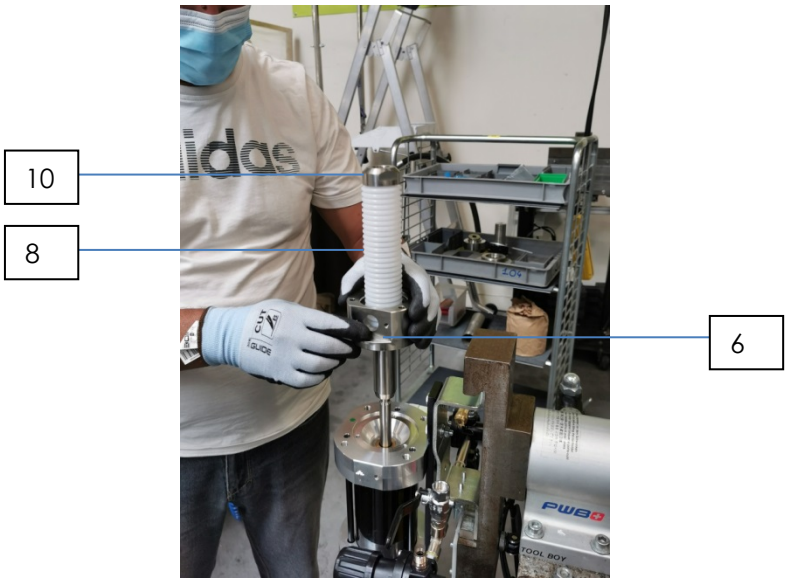
15  **14**  **11** 



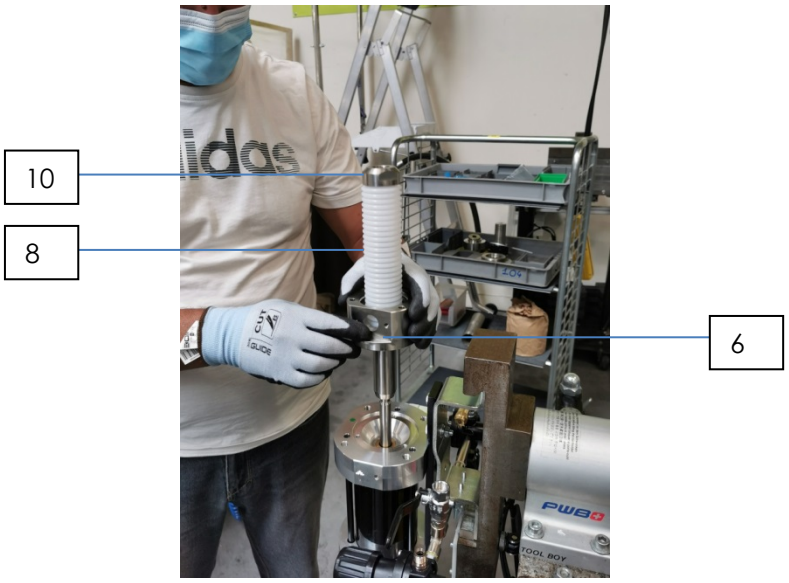
✓ Unscrew the 3 SHC screws M 6 x 60 (13) using a 5 mm Allen wrench.

✓ Loosen the skirt (10) by holding it with a 36 mm open-end wrench and loosening the intermediate piston (11) with an 11 mm open-end wrench.

Tools needed



✓ Remove the suction bearing assembly (6), bellows (8) and skirt (10).



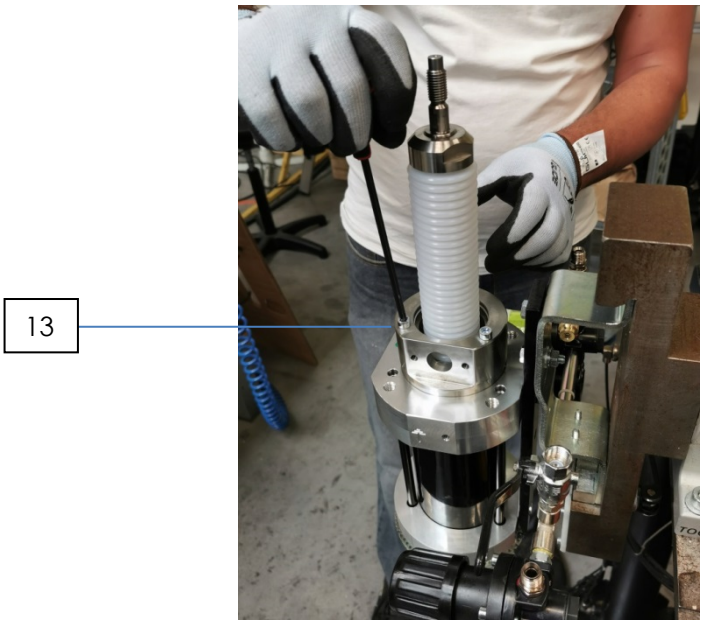
✓ Place the suction bearing assembly (6), bellows (8) and skirt (10) on the intermediate piston (11).

✓ Tighten the skirt (10) by holding it with a 36 mm open-end wrench and tightening the intermediate piston(11) with an 11 mm open-end wrench.

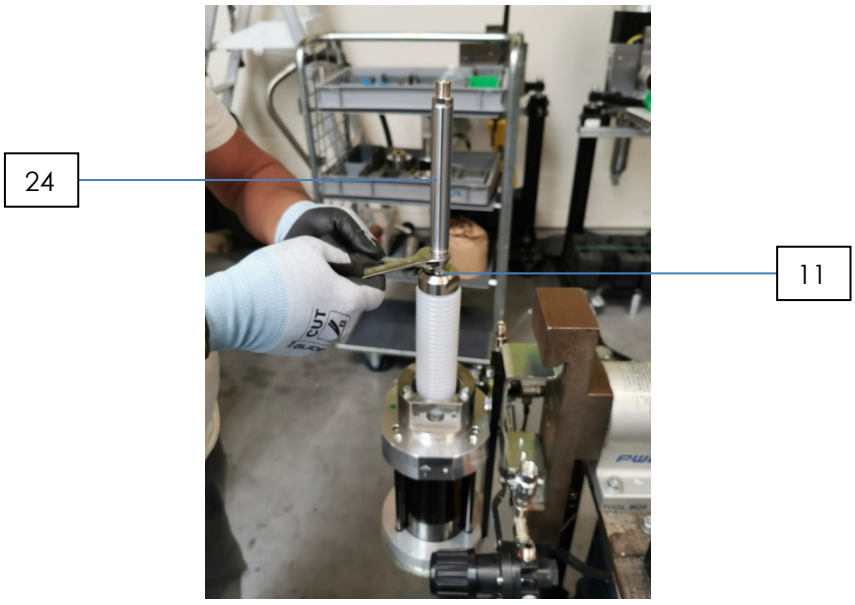
Tools needed

11 

36 



✓ Screw in the 3 M 6 x 60 (13) SHC screws (13) using a 5 mm Allen wrench.

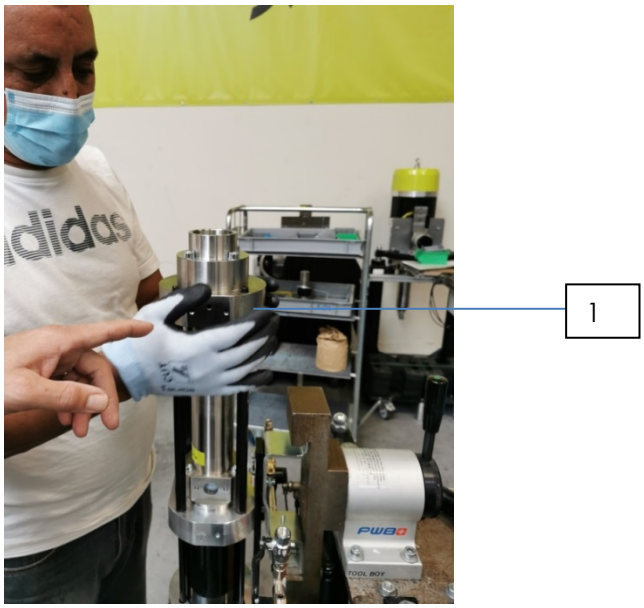


✓ Screw on the piston (24) by placing a 15 mm open-end wrench on the flats of the piston and an 11 mm open-end wrench on the flats of the intermediate piston (11).

Tools needed

5  15  11 

✓ Screw on the 4 tie rods (3) using a 14 mm open-end wrench.

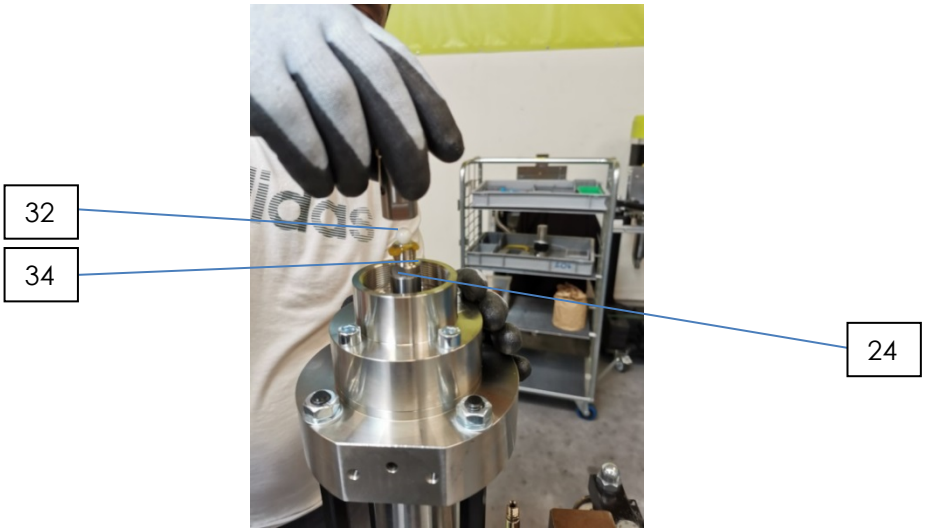


✓ Place the suction flange (1).

Tools needed

14

- ✓ Place the washers (5).
- ✓ Screw on the 4 nuts (4) using a 17 mm socket wrench.



- ✓ Place the ball (32) on the exhaust valve seat (34).
- ✓ Apply adhesive (Loctite 5772) to the piston thread (24).
- ✓ Position the exhaust valve (34) and screw it on manually at the contact.

Tools needed

17

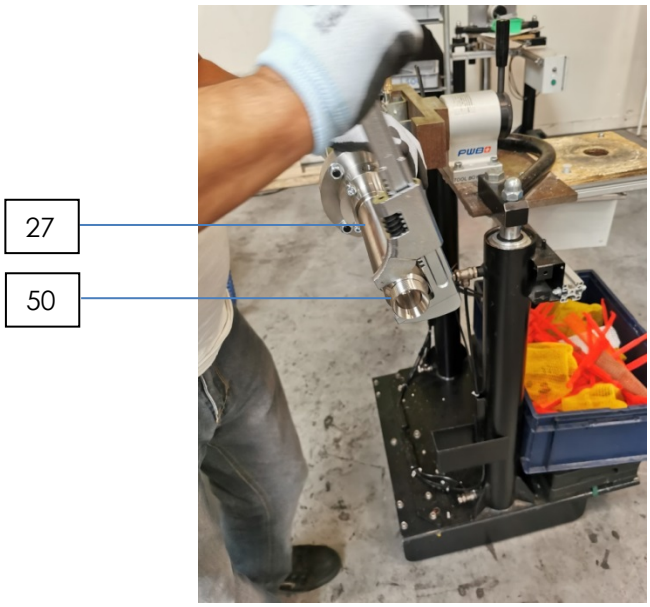
Loctite 5772

- ✓ Hold the piston with a 16 mm open-end wrench and tighten the exhaust valve (34) with an 18 mm open-end wrench.

- ✓ Place the cylinder (27) and screw it manually into contact.
- ✓ Tighten with a 50 mm open-end wrench.

Tools needed

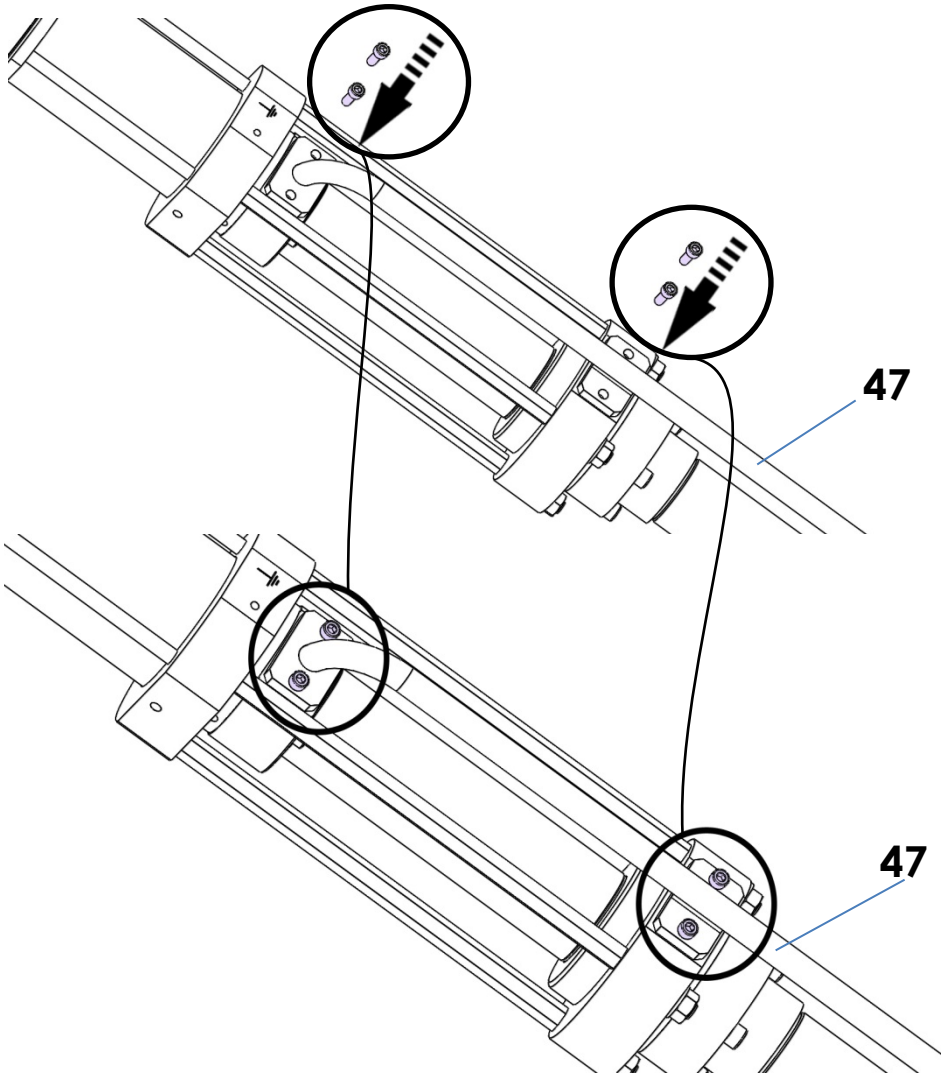
16  18  50 



- ✓ Place the suction valve (50) on the cylinder (27).
- ✓ Screw on the suction valve (50) with a 41 mm open-end wrench.

Tools needed

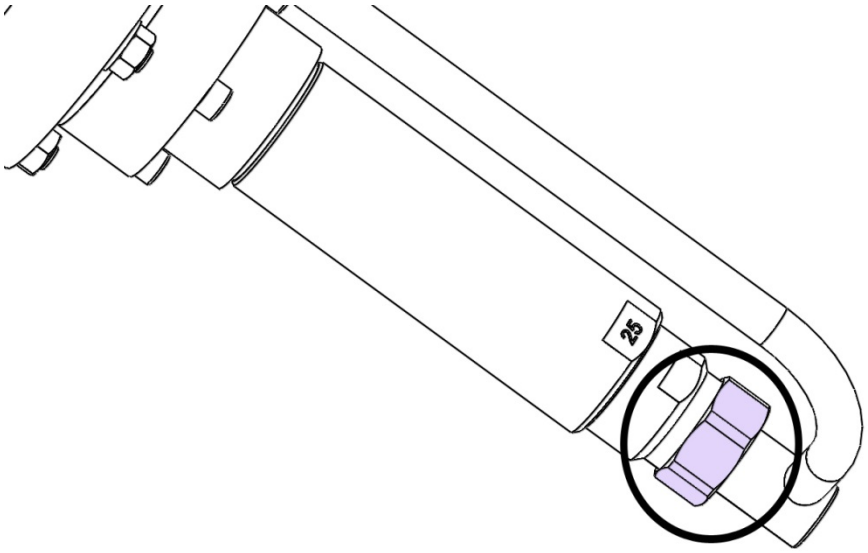
41



✓ Tighten the 4 M 6 x 6 SHC screws of the fluid tube (47) with a 5 mm Allen wrench.

Tools needed

5



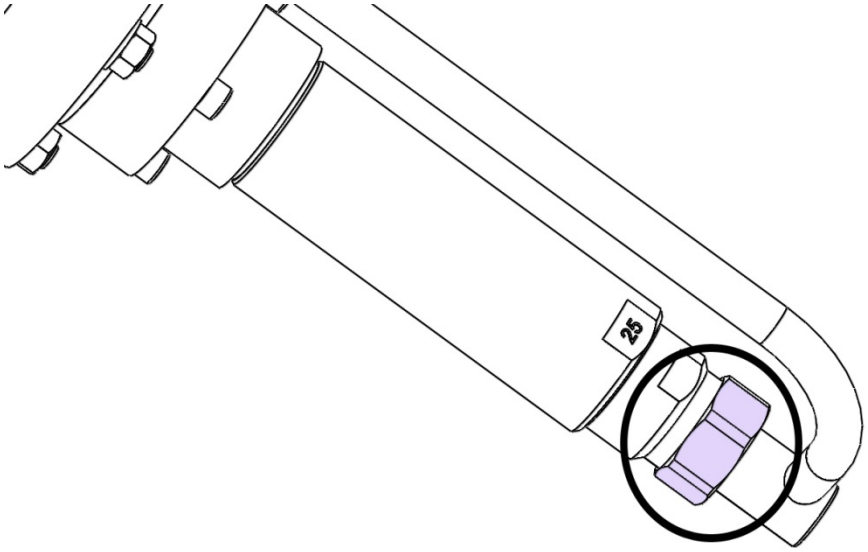
- ✓ Apply grease (anti-seize) to the threads of the suction valve (38).
- ✓ Screw the hexagon nut on the fluid section by hand and then with a 41 mm open-end wrench.

Tools needed

41

Anti-seize grease

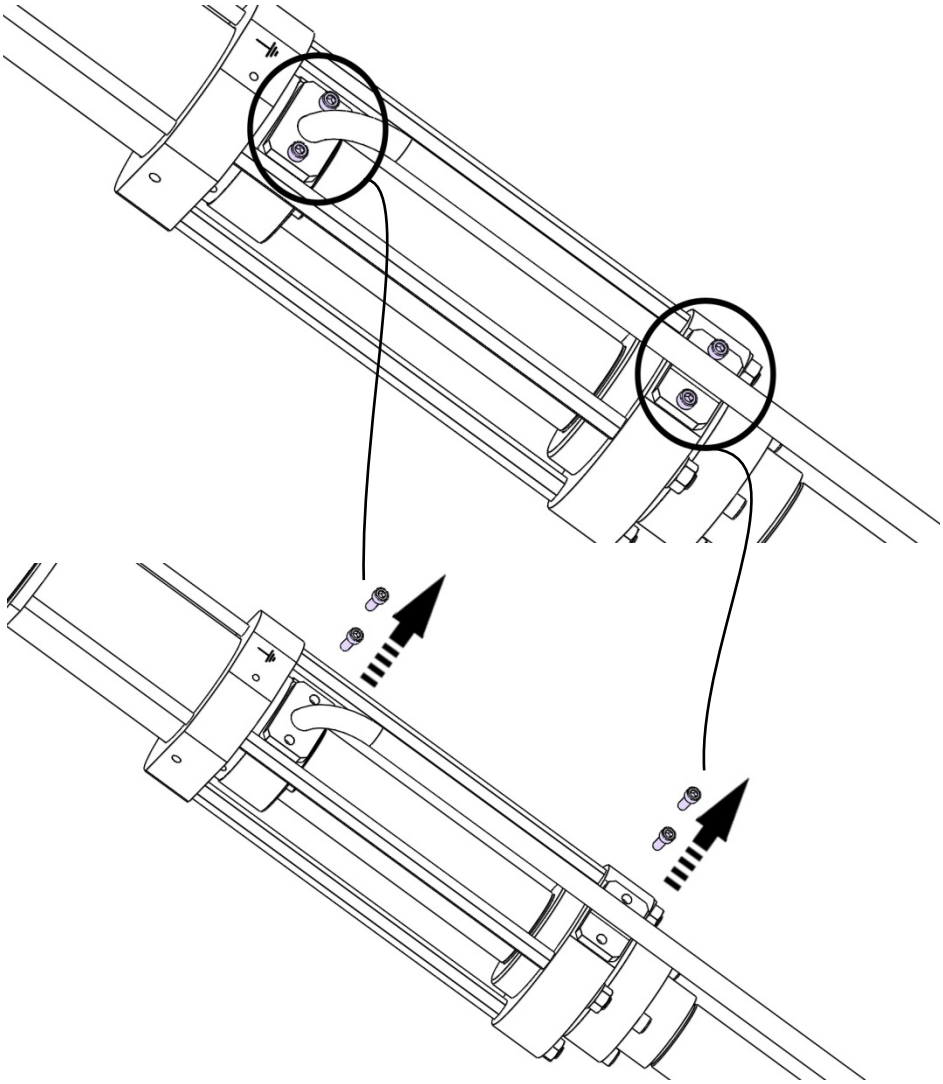
13.3 Changing the bellows



✓ Unscrew the hexagonal nut on the fluid section first with a 41 mm open-end wrench and then manually.

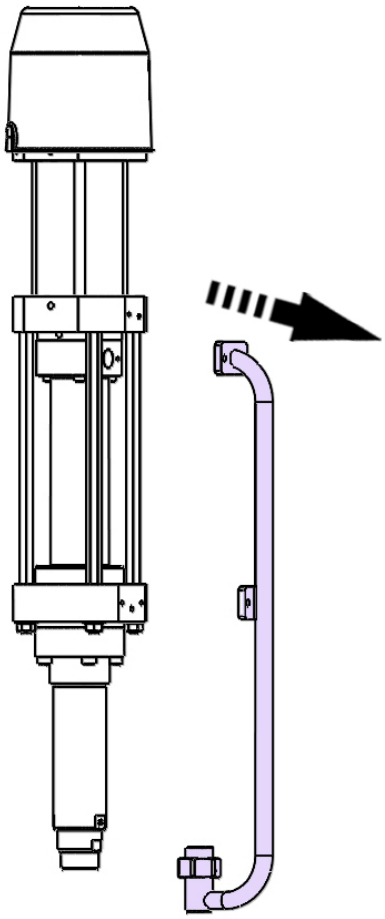
Tools needed

41

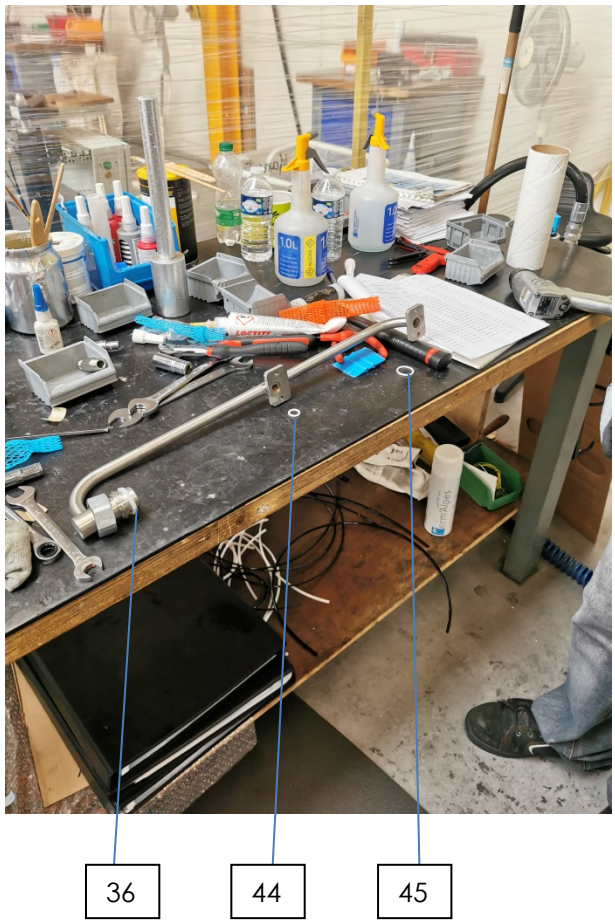


✓ Unscrew the 4 M 6 x 6 SHC screws from the fluid tube (47) using a 5 mm Allen wrench.

Tools needed **5**



✓ Remove the fluid tube (47) and the nut.

