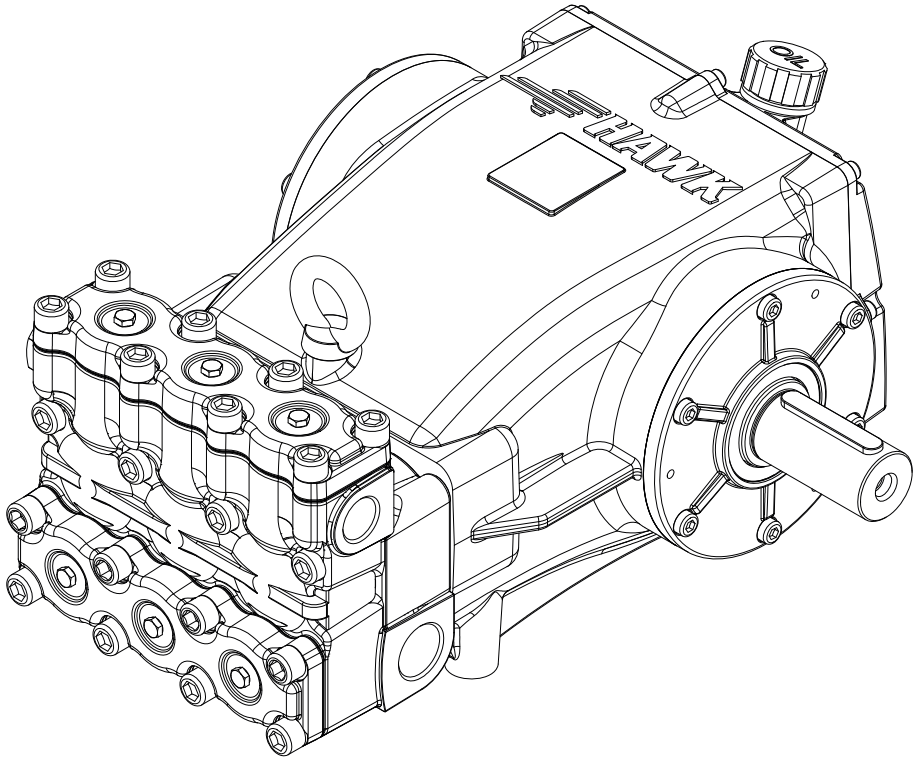
HAWK®
INTERNATIONAL

HHP Series



OPERATING AND MAINTENANCE MANUAL

FOR PUMPS: **HHP25S - HHP30S - HHP38F**
HHP2750 - HHP3650 - HHP4150
HHP5040

03/2013

CONTENTS

1 INTRODUCTION

This manual contains the instructions for operating and maintaining HHP pumps correctly; it is important you have read and understood them properly before you start to use the pumps. Correct use and maintenance of the pump is essential in order to safeguard correct operation. LEUCO S.p.A. is not liable for any damages caused by negligence or failure to comply with the instructions in this manual. Check the pump is intact and there are no missing parts when you first take delivery of it. Report any anomalies before you install and start to use the pump. If you think it could be dangerous, do not install or use it.

1.1 Symbols used in the manual

Warning sign relating to safety at work

You will come across this symbol where the instructions contain a warning of serious potential risks for operator safety.

Warning sign relating to the danger of crushing hands or feet

Hands or feet may be crushed resulting in potentially serious consequences. Wear work gloves and boots and/or the proper safety apparel for the job.

Caution

This symbol is used to draw your attention to the most important parts in the manual.

2 SAFETY

2.1 General recommendations

Improper use of high-pressure pumps and systems and failure to comply with the installation instructions and maintenance standards can lead to serious damage and injury. Personnel involved in the installation and operation of high-pressure systems must have the necessary skills, know the specifications of the system parts and must take all possible precautions to safeguard maximum safety in all operating conditions.
No exceptions are allowed as regards the use of appropriate safety precautions in order to protect the safety of installers and operators.

2.2 Safety and the high pressure circuit

A safety valve or a maximum pressure valve must always be fitted on the high pressure circuit.
The components in the high pressure circuit, especially those operating predominantly outside, must be protected against inclement weather such as rain, frost or heat.
Electrical parts must have adequate protection against direct and indirect water spray and must be suitable for use in a damp environment.
High-pressure pipes must be sized according to the maximum operating pressure in the circuit and always according to the operating range specified by its manufacturer. These precautions must be observed for all the parts in the high pressure circuit.
The ends of the high pressure pipes must be sheathed or otherwise secured to a structure to prevent the risk of whiplash in case of a burst or damage to a coupling.
Appropriately sized housings must also be fitted to protect the moving parts of the drive shaft (flexible and cardan joints, belts, pulleys).

2.3 Safety during pump operation

The room and area where the high pressure system will operate must be clearly marked and access by unauthorised personnel must be prohibited. Access to the area should also be restricted, wherever possible.
Personnel involved must be instructed as regards the conduct required in the area before they start work and be informed as to the potential risks linked to failures or faults in the high pressure system.
Before the operator or operators start up the system, he/they must check the following:
The supply to the system is correct
That electrical parts are fitted with proper safety devices that operate correctly
That there is no abrasion or wear on the high pressure pipes and related couplings.

Personnel must report and verify any anomaly, damage, or reasonable doubt that a fault may occur before or during work. In this case, stop work immediately and reset the pressure to zero.

2.4 Rules of conduct when using high-pressure lances

Anyone operating the lance must put safety first in order to protect himself and any other people nearby over any other action, decision or interest. It is important to use common sense and work responsibly, with due care and attention.
The operator must always wear proper personal protective equipment (a helmet with safety visor, waterproof clothing and rubber boots) with good grip and stability when working on wet ground.
Proper clothing offers protection against water spray but not against the risk of direct impact by the jet of water or very close spray. Additional protection is needed in this case.
It is also advisable to work in teams of at least two people so they can assist one another in case of need or danger. Shifts should be organised in case of long hours or demanding working conditions.
Access to the area within the range of the jet of water must be prohibited; it must be cleared of any items that could be damaged or projected elsewhere if hit by the jet of water.
Always direct the jet of water towards the area of operation, even when simply testing the set up or during the preliminary stages.
Always pay attention to the direction taken by any debris removed by the jet. If necessary, protect items that may be hit by the jet.
Do not distract the operator during work for any reason. Those authorised to access the area where work is in progress must make their presence known immediately and wait for the operator to stop working.
The team members should always be aware of each other's intentions in order to avoid potentially dangerous situations.
Never start up the system and bring it up to pressure before every team member has reached his place of work and the operator has pointed the jet in the direction of work.

2.5 Safety and system maintenance

The high pressure system must be maintained according to the schedule provided by the manufacturer who is responsible for this by law.
Maintenance may only be carried out by qualified personnel.
Pump and system maintenance should always be done using the proper tools in order to prevent damaging components.
Only use original spare parts in order to guarantee the reliability and safety of the system.

3 PUMP IDENTIFICATION

The pump has an identification plate stating the following information:

- Serial number
- Model
- Rotation speed
- Power consumption
- Maximum operating pressure and flow rate

See the table on Page 5 for more information on the dimensions and specifications of each HHP pump.

4 OPERATING INSTRUCTIONS

HHP pumps are designed to work with clean water at a maximum temperature of 40°C.
The life of the seals depends on the water temperature: hotter water increases the risk of cavitation and reduces the working life of the seals.
The pump performance (flow rate, pressure, rpm) indicated in this handbook and in the catalogue refers to the pump's maximum specifications and should not be exceeded for any reason.
HHP pumps are fitted with two Ø G 3/4" suction inlets and two Ø G1/2" delivery outlets.
The pump may be connected to one or both delivery outlets and suction inlets without affecting its operation. However vacant outlets and inlets must be sealed.

