

Owner's Manual

- *Installation*
- *Use*
- *Maintenance*



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1. INTRODUCTION

This manual describes the use and maintenance instructions of the SKH pump, and should be carefully read and understood before using the pump.

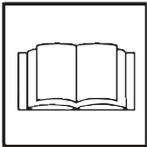
Correct use and adequate maintenance will guarantee the pumps trouble-free operation for a long time. General Pump declines any responsibility for damage caused by misuse or the non-observance of the instructions indicated in this manual.

Upon receiving the pump, check that it is complete and in perfect condition. Should anything be found out of order, please contact us before installing and starting the pump.

2. SYMBOL DESCRIPTIONS



Warning
Potential Danger



Read carefully and understand
the manual before operating
the pump



Danger
High Voltage



Danger
Wear protective mask



Danger
Wear goggles



Danger
Wear protective gloves



Danger
Wear protective boots

3. SAFETY

3.1 General Safety Indications

Improper use of pumps and high pressure systems, and/or failure to observe the installation and maintenance instructions may cause serious injury to people and/or damage to property. Anyone assembling or using high pressure systems must possess the necessary competence to do so, should be aware of the characteristics of the components assembled/used, and must take all precautions necessary to ensure maximum safety in any operating condition. In the interest of safety, both for the Installer and the Operator, no reasonably applicable precaution should be omitted.

3.2 High pressure unit safety requirements

1. The pressure line must always be equipped with a safety valve.
2. High pressure system components, in particular for those units working outside, must be adequately protected against rain, frost and heat.
3. The electrical control system must be adequately protected from water spray, and must comply with the specific regulations in force.
4. High pressure hoses must be properly sized for maximum operating pressure of the system and always and only used within the operating pressure range specified by the hose manufacturer. The same rules should be observed for all other auxiliary systems affected by high pressure.
5. The ends of high pressure hoses must be sheathed and secured to a solid structure to prevent dangerous whiplash in case of bursting or broken connections.
6. Appropriate safety guards must be provided for the pump transmission systems (couplings, pulleys and belts, auxiliary drives).



3.3 Safety During Operation

The working area of a high pressure system must be clearly marked. Access must be prohibited to un-authorized personnel and, wherever possible, the area should be restricted or fenced. The personnel authorized to access this area should first be trained, and informed about the risks that may arise from failures or malfunctions of the high pressure unit.

Before starting the unit, the operator must verify that:

1. The high pressure system is properly fed by a minimum pressure of 75-100 PSI (5-7 Bar), metered in the head flange.
2. The pump intake filters are perfectly clean; we recommend the use of a device that indicates the filters clogging level.
3. Electrical parts are adequately protected and in perfect condition.
4. The high pressure hoses do not show evident signs of abrasion, and that fittings are in perfect shape.
5. During the operation the outer surfaces of the pump may reach high temperatures. Therefore we recommend to take precautions to avoid contact with hot parts.

Any fault or reasonable doubt that may arise before or during operation should be promptly reported and verified by competent personnel. In these cases, pressure should immediately be released and the high pressure system stopped.



3.4 General Procedures For Using Nozzles

1. The Operator must always place his own and other worker's safety before any other interest; his and should always be governed by good sense and responsibility.
2. The Operator must always wear a helmet with a protective visor, waterproof clothing, and appropriate boots capable of guaranteeing grip on wet pavement.

Note: appropriate clothing will effectively protect against water spray, but it may not offer adequate protection against the direct impact of water jets or sprays from a close distance. Some circumstances may require further protection.

3. It is generally best to organize personnel into teams of at least two people capable of giving mutual and immediate assistance in case of necessity and of taking turns during long and demanding operation.
4. Access to the work area that is within the water jets' range must be absolutely prohibited to and free from objects that, inadvertently under a pressure jet, can be damaged and or create dangerous situations.
5. The water jet must only and always be directed in the direction of the work area, including during testing or preliminary tests or checks..
6. The Operator must always pay attention to the trajectory of the debris removed by the water jet. If necessary, suitable guards must be provided by the Operator to protect anything that may be accidentally exposed.
7. The Operator should not be distracted for any reason during operation. Workers needing to access the operating area must wait for the Operator to stop work, and then immediately make their presence known.
8. For safety reasons, it is important that each member of the team is fully aware of the intentions and actions of other team members in order to avoid dangerous misunderstandings.
9. The high pressure system must not be started up and run under pressure without all team members in position and without the Operator having already directed his/her lance toward the work area.

3.5 Safety During System Maintenance

1. The pressure system maintenance must be carried out in the time intervals set by the manufacturer who is responsible for the whole group according to law.
2. Maintenance should always be carried out by trained and authorized personnel.
3. Assembly and disassembly of the pump and its various components must be performed exclusively by authorized personnel, using appropriate equipment in order to avoid damage to components and connections.
4. Always use original spare parts to ensure total reliability and safety.

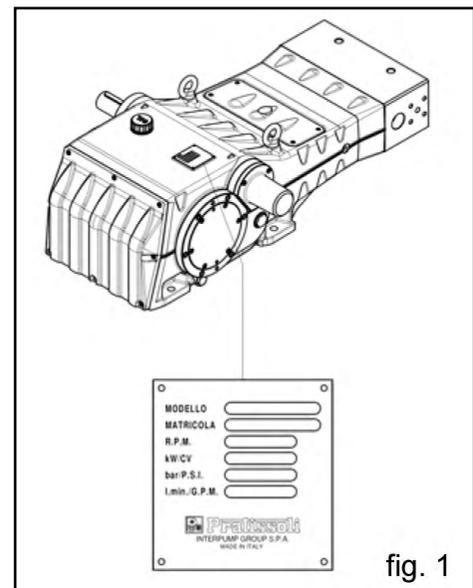
4. PUMP IDENTIFICATION

Each pump has a specific label which contains:

Pump model and version
Serial Number
Maximum RPM
Power - Hp-kW
Pressure - PSI
Flow Rate - GPM



Pump model, version and serial number must always be specified when ordering spare parts.



5. TECHNICAL FEATURES

MODEL	RPM	FLOW RATE		PRESSURE		POWER	
		GPM	l/min	PSI	Bar	Hp	kW
SK2015	1500	11.4	43	21750	1500	168	123
SK2017	1750	11.6	44	21750	1500	171	126
SK2215	1500	13.7	52	18850	1300	176	1291
SK2217	1750	14.0	53	18850	1300	179	132
SK2415	1500	16.4	64	14500	1000	177	130
SK2417	1750	16.6	63	14500	1000	180	132
SK2615	1500	19.3	73	13050	900	171	126
SK2617	1750	19.6	74	13050	900	173	127
SK2815	1500	22.3	84	11600	800	175	128
SK2817	1750	22.7	86	11600	800	179	132
SK3015	1500	25.4	97	10150	700	175	128
SK3017	1750	25.9	98	10150	700	178	131

6. DIMENSIONS AND WEIGHT

For dimensions and weight, please refer to fig. 2.