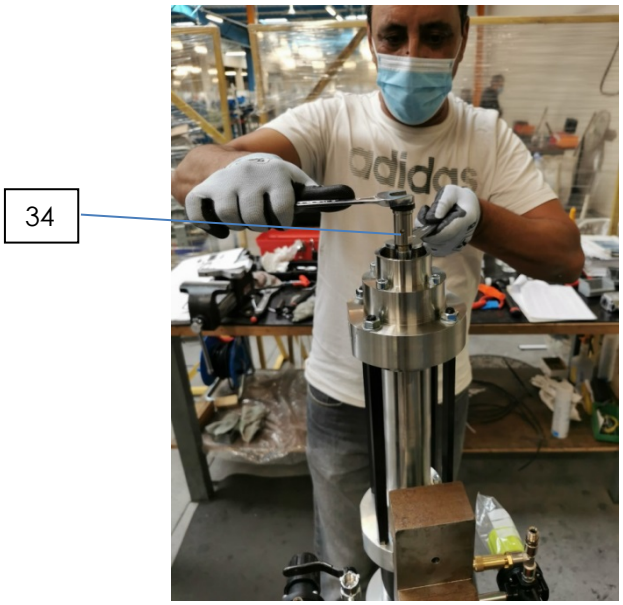


✓ Remove and replace the seals (36, 44 and 45).

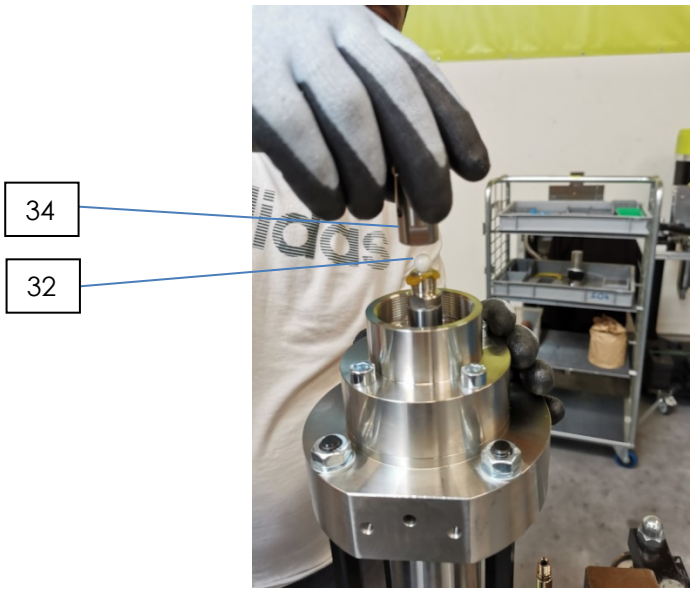
✓ Unscrew the cylinder (27) with a 50 mm wrench.

Tools needed

50



✓ Unscrew the exhaust valve (34) with an 18 mm open-end wrench and lock the piston with a 16 mm wrench.

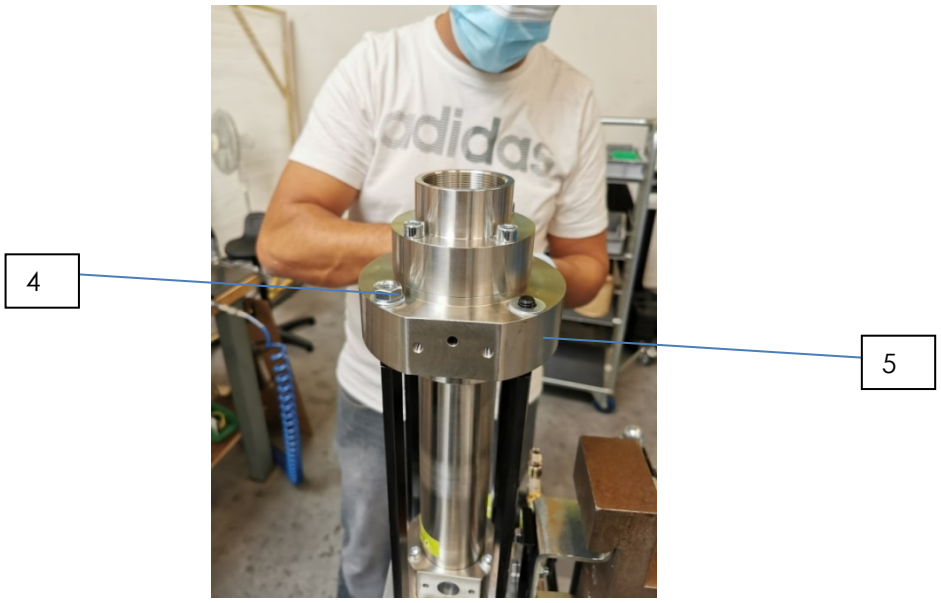


✓ Remove the exhaust valve (34) and the ball (32).

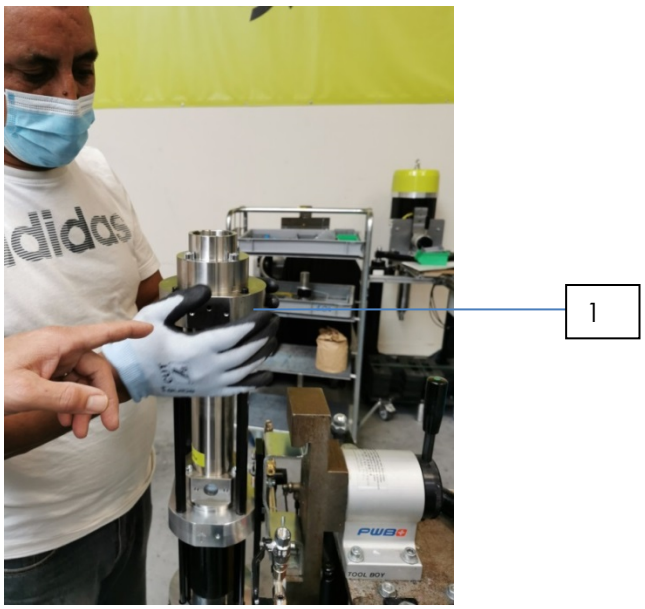
Tools needed

16 

18 



- ✓ Unscrew and remove the 4 nuts (4) using a 17 mm socket wrench.
- ✓ Remove the washers (5).



- ✓ Remove the suction flange (1).

Tools needed

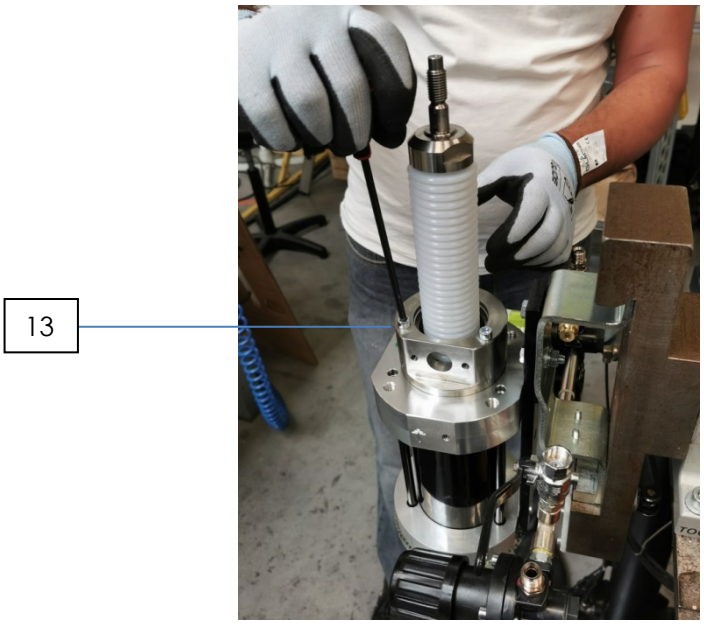
17

✓ Unscrew the 4 tie rods (3) using a 14 mm open-end wrench.

✓ Unscrew the piston (24) by positioning a 15 mm open-end wrench on the flat surfaces of the piston and an11 mm open-end wrench on the flat surfaces of the intermediate piston (11).

Tools needed

15  **14**  **11** 

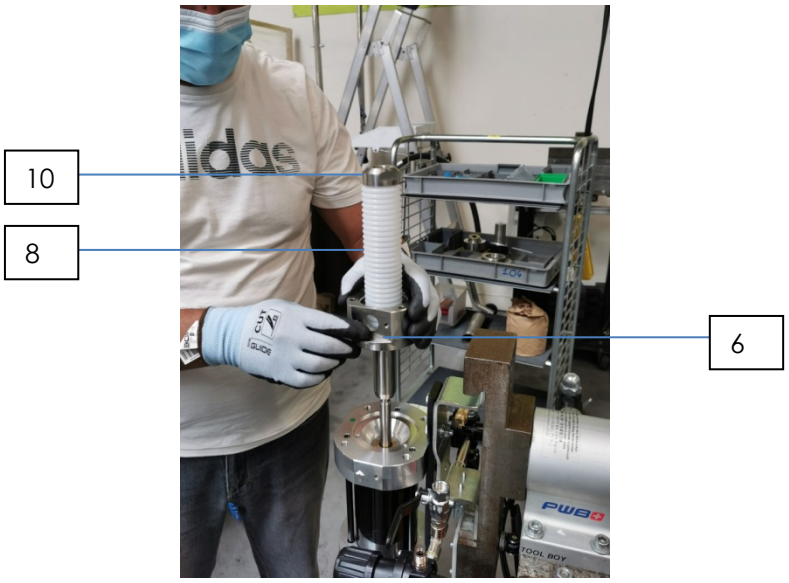


✓ Unscrew the 3 SHC screws M 6 x 60 (13) using a 5 mm Allen wrench.

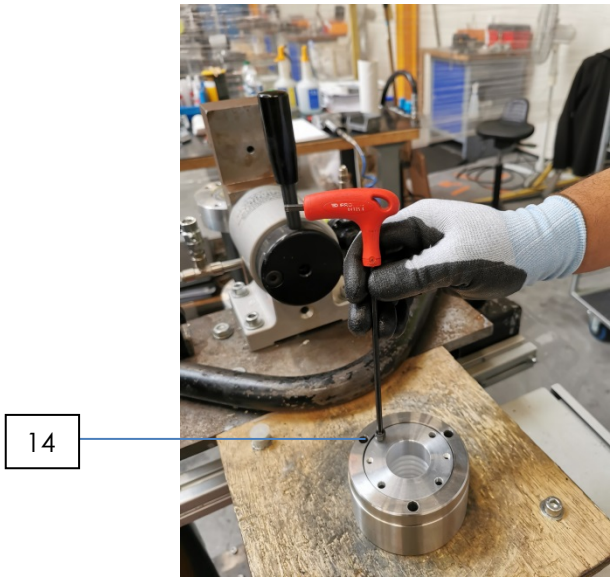
✓ Loosen the skirt (10) by holding it with a 36 mm open-end wrench and loosening the intermediate piston (11) with an 11 mm open-end wrench.

Tools needed

5  36  11 



✓ Remove the suction bearing assembly (6), bellows (8) and skirt (10).



✓ Unscrew the 4 screws (14) using a 4 mm Allen wrench.

Tools needed

4 

✓ Remove the bellows assembly (8) bellows flange (7) and skirt (10).

✓ Remove the bellows flange (7).

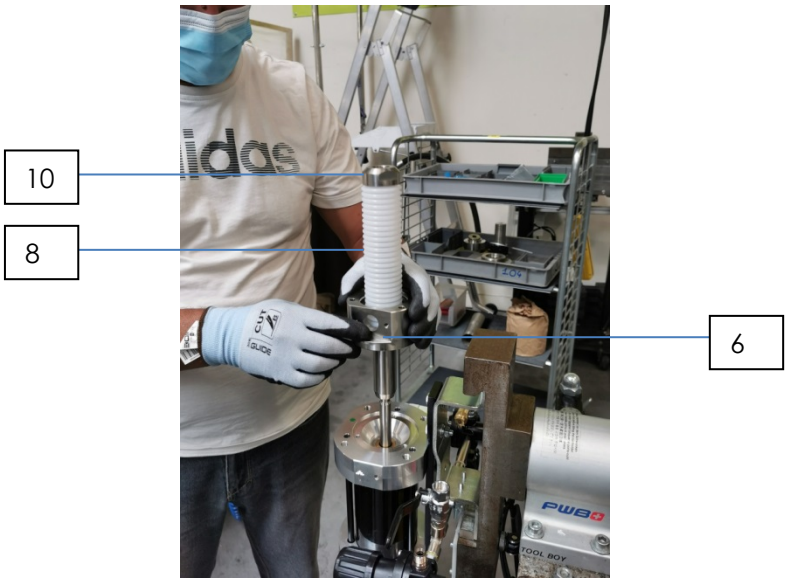
✓ Remove the seal (12) from the suction bearing (6) with a flat screwdriver.

Tools needed

✓ Place the seal (12) in the suction bearing housing (6).

✓ Place the bellows assembly (8) bellows flange (7) and skirt (10) in the suction bearing (6).

✓ Using a 4 mm Allen wrench, screw in the 4 screws (14) one by one so that the bellows flange (7) comes to a stop.

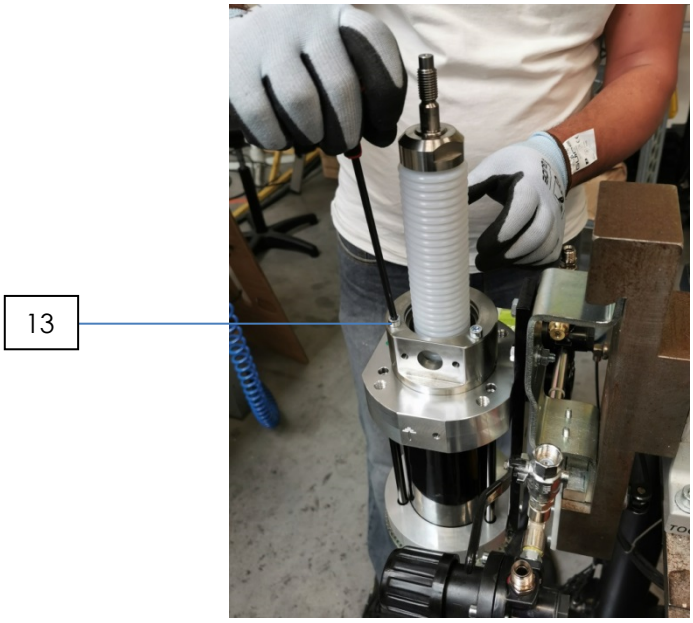


✓ Place the suction bearing (6), bellows (8) and skirt (10) on the intermediate piston (11).

Tools needed

4

✓ Tighten the skirt (10) by holding it with a 36 mm open-end wrench and tightening the intermediate piston(11) with an 11 mm open-end wrench.



✓ Screw in the 3 M 6 x 60 (13) SHC screws (13) using a 5 mm Allen wrench.

Tools needed

11 

5 

✓ Screw on the piston (24) by placing a 15 mm open-end wrench on the flats of the piston and an 11 mm open-end wrench on the flats of the intermediate piston (11).

✓ Screw on the 4 tie rods (3) using a 14 mm open-end wrench.

Tools needed

15  **11**  **14** 

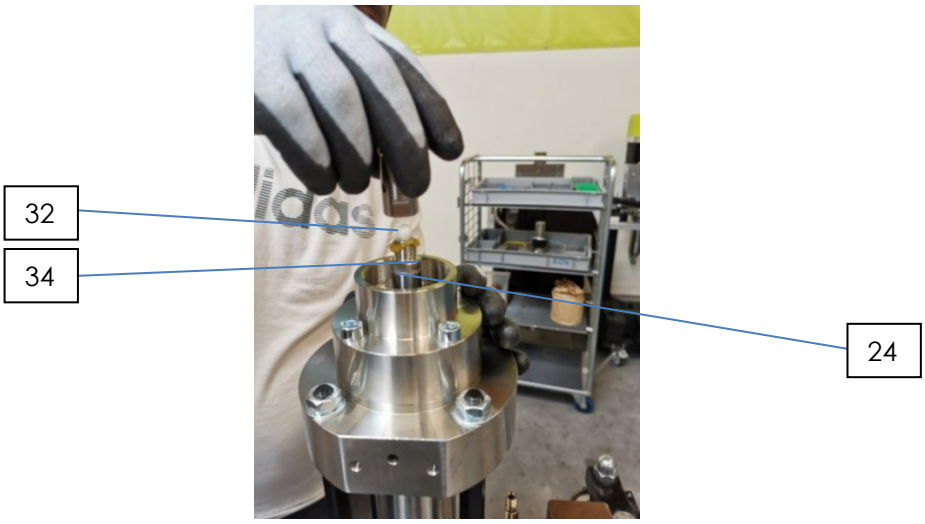
✓ Place the suction flange (1).

✓ Place the washers (5).

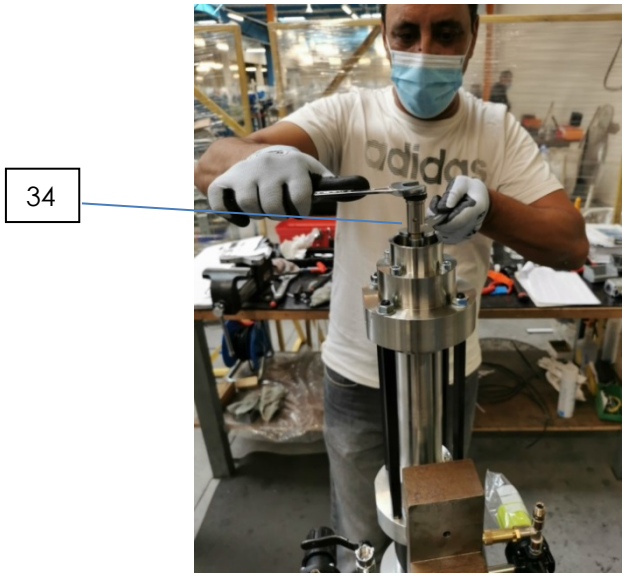
✓ Screw on the 4 nuts (4) using a 17 mm socket wrench.

Tools needed

17



- ✓ Place the ball (32) on the exhaust valve seat (34).
- ✓ Apply adhesive (Loctite 5772) to the piston thread (24).
- ✓ Place the exhaust valve (34) and screw it on manually at the contact.



- ✓ Hold the piston with a 16 mm open-end wrench and tighten the exhaust valve (34) with an 18 mm open-end wrench.

Tools needed

Loctite 5772

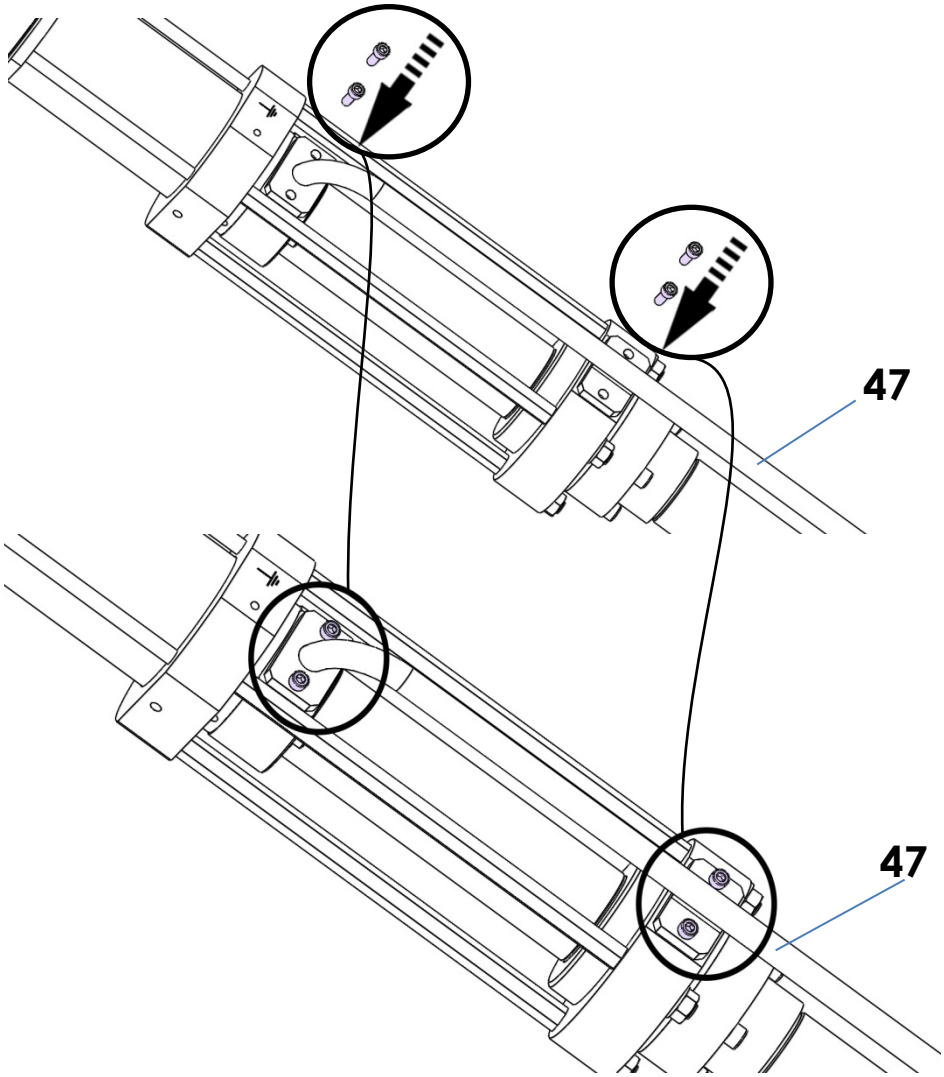
16 

18 

- ✓ Place the cylinder (27) and screw it manually into contact.
- ✓ Tighten with a 50 mm open-end wrench.

Tools needed

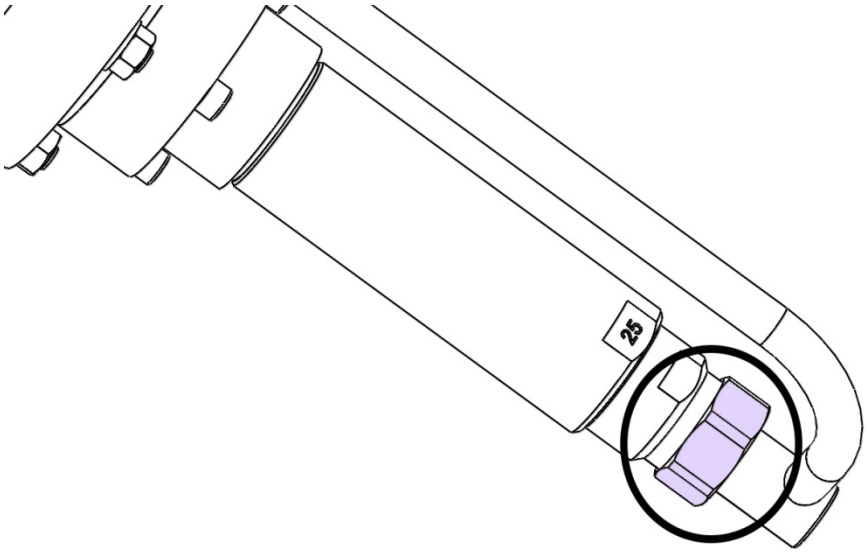
41 



✓ Tighten the 4 M 6 x 6 SHC screws of the fluid tube (47) with a 5 mm Allen wrench.

Tools needed

5



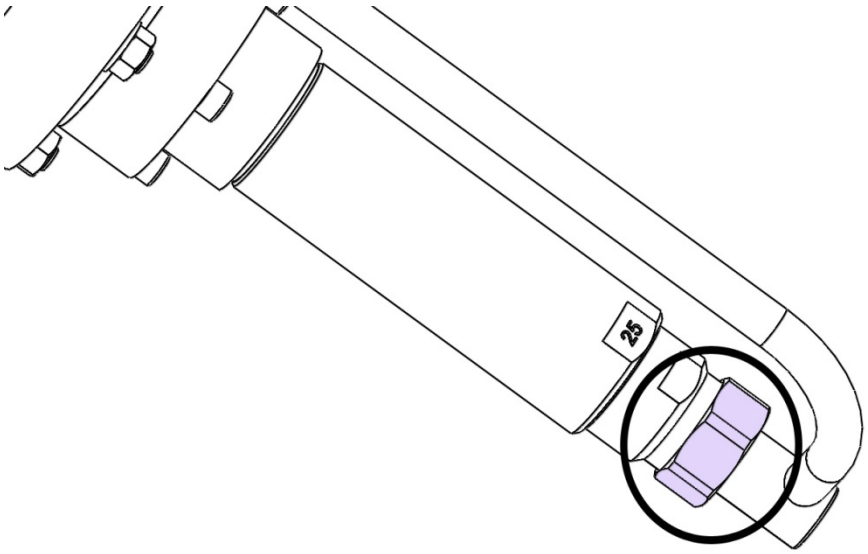
- ✓ Apply grease (anti-seize) to the threads of the suction valve (38).
- ✓ Screw the hexagon nut on the fluid section by hand and then with a 41 mm open-end wrench.