5 INSTALLING THE PUMP

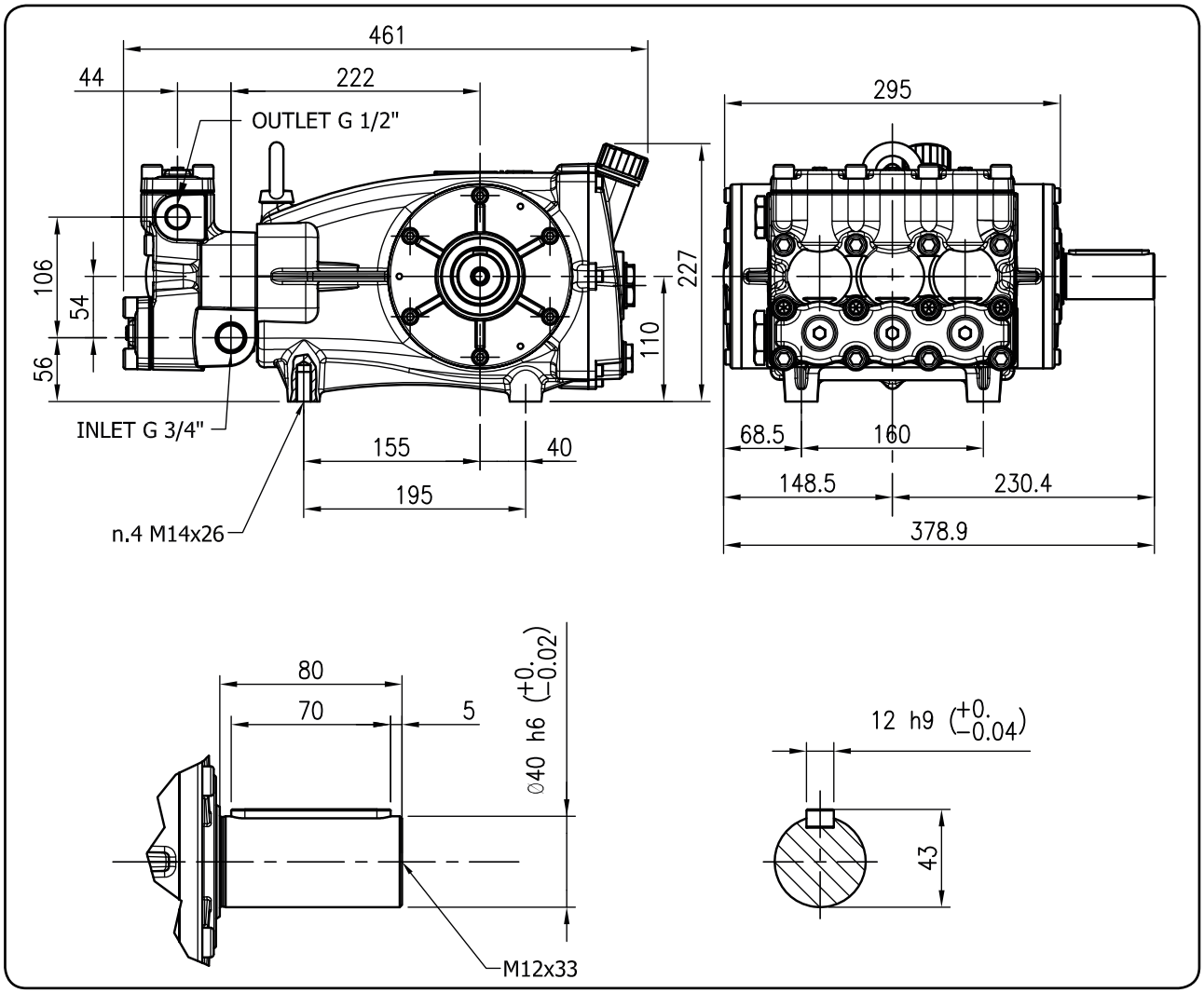
5.1 Position

The pump must be secured in a horizontal position using its M14 support feet.

Caratteristiche Tecniche — **HHP** — ***Technical Characteristics***

Pump Pompe Pumpen Pompa	Pressure Pression Druck Pressione		Volume Dèbit Leistung Portata		RPM t o u r s / min u.p.m. giri/min	Power Puissance Leistung Potenza		Inlet port Entrèe Eingang Aspirazione	Outlet Sortie Ausgang Mandata	Weight Kg Poids Kg Gewicht Kg Peso Kg
	bar	PSI	l/min	GPM		HP	Kw			
HHP25S	500	7250	25	6.6	1000	32.6	24.0	G 3/4	G 1/2	51
HHP30S	500	7250	30	7.9	1000	37	27.2	G 3/4	G 1/2	51
HHP38F	350	5000	38	10.0	1450	34.1	25.1	G 3/4	G 1/2	51

Dimensioni d' ingombro — ***Overall dimensions***



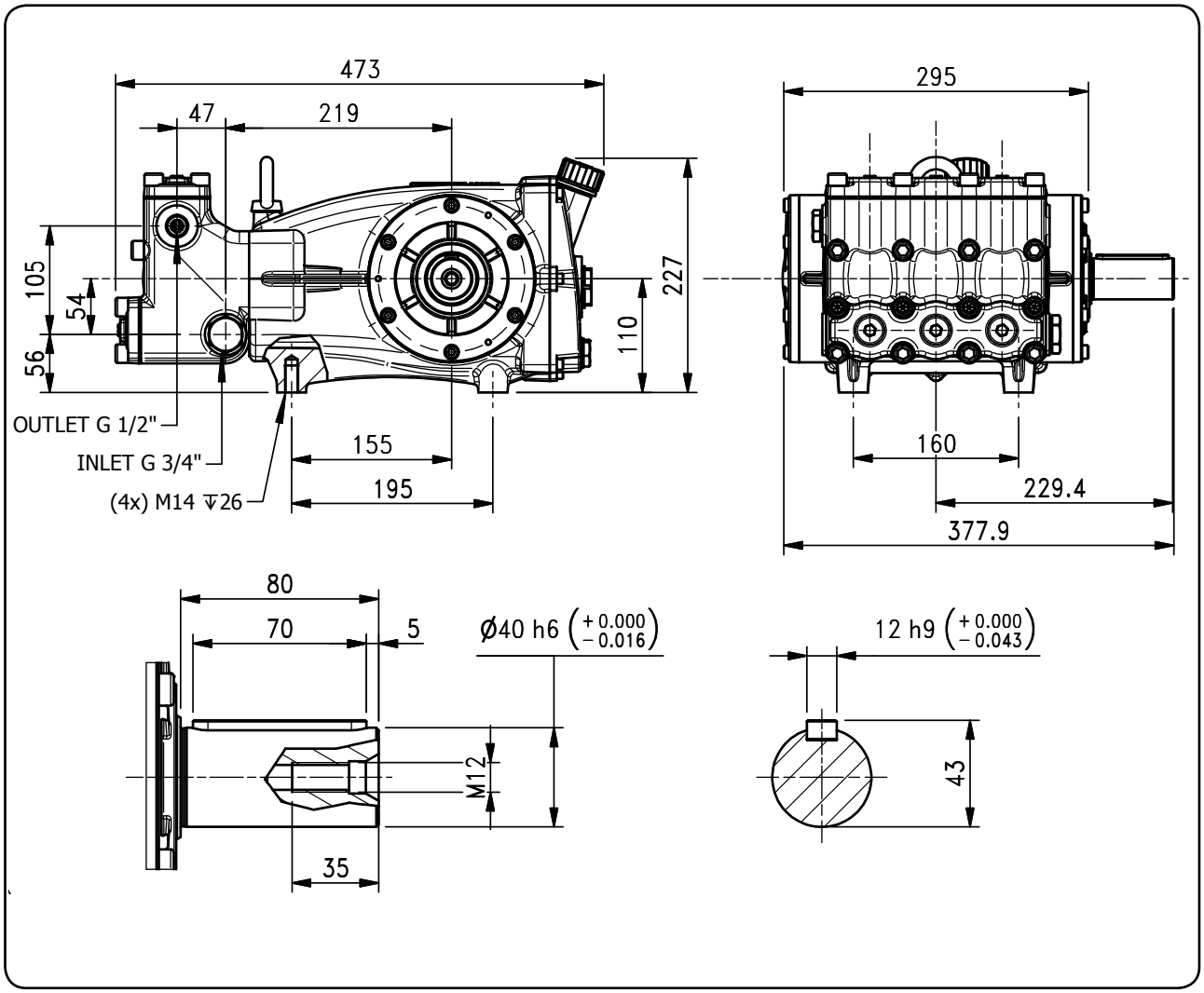
Lubrificazione: Olio SAE 10/40W
Capacità 3.5 Litri