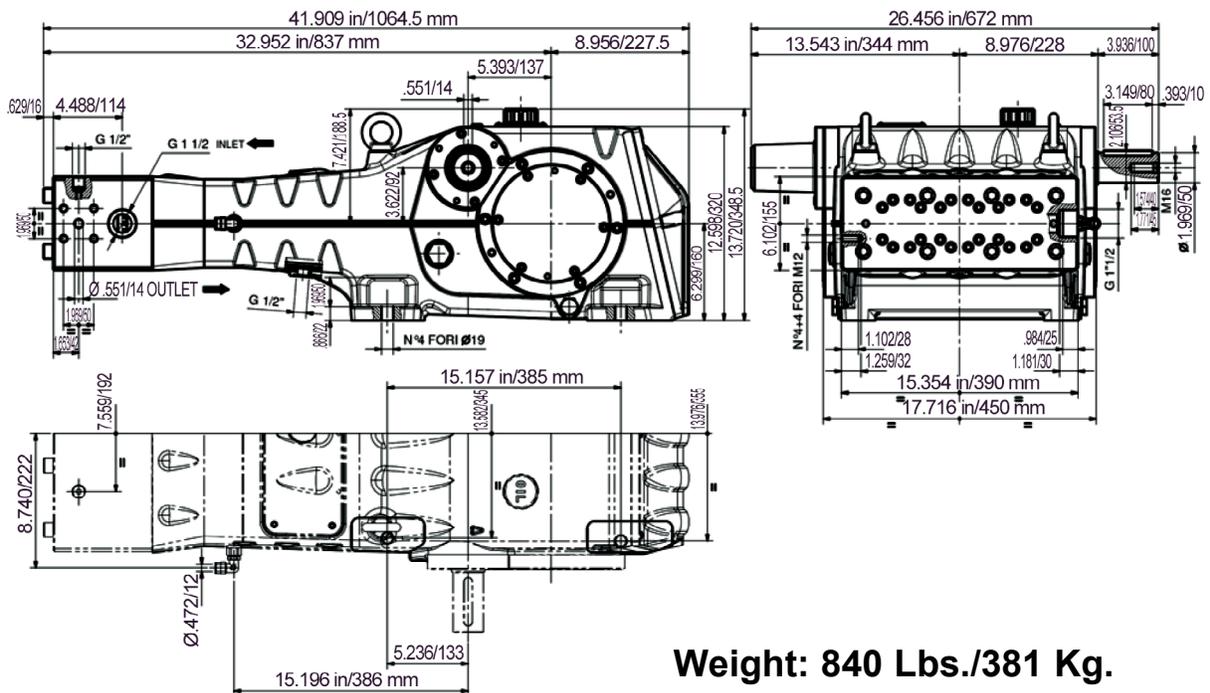


fig. 2

7. INFORMATION ABOUT PUMP USE



The SKH pump has been designed to operate in environments with atmospheres that are not potentially explosive, and with filtered water (see section 9.6)

Other fluids may be used only upon the approval of The Customer Service Department.



7.1 Water Temperature

The max water temperature is 86° F (30° C).

7.2 Max Flow Rate and Pressure Values

The performance values indicated in the catalog refer to the maximum performance of the pump. Regardless of the power used, pressure and maximum RPM values indicated on the plate may not be exceeded unless expressly authorized by the **Customer Service Department.**

7.3 Lowest RPM

The minimum speed allowed for these types of pumps is 300 rpm; any rpm other than mentioned and shown in the performance table (see chapter 5) must be explicitly authorized by the **Customer Service Department.**

7.4 Vibration

The detection of vibration shall be carried out only with the pump set up on the plant and at the performance declared by the customer. Values must be in accordance with regulations.

7.5 Recommended Lubricant Oil Types & Manufacturers

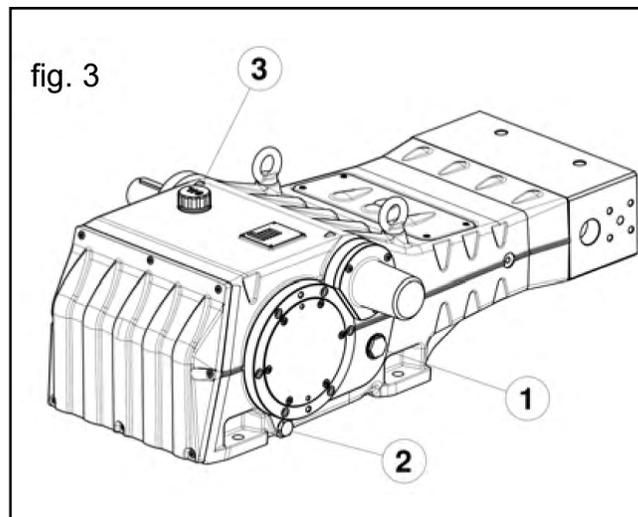
The pump is delivered with lubricant oil compliant with room temperatures ranging between 32° and 89.6° F (0° and 30°C). Some recommended lubricant types are indicated in the table below; these lubricants are treated with additives in order to increase corrosion protection and resistance to fatigue. As an alternative, Automotive SAE 85W-90 gearing lubricants may also be used.

BRAND	TYPE
GENERAL PUMP	SERIES 220
ARAL	Aral Degol BG220
BP	ENERGOL HLP 220
CASTROL	Hyspin VG 220, Magna 220
ELF	POLYTELIS 220
ESSO	NUTO 220
FINA	Cirkan 220
FUCHS	RENOLIN 220
MOBIL	DTE OIL BB
SHELL	TELLUS C 220
TEXACO	RANDO HD 220
TOTAL	CORTIS 220

Check the oil level with the oil level lights located on the sides (1, fig. 3). If necessary, top off via the oil plug (3, fig. 3).

To correctly check the oil level the pump must be at ambient temperature. To change the oil the pump must be at operating temperature, and is done by removing the plug (2, fig. 3).

Checking and changing the oil must be done as shown in section 11. The quantity necessary is 473.4 oz. (14 liters).