Tools needed

41

Anti-seize grease

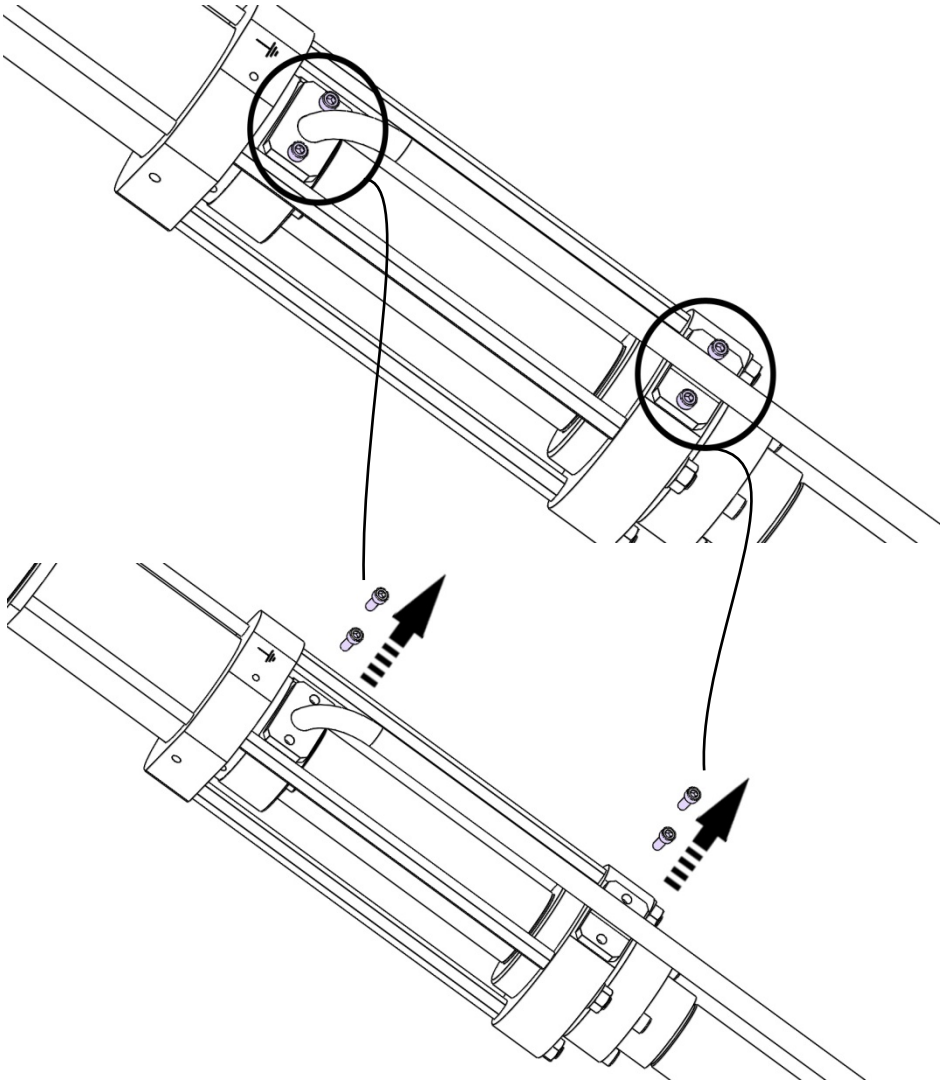
13.4 Dismantling / Reassembling the suction valve



✓ Unscrew the hexagonal nut on the fluid section first with a 41 mm open-end wrench and then manually.

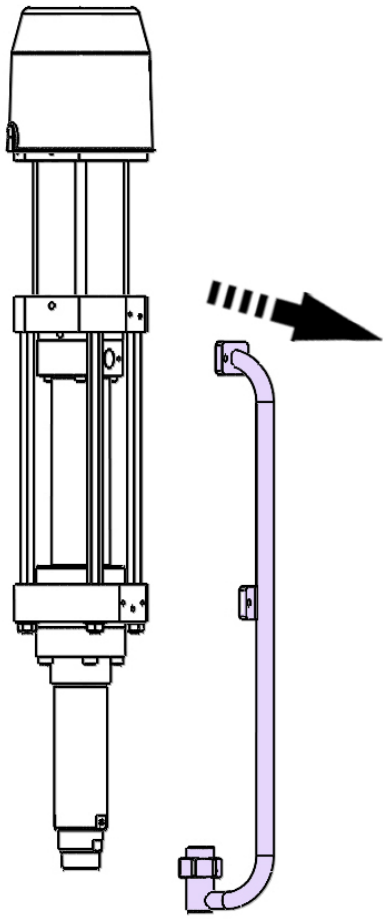
Tools needed

41

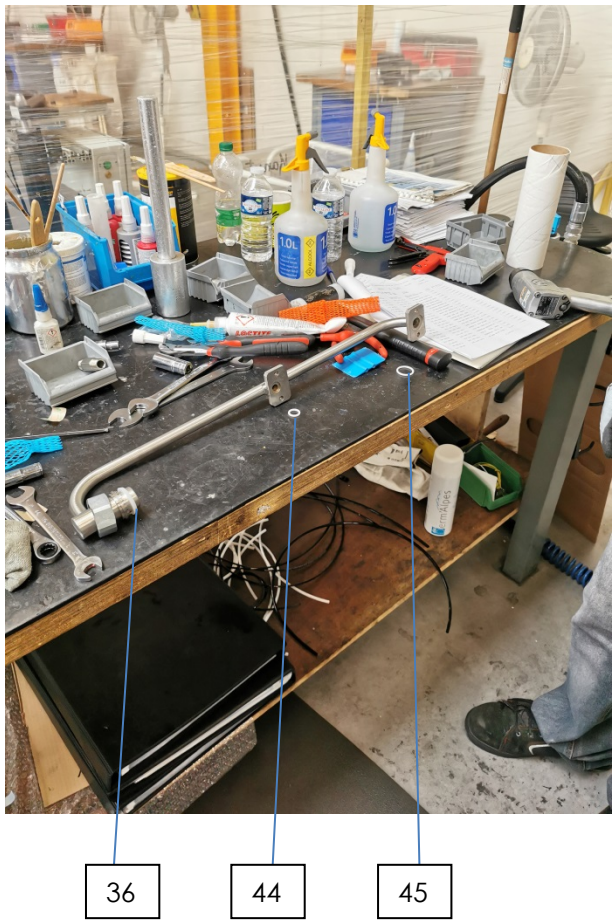


✓ Unscrew the 4 M 6 x 6 SHC screws from the fluid tube (47) using a 5 mm Allen wrench.

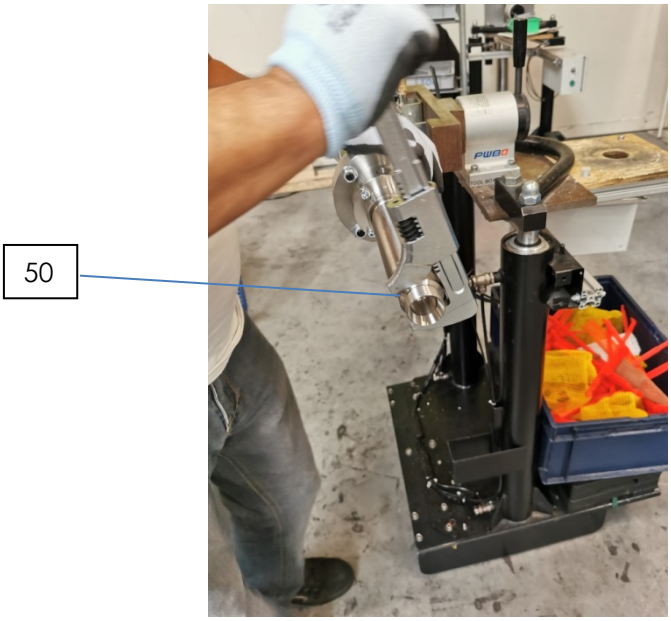
Tools needed **5**



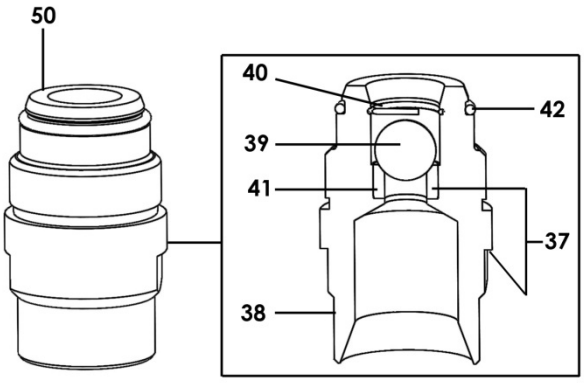
✓ Remove the fluid tube (47) and the nut.



✓ Remove and replace the seals (36, 44 and 45).



✓ Unscrew the suction valve (50) with a 41 mm wrench.



✓ Remove the gasket (42) with a flat screwdriver.

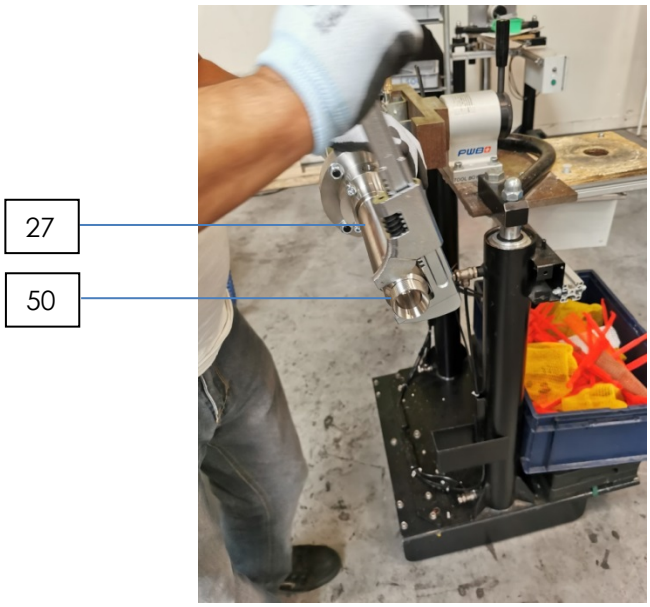
✓ Remove the locking ring (40) with a flat screwdriver.

✓ Remove the ball (39).

✓ Clean the parts, change the gasket (42) and reassemble the ball (39) and the retaining ring (40).

Tools needed

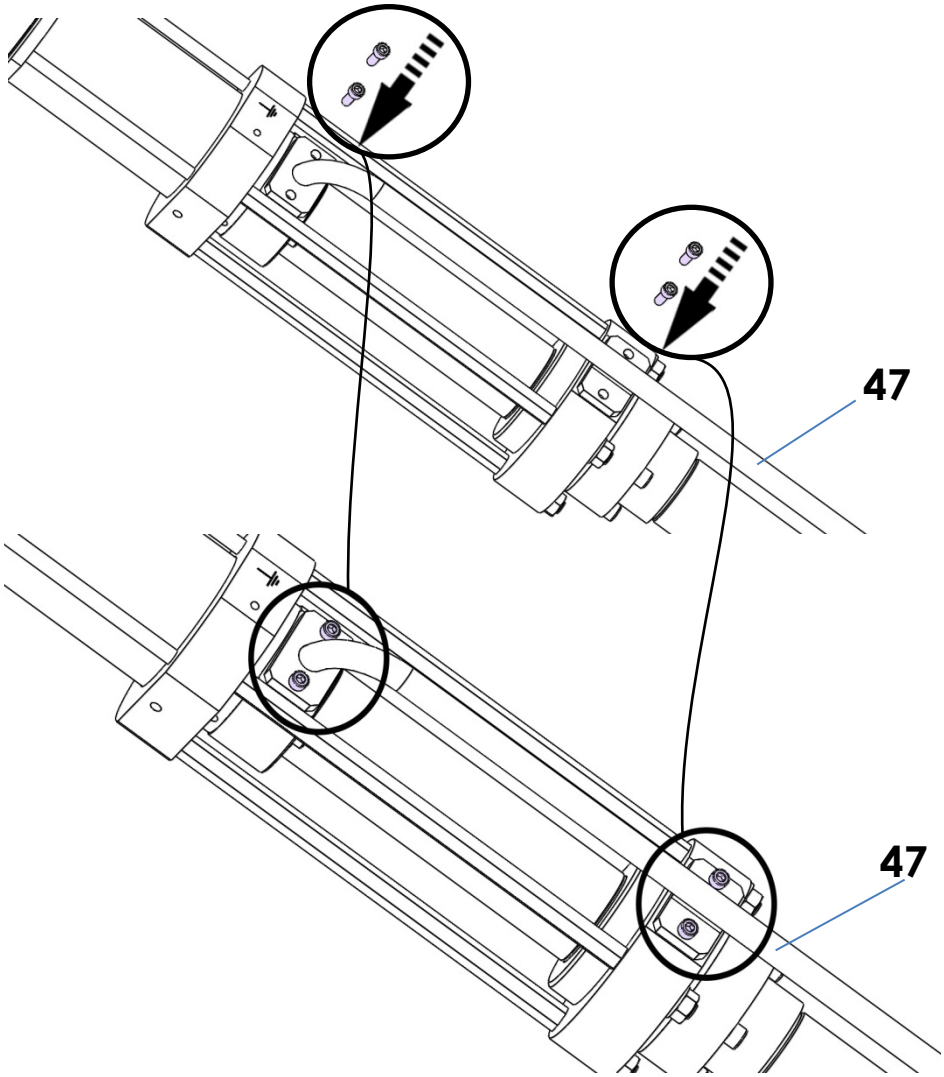
41



- ✓ Place the suction valve (50) on the cylinder (27).
- ✓ Screw on the suction valve (50) with a 41 mm open-end wrench.

Tools needed

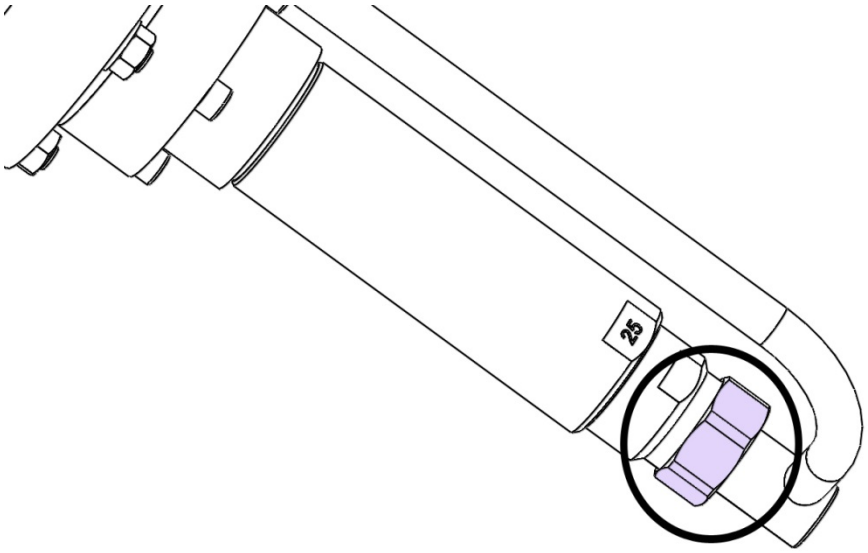
41



✓ Tighten the 4 M 6 x 6 SHC screws of the fluid tube (47) with a 5 mm Allen wrench.

Tools needed

5



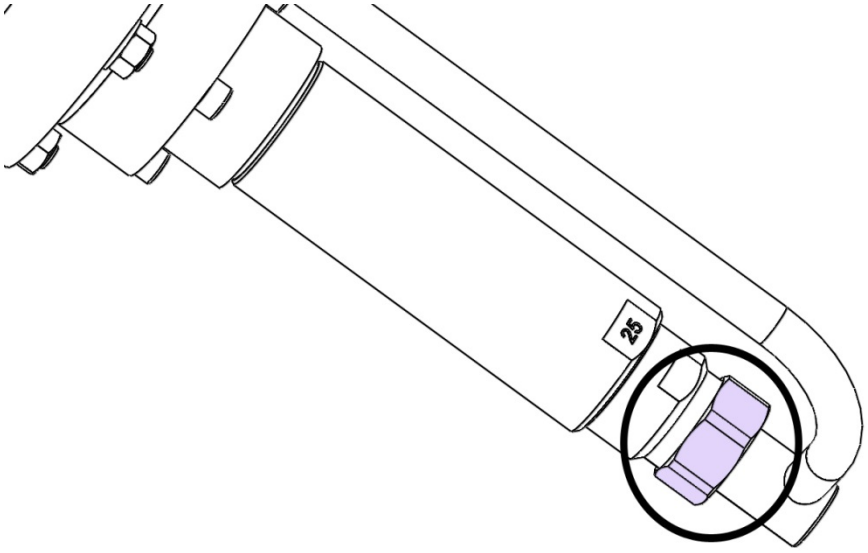
- ✓ Apply grease (anti-seize) to the threads of the suction valve (38).
- ✓ Screw the hexagon nut on the fluid section by hand and then with a 41 mm open-end wrench.

Tools needed

41

Anti-seize grease

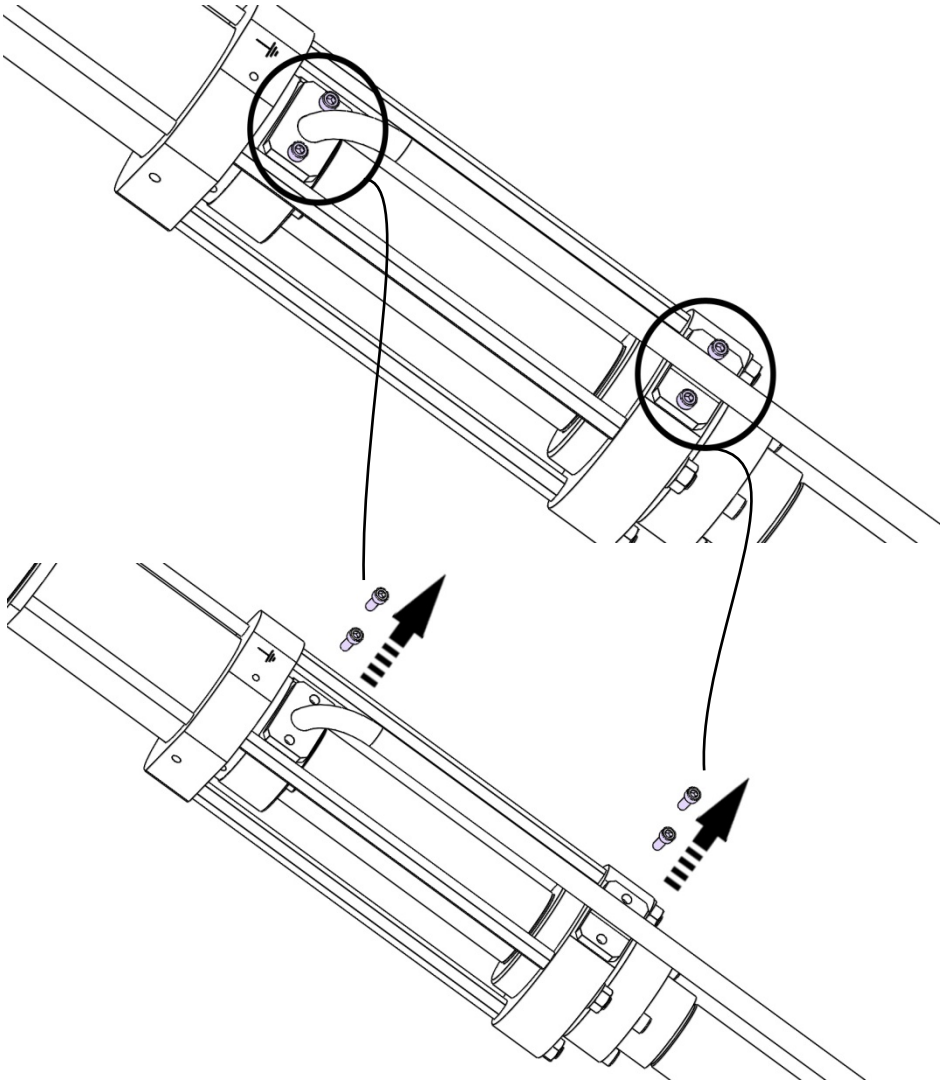
13.5 Disassembly / Reassembly of the exhaust valve



✓ Unscrew the hexagonal nut on the fluid section first with a 41 mm open-end wrench and then manually.

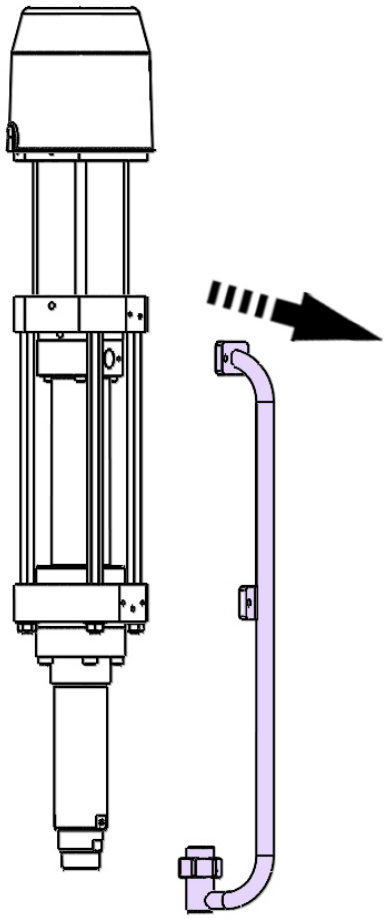
Tools needed

41

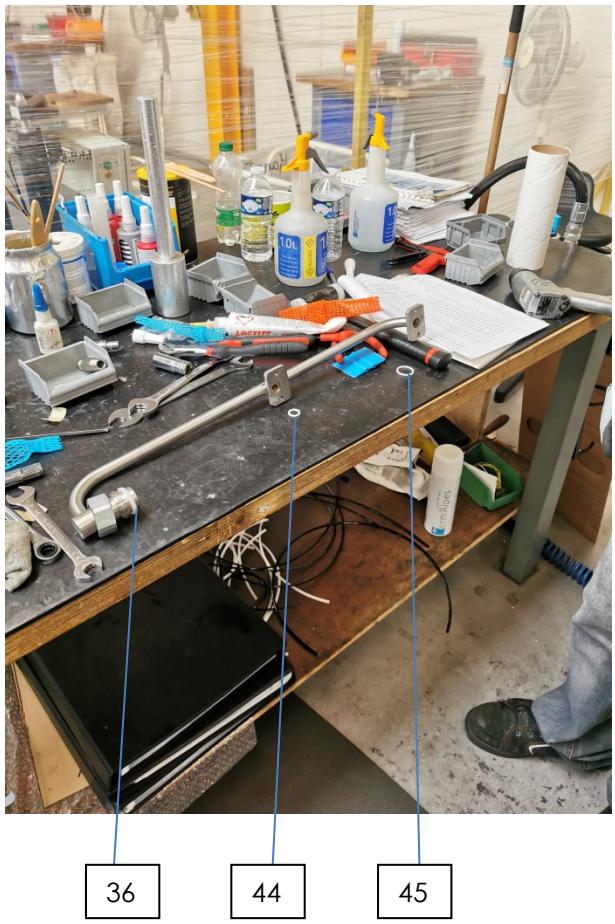


✓ Unscrew the 4 M 6 x 6 SHC screws from the fluid tube (47) using a 5 mm Allen wrench.

Tools needed **5**



✓ Remove the fluid tube (47) and the nut.



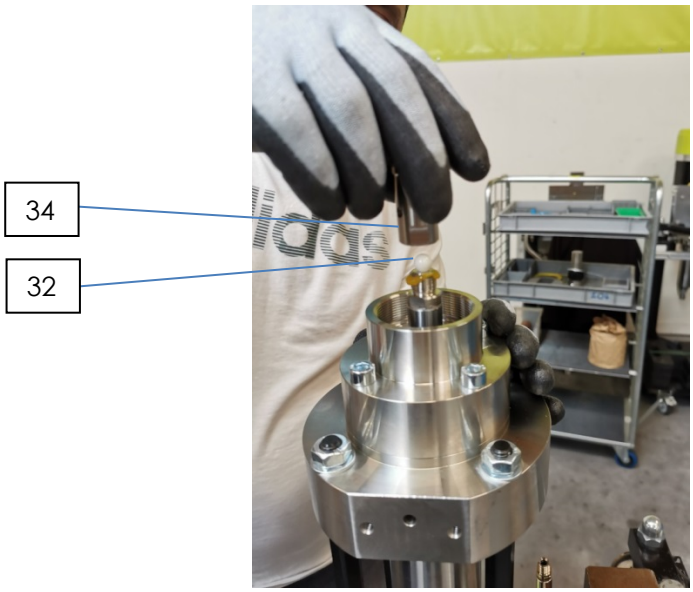
✓ Remove and replace the seals (36, 44 and 45).

✓ Unscrew the cylinder (27) with a 50 mm wrench.

Tools needed

50

✓ Unscrew the exhaust valve (34) with an 18 mm open-end wrench and lock the piston with a 16 mm wrench.

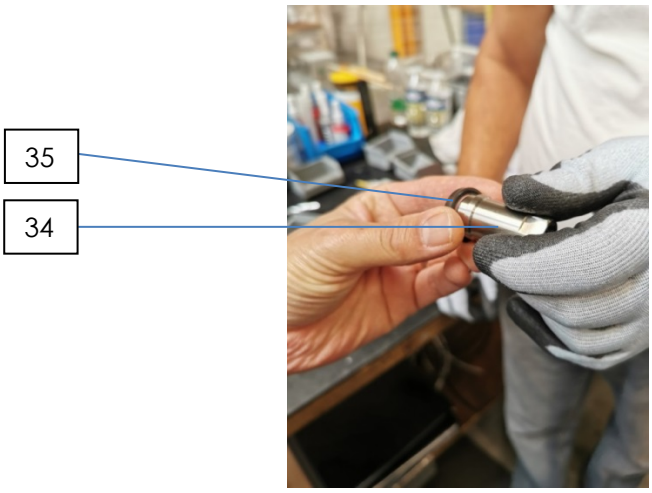


✓ Remove the exhaust valve (34) and the ball (32).

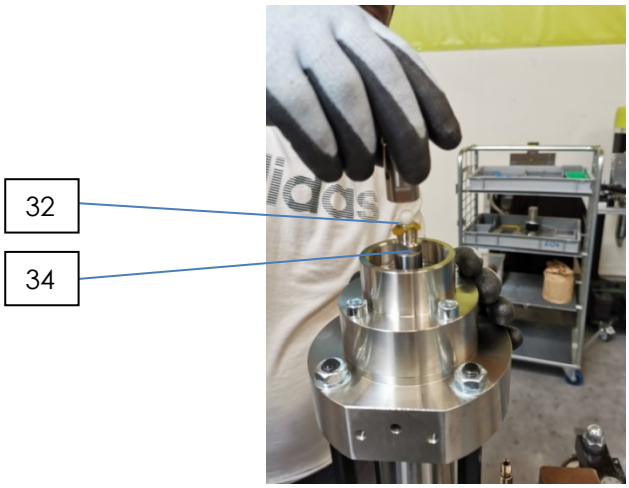
Tools needed

16 

18 



- ✓ Remove the seal (35).
- ✓ Clean the parts.
- ✓ Replace the seal (35), grease it (PTFE grease) and reinstall it on the exhaust valve (34).