Lubrification: SAE 10/40W Oil
Capacity 3.5 Litres

Caratteristiche Tecniche — # HHP 2011 SERIES — ***Technical Characteristics***

Pump Pompe Pumpen Pompa	Pressure Pression Druck Pressione		Volume Dèbit Leistung Portata		RPM t o u r s / min u.p.m. giri/min	Power Puissance Leistung Potenza		Inlet port Entrèe Eingang Aspirazione	Outlet Sortie Ausgang Mandata	Weight Kg Poids Kg Gewicht Kg Peso Kg
	bar	PSI	l/min	GPM		HP	Kw			
HHP2750	500	7250	27	7.1	1450	35.5	26.1	G 3/4	G 1/2	51
HHP3650	500	7250	36	9.5	1450	46.9	34.5	G 3/4	G 1/2	51
HHP4150	500	7250	41	10.8	1450	53.7	39.5	G 3/4	G 1/2	51
HHP5040	400	5800	50	13.3	1740	51.5	37.9	G 3/4	G 1/2	51

Dimensioni d' ingombro — ***Overall dimensions***



Lubrificazione: Olio SAE 10/40W
Capacità 3.5 Litri

Lubrification: SAE 10/40W Oil
Capacity 3.5 Litres


Figure 1

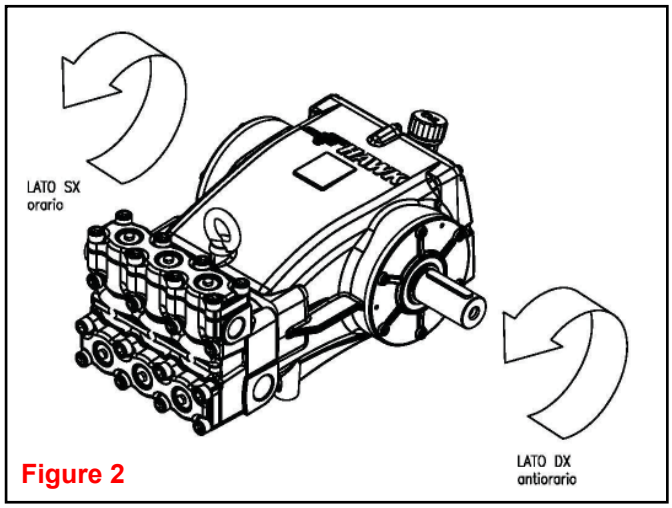


Figure 2

The base used must be sufficiently flat and rigid in order to prevent bending and misalignment of the pump-transmission centre line, which may be caused by the torque transmitted during operation.
You may also need to fit anti-vibration mounts between the floor and the pump support.

The pump is fitted with a lifting eyebolt to facilitate handling and installation (Figure 1).

Replace the transportation crankcase cap with the oil dipstick and check there is the correct amount of fluid in the pump.

The oil dip stick must remain accessible at all times when the pump is mounted.

Avoid rigid connections to the pump shaft.

For this reason, the following types of transmission are recommended:

- Flexible joint
- Belts and pulleys
- Cardan joints
- Reduction unit

5.2 Direction of rotation

The direction of rotation of the pump shaft is not important; nevertheless it is advisable to apply rotation to the pump shaft as shown in Figure 2.

5.3 Hydraulic connections

Use flexible hoses in order to isolate the system from the vibration caused by the pump.
The suction hose should be sufficiently stiff so it keeps its shape and is not affected by the vacuum produced by the pump.

5.4 Suction line

In order to guarantee proper pump operation, the suction line must comply with the following recommendations:

- It's diameter must be in proportion with the suction outlet connector, avoiding bottlenecks that could cause drops in pressure and cavitation;
- It must run as uniformly and as straight as possible and be designed to facilitate the release of any pockets of air;
- It must have no leaks and be designed to guarantee the seal over time;
- It must have as few 90° bends, connections with other pipelines, bottlenecks, reverse gradients, reverse U-bends and T-junctions as possible;
- It must be designed so the circuit is not drained when the pump stops operating;
- The use of oil-pressure fittings should be avoided;
- The use of Venturi tubes or injectors for the suction of detergents should be avoided;
- The use of foot valves or other one-way valves should be avoided
- If connected to a supply tank, the tank size should

be large enough to avoid a vortex or turbulence close to the outlet of the pump's suction pipe;
- The use of by-pass valves draining directly into the suction line should be avoided;
- If there is a suction tank, it should be designed with internal partitions to prevent the flow from the by-pass valve creating a vortex and turbulence close to the outlet of the pump's suction pipe
- Make sure the suction pipe is always clean

5.5 Filter

If you intend to fit a pump suction filter, please note the following recommendations:

- Place the filter as close to the pump as possible; make sure it can be inspected with ease;
- Its minimum flow rate must be three times the flow rate of the pump;
- The diameter of the inlet and outlet mouths must be the same as the pump's suction pipe and outlet;
- Cleaning must be done frequently and regularly based on the specific operating conditions.

5.6 Delivery line

The delivery line must comply with the following instructions and recommendations:

- The initial section of the delivery pipe must be a hose so that any vibrations produced by the pump are dampened.
- Use high pressure pipes and fittings to safeguard high safety margins in all operating conditions
- Always fit maximum pressure valves with the proper setting
- Prefer glycerine-bath pressure gauges designed to support the typical swinging loads and water hammer of piston pumps
- Remember that pressure losses along the delivery line always result in the drop of the actual pressure at the end of the line compared to the pressure measured at the pump
- Suitable dampers should be fitted if the effects of the pump's pulsations are particularly detrimental.

6 START UP AND OPERATION

6.1 Preliminary checks

Before starting up the pump, always check:

- The suction line is connected and full: **never run the pump dry;**
- There are no leaks;
- Any shut off valves on the suction circuit are open; check the water reaches the pump freely;
- The delivery line drains freely in order to guarantee the rapid release of any air in the circuit and encouraging the priming of the pump;
- All the fittings and connections are tight;
- The pump/transmission alignment is within the tolerances allowed;
- Control the level of the oil inside the crankcase is correct using the dipstick attached to the bleed plug or by looking through the sight glass.

6.2 Start up

When the pump is first started up, check:

- The direction of pump rotation is correct.
- Always avoid starting up the pump when a load is connected.
  Always drain the pressure control valve pressure or operate any draining mechanisms.
- Check the system does not exceed the operating specifications indicated on the plate when running.
- Wait a few minutes before bringing the circuit up to pressure and check the pump is taking up water properly.
- Before stopping the pump, reset the pressure using the control valve and any mechanisms for draining the circuit.
  If the pump is coupled to an endothermic engine, run the engine idle before stopping it.
- If there is a supply pump on the suction circuit, wait until it is up to pressure before starting up the piston pump.