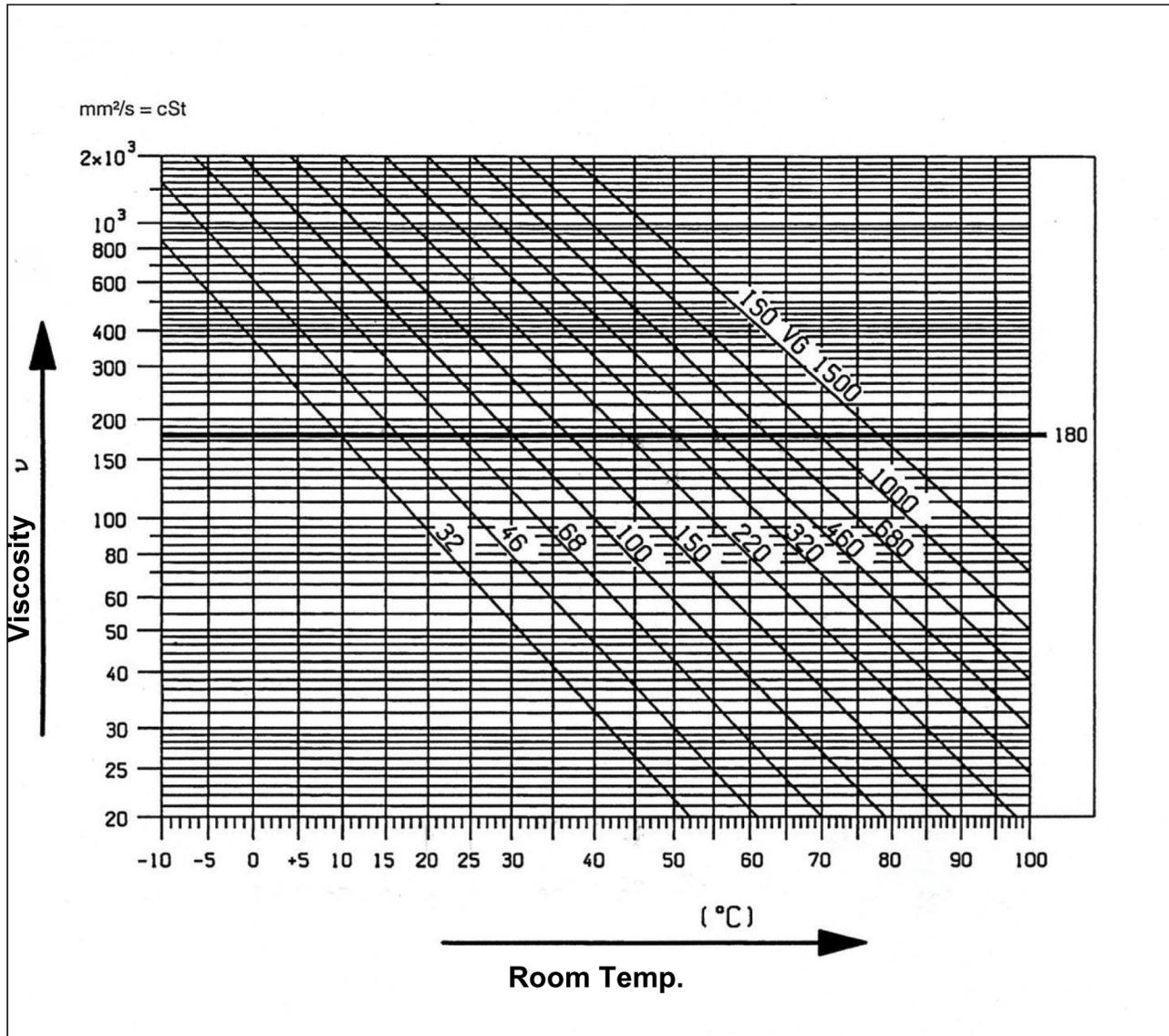




In any case, oil must be changed at least once a year since it may deteriorate by oxidation.

For room temperatures that differ from that mentioned earlier, follow the indications contained in the diagram below, keeping in mind that the oil must have a minimum viscosity of 180 cSt.

VISCOSITY/ROOM TEMPERATURE DIAGRAM

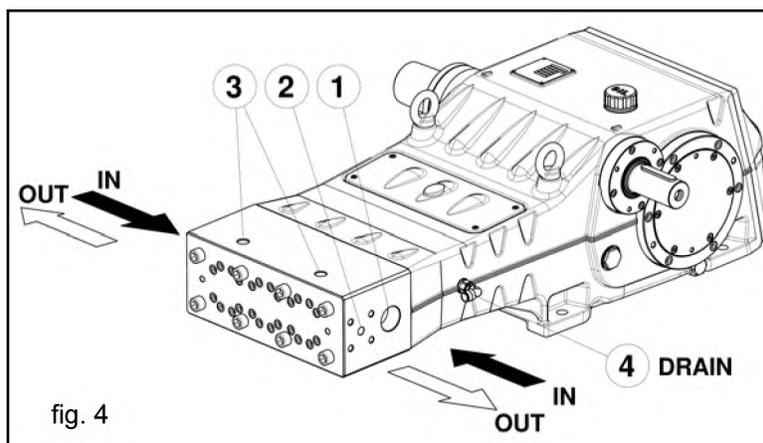


Exhausted oil must be collected in an appropriate container and disposed of in appropriate locations. Do not under any circumstances discard it into the environment.

8. PORTS AND CONNECTIONS

SK Series pumps are equipped with (see fig. 4):

1. 2 inlet ports "IN", 1-1/2" BSP-F.
The line can be connected to either of the two inlet ports; the ones not being used must be hermetically sealed.
2. 2 outlet ports "OUT", Ø 3/4" HP Special.
3. 2 service ports, 1/2". These can be used for the pressure gauge
4. 1 drain port "DRAIN" supplied with an adjustable 90° rapid fitting for Ø 12 mm polyamide pipes. It is used to recover the fluid drained from the packing cooling circuit, and must be connected to the outlet port being careful to avoid counter-pressure.

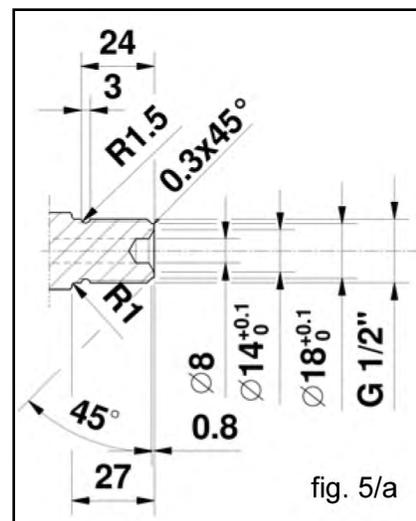
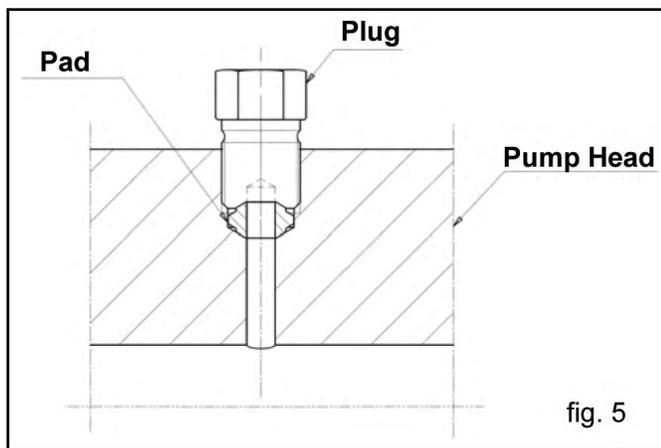


8.1 Conical seal pads/ferrules

SKH pumps are provided with 4 steel conical pads, for use in the corresponding outlet ports of the pump (see fig. 5) or in the optional connection flanges, to ensure the connection seal. While the seat of the pump's outlet port is already machined to accept the conical pad, if it is necessary to make the connection for the outlet connection or the closing plug, these must be specifically machined as shown in fig. 5a.