- ✓ Place the ball (32) on the exhaust valve (34).
- ✓ Apply adhesive (Loctite 5772) to the piston thread (24).
- ✓ Place the exhaust valve (34) and screw it on manually at the contact.

Tools needed

PTFE grease

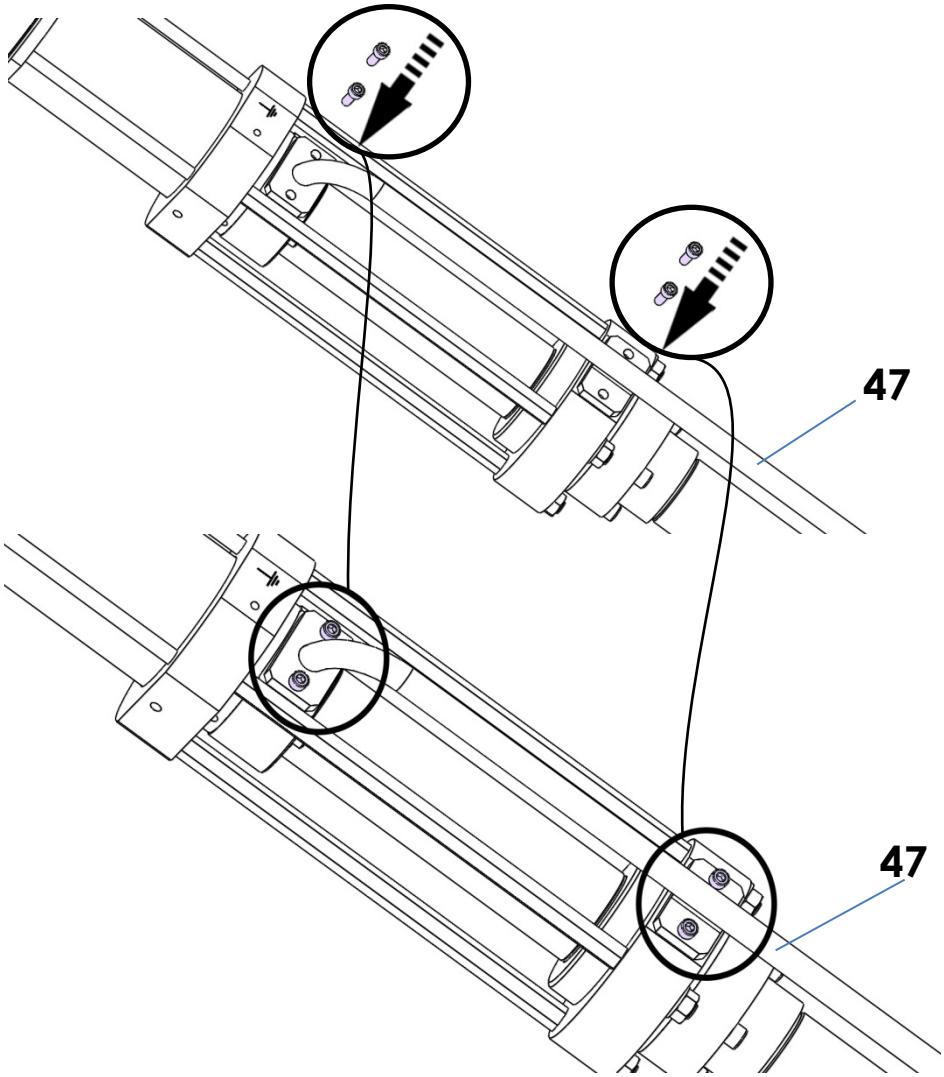
Loctite 5772

- ✓ Hold the piston with a 16 mm open-end wrench and tighten the exhaust valve (34) with an 18 mm open-end wrench.

- ✓ Place the cylinder(27) and screw it manually into contact.
- ✓ Tighten with a 50 mm open-end wrench.

Tools needed

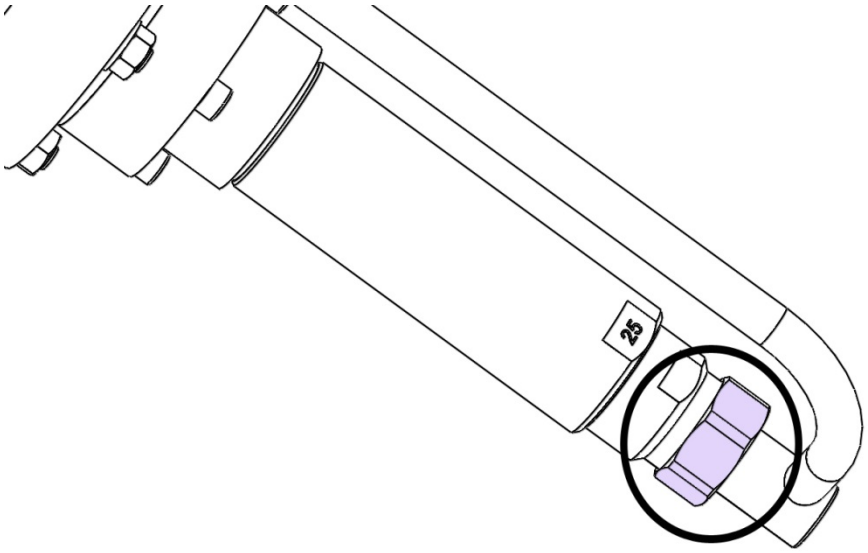
16  18  50 



✓ Tighten the 4 M 6 x 6 SHC screws of the fluid tube (47) with a 5 mm Allen wrench.

Tools needed

5



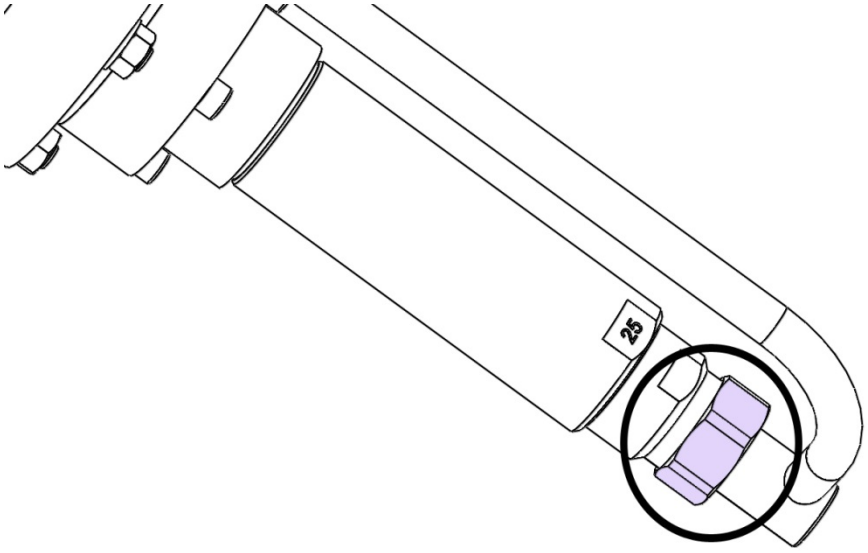
- ✓ Apply grease (anti-seize) to the threads of the suction valve (38).
- ✓ Screw the hexagon nut on the fluid section by hand and then with a 41 mm open-end wrench.

Tools needed

41

Anti-seize grease

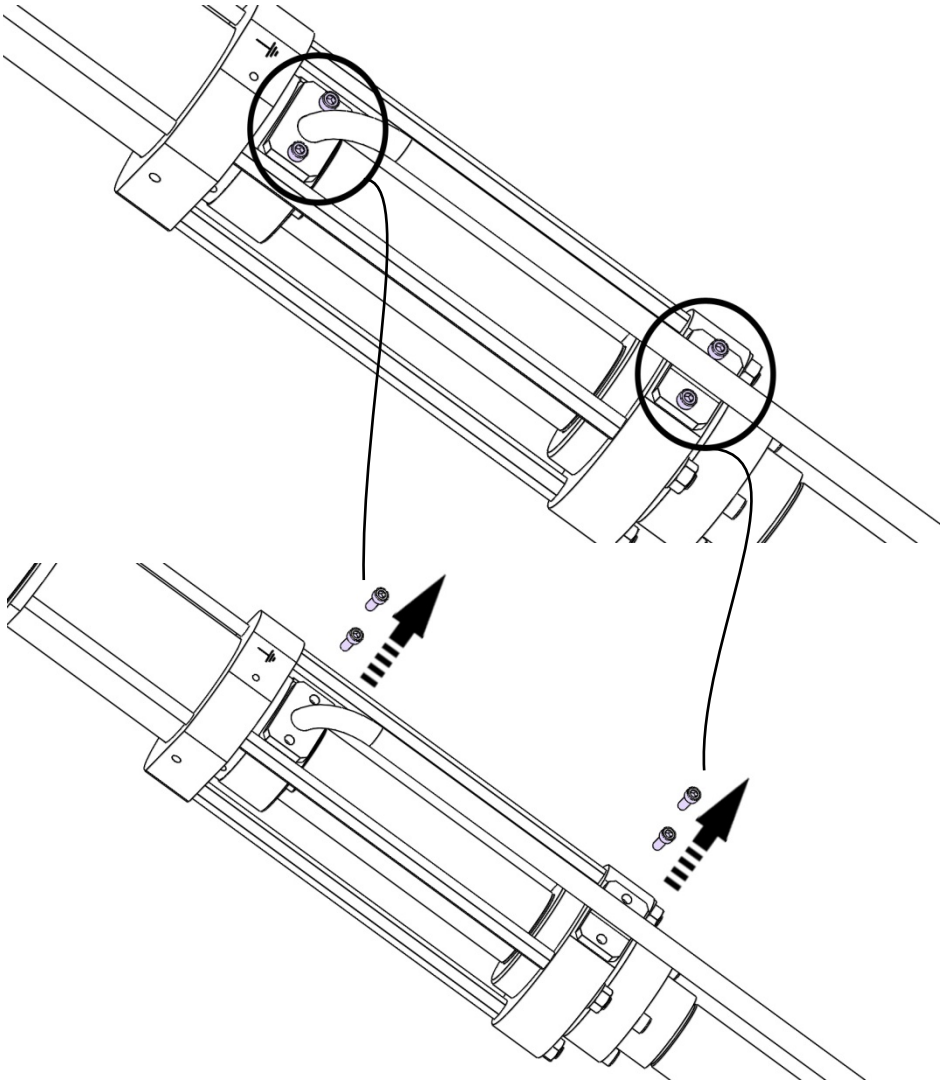
13.6 Disassembly / Reassembly of the exhaust flange



✓ Unscrew the hexagonal nut on the fluid section first with a 41 mm open-end wrench and then manually.

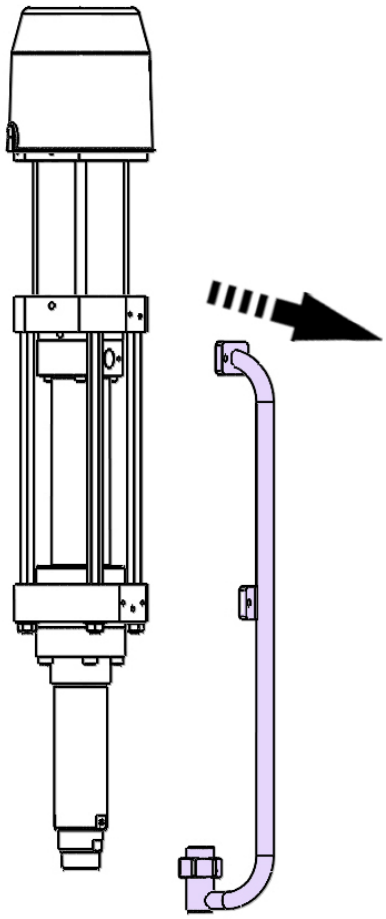
Tools needed

41

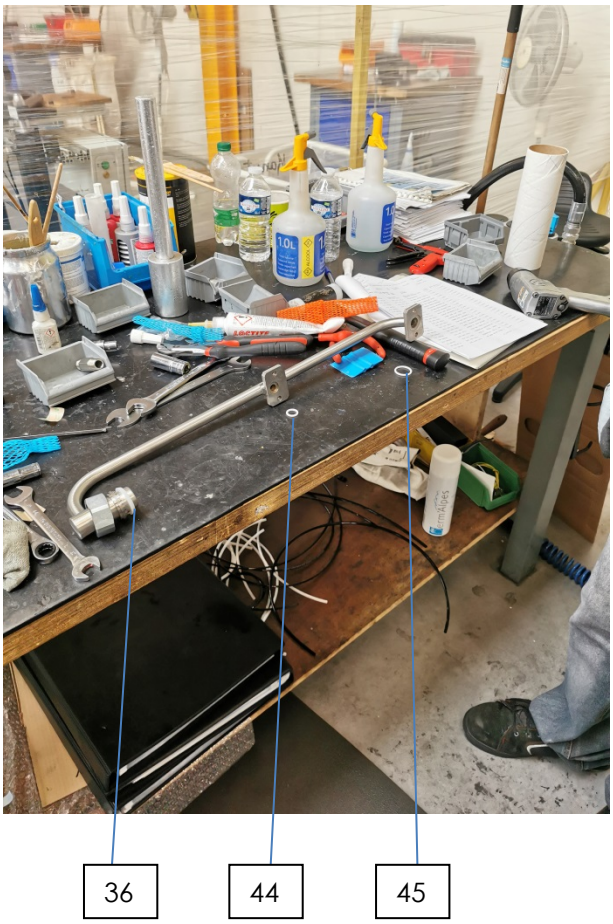


✓ Unscrew the 4 M 6 x 6 SHC screws from the fluid tube (47) using a 5 mm Allen wrench.

Tools needed **5**



✓ Remove the fluid tube (47) and the nut.



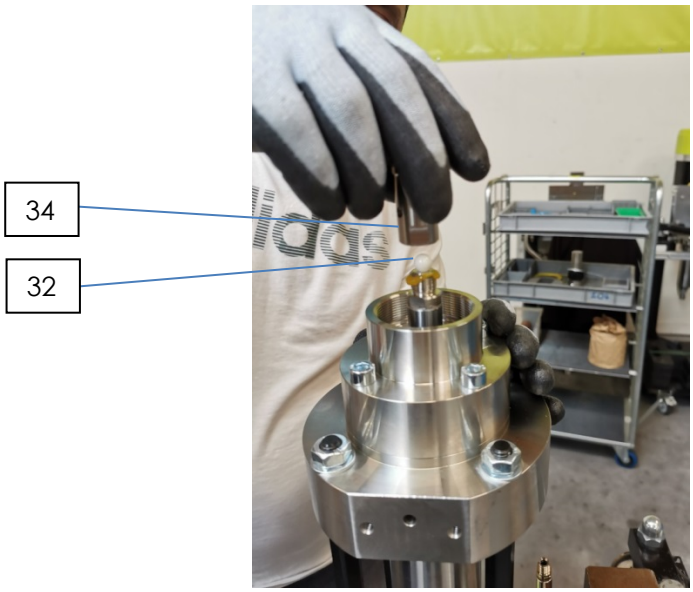
✓ Remove and replace the seals (36, 44 and 45).

✓ Unscrew the cylinder (27) with a 50 mm wrench.

Tools needed

50 

✓ Unscrew the exhaust valve (34) with an 18 mm open-end wrench and lock the piston with a 16 mm wrench.

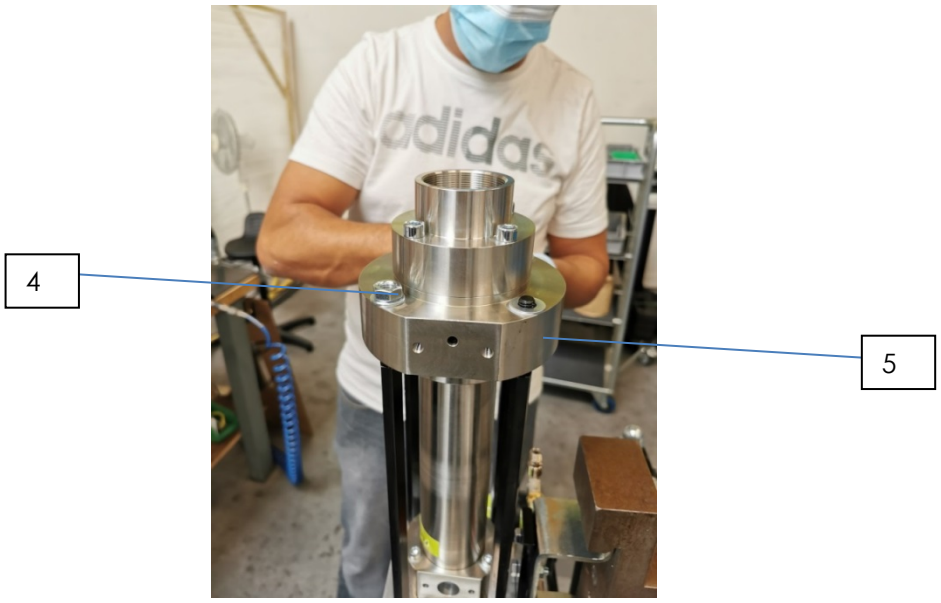


✓ Remove the exhaust valve (34) and the ball (32).

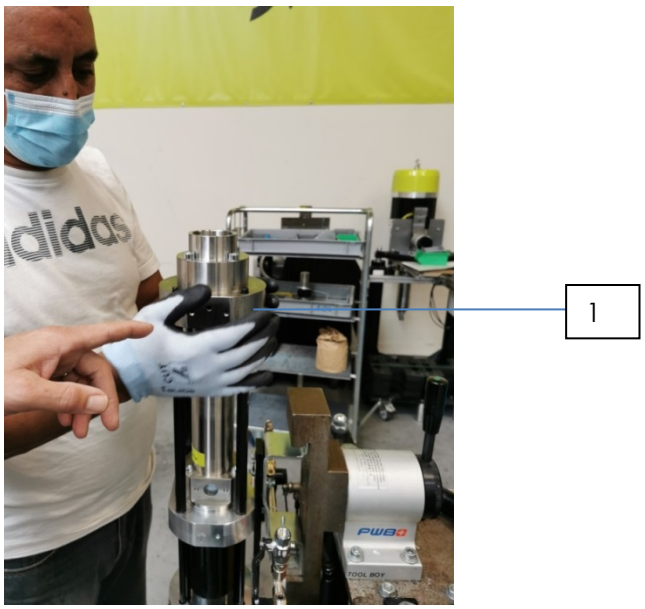
Tools needed

16 

18 



- ✓ Unscrew and remove the 4 nuts (4) using a 17 mm socket wrench.
- ✓ Remove the washers (5).

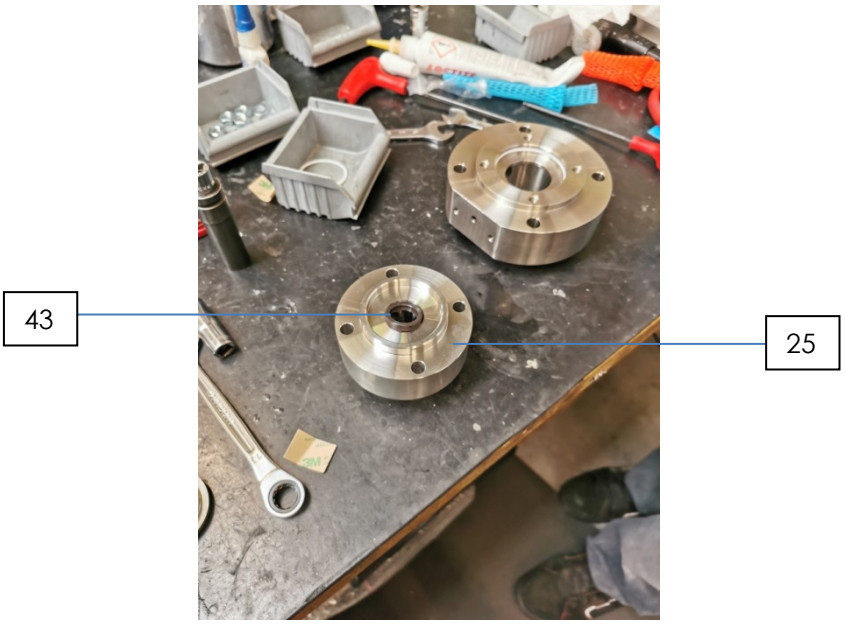


- ✓ Remove the suction flange (1).

Tools needed

17

✓ Remove the 4 screws (9) with a 6 mm Allen wrench.



✓ Remove the exhaust flange (25).

✓ Remove the GT seal (43) manually.

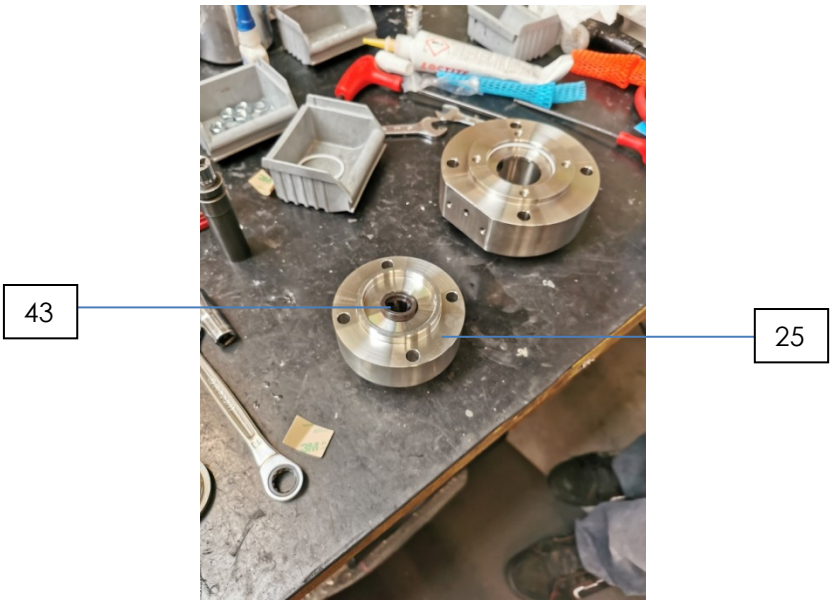
Tools needed

6

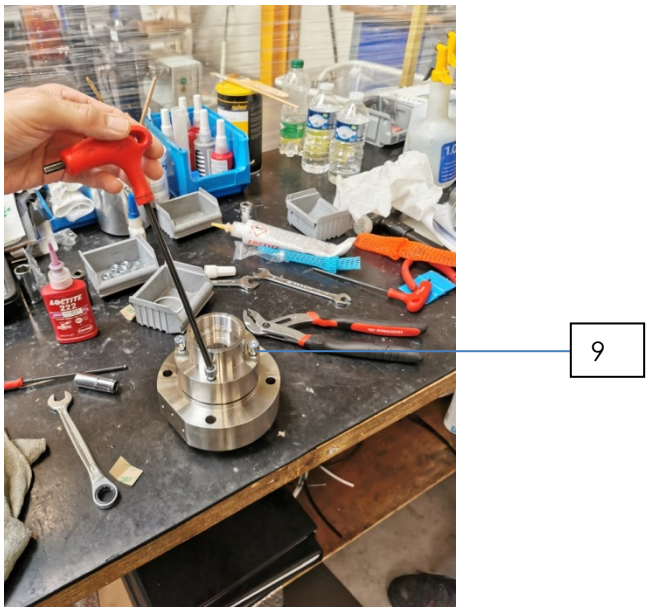
- ✓ Remove the seal (12) with a flat screwdriver.
- ✓ Clean the parts.
- ✓ Change and grease the seal (12).

Tools needed

Isoflex grease



✓ Change the GT seal (43).

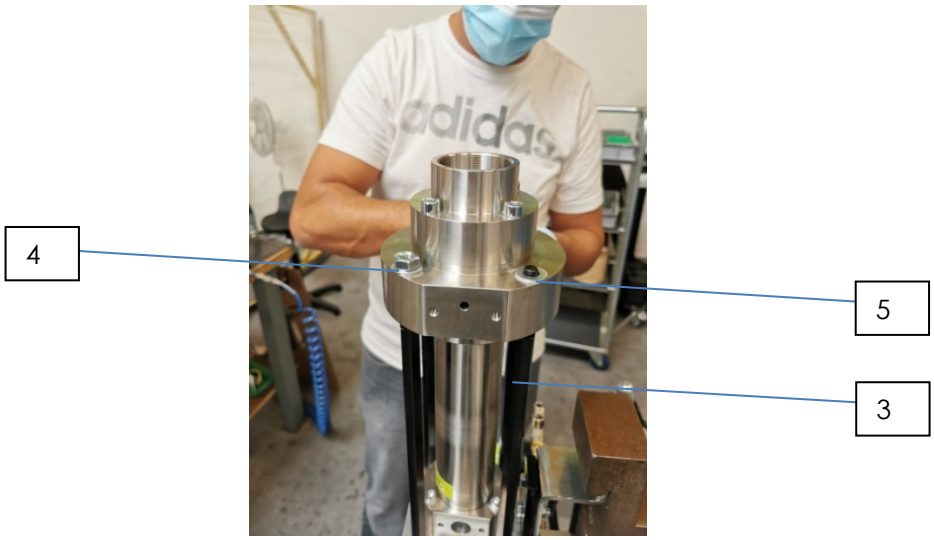


✓ Tighten the 4 screws (9) with a 6 mm Allen wrench.