7 MAINTENANCE

7.1 Routine maintenance of mechanical parts

The routine mechanical maintenance required is described below:

Check the level of the oil regularly, usually once a week. Top up to the proper level, if necessary. The level should be checked when the oil is at room temperature, however the oil should be changed at its operating temperature through the oil cap.

Warning: If the pump has been running for several minutes, the oil may be very hot: protect your hands by wearing work gloves before starting to change the oil.

The first oil change is to be carried out after 50 hours of operation and then every 1000 hours, or once a year. The required amount is 3.5 litres.

7.2 Removal of mechanical parts

Remove parts as described below:

Empty the oil out of the crankcase through the drain plug;

- Take the key off the shaft;
- Remove the manifold housing;
- Remove the oil seals on the plunger rods by means of a screwdriver;
- Remove the rear cover;
- Unscrew the connecting rod feet, making sure you remember the position of each one in relation to its connecting rod (Figure 3);
- Unscrew the bearing housings and take them off the crankcase (Figure 4);
- Press the plunger rods down to the bottom of the crankcase with their connecting rods;
- Take the shaft out from the side through one of the holes on the bearing housing, PTO side (figure 5);

The ceramic plunger and splash washer must first be removed before the plunger rods and their connecting rods can be removed.

7.3 Assembly of mechanical parts

The mechanical parts are reassembled as follows:

- Replace the plunger rods with their connecting rods if they were removed, pressing them down to the bottom of the crankcase;
- After turning the connecting rod by 45° on the opposite side to the PTO, insert the shaft through one of the holes on the bearing housing, making sure the PTO remains on the required side of the crankcase (the shaft should still be inserted on the side without the PTO, supporting this with your hand);

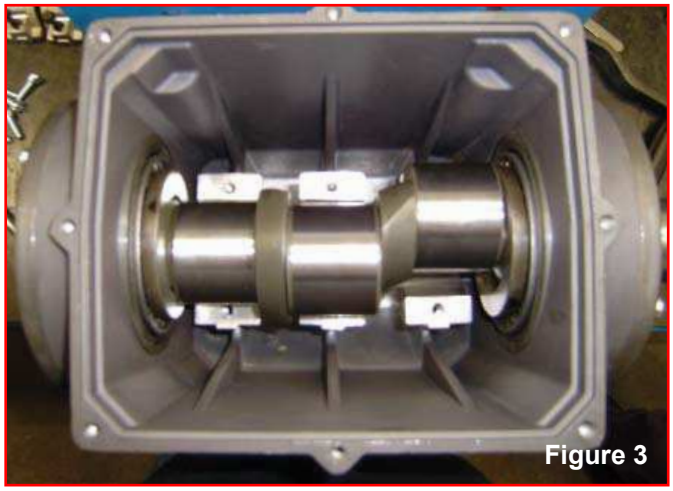


Figure 3


Figure 4


Figura 5

- Replace the oil seal if it is worn and then insert the two bearing housings in the crankcase holes, remembering to check the wear rings. Tighten the 6 screws by applying 20 Nm torque;
- Replace the connecting rod feet, taking care not to swap their positions and respecting the torque of 38 Nm;
- Fit new oil seals on the plunger rods;
- Replace the rear cover and tighten the screws by applying 10 Nm torque;
- Replace the plungers fitted with the splash washers if they were removed in order to remove the connecting rods and their rods, tightening the plunger screws by applying 20 Nm torque;
- Replace the manifold housing using some of the studs on the crankcase, if necessary;
- Replace the shaft key.

7.4 Inspecting the bearings

After removing the mechanical parts as instructed above, inspect the rollers and their tracks.
If you note no signs of unusual wear, clean the rollers and tracks with solvent before coating them with a thin layer of lubricating oil (the same oil as in the crankcase).
Now replace the mechanical parts as instructed above.
If the rollers or tracks show clear signs of wear, replace them as instructed below.

7.5 Changing the bearings

Once the bearing housings and the shaft have been removed as instructed above, take the outer bearing ring nuts off their respective housings and the internal ring nuts off the shaft using a pin punch or similar tool.
The new bearings can be fitted using a press or fly press using the proper rings to help you.
Do not swap the outer bearing ring nuts when fitting them inside the housings.

8 MAINTENANCE OF HYDRAULIC PARTS

The maintenance of the hydraulic parts requires the check valves to be changed every 800 hours and the replacement of the seals every time you note water leaking or a significant drop in the flow rate (hence the maximum pressure reached by the pump).

8.1 Replacing the check valves

Replace the check valves inside the manifold housing as follows:

- Unscrew the 3 M6 hexagonal head screws on each check valve cover (Figure 6).
- Unscrew the 8 M12 allen screws securing the check valve cover and remove it.
- With the aid of a screw or an M6 threaded bar, screwed into the threaded hole of each VAM cap (or using the appropriate tool-kit equipment), remove the VAM valves (Figure 7).
- Extract the aspiration/delivery valve cage using curved nose pliers.
- The cage is pressed down to secure it to its seat and so it is easily assembled and removed using standard tools such as a hammer and screwdriver (Figure 8).
- When fitting the replacement check valves, pay attention when you are putting them into position and take care to press them down to the bottom of the slot, so they remain slightly raised or tilted to one side. When replacing the plugs, also take care to check that the O-rings do not protrude or are cut against the perimeter of the manifold housing.
- Finally, screw down the check valve covers by applying 80 Nm torque to the respective screws.