At every disassembly, the conical pads must be replaced.



9. PUMP INSTALLATION

9.1 Installation

The pump must be installed in a horizontal position using the drilled $\varnothing 19$ support feet. The base must be perfectly flat and rigid enough as not to allow bending or misalignment on the pump coupling and axis/transmission due to torque transmitted during operation.

Two lifting eye bolts are mounted on the pump for easy installation, as per the figure below.



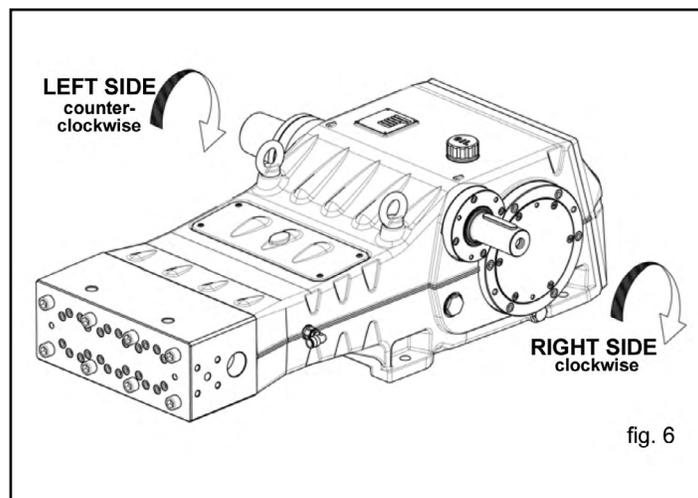
The pump's shaft (PTO) must not be rigidly connected to the motor unit.

The following transmission types are suggested:

- Flexible joint
- Cardan Joint (please respect the maximum working angles indicated by the manufacturer)

9.2 Direction of rotation

The PTO rotation is indicated by an arrow located on the reduction gear cover. From a position facing the pump head, the rotation direction will be as in fig. 6.



The power take-off can be taken from either side of the pump. Generally the pump is supplied with the PTO shank for the right-hand side (see fig. 6). To get the power take-off from the left hand side, the shaft end cover must be taken off and remounted on the right hand side of the pump (see 2.1.1 in the Repair Manual). Vice-versa, the lug must be removed from the right hand side and inserted in the shank of the left hand side.

9.3 Hydraulic Connections

To isolate the plant from the vibrations produced by the pump, we recommend building the first section of hose adjacent to the pump (for both intake and outlet) with flexible hose. The solidity of the intake section must be enough to prevent deformation caused by the depression produced by the pump.

9.4 Pump Supply

SKH pumps require a positive water head (NPSH_r) of between 75-100 PSI (5-7 Bar) at the pump head entrance. The booster supply pump must have a flow rate at least double that of the rated flow rate of the plunger pump, and a minimum pressure of 75 PSI (5 bar). These supply conditions must be respected for any and all working regimes. The booster pump must be run independent of the plunger pump.



The booster pump must always be started before the plunger pump. We recommend installing a pressure switch on the supply line downstream of the filters, to protect the pump.



In order to ensure the seal durability it is recommended, if necessary, to operate the pump at a minimum pressure of 362-435 PSI (25-30 bar).



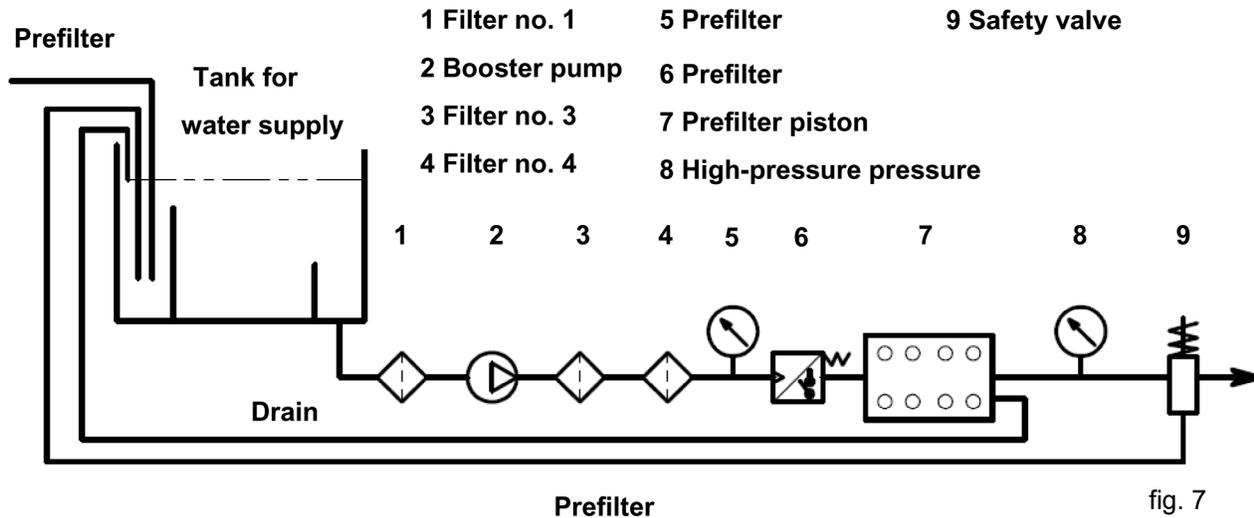
9.5 Suction Line

For the pump's correct operation, the suction line must have the following characteristics:

1. Minimum internal diameter as indicated in the diagram in paragraph 9.8 and in any case equal or greater than the pump head's value. Along the duct, avoid localized diameter reductions that may cause pressure drops with subsequent cavitation. Absolutely avoid 90° elbows, connections with other hoses, bottlenecks, counter-slopes, upside down "U" shaped curves, "T" connections.
2. With a layout that is set in such a way to prevent cavitation.
3. It should be perfectly airtight, and built in a way that guarantees perfect sealing over time.
4. Avoid pump emptying when stopping (even partial emptying).
5. Do not use hydraulic fittings, 3 or 4 way fittings, adapters, etc., since they may hinder the pump's performance.
6. Do not install Venturi tubes or injectors for detergent intake.
7. Avoid the use of standing valves, check valves, or any other type of one-way valves.
8. Do not connect the by-pass line from the valve directly to the pump suction line.
9. Provide appropriate baffle plates inside the tank in order to avoid water flows coming from both the by-pass and feeding lines may create turbulence near the tank's outlet port.
10. Make sure that the suction line is perfectly clean inside before connecting it to the pump.
11. The pressure gauge for checking booster pressure must be installed near the plunger pump's outlet port, and always downstream from the filters.