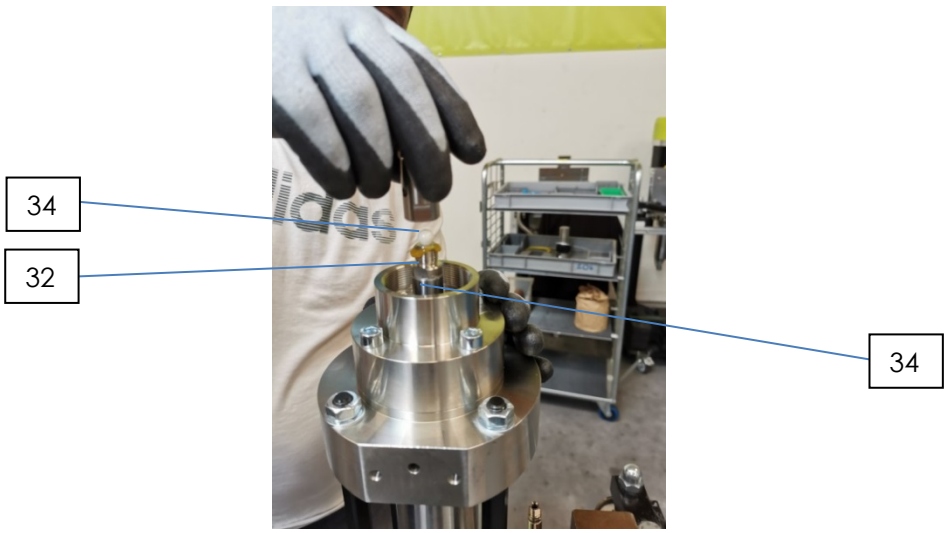
✓ Mount the exhaust flange (25) on the suction flange (1).

Tools needed

6 



- ✓ Place the suction flange/exhaust flange assembly on the 4 tie rods (3).
- ✓ Place the washers (5).
- ✓ Screw on the 4 nuts (4) using a 17 mm socket wrench.



- ✓ Place the ball (32) on the exhaust valve seat (34).
- ✓ Apply adhesive (Loctite 5772) to the piston thread (24).
- ✓ Place the exhaust valve (34) and screw it manually at the contact.

Tools needed

17

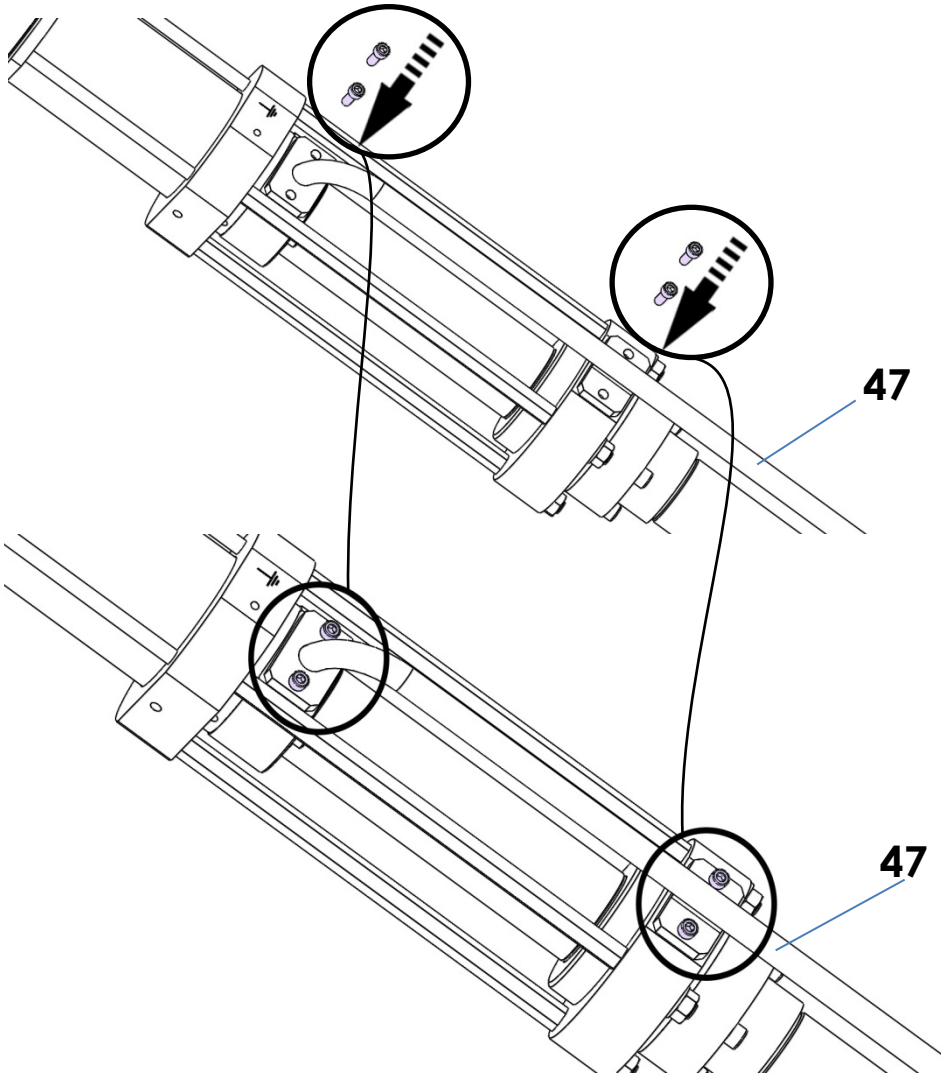
Loctite 5772

- ✓ Hold the piston with a 16 mm open-end wrench and tighten the exhaust valve (34) with an 18 mm open-end wrench.

- ✓ Place the cylinder (27) and screw it manually into contact.
- ✓ Tighten with a 50 mm open-end wrench.

Tools needed

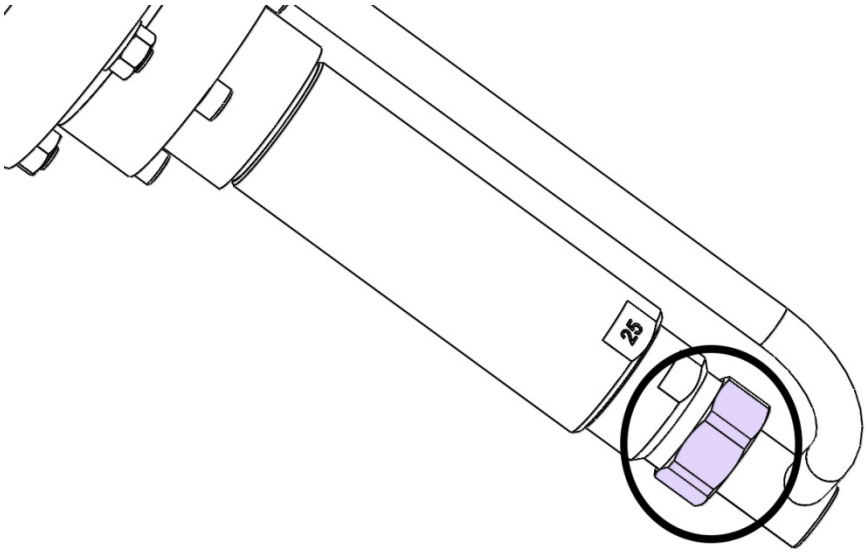
16  18  50 



✓ Tighten the 4 M 6 x 6 SHC screws of the fluid tube (47) with a 5 mm Allen wrench.

Tools needed

5



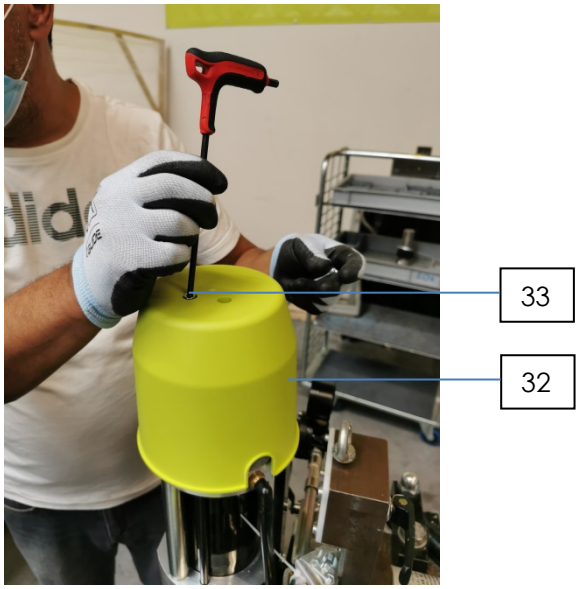
- ✓ Apply grease (anti-seize) to the threads of the suction valve (38).
- ✓ Screw the hexagon nut on the fluid section by hand and then with a 41 mm open-end wrench.

Tools needed

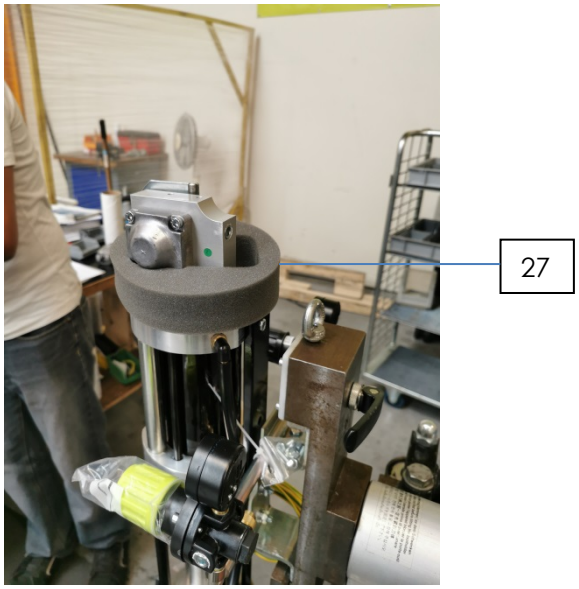
41

Anti-seize grease

13.7 Disassembly / Reassembly of the motor



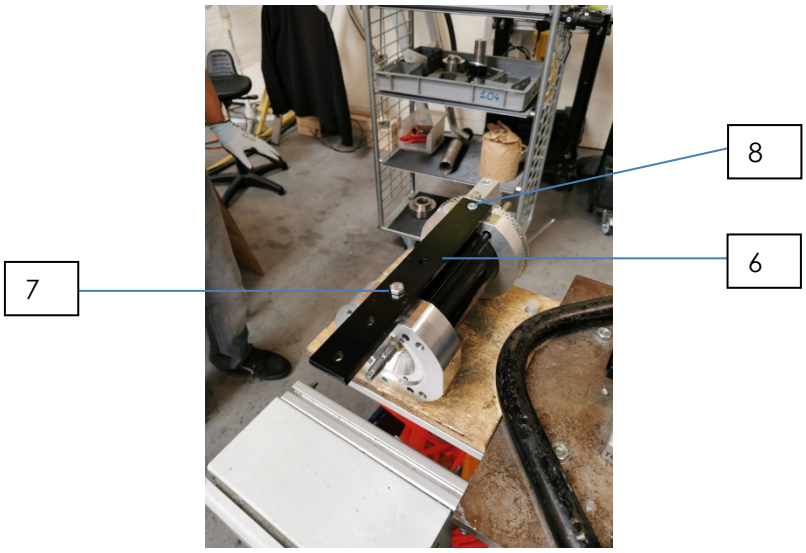
- ✓ Unscrew the 2 screws (33) using a 5 mm Allen wrench.
- ✓ Remove the motor cover (32).



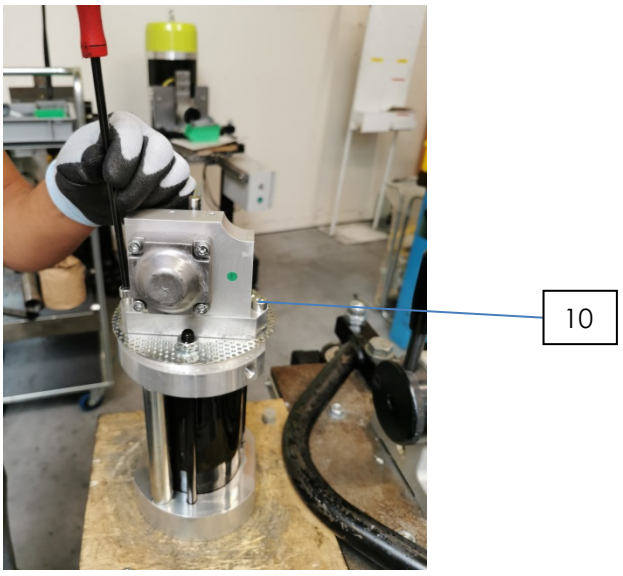
- ✓ Remove the muffler (27).

Tools needed

5



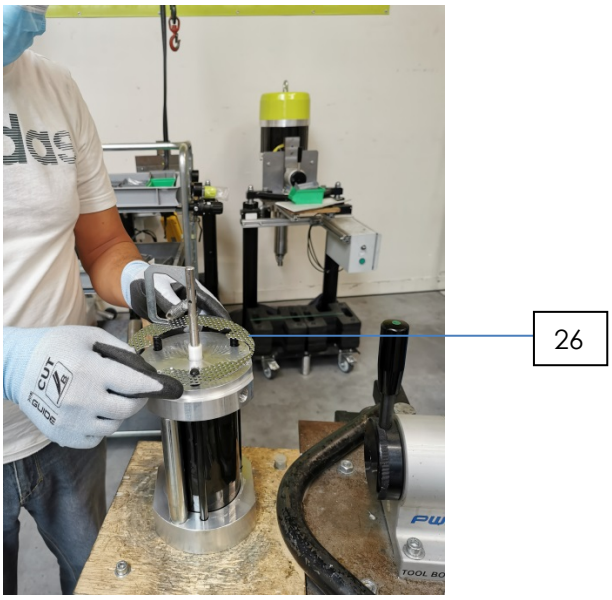
✓ Unscrew the screw (7) from the interface plate (6) using a 13 mm open-end wrench and the screw (8) using a 6 mm Allen wrench.



✓ Unscrew the 2 screws (10) using 6 mm Allen wrench.

Tools needed

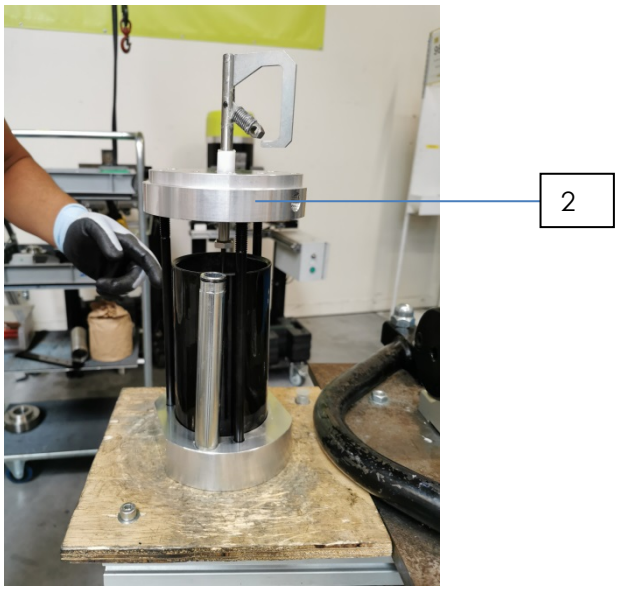
✓ Unscrew the 3 nuts (24) of the tie rods (22) with a 17 mm open-end wrench and remove the 3 washers (23).



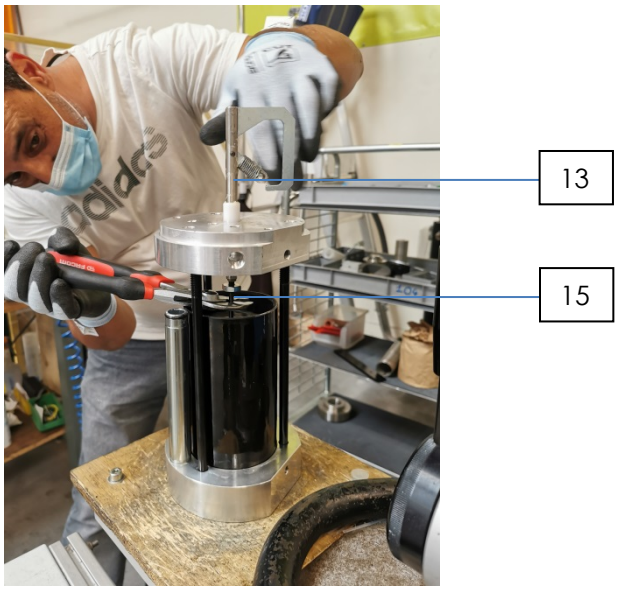
✓ Remove the retaining washer (26).

Tools needed

17



✓ Manually lift the upper flange (2).

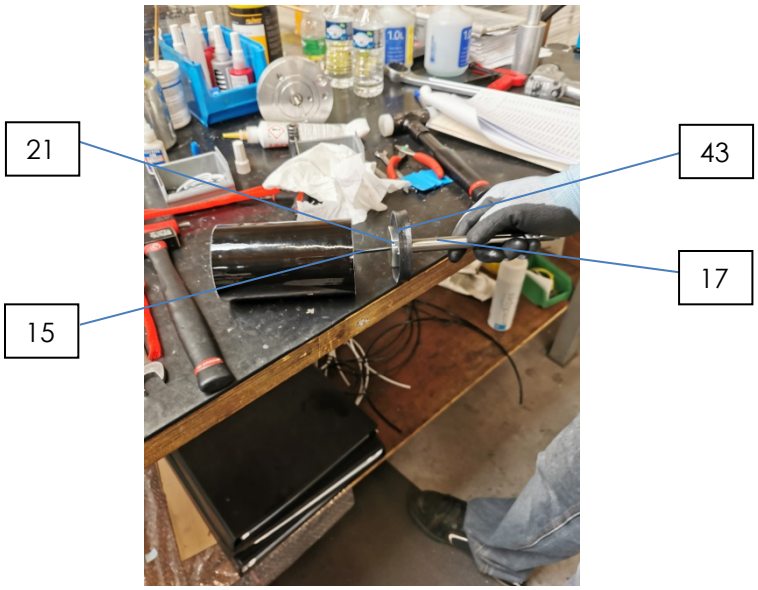


✓ Hold the rod driving (15) with pliers and unscrew the control fork (13) manually.

✓ Remove the cylinder seal (41) with a flat screwdriver.

✓ Manually remove the investment ring (40).

Tools needed



✓ Manually remove the piston assembly (43), piston rod (17) against nut (21), rod driving (15) and piston nut (42).

✓ Unscrew the 3 tie rods (22).

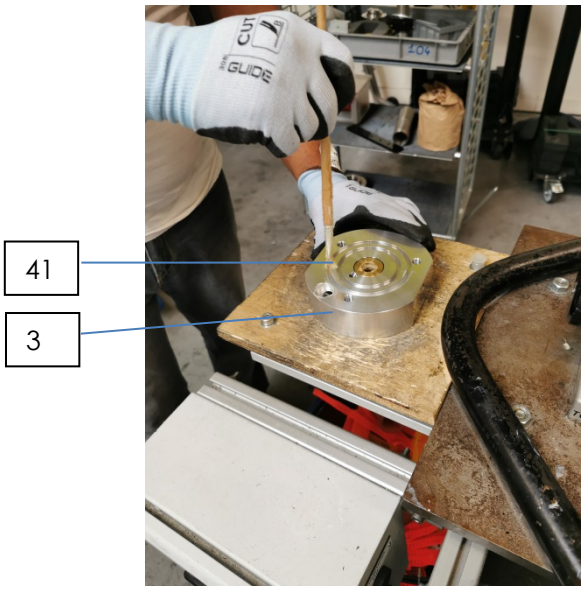
✓ Manually remove the tube (20).

✓ Remove the 2 piston seals(19) with a flat screwdriver.

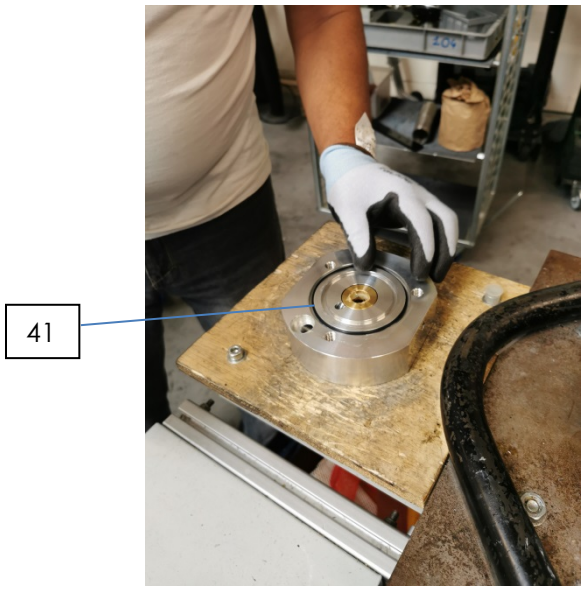
Tools needed

✓ Remove the cylinder seal (41) with a flat screwdriver.

Tools needed



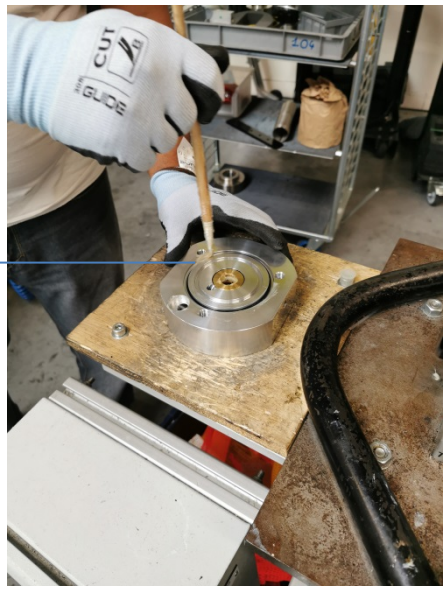
✓ Grease the seal housing (41) of the lower flange (3).



✓ Insert the cylinder gasket (41) into its lower flange seat (3).

Tools needed

Isoflex grease



✓ Grease the seal (41).

✓ Grease the 2 seals' housings of tube (20).

Tools needed

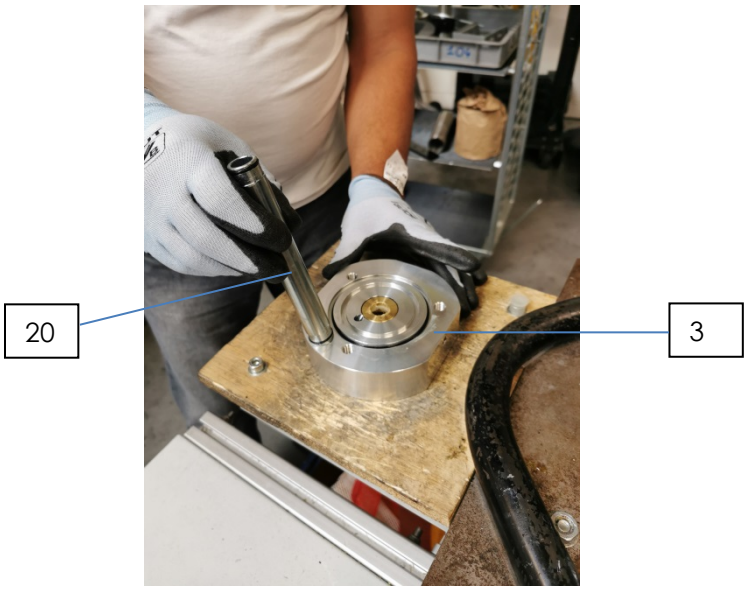
Isoflex grease

✓ Insert the 2 piston seals (19) into their housings in the tube (20).

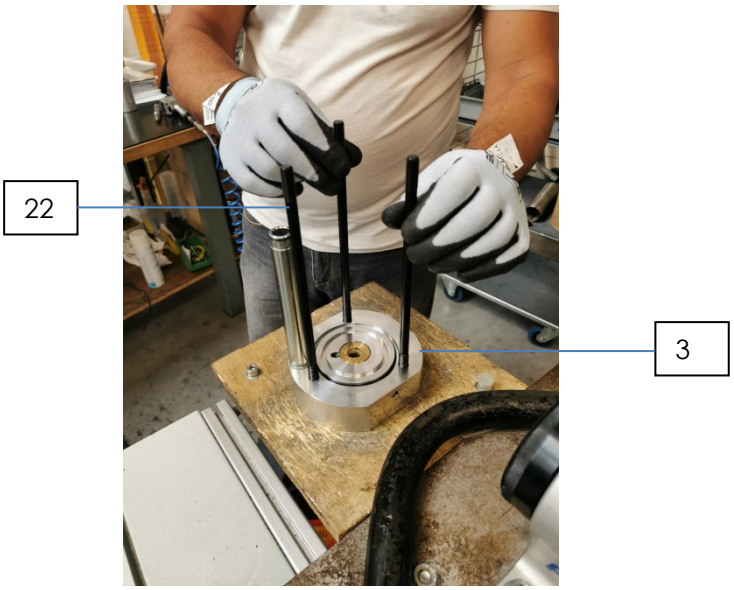
✓ Grease the 2 seals (19) of the tube (20).

Tools needed

Isoflex grease



✓ Manually insert the tube (20) on the lower flange (3).