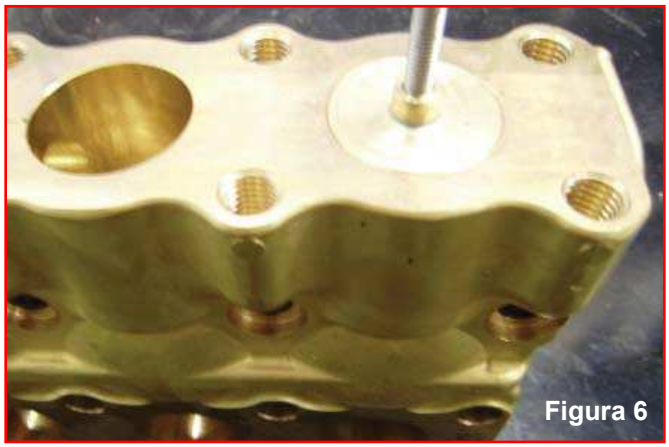


Figura 6

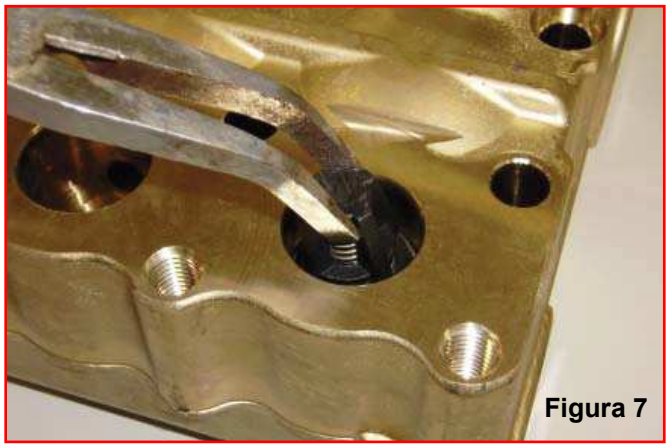


Figura 7

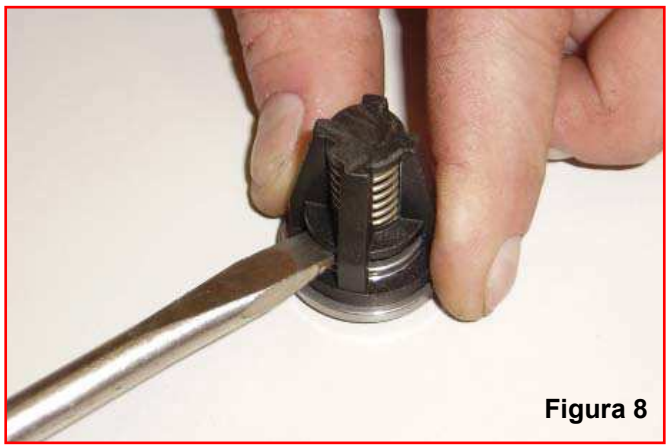


Figura 8

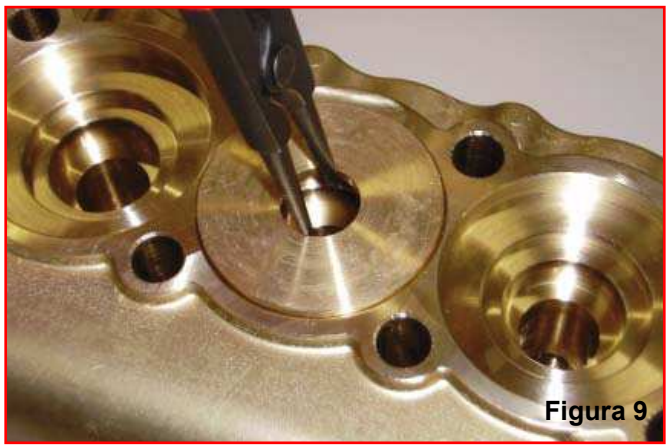


Figura 9

8.2 Replacing the seals

Replace the seals as follows:

- Remove the 8 M12 allen screws securing the manifold housing to the crankcase and take them off the plungers. You can use a screwdriver to do this, but take care not to damage the surfaces of the manifold housing and crankcase.
- Use the round nose pliers in the tool-kit to remove the whole seal pack. If it proves particularly difficult to remove it, you can use a screwdriver but take care not to damage the surfaces and edges of the seal slots (Figure 9).
- Insert the replacement seal pack, following the sequence of the components shown in Figure 10.
- Use the special tools provided in the tool-kit to fit the high and low pressure seals, applying a coat of grease to the rim of the seal slot to assist the operation (Figures 11 and 12).
- Replace the manifold housing once the seal packs have been inserted into place, using some studs screwed into the crankcase if necessary and then tighten the 8 screws by applying 80 Nm torque.

8.3 Replacing the plungers

If one or more plungers need replacing, follow the instructions below:

- After removing the manifold housing as described at the beginning of the previous section, unscrew the plunger screws using the appropriate key. After these have been removed, the plunger can be pulled out of the rods with ease. Now check the O-ring under the head of the plunger screw (Figure 13).
- Follow the steps in reverse order to replace the plungers, tightening the plunger screws by applying 20 Nm torque (Figure 14).


Figura 10


Figura 11

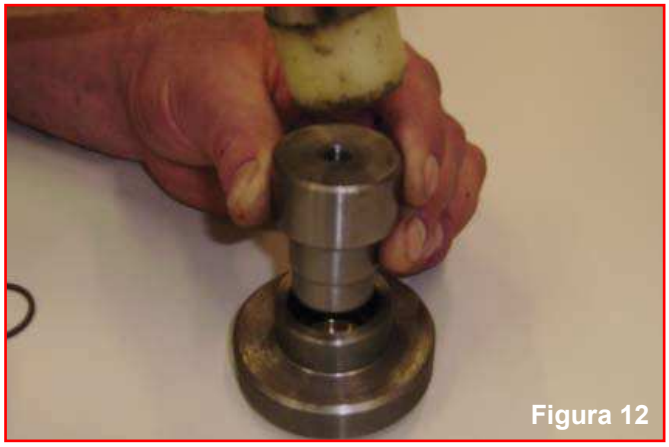


Figura 12

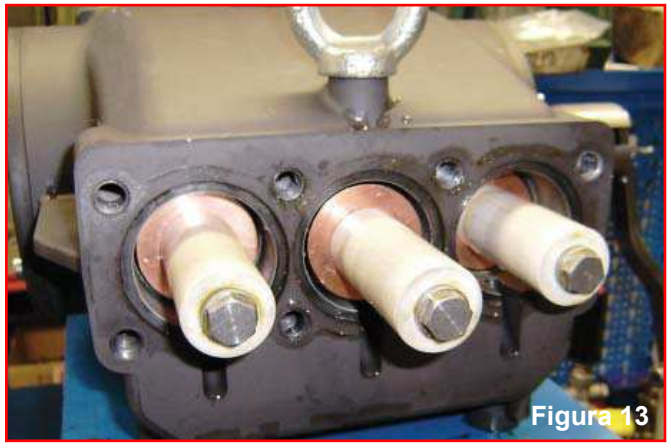


Figura 13

9 MAINTENANCE TOOLS

Use the special tools provided in the product's tool-kit for pump maintenance, as this will facilitate the maintenance of certain parts. If the special tool-kit is not available, standard tools can be used (screwdrivers, pin punches etc) but take care not to damage the pump's parts.

10 DOWNTIME

If the pump has been inactive for some time, it is good practice to check the oil, inspect the check valve and follow the initial start-up procedure before starting it up again.
Before a planned period of inactivity, drain the water out of all the circuits and run the pump for a few seconds to empty the water out of the pump.

11 PRECAUTIONS AGAINST FREEZING

Take the following precautions when the pump is operated in cold climates where there is the risk of freezing: at the end of work, drain the water out all of the circuits through the outlets at the lowest points in the line.
Run the pump for a few seconds so that any remaining water is also drained out of the pump.
If you find ice, do not start up the system until the circuit has thawed out completely in order to prevent serious damage to the pump.

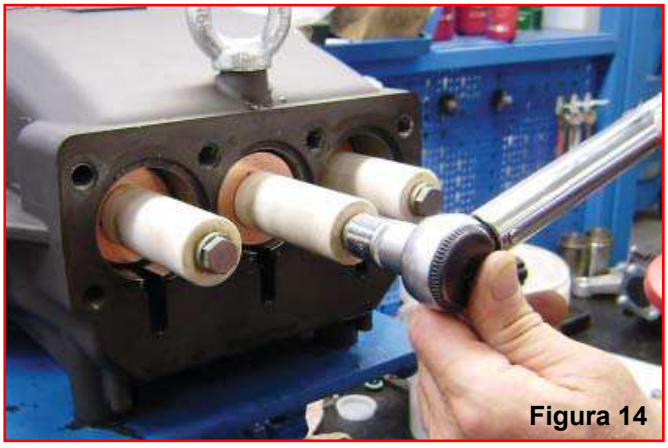


Figura 14

12 TERMS OF GUARANTEE

LEUCO S.p.A. guarantees that HAWK products are free from manufacturing and material faults for a period of one year from the date when they leave its premises.
This guarantee is at the discretion of LEUCO S.p.A. and is limited to the repair and replacement of parts or of products that it deems defective at the time of delivery.
All the products covered by this limited guarantee must be returned freight paid for inspection, repair or replacement by the manufacturer.
This limited is the only form of guarantee and replaces any other form of explicit or implicit guarantee, including guarantees of fitness for sale or any particular purpose. The manufacturer refuses any such liability with this statement.
Faulty products will only be repaired or replaced according to these terms and LEUCO S.p.A. is not liable for any further loss, damage or expense, including accidental or indirect damage caused directly or indirectly as a result of the sale or use of these products.
The unauthorised use of spare parts that were not manufactured by LEUCO S.p.A. automatically invalidates this guarantee, which is subject to the instructions for installation and operation provided above. There are no additional guarantees other than the guarantee described above.