9.6 Filtration

The level of filtration permitted for this series of pumps must be maximum 20 µm (micron). Normally this is obtained by a battery of at least three filters, positioned as shown in fig. 7.



The filters must be installed as close as possible to the pump. They must be easily accessible for inspection and must have the following specifications:

- Filter number 1: 250 µm
- Filter number 3: 100 µm
- Filter number 4: 20 µm



In order to guarantee correct pump operation, it is important to plan periodical cleaning of the filter depending on actual pump usage, water quality and actual clogging conditions.

To guarantee the supply pressure required (see 9.4) install a pressure switch.

9.7 Outlet Line

To obtain a correct delivery line, please comply with the following installation instructions:

1. The internal diameter of the pump must allow to guarantee correct fluid speed; see digram in paragraph 9.8
2. The first section of the hose connected to the pump must be flexible in order to isolate pump vibrations from the rest of the system.
3. Use high pressure hoses and fittings that guarantee wide safety margins in any working condition.
4. Install a safety valve on the delivery line.
5. Use pressure switches suitable for the pulsating loads typical of plunger pumps.
6. In the design phase, take into proper account the pressure drop along the line, since this causes a reduction in usage pressure with respect to the value measured at the pump.
7. If the pump pulsations are harmful for particular applications, install an appropriately sized pulsation dampener on the outlet line.

9.8 Internal Diameter of the Hose Line

To determine the internal diameter of the hose, please refer to the following diagram.

Inlet Hose

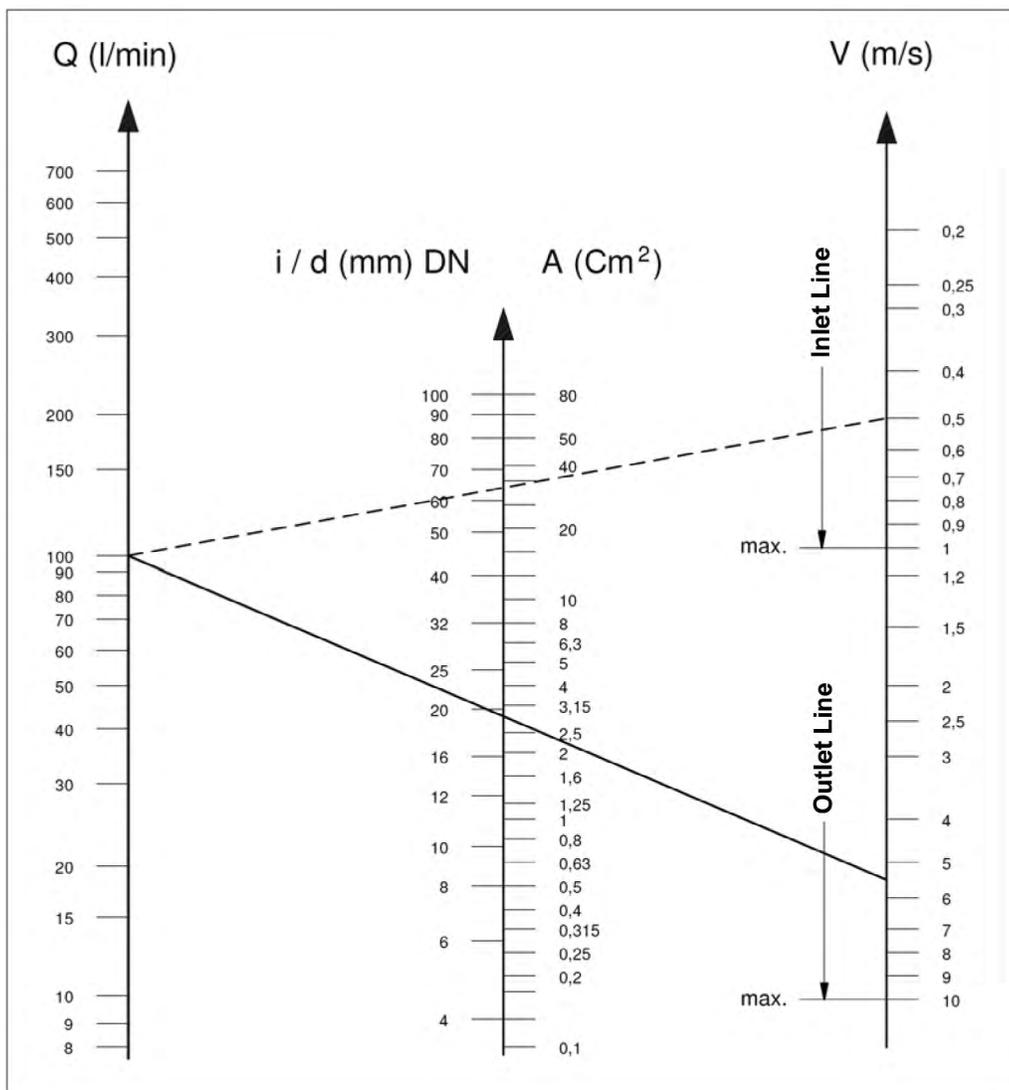
With a flow rate of ~26 GPM (99 l/mn) and water speed of 0.5 m/sec. The diagram line that connects the two scales intersects the central scale, indicating the diameters, at a value of ~ 2.5 inch (65 mm).

Outlet Hose

With a flow rate of ~26 GPM (99 l/mn) and water speed of 5.5 m/sec. The diagram line that connects the two scales intersects the central scale, indicating the diameters at a value of ~ .75 inch (19 mm).

Optimal speed to be obtained with the booster pump:

- Suction: ≤ 1 m/sec.
- Delivery: ≤ 5.5 m/sec.



The diagram does not take into account the hose and valve resistance, the pressure drop due to the pipe length, the viscosity and the temperature of the pumped fluid. If necessary, contact our Customer Service Department.

10. START-UP AND OPERATION

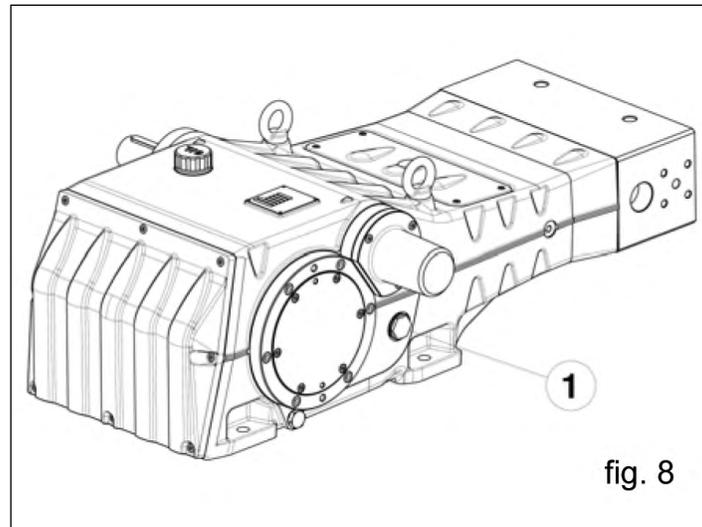
10.1 Preliminary Inspections

Before Start-up Be sure that:



The inlet line is connected and up to pressure (see Chapter 9) the pump must NEVER run dry.