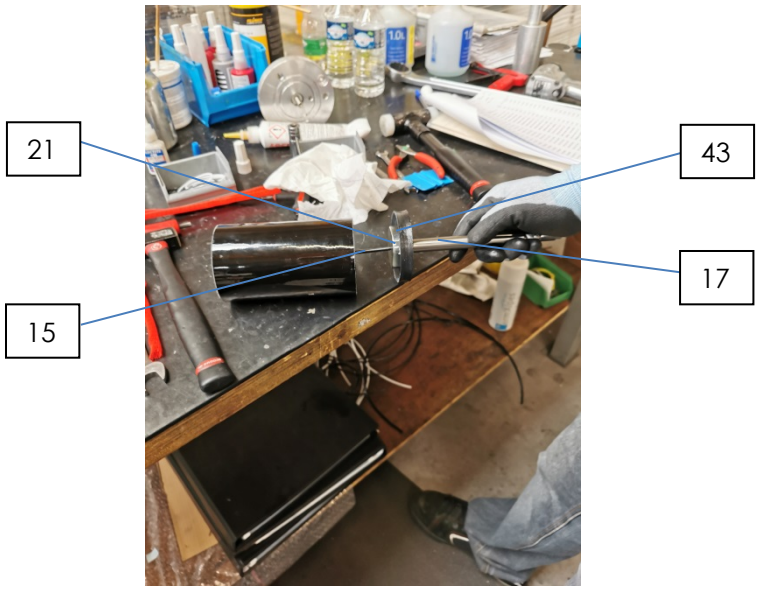
✓ Screw the 3 tie rods (22) on the lower flange (3) with a wrench.

✓ Grease the inside of the cylinder (40).

✓ Grease the piston (43).

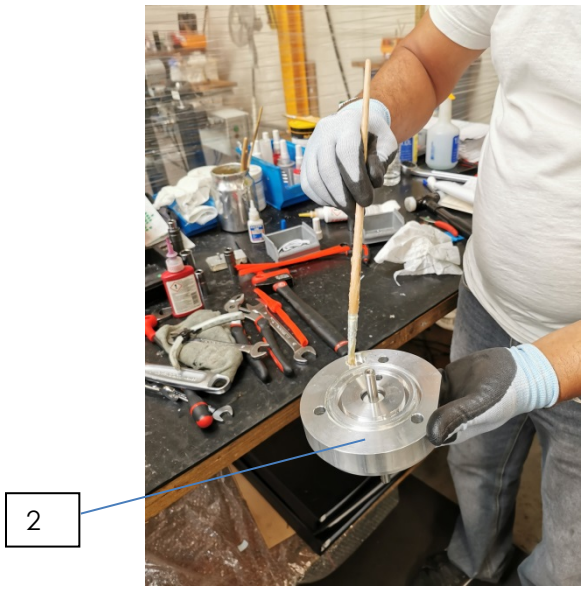
Tools needed

Isoflex grease

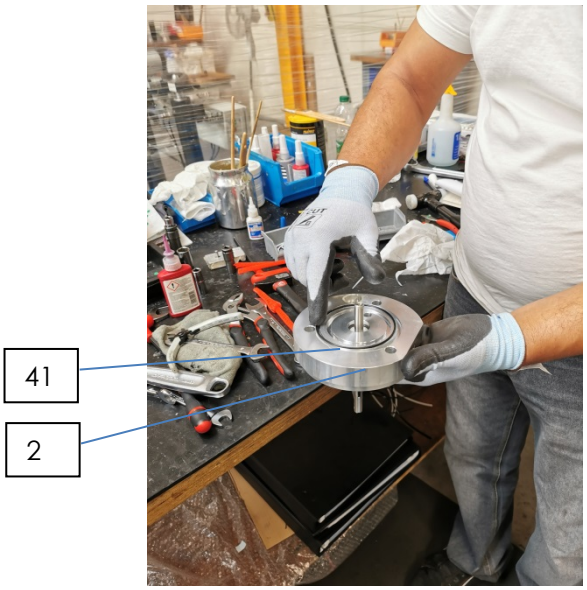


✓ Manually insert the piston assembly (43), piston rod (17) against nut (21), driving rod (15) and piston nut (42) into the cylinder (40).

✓ Manually insert the cylinder assembly (40) piston (43), piston rod (17) against nut (21), driving rod (15) and piston nut (42) on the lower flange (3).



✓ Grease the place of the tube on the upper flange (2) and the position of the cylinder seal (41).



✓ Insert the seal (41) on the upper flange (2).

Tools needed

Isoflex grease

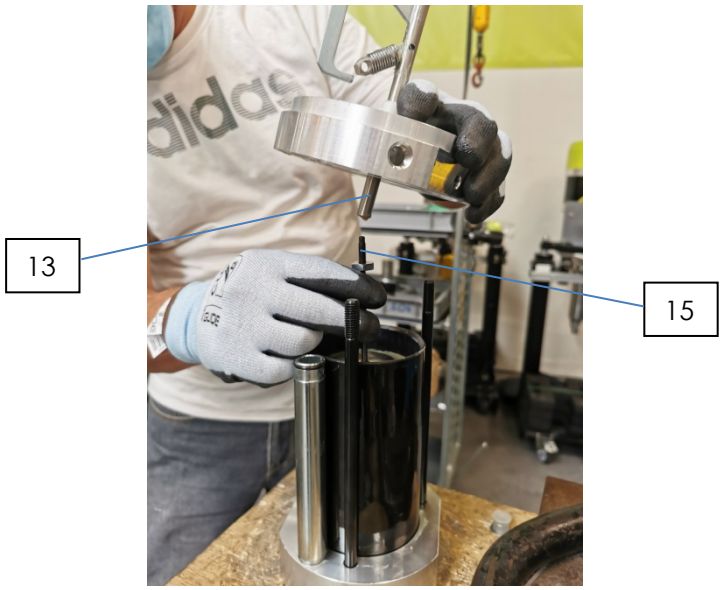
✓ Grease the seal (41).

✓ Apply adhesive (Loctite 5772) to the threads of the control fork (13).

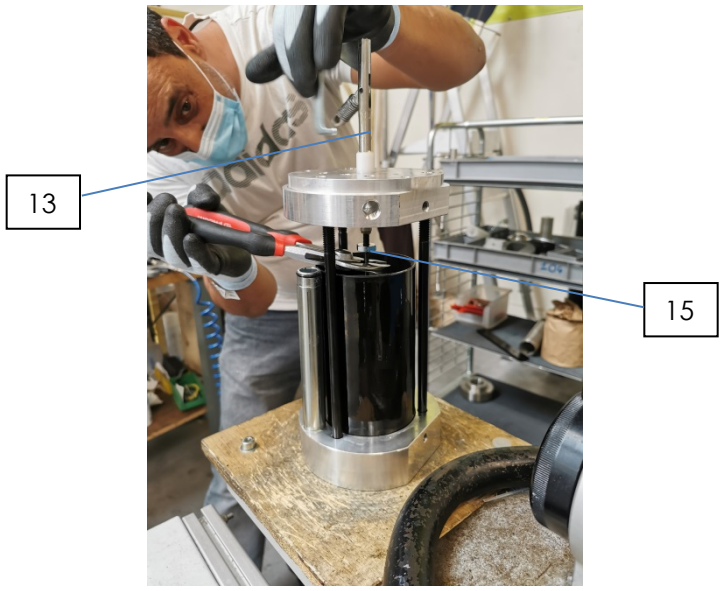
Tools needed

Isoflex grease

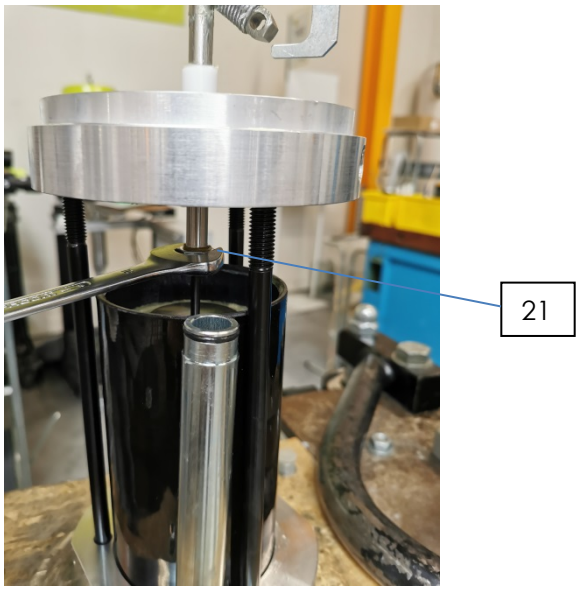
Loctite 5772



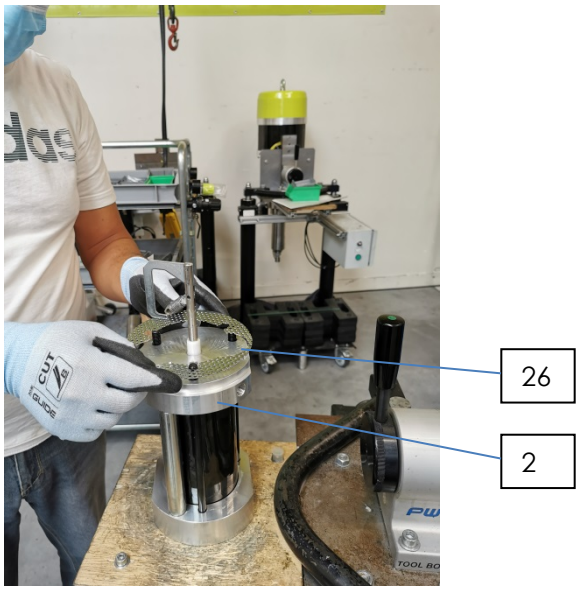
✓ Insert the control fork (13) on the driving rod (15).



✓ Hold the driving rod (15) with pliers and screw on the control fork (13) by hand until it touches the control rod (13).



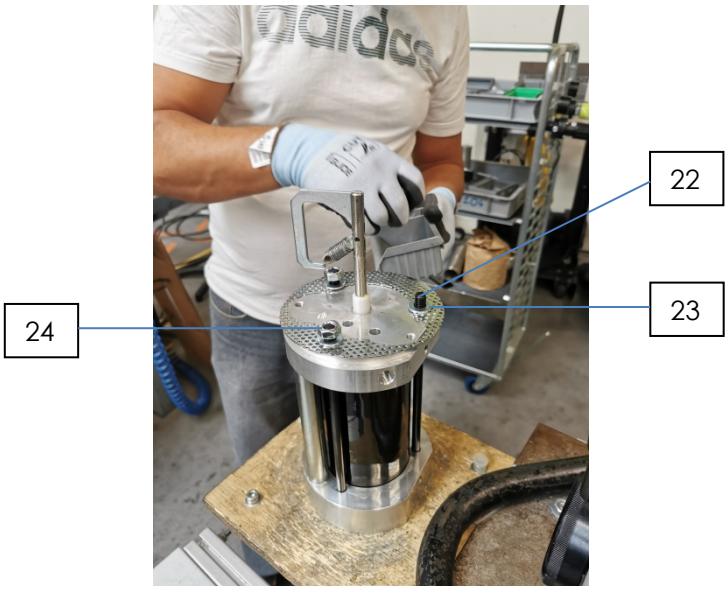
✓ Tighten the lower lock nut (21) with a 16 mm open-end wrench.



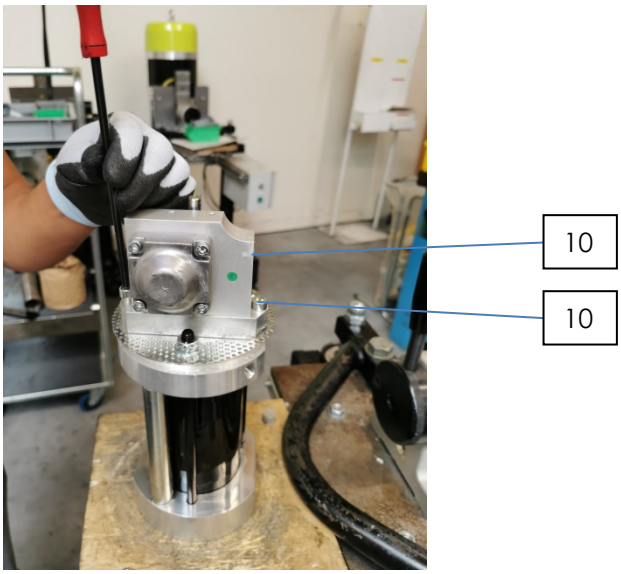
✓ Place the retaining washer (26) on the upper flange (2).

Tools needed

16



✓ Insert the 3 washers (23) on the tie rods (22) and screw on the 3 nuts (24) with a 17 mm open-end wrench.



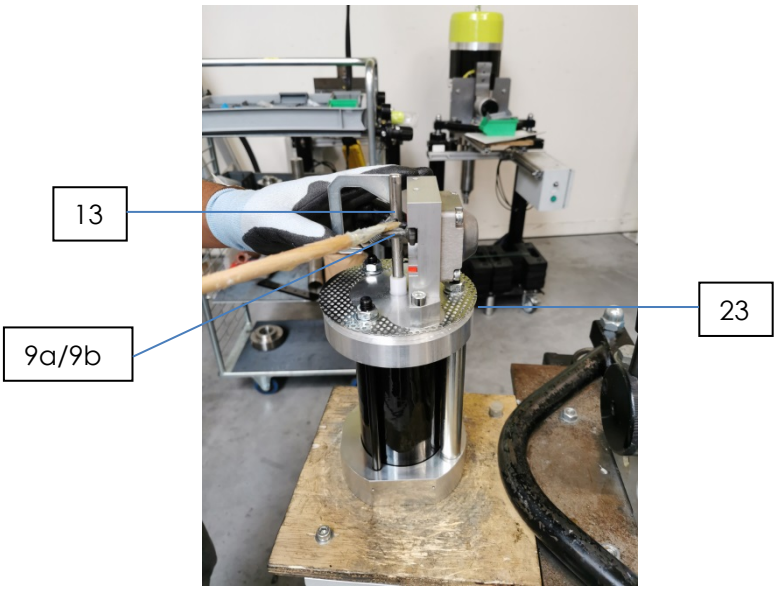
✓ Position the reversing block (9a/9b) on the upper flange (2).

✓ Tighten the 2 screws (10) with a 6 mm Allen wrench.

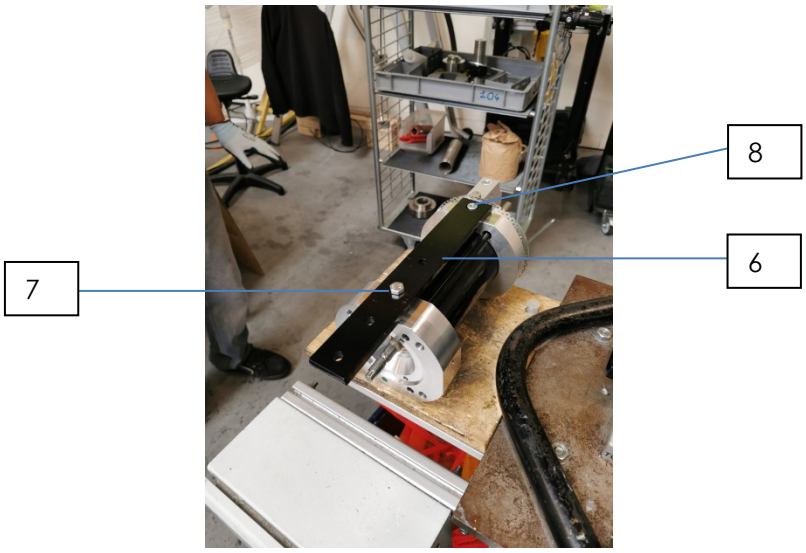
Tools needed

16 

6 



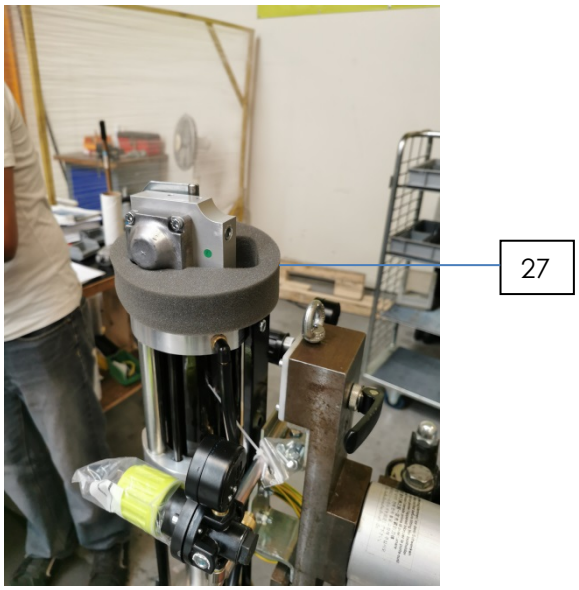
- ✓ Grease the rod of the control fork (13) as well as the rod of the reversing block (9a/9b).



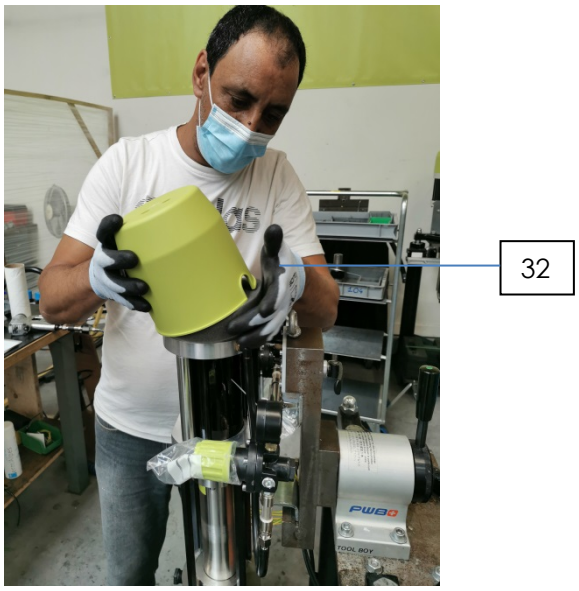
- ✓ Place the interface plate (6).
- ✓ Screw in the screw (7) with a 13 mm open-end wrench and screw (8) with a 6 mm Allen wrench.

Tools needed

6  **13** 



✓ Place the muffler (27).

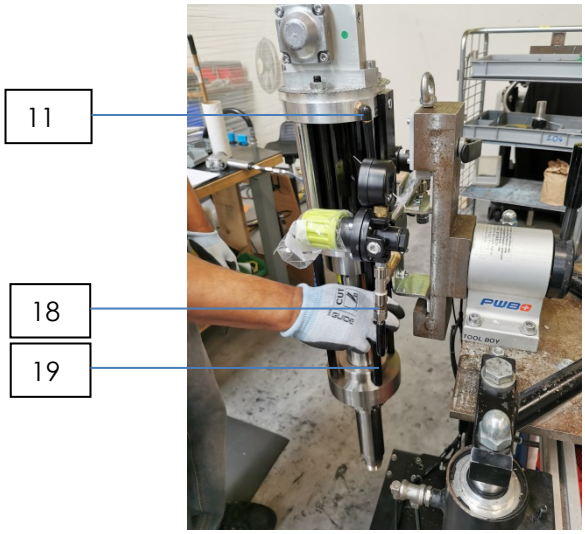


✓ Place the cover (32).

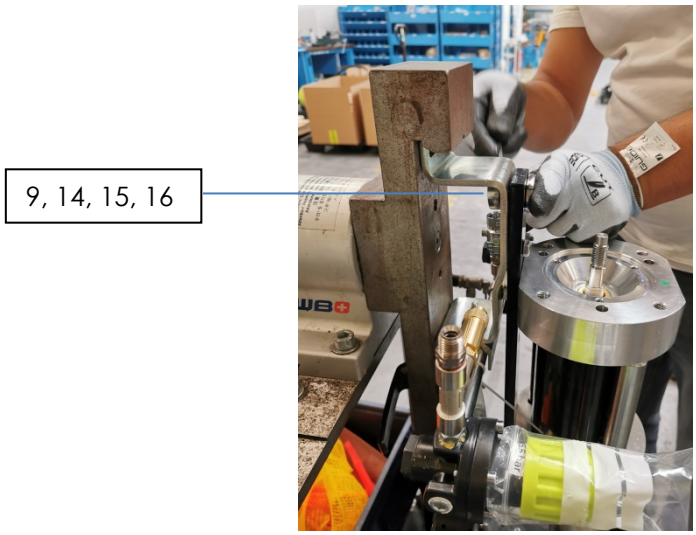
✓ Tighten the 2 screws (33) with a 5 mm Allen wrench.

Tools needed

13.8 Disassembly / Reassembly of air supply assembly



- ✓ Disconnect the hose (19) between connectors (11) and (18).

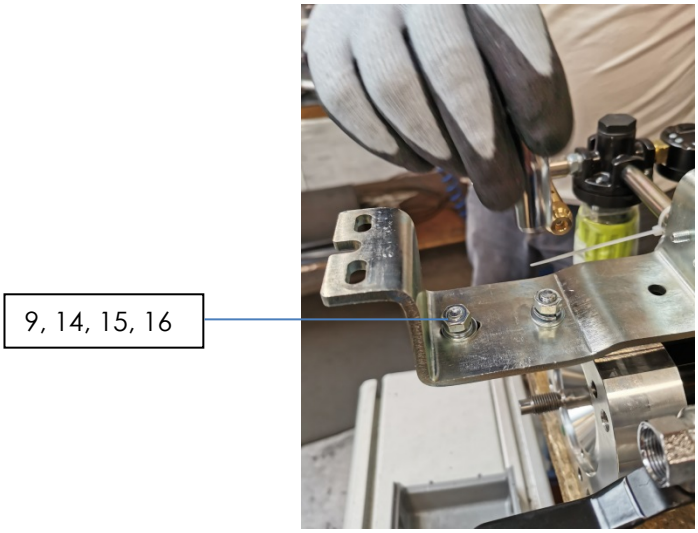


- ✓ Unscrew the 2 screws (9) and the 2 nuts (16) using 2 flat 13 mm wrenches.
- ✓ Remove the 2 washers (14), the 2 screws (9), the 2 washers (15) and the 2 nuts (16).

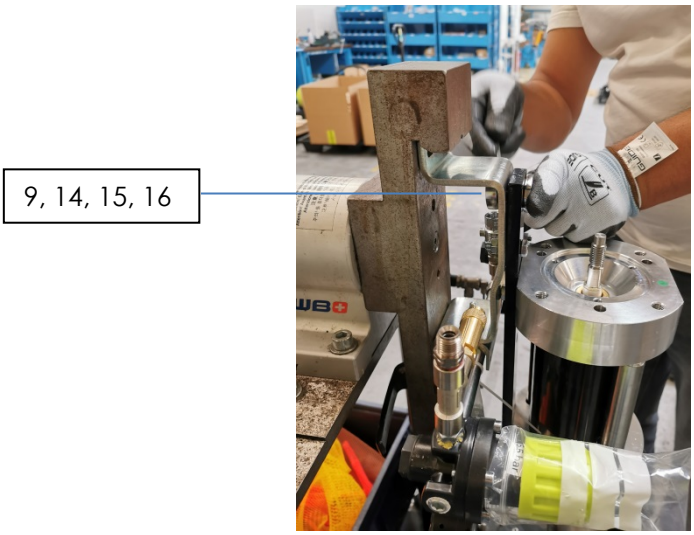
Tools needed

13 x2

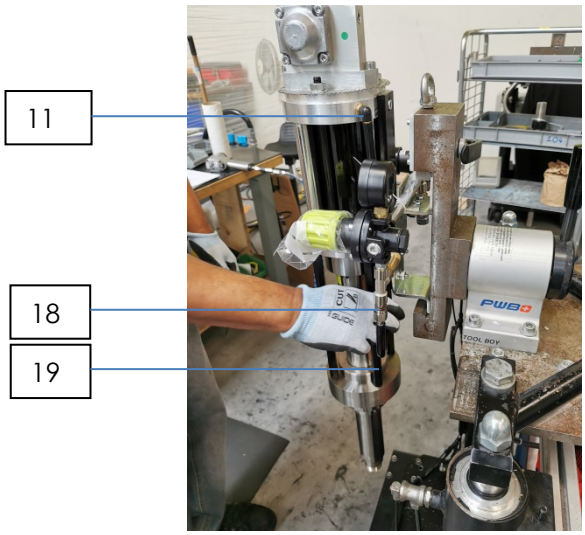
✓ Place the air supply assembly (10) on the interface plate (6).



✓ Place the 2 washers (14), the 2 screws (9), the 2 washers (15) and the 2 nuts (16).



✓ Tighten the 2 screws (9) and the 2 nuts (16) with 2 13 mm open-end wrenches.



✓ Connect the hose (19) between connectors (11) and (18).