13 PREVENTIVE MAINTENANCE SCHEDULE

CONTROL	DAILY	WEEKLY	50h	800h	1000h	2000h
Clean filters	X					
Oil Level/Condition	X					
Oil/water leaks	X					
Hydraulic system		X				
Change Oil			X		X	
Replace check valves				X		
Replace seals						X

14 TROUBLESHOOTING

14.1 The pump does not make any noise when it is started up:

- The pump is not primed and is running without water;
- No water in the supply circuit;
- The pump valves are blocked or damaged;
- The delivery line is closed and does not allow the air in the pump to escape;

14.2 The pump does not work normally:

- Air intake;
- Poor supply;
- Fittings, elbows and bends on the supply line are restricting the passage of water;
- The suction filter is too small or is clogged;
- The supply pump is undersized or delivers insufficient pressure/flow;
- The pump will not prime because of insufficient head or the delivery is closed during priming;
- The pump cannot prime because a check valve is blocked or damaged;
- The seals are worn;
- The pressure control valve is damaged or is not working properly;
- Problems in the transmission (misalignment, clearance, loose or worn belts, etc.).
- Incorrect rpm.

14.3 The pump does not deliver the proper flow rate:

- Insufficient supply (see above);
- The number of rpm is less than the rpm specified on the plate;
- Excessive leakage from the pressure control valve;
- Worn or damaged check valves;
- Worn or damaged seals;

14.4 The pump does not reach the proper pressure:

- A nozzle has been mounted whose section is too large, or whose section has become enlarged with use;
- Insufficient rpm;
- Worn or damaged seals;
- Excessive leakage from the pressure control valve;
- Worn or damaged check valves;

14.5 The pump leaks a lot:

- The seals are worn or damaged as a result of normal wear or due to cavitation problems.

14.6 The pump overheats:

- Incorrect direction of rotation;
- The operating pressure of the pump is too high;
- The number of rpm is too high;
- Low oil level or unsuitable or exhausted oil that needs changing;
- Water in the oil due to damaged or worn plunger oil seals;
- The tension of the drive belts is excessive or the joint for connection to the motor or rpm reducer is not aligned properly.

14.7 Vibration or knocking on the pipes:

- Air intake;
- Erratic operation or damaged pressure control valve;
- Undersized drain line for the control valve;
- Blocked or damaged check valves;
- Irregular rpm.

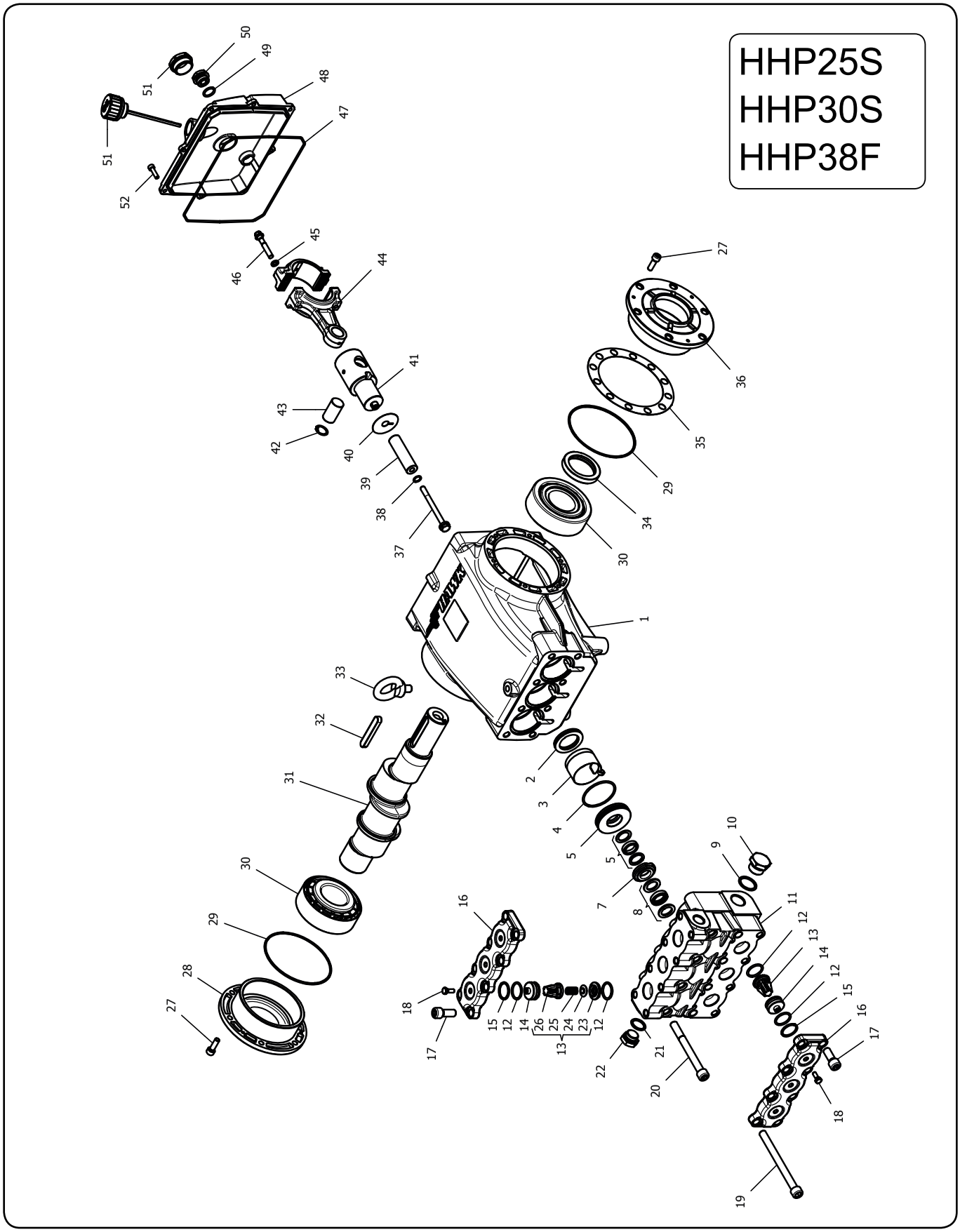
15 REGULATIONS FOR DISPOSAL

The package materials are recyclable, and should go in the appropriate recycling container rather than the household waste bin.

The pump contains valuable recyclable materials, which should be disposed of appropriately so they can be re-used.
Oil should not be released into the environment. After use, the pump should therefore be disposed of through an appropriate waste collection centre.