1. The inlet line must be perfectly airtight.
2. All the On-Off valves between the pump and the feeding source are completely open. The outlet line must discharge freely in order to allow the air in the pump to be expelled easily, thus facilitating pump priming.
3. All fittings and connections must be correctly tightened.
4. Coupling tolerances on the pump/transmission axis (half-joint misalignment, Cardan inclination, belt tightening, etc.) must remain within the limits indicated by the transmission Manufacturer.
5. The pump's oil level must be verified using the correct dipsticks (position 1, fig 8).



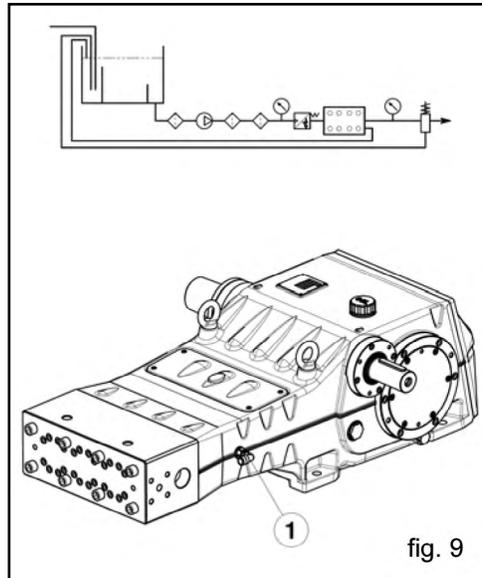
In case the pump has not run for a long period of time, recover the correct operation of the suction valves by opening the three valve-lifting devices (see fig. 9). Be sure to re-close the valves before the pump start-up.

10.2 Start-up

1. When starting the pump for the first time, check for the correct direction of rotation.
2. The pump must be started off-load.
3. Verify correct feeding pressure.
4. During operation, check that the rotating speed does not exceed the rated value.
5. Before putting the pump under pressure let it run for at least 3 minutes.
6. Before stopping the pump, release the pressure by acting on the adjustment valve or on any discharging device.

10.3 Cooling Circuit Seal Packing

During operation, some water from the cooling circuit seal packings will be discharged from port 1 (fig. 9). The drainage from this circuit must be redirected to the inlet line upstream of the booster pump (fig. 9) or to the collection tank.



11. PREVENTIVE MAINTENANCE

To guarantee pump reliability and efficiency, comply with the maintenance intervals as indicated in the table below.

PREVENTIVE MAINTENANCE	
EVERY 500 HOURS	EVERY 1000 HOURS
Check oil level	Change oil
	Check / Replace:* <ul style="list-style-type: none"> • Valves • Valve seats • Valve springs • Valve guides
	Check / Replace: <ul style="list-style-type: none"> • H.P packings • L.P. packings

* For replacement follow instructions contained in the repair manual.

12. PUMP STORAGE

12.1 Inactivity for Lengthly Periods



If the pump is started for the first time after a long period of inactivity, before putting it into operation check the oil level, inspect the valves as indicated in Chapter 10, and then follow the prescribed startup procedures.

12.2 Filling the Pump With An Anti-Corrosion Emulsion or Anit-freeze By Using An External Diaphragm Pump As In The Layout Shown in Paragraph 9.6.

- a) Close the filter draining, if open.
- b) Be sure that the connecting hose is clean, spread with grease and connect it to the high pressure outlet port.
- c) Fit a suction hose to the membrane pump. Open the pump suction connection and fit hose between it and the membrane pump.
- d) Fill the container with the solution/emulsion.
- e) Put the free extremities of the suction line and the high pressure outlet hose inside the container.
- f) Start up the diphragm pump.
- g) Pump the emulsion until it comes out of the high pressure hose.
- h) Continue pumping for at least another minute; if needed, the emulsion can be reinforced by adding, for example, Shell Donax
- i) Stop the pump, remove the hose from the suction connection and close it with a plug.
- j) Remove the hose from the high pressure outlet port. Clean, grease and plug both connections and the hoses.

12.3 Hoses

- a) Before greasing and protecting the hoses according to the previously described procedure, dry the connections using compressed air.
- b) Cover with polyethelene.
- c) Do not wrap them too tightly; be sure there is no bending.

13. PRECAUTIONS AGAINST FREEZING



In areas and periods of the year where there is risk of freezing, follow the instructions indicated in Chapter 12 (see paragraph 12.2).



In the presence of ice, in no case must the pump be started until the entire circuit has been completely thawed out; not complying with this indication may cause serious damage to the pump.

14. WARRANTY TERMS

The pump is guaranteed for a period of 5 years from the delivery date, with the exception of parts subject to wear. In any case, please refer to the contract terms for other warranty conditions. The warranty is void if:

- a) The pump has been used for purposes that differ from that agreed.
- b) The pump has been fit with an electric or diesel engine with performance greater than that indicated in the table.
- c) The required safety devices were unadjusted or disconnected.
- d) The pump was used with accessories or spare parts not supplied by General Pump.
- e) Damage was caused by:
 - 1) improper use
 - 2) the non-observance of maintenance instructions
 - 3) use not compliant with operating instructions
 - 4) insufficient flow rate
 - 5) faulty installation
 - 6) incorrect positioning or sizing of the hoses
 - 7) non-authorized design changes
 - 8) cavitation

15. TROUBLESHOOTING**The pump does not produce any noise at start-up:**

- The pump is not primed and is running dry
- There is no water in the inlet line
- The valves are blocked
- The delivery line is closed and does not allow the air in the pump to be discharged

**The pump pulses irregularly (knocking):**

- Air suction
- Insufficient feeding
- Bends, elbows, fittings along the suction line obstruct the fluid's passage
- The inlet filter is dirty or too small
- The booster pump, where provided, supplies insufficient pressure or flow rate
- The pump is not primed due to insufficient head or the delivery line is closed during priming
- The pump is not primed due to valve seizing
- Worn valves
- Worn pressure packings
- Incorrect operation of the pressure adjustment valve
- Transmission problems

**The pump does not deliver the rated flow / is noisy:**

- Insufficient feeding (see the causes listed above)
- RPM are less than the rated flow
- Excessive amount of water by-passed by the pressure adjustment valve



- Worn valves
- Leakage from the pressure packings
- Cavitation due to:
 - 1) Wrong sizing of the suction hose/undersized diameters
 - 2) Insufficient flow rate
 - 3) High water temperature

Insufficient pump pressure:

- The nozzle (or has become) too large
- Insufficient RPM
- Leakage from the pressure packings
- Incorrect operation of the pressure adjustment valve
- Worn valves

Overheated pump:

- The pump is overloaded (pressure or RPM exceed the rated values)
- Oil level is too low, or the oil is not of a suitable type, indicated in Chapter 7 (see paragraph 7.4)
- Incorrect alignment of the joint or pulleys
- Excessive inclination of the pump during operation

Pump vibrations or knocking:

- Air suction
- Incorrect operation of the pressure adjustment valve
- Valve malfunction
- Irregular drive transmission motion

16. EXPLODED VIEW AND PARTS LIST

Pockets to fill with grease

**** Lubricate with silicone grease Type OKS 1110, following the operations listed below:
a) The external diameter must only be slightly moistened
b) On the internal diameter, grease must be applied paying great attention to filling all the pockets between the sealing lips as shown in the figure.