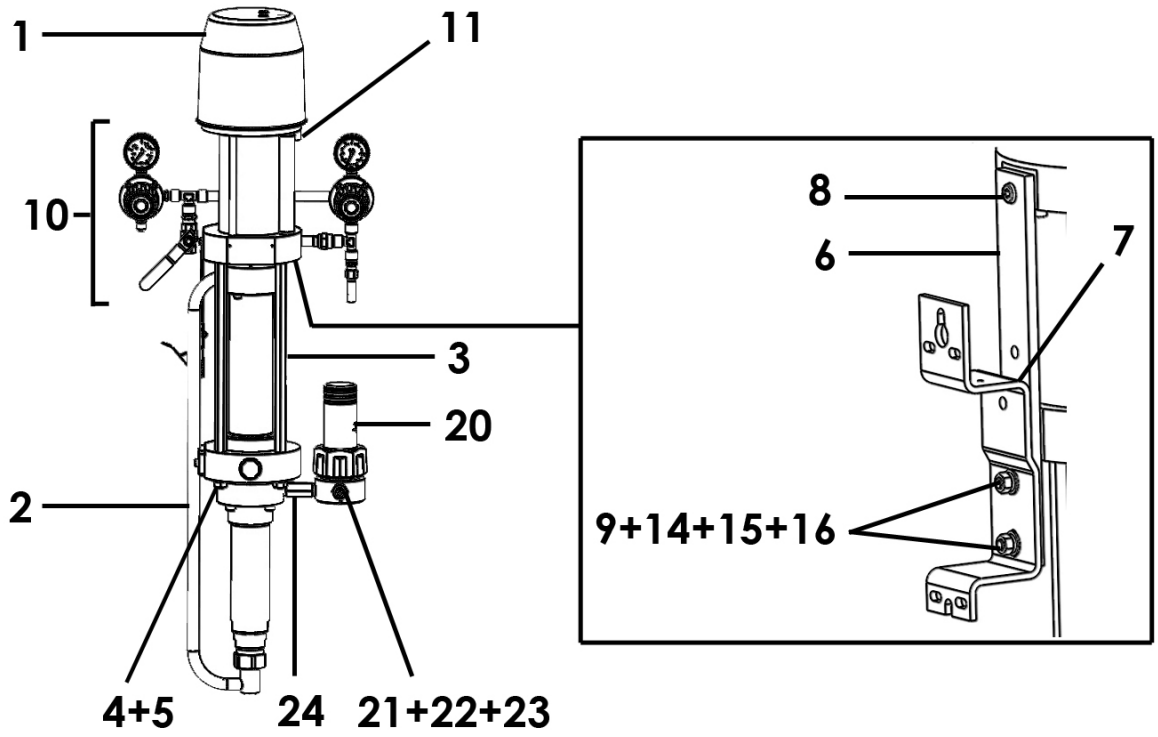
Tools needed

13 x2

14 Spare parts

Use only genuine SAMES KREMLIN accessories and spare parts designed to withstand the pump's operating pressures.

14.1 Wall mounted pump, model 20F50 pH



Wall mounted pump 20F50 pH without filter part number
NS

Ind	# Part numbers	Description	Qty
-	**NS**	**Bare pump 20F50 pH**	**1**
*1	146 260 000	▪ Motor 500-4	1
*2	NS	▪ Fluid section F50 pH	1
3	044 970 060	▪ ▪ Coupling rod (x 1)	4
4	953 010 021	▪ ▪ Nut, HM 10 (x 1)	4
5	963 040 021	▪ ▪ Washer, MU 10 (x 1)	4
***-**	**151 775 010**	**Mounting assembly**	**1**
6	051 770 101	▪ Plate	1
7	933 011 279	▪ Screw H 8 x 20	1
8	933 151 147	▪ Screw SHC M 8 x 10	1
9	NS	▪ Screw HM 8 x 25	2
14	88 664	▪ Washer W8 (x 1)	2
15	963 040 019	▪ Washer MN 8 (x 1)	2
16	953 010 019	▪ Nut HM 8 (x 1)	2
10	**151 796 130**	**Air supply assembly**	**1**
11	**905 150 012**	**Elbow, M 1/4 BSP - T 8 x 12**	**1**

*** Preceding the index number denotes a suggested spare parts.**

N S: Denotes parts are not serviceable.

Nota :
The ind. 3 (coupling rod), ind. 4 (nut) and ind. 5 (washer) are sold with the fluid section, model F50 pH.

Wall mounted pump 20F50 pH with filter part number
151 772 200

Ind	# Part numbers	Description	Qty
-	**NS**	**Wall mounted pump 20F50 pH without filter**	**1**
-	NS	▪ Bare pump 20F50 pH	1
*1	146 260 000	▪ ▪ Motor 500-4	1
*2	NS	▪ ▪ Fluid section F50 pH	1
*-	151 775 010	▪ Mounting assembly	1
6	051 770 101	▪ ▪ Plate	1
7	933 011 279	▪ ▪ Screw H 8 x 20	1
8	933 151 147	▪ ▪ Screw SHC M 8 x 10	1
9	NS	▪ ▪ Screw HM 8 x 25	2
14	88 664	▪ ▪ Washer W8 (x 1)	2
15	963 040 019	▪ ▪ Washer MN 8 (x 1)	2
16	953 010 019	▪ ▪ Nut HM 8 (x 1)	2
10	151 796 130	▪ Air supply assembly	1
11	905 150 012	▪ Elbow, M 1/4 BSP - T 8 x 12	1
20	**NS**	**Fluid filter 3/8", model 250 bar / 3625.75 psi**	**1**
21	**905 210 503**	**Adaptor stainless steel, double male, 3/8 NPT – # 5 JIC (1/2 JIC)**	**1**
22	**905 210 304**	**Plug, stainless steel 3/8 NPT**	**1**
23	**905 210 303**	**Plug, stainless steel 1/4 NPT**	**1**
24	**055 580 301**	**Sleeve, stainless steel MM 3/8 NPT**	**1**

*** Preceding the index number denotes a suggested spare parts.**

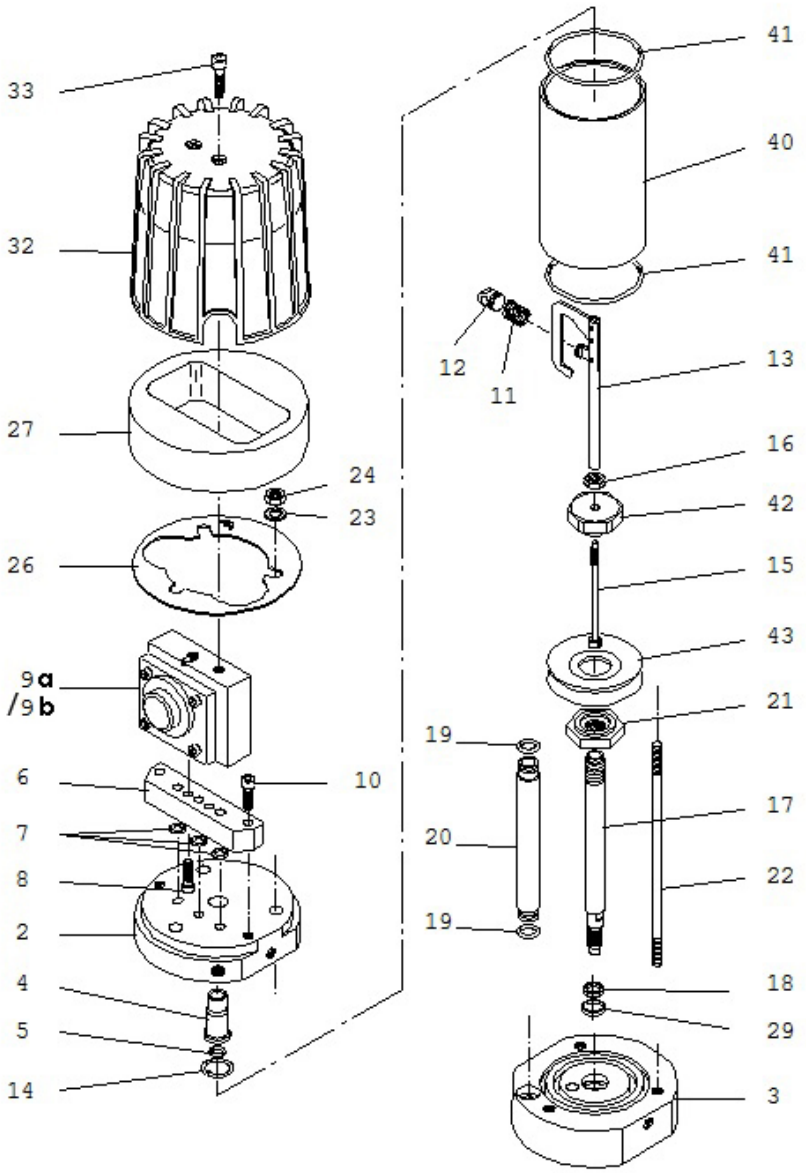
N S: Denotes parts are not serviceable.

Options

Ind	# Part numbers	Description	Qty
-	149 596 150	Suction rod Ø 25 (Length 600 mm)	1
-	149 596 160	Suction rod Ø 25 for drum 200L (Length 1m)	1
-	149 596 152	▪ Strainer Ø 25	1
-	049 596 000	Drain rod, stainless steel	1

14.2 Motor, model 500-4 stroke 100

Motor part number
146 260 000



Ind	# Part numbers	Description	Qty
2	046 260 901	Upper flange	1
3	146 260 902	Lower flange	1
4	044 570 106	Guide ring	1
5	144 579 923	Ring, R 8 bis (x 10)	1
6	046 230 005	Base, reversing-block	1
7	109 420 257	O Ring (x 10)	3
8	933 151 277	Screw, SHC M 6 x 20 (x 1)	2
*9a	NS	Reversing-block	1
*9b	144 630 720	Right reversing-block with two bearings	1
10	930 151 446	Screw, SHC M 8 x 35 (x 1)	2
11	050 311 232	Spring	1
12	044 570 131	Linkage, female	1
13	044 570 900	Control fork assembly	1
14	902 202 002	Retaining ring	1
15	046 180 003	Rod driving	1
16	046 144 907	Nut	1
17	146 180 007	Piston rod	1
18	046 180 010	Seal, ring	1
19	129 400 902	Piston seal (x 10)	2
20	046 144 901	Tube, connecting	1
21	000 323 716	Lower locknut	1
22	046 180 009	Tie-rod (x 1)	3
23	963 040 021	Washer, MN 1(x 1)0	3
24	953 010 021	Nut, HM 10 (x 1)	3
26	046 260 903	Washer	1
27	046 230 007	Muffler	1
29	909 420 291	Seal	1
32	044 570 135	Cover	1
33	933 151 387	Screw, SHC M 6 x 30 (x 1)	2
*40	046 260 001	Cylinder	1
41	000 323 061	Seal, cylinder (x 1)	2
42	046 144 908	Piston nut	1
43	046 140 002	Piston	1
-	901 180 024	Ground (Length 5m / 196.85")	1

Ind	# Part numbers	Description	Qty
*	146 260 990	Package of seals of the air motor (ind. 5, 7 (x 3), 11, 18, 19 (x 2), 29, 41 (x 2) + package of seals of the reversing-block)	1
*	146 260 995	Servicing kit (ind. 4, 43 + package of seals of the air motor + ind. 2, 4, 7, 8, 13 of the reversing-block)	1

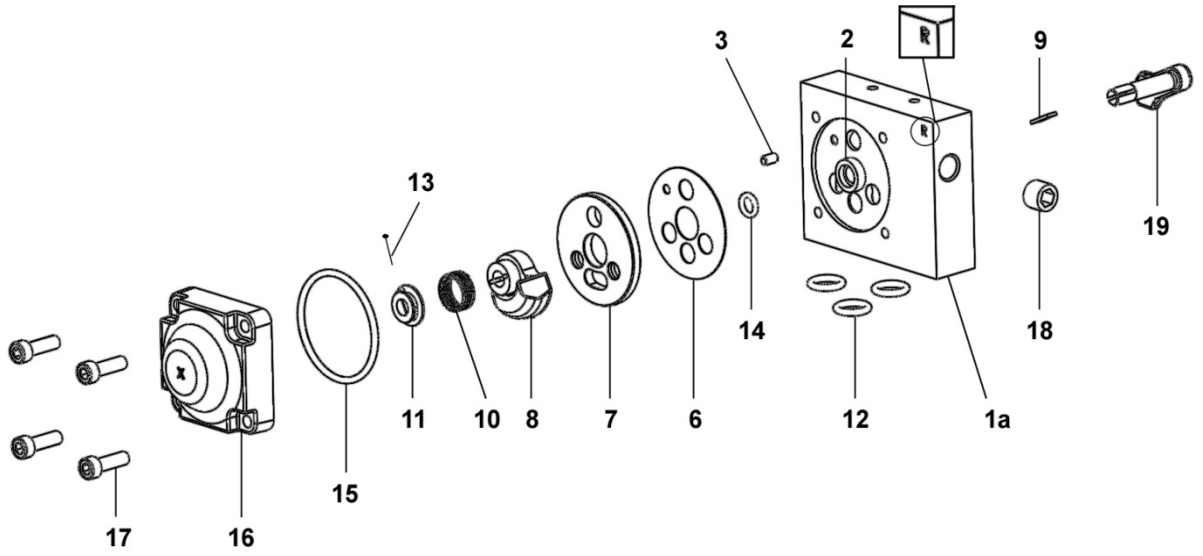
*** Preceding the index number denotes a suggested spare parts.**

N S: Denotes parts are not serviceable.

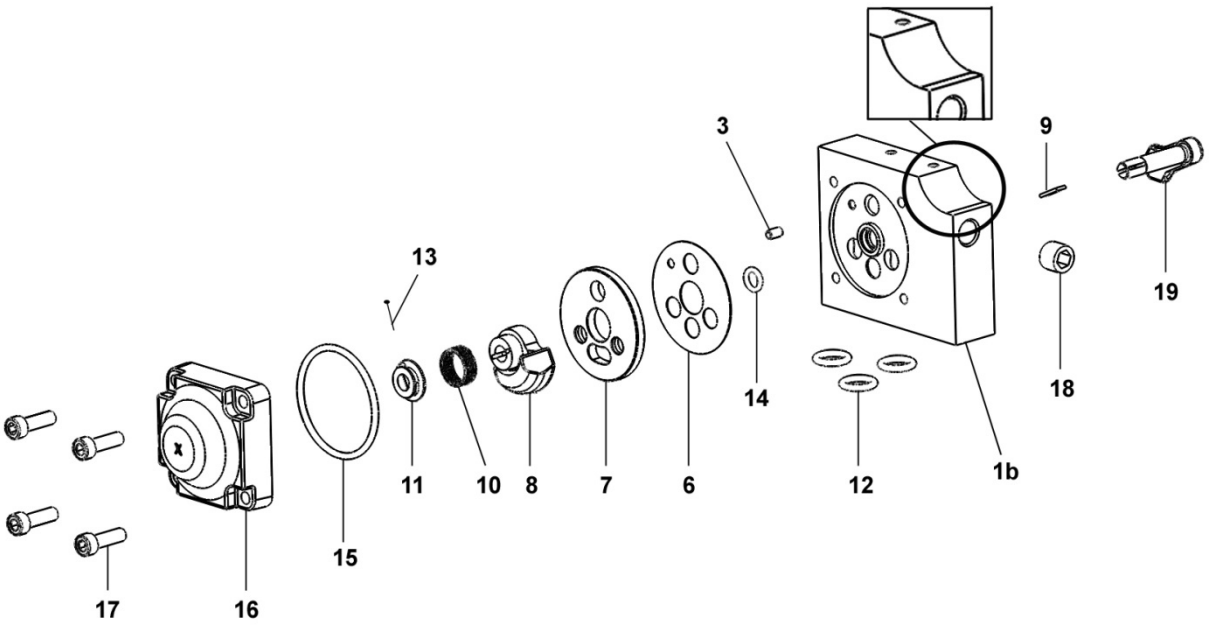
Nota :
The pumps with serial number is > to 17 AF 1048 are fitted with the reversing-block # 146.630.720. Install ind. 2 (guide ring of the reversing-block) only if your reversing-block has R.

14.3 Reversing-block

Reversing-block part number
NS



Right reversing-block with two bearings part number
144 630 720



Common parts

Ind	# Part numbers	Description	Qty
*6	144 579 912	Gasket seal (x 10)	1
*7	046 170 508	Base, fixed	1
*8	044 570 324	Base, mobile	1
9	044 570 325	Pin	1
10	921 140 102	Spring	1
11	044 571 006	Stop, spring	1
*12	144 579 922	Ring, R 10 (x 10)	3
*13	144 579 911	Pin (package of 10 pins + 1 stop ind. 11)	1
*14	144 579 910	Ring, R 6a (x 10)	1
*15	NS	Seal, cover	1
16	144 630 415	Cover	1
17	933 151 277	Screw, SHC M 6x20 (x 1)	4
18	906 333 102	Plug, 1/4 BSP	1
19	046 170 510	Lever, control	1

Ind	# Part numbers	Description	Qty
*	146 270 950	Package of seals (ind. 6, 12 (x 3), 14, 15)	1
*	144 630 425	Servicing kit - bases (ind. 7, 8)	1

*** Preceding the index number denotes a suggested spare parts.**

N S: Denotes parts are not serviceable.

Specific parts

For NS

Ind	# Part numbers	Description	Qty
*	**144 630 410**	**Block assembly, reversing**	**1**
1a	NS	▪ Body	1
2	NS	▪ Guide ring	1
3	NS	▪ Pin, Ø 4 x 8	1
-	NS	▪ Stop (glued on body ind. 1a)	1
-	NS	▪ Ball bearing	1

For # 144 630 720

Ind	# Part numbers	Description	Qty
*	**144 630 715**	**Block assembly, reversing**	**1**
1b	NS	▪ Body	1
3	NS	▪ Pin, Ø 4 x 8	1
-	NS	▪ Stop (glued on body ind. 1b)	1
-	NS	▪ Ball bearing	1

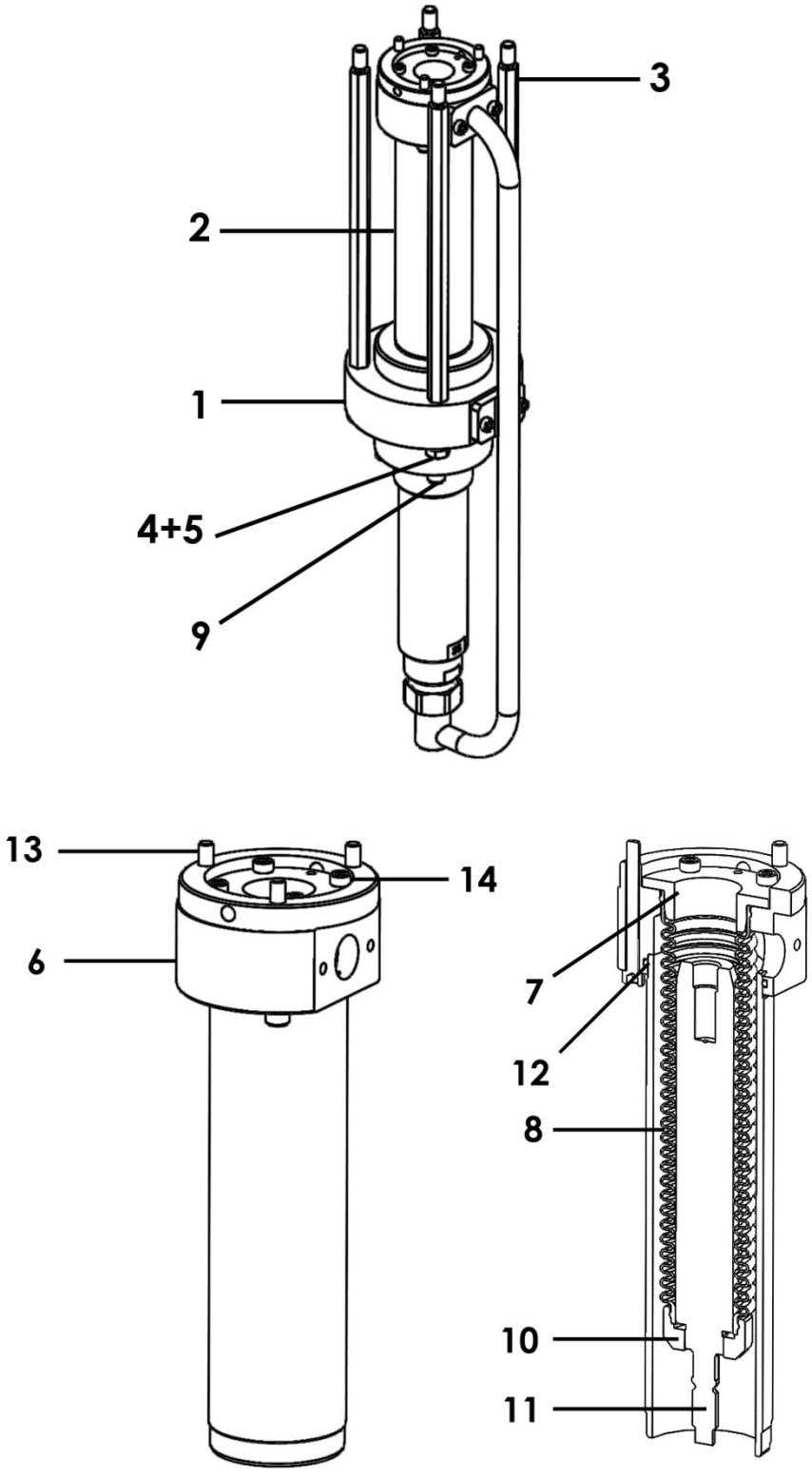
* Preceding the index number denotes a suggested spare parts.

N S: Denotes parts are not serviceable.

Nota :
Install ind. 2 (guide ring of the reversing-block) only if your reversing-block has R.

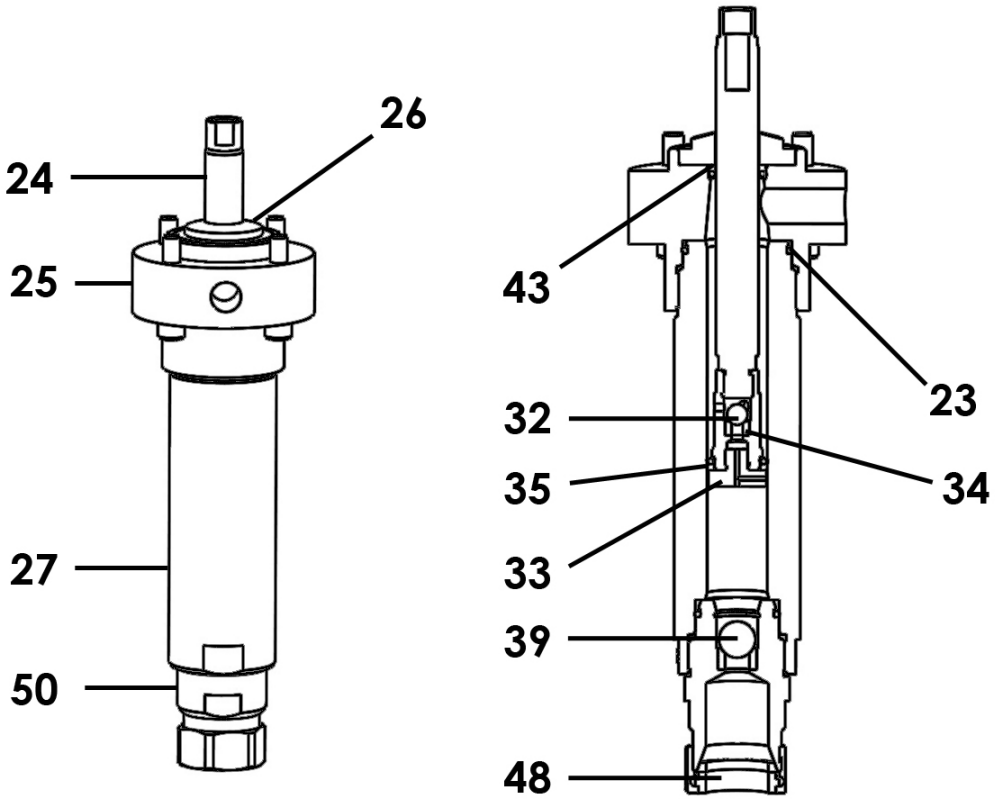
14.4 Fluid section, model F50 pH

Fluid section part number
NS



Ind	# Part numbers	Description	Qty
1	044 970 451	Suction flange	1
2	044 970 052	Cylinder	1
3	044 970 060	Coupling rod (x 1)	4
4	953 010 021	Nut, HM 10 (x 1)	4
5	963 040 021	Washer, MU 10 (x 1)	4
6	044 970 445	Suction bearing	1
7	044 970 046	Flange, bellows	1
*8	044 970 055	Bellows	1
9	933 151 526	Screw, SHC M 8 x 45 (x 1)	4
10	044 970 047	Skirt	1
11	044 970 049	Intermediate piston	1
12	050 040 323	Seal, PTFE (x 1)	2
13	930 151 598	Screw, SHC M 6 x 60 (x 1)	3
14	931 151 168	Screw, SHC 5 x 12 (x 1)	4

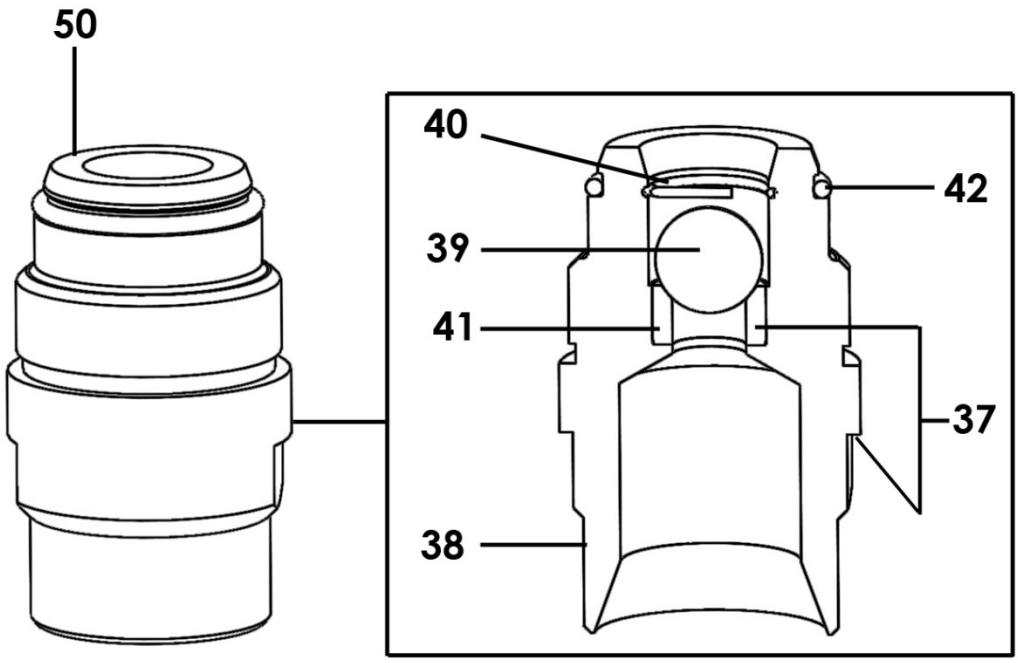
*** Preceding the index number denotes a suggested spare parts.**



Ind	# Part numbers	Description	Qty
23	050 040 317	Seal, PTFE	1
*24	144 951 201	Piston	1
25	044 950 202	Exhaust flange	1
26	044 950 203	Flange, GT seal	1
27	044 950 002	Cylinder	1
32	NS	Ball, ceramics Ø 9,525	1
*33	144 951 007	Wetting-cup	1
***34**	**144 951 215**	**Exhaust valve assembly**	**1**
-	NS	▪ Exhaust seat support	1
-	NS	▪ Exhaust seat	1
35	909 150 245	Rod seal, GT	1

*** Preceding the index number denotes a suggested spare parts.**

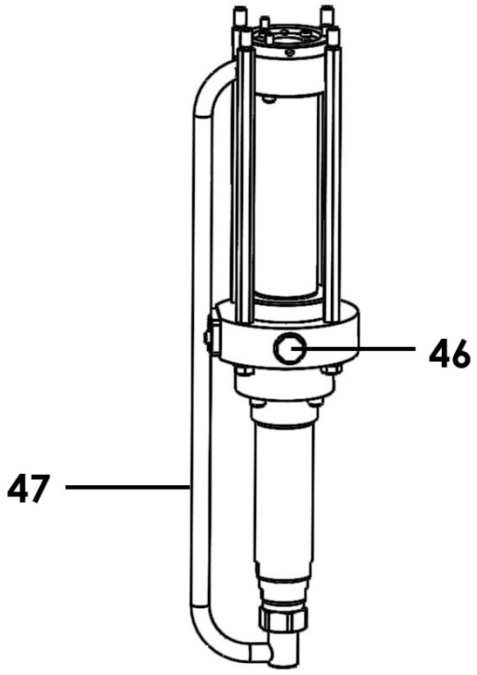
N S: Denotes parts are not serviceable.