16 NOTES

17 EXPLODED DRAWING AND LIST OF SPARE PARTS



KIT RICAMBI / SPARE PARTS KIT			***HHP Pompe / Pumps***		
Posizioni incluse *Included Positions*	Codice e Descrizione *Part Number & Description*	Q.tà per Pompa *Q.ty by Pump*	HHP25S	HHP30S	HHP38F
4 - 6 - 8	2600.70 Guarnizioni pistone Ø20 / Plunger Seals Ø20 mm	1	■	■	■
4 - 5 - 6 - 7 - 8	2600.71 Pacco completo guarnzioni pistone Ø20 */ Complete Seals Packing Ø20 mm*	3			
37 - 38 - 39 - 40	2600.72 Pistone Ø30 */ Plunger 20 mm*	3			
12 - 13 - 15	2600.73 VAM */ Complete check valve*	6			■
12 - 13 - 15	2600.86 VAM */ Complete check valve*	6	■	■	
2 - 3	2600.64 Anelli tenuta olio asta */ Plunger Oil Seals*	1	■	■	■
4 - 5 - 6 - 7- 8 9 - 10 - 11- 12 13 - 14 - 15 - 16 17 - 18 - 21 - 22	2600.74 Testata completa */ Complete Manifold*	1			■
4 - 5 - 6 - 7- 8 9 - 10 - 11- 12 13 - 14 - 15 - 16 17 - 18 - 21 - 22	2600.87 Testata completa */ Complete Manifold*	1	■	■	
	2412.03 Tool kit	1	■	■	■

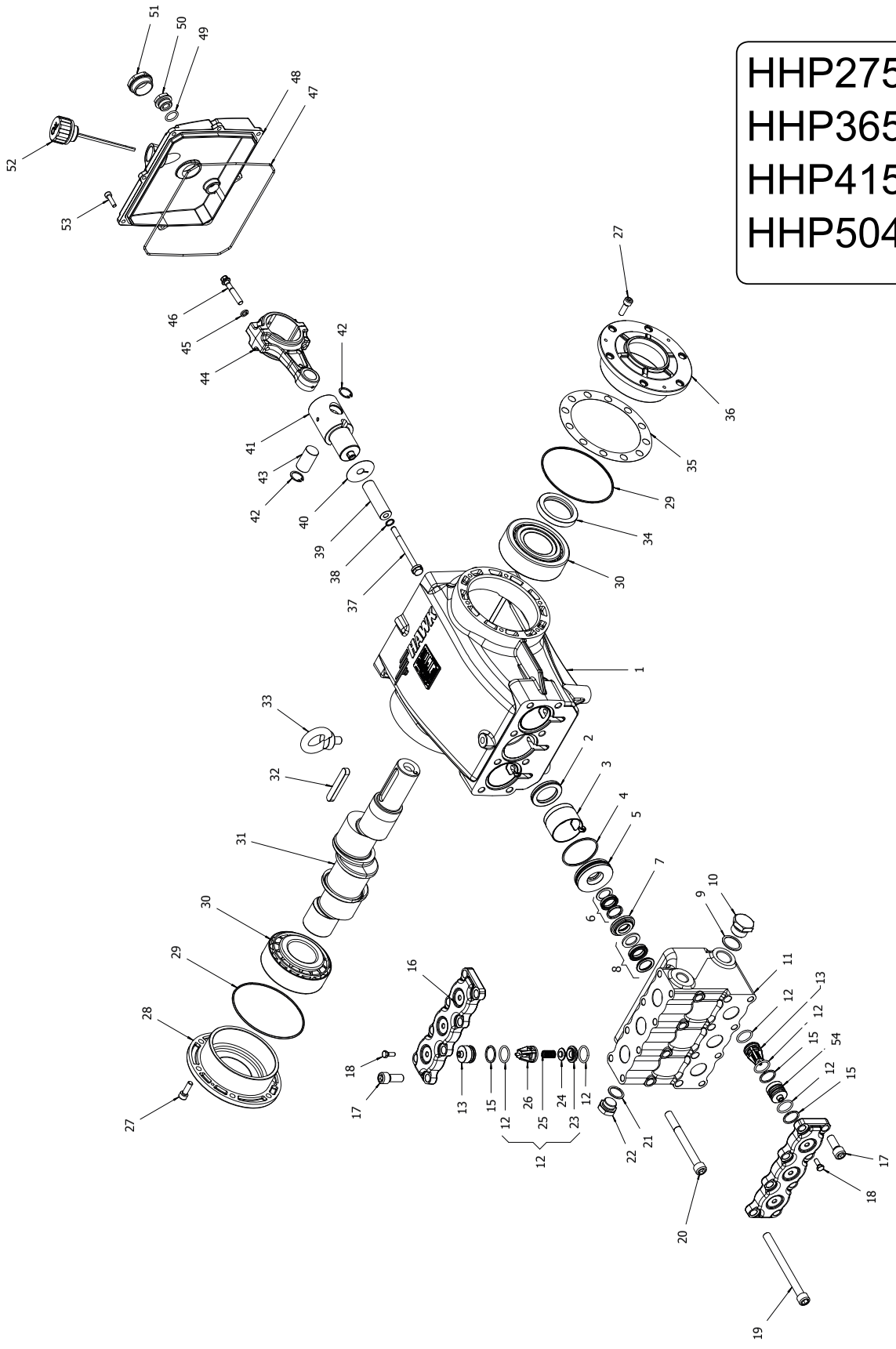
LISTA RICAMBI / ***PARTS LIST***						**HHP Pompe** / ***Pumps***
Pos. *Item*	Codice *Part number*	Descrizione *Description*	Q.tà per Pompa *Q.ty by Pump*	HHP25S	HHP30S	HHP38F
1	0202.94	Carter / *Carter*	1	■	■	■
****2***	0001.15	Anello radiale / *Plunger oil seal*	3			
****3***	0101.24	Boccola paraolio aste / *Plastic bushing*	3			
****4***	0601.16	"O" Ring Ø2,62x56,82 / *"O" Ring Ø2.62x56,82*	3			
****5***	1201.52	Pressore Ø20 / *Pressure ring Ø20*	3			
****6***	0002.52	Anello tenuta "U" Ø20x28 / *"U" seal, Ø20x28*	3			
****7***	0300.70	Diffusore Interm. Ø20 / *Intermed.ring Ø20*	3			
****8***	0002.66	Anello tenuta "U" Ø20x30 mm 500 BAR / *"U" seal 500 BAR Ø20x30 mm*	3			
****9***	0603.11	Guarnizione rame G 3/4" Ø26,7/32,5x1,5 / *Copper washer G 3/4" Ø26,7/32,5x1,5*	1			
****10***	1601.58	Tappo G 3/4" inox / *Brass plug G 3/4" stainless steel*	1			
****11***	1602.33	Testata / *Manifold housing*	1	■	■	
	1602.36	Testata / *Manifold housing*	1			■
****12***	0601.66	"O" Ring Ø2,62x25,07-3100 / *"O" Ring Ø2.62x25,07-3100*	12			■
	0601.97	"O" Ring Ø2,62x22,22 / *"O" Ring Ø2,62x22,22*	12	■	■	
****13***	3604.02	Valvola premontata / *Valve assembly*	6			■
	3604.03	Valvola premontata / *Valve assembly*	6	■	■	
****14***	1601.63	Tappo valvola / *Valve plug*	6			■
	1601.64	Tappo valvola / *Valve plug*	6	■	■	
****15***	0009.41	Anello antiestrusione / *Back ring*	6			■
	0009.42	Anello antiestrusione / *Back ring*	6	■	■	
****16***	0203.54	Coperchio VAM / *Valves cover*	2	■	■	■
****17***	1801.07	Vite TCEI M12x30 UNI 5931 / *Screw M12x30 UNI 5931*	12			
****18***	1802.01	Vite TE M6x16 UNI 5739 / *Screw M6x16 UNI 5739*	6			
19	1801.09	Vite TCEI M12x140 UNI 5931 / *Screw M12x140 UNI 5931*	4			
20	1801.10	Vite TCEI M12x120 UNI 5931 / *Screw TCEI M12x120 UNI 5931*	4			
****21***	0603.07	Guarnizione rame G1/2" Ø21,25/27x1,5 / *Copper washer G1/2" Ø21,25/27x1,5*	1			
****22***	1601.54	Tappo G 1/2" inox / *Brass plug G 1/2" stainless steel*	1			
23	1503.32	Sede valvola / *Valve seat*	6			■
	1503.33	Sede valvola / *Valve seat*	6	■	■	
24	1202.15	Piattello valvola / *Valve plate*	6	■	■	■
25	0900.32	Molla valvola / *Valve spring*	6			
26	0604.13	Gabbia valvola / *Valve cage*	6			
27	1801.06	Vite TCEI M8x25 UNI 5931 / *Screw M8x25 UNI 5931*	12			
28	0500.98	Flangia chiusa / *Closed bearing housing*	1			
29	0601.12	"O" Ring Ø2,62x120,32 NBR / *"O" Ring Ø2.62x120.32*	2			
30	0200.12	Cuscinetto 32310 rulli conici / *Roller bearing 32310*	2			