**** Lubricate with silicone grease Type OKS 1110. The external and internal diameters must be only slightly moistened.

** Lubricate the threaded shank with Molybdenum Disulphide grease code 12001500

* Lock with LOCTITE 243

SKH

DIS. COD. 78.9506.00 0

Tightening of head and liner screws pos. 14 and pos. 13

Tightening seal support screws pos.26

Tightening M8x50 screws in the indicated sequence (1-2-3-4-5-6-7-8-9-10) performed in a single phase at the indicated torque.

OPERATION 1: Tightening M16x280 screws (pos.14) in two steps observing the sequence indicated in figure: (A-B-C-D-E-F-G-H)

1^ Phase = 120Nm 2^ Phase = 200Nm

OPERATION 2: Tightening M10x140 screws (pos. 13) in four steps observing the sequence indicated in figure:

(1-2-3-4-5-6-7-8) 1^ Phase = 40Nm 2^ Phase = 65Nm 3^ Phase = 83Nm 4^ Phase = 83Nm

Item	Part No.	Description	QTY.
1	F78120056	Manifold	1
2	F36208060	Valve Guide	3
3	F94747500	Spring, Ø 18x35 SK20, 22, 24	3
	F94948900	Spring, Ø18.9x35, SK26, 28, 30	3
4	F36208356	Valve, Ø 20, 22, 24	3
	F36208456	Valve, Ø 26, 28, 30	3
5	F93198700	Seal, Ø 36x41x3.8	3
	F93198900	Seal, Ø 46x51x3.8, SKH26-28-30	3
6	F36208156	Valve Seat, Ø 20, 22, 24	3
	F36208256	Valve Seat, Ø 26, 28, 30	3
7	F90390300	O-ring, Ø 60x2x2.62	3
8	F36207856	Valve Glide, Ø 20, 22, 24	3
	F36207956	Valve Guide, Ø 26, 28, 30	3
9	F94764000	Spring, Ø 32x40, INOX, SK20, 22, 24	3
	F94770500	Spring, Ø 41.5x44, INOX, SK26, 28, 30	3
10	F78210020	Cylinder Bushing	1
11	F78060256	Liner, Ø 20, 22, 24	3
	F78060356	Liner, Ø 26, 28, 30	3
12	F78217956	Plunger Support, Ø 20-22-24	3
	F78218056	Plunger Support, Ø 26-28-30	3
13	F99382800	Screw, TCEI, M10x140	24
14	F99523200	Screw, TCEI, M16x280	8
15	F90381800	O-ring, Ø 7.59x2.62	2
16	F78040601	Plunger Assembly, Ø 20	3
	F78040701	Plunger Assembly, Ø 22	3
	F78040801	Plunger Assembly, Ø 24	3
	F78040901	Plunger Assembly, Ø 26	3
	F78041001	Plunger Assembly, Ø 28	3
	F78041101	Plunger Assembly, Ø 30	3
17	F90271200	H.P. Packing, Ø 20x36x17.9	3
	F90273300	H.P. Packing, Ø 22x36x17.9	3
	F90274400	H.P. Packing, Ø 24x36x17.9	3
	F90274900	H.P. Packing, Ø 26x46x20.5	3
	F90275900	H.P. Packing, Ø 28x46x18.5	3
	F90277800	H.P. Packing, Ø 30x46x17.8	3
18	F78212568	Anti-extrusion Ring, Ø20	3
	F78212668	Anti-extrusion Ring, Ø22	3
	F78212768	Anti-extrusion Ring, Ø24	3
	F78212868	Anti-extrusion Ring, Ø26	3
	F78212978	Anti-extrusion Ring, Ø28	3
	F78213068	Anti-extrusion Ring, Ø30	3
19	F78213160	Bushing Gasket, Ø 20	3
	F78213260	Bushing Gasket, Ø 22	3
	F78213360	Bushing Gasket, Ø 24	3
	F78213460	Bushing Gasket, Ø 26	3
	F78213560	Bushing Gasket, Ø 28	3
	F78213660	Bushing Gasket, Ø 30	3
20	F90268900	L.P. Packing, Ø 20x28x6	3
	F90271400	L.P. Packing, Ø 22x30x6	3
	F90273900	L.P. Packing, Ø 24x32x6	3
	F90274920	L.P. Packing, Ø 26x34x8	3
	F90275200	L.P. Packing, Ø 28x36x6	3
	F90276300	L.P. Packing, Ø 30x38x6	3
21	F78211356	Packing, Ø 20	3
	F78211456	Packing, Ø 22	3
	F78211556	Packing, Ø 24	3
	F78211656	Packing, Ø 26	3
	F78211756	Packing, Ø 28	3
	F78211856	Packing, Ø 30	3
22	F90078000	Ring, INOX	3
23	F90387800	O-ring, Ø 39.34x2.62 (SK20, 22, 24)	3
	F90388800	O-ring, Ø 48.89x2.62 (SK26, 28, 30)	3
24	F90391450	O-ring, Ø 75.87 NBR70 SH3300	6
	F78210756	Gasket Support, Ø 20	3
25	F78210856	Gasket Support, Ø 22	3
	F78210956	Gasket Support, Ø 24	3
	F78218856	Gasket Support, Ø 26	3
	F78218956	Gasket Support, Ø 28	3
	F78219056	Gasket Support, Ø 30	3
	26	F99326100	Screw, M8x100
27	F90386500	O-ring, Ø 29.82x2.62	3
28	F74213351	Washer	3