Ind	# Part numbers	Description	Qty
***37**	**144 951 230**	**Suction valve assembly**	**1**
50	**NS**	**Suction valve assembly**	**1**
38	NS	▪ Suction valve	1
39	907 414 703	▪ Ball, ceramics Ø 16	1
40	044 550 029	▪ Rush	1
41	NS	▪ Seat, carbide	1
42	050 040 318	▪ O-Ring, PTFE	1

*** Preceding the index number denotes a suggested spare parts.**

N S: Denotes parts are not serviceable.



Ind	# Part numbers	Description	Qty
43	909 150 244	Piston seal, GT	1
44	129 489 902	O-Ring, PTFE (x 10)	1
45	150 040 321	O-Ring, PTFE (x 10)	1
46	NS	Plug, M 1/2 G	1
47	044 950 271	Fluid tube with screws, SHC M 6 x 16 (x 4)	1
48	044 950 230	Suction fitting sub-assembly	1

N S: Denotes parts are not serviceable.

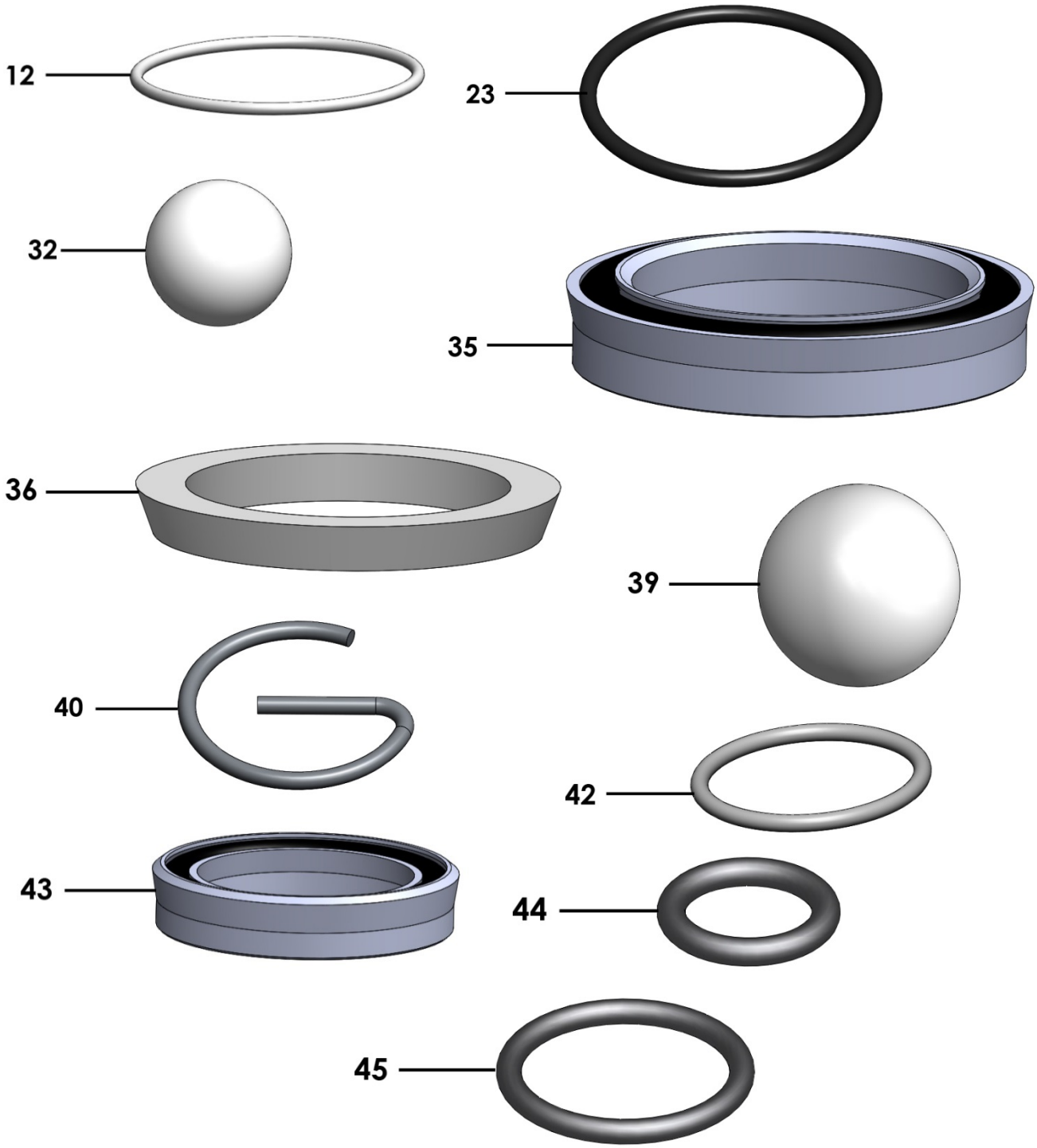
Servicing kit

144 951 095

Ind	# Part numbers	Description	Qty
***-**	**144 951 095**	**Servicing kit**	**1**
34	144 951 215	▪ Exhaust valve assembly	1
37	144 951 230	▪ Suction valve assembly	1
*-	144 951 090	▪ Package of seals	1

*** Preceding the index number denotes a suggested spare parts.**

Package of seals
 # 144 951 090

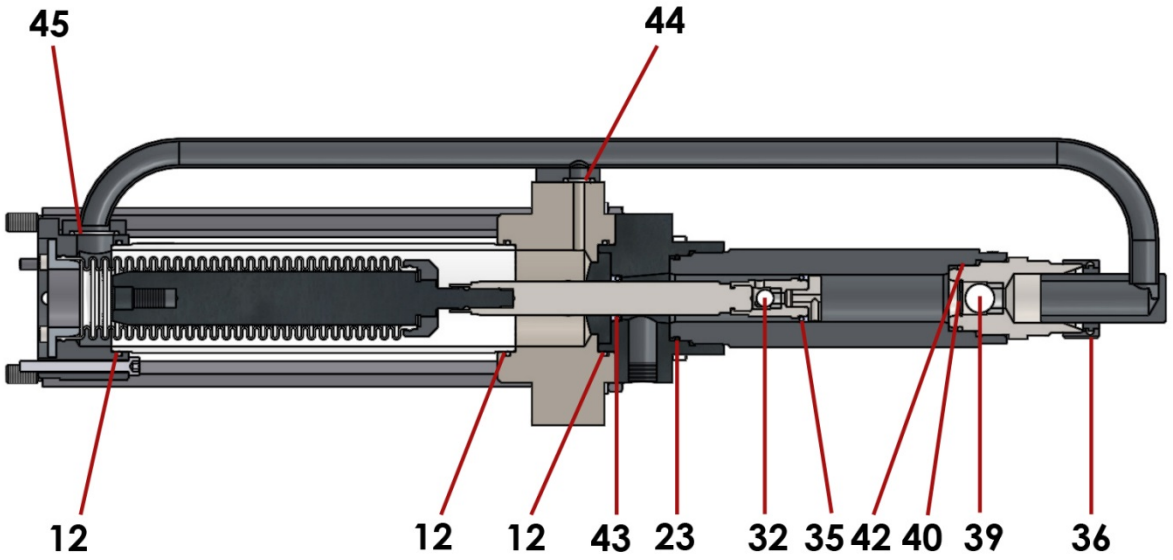


Ind	# Part numbers	Description	Qty
*	**144 951 090**	**Package of seals**	**1**
12	050 040 323	▪ Seal, PTFE (x 1)	3
23	050 040 317	▪ Seal, PTFE	1
32	NS	▪ Ball, ceramics Ø 9,525	1
35	909 150 245	▪ Rod seal, GT	1
36	144 970 106	▪ Seal (x 10)	1
39	907 414 703	▪ Ball, ceramics Ø 16	1
40	044 550 029	▪ Rush	1
42	050 040 318	▪ O-Ring, PTFE	1
43	909 150 244	▪ Piston seal, GT	1
44	129 489 902	▪ Seal, PTFE (x 10)	1
45	150 040 321	▪ Seal, PTFE (x 10)	1

*** Preceding the index number denotes a suggested spare parts.**

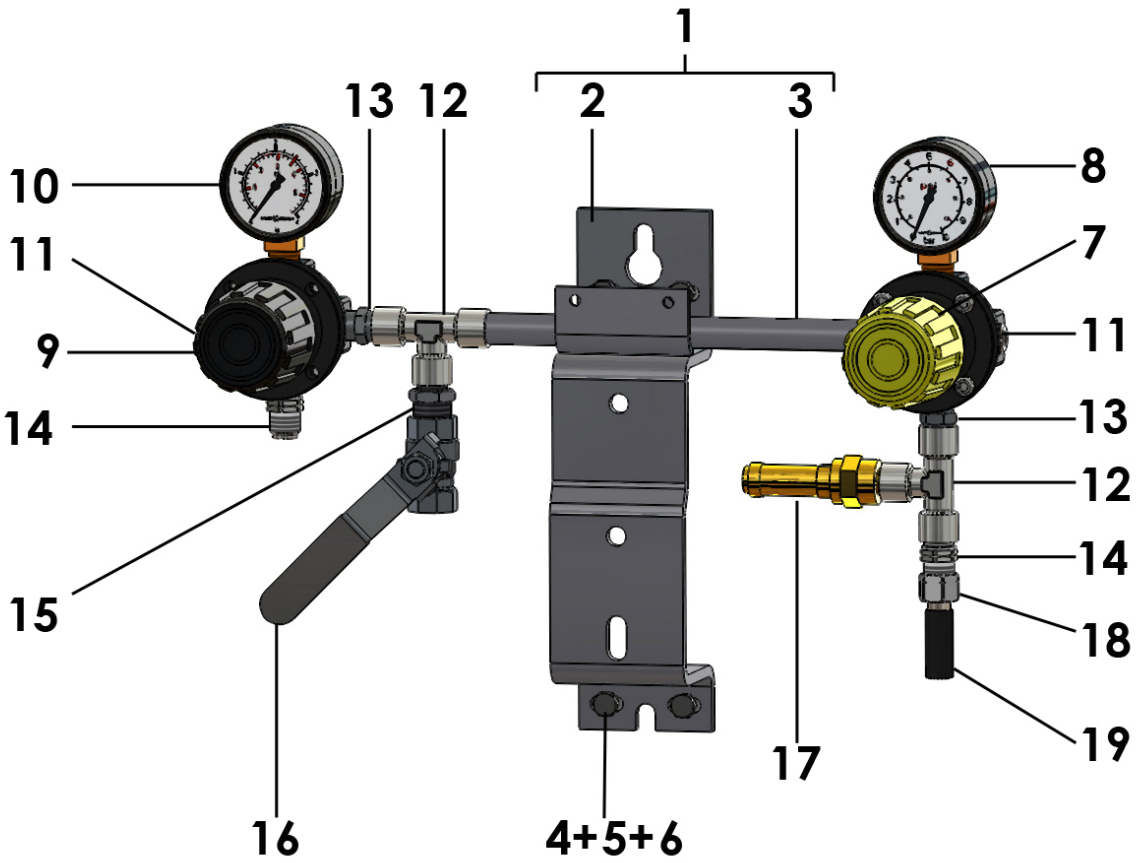
N S: Denotes parts are not serviceable.

How to assemble the seals



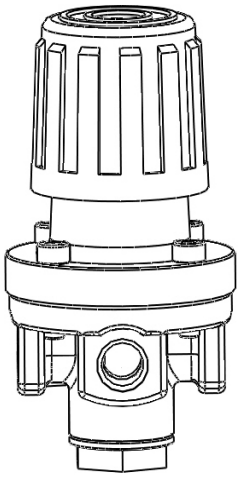
14.5 Air supply assembly

Air supply assembly part number
151 796 130

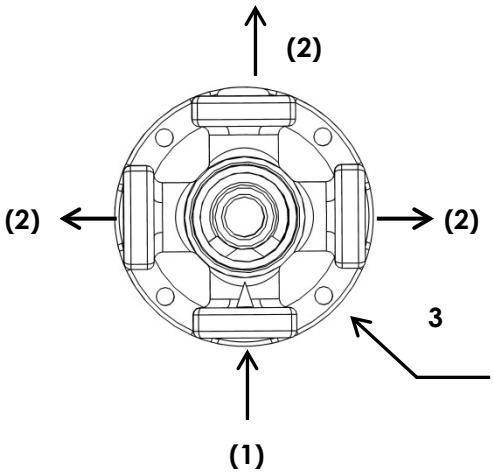


Ind	# Part numbers	Description	Qty
1	**044 910 121**	**Pump bracket assembly**	**1**
2	044 910 122	▪ Pump bracket	1
3	051 751 011	▪ Air supply bracket	1
4	933 011 196	▪ Screw HM 6 x 16 (x 1)	6
5	953 010 016	▪ Nut HM 6 (x 1)	6
6	963 040 016	▪ Washer M 6 (x 1)	6
7	016 370 500	Air regulator, 1/4 - 5,5 bar / 79.77 psi – phosphorus knob	1
8	910 011 402	Gauge, 0 - 10 bar / 0 – 145 psi	1
9	016 380 500	Air regulator, 1/4 – 3.5 bar / 50.76 psi – black knob	1
10	910 011 404	Gauge, 0 - 4 bar / 0 – 58 psi	1
11	906 333 102	Plug, 8 x 13 (x 1)	2
12	552 436	Tee, FFF 1/4 BSP (x 1)	2
13	050 102 213	Fitting, double male, 1/4 BSP (x 1)	2
14	050 102 624	Fitting, double male, 1/4 BSP – 1/4 NPS (x 1)	2
15	904 523 003	Fitting, double male, 1/4 BSP – 3/8 BSP	1
16	903 090 209	Valve, F 3/8	1
17	903 080 401	Discharge valve – setting 6.5 bar / 94 psi	1
18	050 231 702	Adaptor, F 1/4 NPS	1
19	050 372 226	Hose, 8 x 12	1

14.6 Air regulator 1/4"



	Air regulator + knob	
Pressure	Standard mounting	
	Phosphorus	Black
	#	
3.5 bar / 51 psi	-	016 380 500
5.5 bar / 80 psi	016 370 500	-



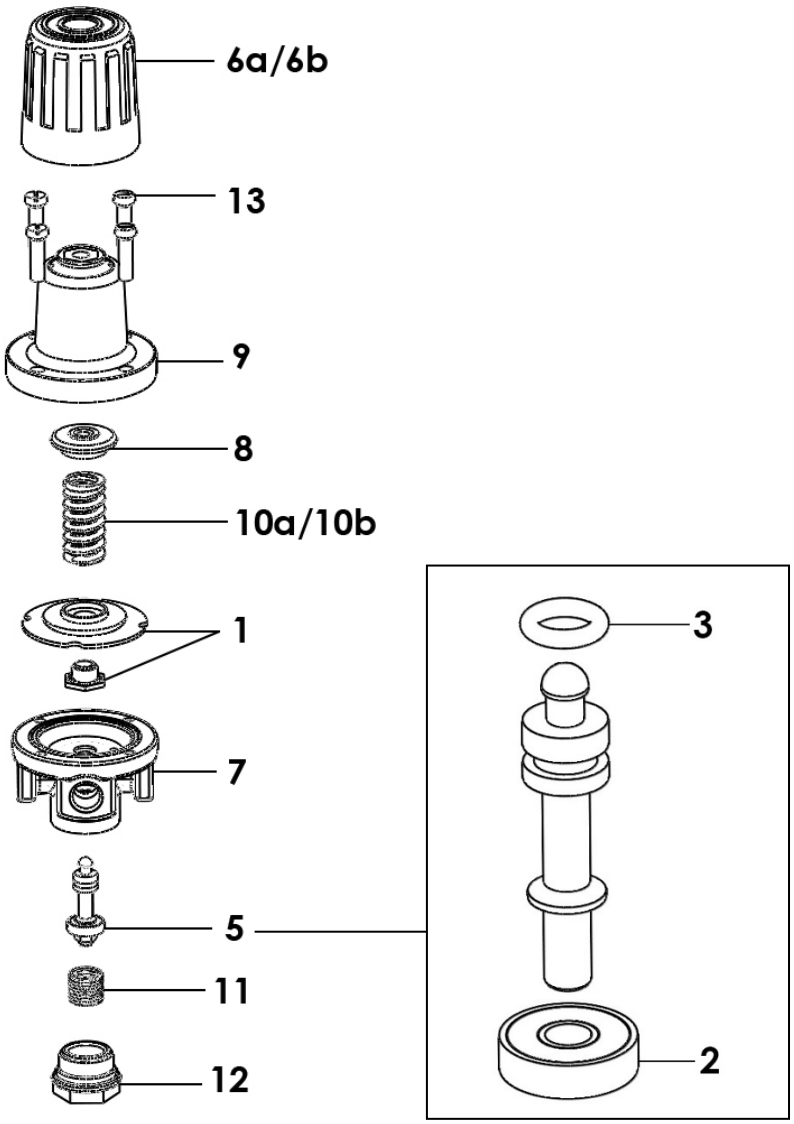
Attention :
Fit air regulator as shown bellow (in the direction of the arrow engraved on the body).

(1) : Air inlet F 1/4"

(2) : Air outlet F 1/4"

(3) Ø 55 mm / 2" 5/32

(4) Inlet and outlet connections F 1/4"


6a/6b
13
9
8
10a/10b
1
7
5
11
12
3
2

Common parts

Ind	# Part numbers	Description	Qty
***-**	**016 189 901**	**Spare set**	**1**
1	016 180 500	▪ Seat and diaphragm assembly	1
2	016 180 300	▪ Valve	1
3	909 130 305	▪ O-Ring R	1
*5	016 180 400	Piston assembly	1
7	016 180 001	Body	1
8	016 180 005	Spring support	1
9	016 180 100	Hat	1
11	050 312 302	Spring (valve)	1
12	016 180 006	Plug	1
13	933 151 275	Screw, 5 x 20 (x 1)	4

Specific parts

For P = 3.5 bar / 51 psi

Ind	# Part numbers	Description	Qty
6a	016 370 505	Black knob	1
10a	050 319 903	Spring (3.5 bar / 51 psi)	1

For P = 5.5 bar / 80 psi

Ind	# Part numbers	Description	Qty
6b	016 380 505	Phosphorus knob	1
10b	050 319 402	Spring (5.5 bar / 80 psi)	1

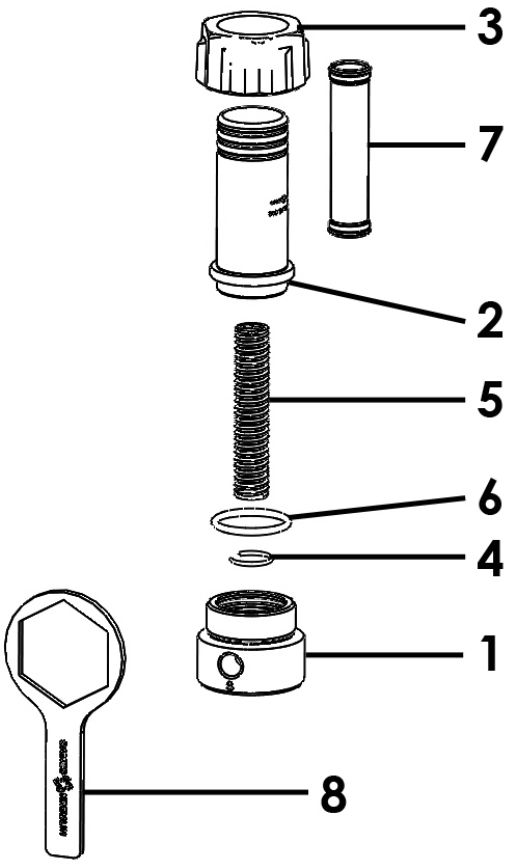
*** Preceding the index number denotes a suggested spare parts.**

Options

Ind	# Part numbers	Description	Qty
-	016 180 010	Support, regulator	1
-	144 910 129	Package of screws (screws, nuts and washers)	1
-	906 333 102	Plug 1/4	-
-	910 011 404	Gauge (0 – 4 bar / 0 – 58 psi) with bottom inlet	-
-	910 011 402	Gauge (0 – 10 bar / 0 – 145 psi) (with bottom inlet)	-
-	910 011 403	Gauge (0 – 6 bar / 0 -81 psi) (with back inlet)	-

14.7 Fluid filter 3/8 ", model 250 bar / 3625.75 psi

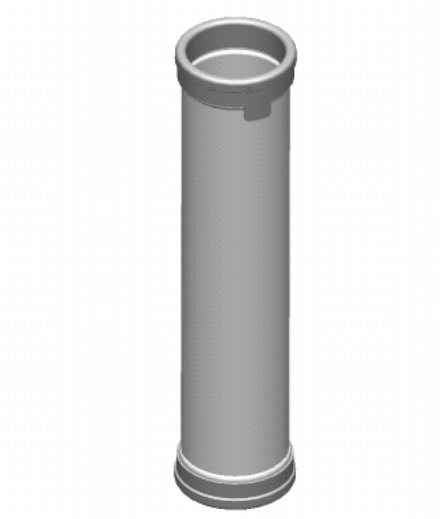
Filter part number
NS



Ind	# Part numbers	Description	Qty
1	055 580 201	Base 3/8	1
2	055 580 202	Bowl	1
3	055 280 002	Nut	1
4	055 190 007	Stop ring	1
5	055 190 005	Spring	1
*6	150 040 327	Seal (x 5)	1
7	000 161 106	Screen n° 6 (168 µ)	1
8	049 030 018	Wrench	1

* Preceding the index number denotes a suggested spare parts.

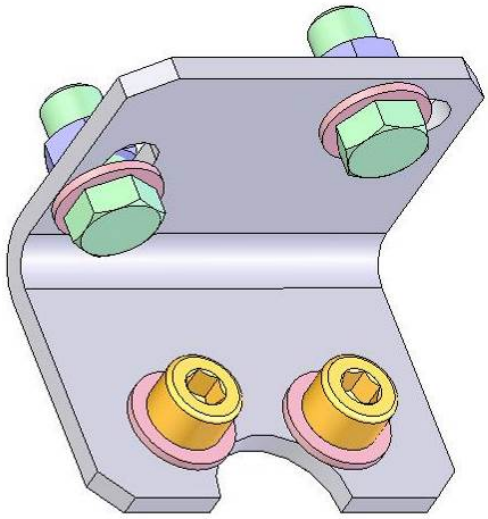
Options



Ind. 7

Ind	# Part numbers	Description	Qty
-	000 161 101	Screen n ° 1 (37 µ)	1
-	000 161 102	Screen n ° 2 (77 µ)	1
-	000 161 104	Screen n° 4 (99 µ)	1
7	**000 161 106**	**Screen n° 6 (168 µ)**	**1**
-	000 161 108	Screen n° 8 (210 µ)*	1
-	000 161 112	Screen n° 12 (280 µ)	1
-	000 161 115	Screen n° 15 (360 µ)	1
-	000 161 020	Screen n° 20 (510 µ)	1
-	000 161 030	Screen n° 30 (750 µ)	1
-	100 161 104	Set of 25 screens n° 4	1
-	100 161 106	Set of 25 screens n° 6	1
-	100 161 108	Set of 25 screens n° 8	1
-	100 161 112	Set of 25 screens n° 12	1

*** Original screen mounted on the pump.**



Ind	# Part number	Description	Qty
-	155 190 105	Mounting bracket with screws, washers and nuts	1