Item	Part No.	Description	QTY.
29	F74150222	Open Inspection cover	1
30	F90167900	Ring, rad. Ø40x52x7	3
31	F78213771	Plunger Guide Oil Seal Cover	3
32	F90391400	O-ring, Ø 72.69x2.62	3
33	F90450000	O-ring, Ø 266.06x5.34	2
34	F74150122	Closed Inspection Cover	1
35	F78050236	Plunger Guide Rod	3
36	F99191600	Screw, STEI, M6x30	3
37	F99188400	Elastic Pin, Ø 5x16	3
38	F90917900	Screw, TE, M10x35	3
39	F79050443	Plunger Guide	3
	F79050543	Plunger Guide, +1.0	3
40	F99441000	Connecting Rod Screw, M12x1.25x87	6
41	F78160020	Crankcase Cover	1
42	F99305900	Screw, TCEI, M8x20	23
43	F90417000	O-ring, Ø 355.19x3.53	1
44	F78010013	Pump Body	1
45	F98195500	Plug, Ø 9x10	1
46	F90069700	Ring, 35 UNI	6
47	F97745000	Flinger Washer, Ø 35x64	3
48	F97597800	Oil Level Indicator	2
49	F78214200	Pressure Bushing	2
50	F78020035	Crankshaft	1
51	F99426800	Screw, TCEI, M12x25	8
52	F78213955	Bearing Flange	2
53	F91886200	Bearing	2
54	F78150200	Side Cover	2
55	F90392900	O-ring, Ø152.07x2.62	2
56	F90394000	O-ring, Ø183.62x2.62	2
57	F99368600	Screw, TCEI, M10x30	12
58	F78150013	Bearing Cover Door	3
	F90930000	Babbit Bearing, Upper	3
	F90930100	Babbit Bearing, Upper, +0.25	3
59	F90930200	Babbit Bearing, Upper, +0.50	3
	F90931000	Babbit Bearing, Lower	3
	F90931100	Babbit Bearing, Lower, +0.25	3
60	F90931200	Babbit Bearing, Lower, +0.50	3
	F78030101	Connecting Rod Assembly	3
61	F10072735	Left Ring Gear, Z59 R2.95, Helicol	1
62	F10073135	Left Ring Gear, Z61 R3.389, Helicol	1
63	F10072835	Right Ring Gear, Z59 R2.95, Helicol	1
	F10073235	Right Ring Gear, Z61 R3.389, Helicol	1
64	F97618500	Pin, Ø 8x18	2
65	F96751400	Washer, Ø 21.5x27x1.5	2
66	F98218700	Plug, G1/2"x13	2
67	F98233300	Oil Plug	1
68	F91501000	Key	1
69	F93105000	Lift Ring, M16 UNI 1947	2
70	F99183700	Screw, TCEI, M6x148.8	8
71	F96738000	Washer, Ø 17.5x23x1.5	1
72	F78214566	Fitting Ø 3-3/8Mx3/8F	1
73	F96416400	Open Side Cover	1
74	F10073355	Pinion, Z20 R2.95, Helicol	1
	F10073555	Pinion, Z18 R3.389, Helicol	1
75	F78150120	Open End Cover	1
76	F90172400	Ring, Rad., Ø 55x75x8, Viton	2
77	F78150320	Side PTO Bearing Cover, Left	1
78	F90391800	O-ring, Ø94.92x2.62	2
79	F91859700	Roller Bearing	4
80	F78214089	External Bearing Spacer	2
81	F78214189	Internal Bearing Spacer	2
82	F78214489	Bushing	2
83	F78214389	Bushing	2
84	F90358100	O-ring, Ø 8.73x1.78	8
85	F99308400	Screw, TCEI, M8x30	1
86	F78150420	Bearing Cover	1
87	F93174000	Washer Conical, 1/2"	2
88	F97618500	Pin, Ø 8x18	4
	F78100570	Head Ring, Ø 20	3
	F78100670	Head Ring, Ø 22-24	3
	F78100870	Head Ring, Ø 26	3
	F78100970	Head Ring, Ø 28	3
	F78101070	Head Ring, Ø 30	3

See next page for repair kits

REPAIR KITS

KIT NUMBER	F2079 (SKH20) Plunger Packing Kit	F2080 (SKH22) Plunger Packing Kit	F2081 (SKH24) Plunger Packing Kit	F2082 (SKH26) Plunger Packing Kit	F2083 (SKH28) Plunger Packing Kit	F2084 (SKH30) Plunger Packing Kit
Positions Included	7, 15, 17, 18, 19, 20, 23, 24	7, 15, 17, 18, 19, 20, 23, 24	7, 15, 17, 18, 19, 20, 23, 24	7, 15, 17, 18, 19, 20, 23, 24	7, 15, 17, 18, 19, 20, 23, 24	7, 15, 17, 18, 19, 20, 23, 24

KIT NUMBER	F2085 (SKH20, SKH22, SKH24) Valve Seal Kit	F2086 (SKH26, SKH28, SKH30) Valve Seal Kit
Positions Included	5	5

KIT NUMBER	F2087 (SKH20) Complete Seals Kit	F2088 (SKH22) Complete Seals Kit	F2089 (SKH24) Complete Seals Kit	F2090 (SKH26) Complete Seals Kit	F2091 (SKH28) Complete Seals Kit	F2092 (SKH30) Complete Seals Kit
Positions Included	5, 7, 15, 17, 18, 19, 20, 23, 24, 27, 30, 32, 33, 43, 55, 56,76, 78, 84	5, 7, 15, 17, 18, 19, 20, 23, 24, 27, 30, 32, 33, 43, 55, 56,76, 78, 84,	5, 7, 15, 17, 18, 19, 20, 23, 24, 27, 30, 32, 33, 43, 55, 56,76, 78, 84	5, 7, 15, 17, 18, 19, 20, 23, 24, 27, 30, 32, 33, 43, 55, 56,76, 78, 8	5, 7, 15, 17, 18, 19, 20, 23, 24, 27, 30, 32, 33, 43, 55, 56,76, 78, 84	5, 7, 15, 17, 18, 19, 20, 23, 24, 27, 30, 32, 33, 43, 55, 56,76, 78, 84

KIT NUMBER	F2076 (All SKH models) Connecting Rod Bushing Kit	F2077 (All SKH models) Connecting Rod Bushing Kit +0.25	F2078 (All SKH models) Connecting Rod Bushing Kit +0.50
Positions Included	59, 60	59, 60	59, 60

KIT NUMBER	F2111 (SKH20, SKH22, SKH24) Inlet & Outlet Valves Kit	F2112 (SKH26, SKH28, SKH30) Inlet & Outlet Valves Kit
Positions Included	2, 3, 4, 5, 6, 8, 9	2, 3, 4, 5, 6, 8, 9

KIT NUMBER	F2371 (SKH20) Conversion Kit SK to SKH	F2372 (SKH22) Conversion Kit SK to SKH	F2373 (SKH24) Conversion Kit SK to SKH	F2374 (SKH26) Conversion Kit SK to SKH	F2375 (SKH28) Conversion Kit SK to SKH	F2376 (SKH30) Conversion Kit SK to SKH
Positions Included	5, 7, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 89	5, 7, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 89	5, 7, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 89	5, 7, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 89	5, 7, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 89	5, 7, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 89

MAINTENANCE LOG

HOURS & DATE

OIL CHANGE							
GREASE							
PACKING REPLACEMENT							
PLUNGER REPLACEMENT							
VALVE REPLACEMENT							



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