LISTA RICAMBI / ***PARTS LIST***						**HHP Pompe** / ***Pumps***
Pos. *Item*	Codice *Part number*	Descrizione *Description*	Q.tà per Pompa *Q.ty by Pump*	HHP25S	HHP30S	HHP38F
	0006.21	Albero singola P.d.F. / *Single - endend crankshaft*	1			■
31	0006.24	Albero singola P.d.F. / *Single - endend crankshaft*	1	■		
	0006.25	Albero singola P.d.F. / *Single - endend crankshaft*	1		■	
32	0206.07	Chiavetta / *Crankshaft key*	1			
33	1800.12	Golfare M12 / *Eyebolt*	1			
34	0001.14	Anello radiale / *Crankshaft seal*	1			
35	0301.12	Distanziale / *Shim*	1			
36	0500.97	Flangia aperta / *Bearing housing*	1			
****37***	1800.11	Vite pistone / *Plunger bolt*	3			
****38***	0601.15	"O" Ring Ø1,78x11,11 / *"O" Ring Ø1.78x11.11*	3			
****39***	1200.27	Pistone Ø20 / *Plunger 20 mm*	3			
****40***	1400.55	Rosetta rame pistone / *Copper spacer*	3			
41	0003.22	Asta pattino / *Plunger rod*	3			
42	1501.05	Anello Ø22 / *Ring Ø22*	6	■	■	■
43	1502.05	Spinotto / *Connecting rod pin*	3			
44	0100.09	Biella / *Connecting rod*	3			
45	1403.05	Rosetta elastica Ø8 / *Spring washer Ø8*	6			
46	1800.13	Vite biella / *Connecting rod screw*	6			
47	0601.11	"O" ring Ø 2,62x209,23 / *"O" ring Ø 2.62x209.23*	1			
48	0203.55	Coperchio carter / *Cranckcase cover*	1			
49	0601.19	"O" ring Ø 2,62x17,13 / *"O" ring Ø 2.62x17,13*	1			
50	1601.20	Tappo G 1/2" ottone / *Brass plug G 1/2"*	1			
51	0700.06	Spia livello olio G 1" / *Sight glass G 1"*	1			
52	1600.13	Tappo sfiato olio G 3/4" / *Oil dip stick G 3/4"*	1			
53	1801.26	Vite TCEI M6x22 UNI 5931 / *Screw TCEI M6x22 UNI 5931*	8			

		Particolare disponibile solo in kit / *Part available in kit only*

*		Particolare disponibile anche in kit / *Part available in kit also*

HHP2750
HHP3650
HHP4150
HHP5040



KIT RICAMBI / SPARE PARTS KIT			***HHP Pompe / Pumps***			
Posizioni incluse *Included Positions*	Codice e Descrizione *Part Number & Description*	Q.tà per Pompa *Q.ty by Pump*	HHP2750	HHP3650	HHP4150	HHP5040
4 - 6 - 8	2600.70 Guarnizioni pistone Ø20 / Plunger Seals Ø20 mm	1	■	■	■	■
4 - 5 - 6 - 7 - 8	2600.82 Pacco completo guarnizioni pistone Ø20 / *Complete Seals Packing Ø20 mm*	3				
37 - 38 - 39 - 40	2600.97 Pistone Ø30 / *Plunger 20 mm*	3				
12 - 13 - 15	2600.98 VAM / *Complete check valve*	6				
2 - 3	2600.64 Anelli tenuta olio asta / *Plunger Oil Seals*	1				
4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 21 - 22	2600.99 Testata completa / *Complete Manifold*	1				
	2412.03 Tool kit	1				

LISTA RICAMBI / ***PARTS LIST***				***HHP* Pompe** / ***Pumps***			
Pos. *Item*	Codice *Part number*	Descrizione *Description*	Q.tà per Pompa *Q.ty by Pump*	HHP2750	HHP3650	HHP4150	HHP5040
1	0202.94	Carter / *Carter*	1				
****2***	0001.15	Anello radiale / *Plunger oil seal*	3				
****3***	0101.24	Boccola paraolio aste / *Plastic bushing*	3				
****4***	0601.16	"O" Ring Ø2,62x56,82 / *"O" Ring Ø2.62x56,82*	3				
****5***	1201.54	Pressore Ø20 / *Pressure ring Ø20*	3				
****6***	0002.52	Anello tenuta "U" Ø20x28 / *"U" seal, Ø20x28*	3				
****7***	0300.74	Diffusore Interm. Ø20 / *Intermed.ring Ø20*	3				
****8***	0002.66	Anello tenuta "U" Ø20x30 mm 500 BAR / *"U" seal 500 BAR Ø20x30 mm*	3				
****9***	0603.11	Guarnizione rame G 3/4" Ø26,7/32,5x1,5 / *Copper washer G 3/4" Ø26,7/32,5x1,5*	1				
****10***	1601.58	Tappo G 3/4" inox / *Brass plug G 3/4" stainless steel*	1				
****11***	1602.37	Testata / *Manifold housing*	1				
****12***	0601.97	"O" Ring Ø2,62x22,22 / *"O" Ring Ø2,62x22,22*	15				
****13***	3604.75	Valvola premontata / *Valve assembly*	6				
****14***	1601.66	Tappo valvola / *Valve plug*	3				
****15***	0009.42	Anello antiestrusione / *Back ring*	9	■	■	■	■
****16***	0203.54	Coperchio VAM / *Valves cover*	2				
****17***	1801.07	Vite TCEI M12x30 UNI 5931 / *Screw M12x30 UNI 5931*	12				
****18***	1802.01	Vite TE M6x16 UNI 5739 / *Screw M6x16 UNI 5739*	6				
****19***	1801.09	Vite TCEI M12x140 UNI 5931 / *Screw M12x140 UNI 5931*	4				
****20***	1801.10	Vite TCEI M12x120 UNI 5931 / *Screw TCEI M12x120 UNI 5931*	4				
****21***	0603.07	Guarnizione rame G1/2" Ø21,25/27x1,5 / *Copper washer G1/2" Ø21,25/27x1,5*	1				
****22***	1601.54	Tappo G 1/2" inox / *Brass plug G 1/2" stainless steel*	1				
****23***	1503.33	Sede valvola / *Valve seat*	6				
24	1202.15	Piattello valvola / *Valve plate*	6				
25	0900.32	Molla valvola / *Valve spring*	6				
26	0604.06	Gabbia valvola / *Valve cage*	6				
27	1801.06	Vite TCEI M8x25 UNI 5931 / *Screw M8x25 UNI 5931*	12				
28	0500.98	Flangia chiusa / *Closed bearing housing*	1				
29	0601.12	"O" Ring Ø2,62x120,32 NBR / *"O" Ring Ø2.62x120.32*	2				
30	0200.12	Cuscinetto 32310 rulli conici / *Roller bearing 32310*	2				
31	0006.23	Albero singola P.d.F. / *Single - endend crankshaft*	1	■			
	0006.24	Albero singola P.d.F. / *Single - endend crankshaft*	1		■		
	0006.25	Albero singola P.d.F. / *Single - endend crankshaft*	1			■	■

LISTA RICAMBI / ***PARTS LIST***							**HHP Pompe** / ***Pumps***
Pos. *Item*	Codice *Part number*	Descrizione *Description*	Q.tà per Pompa *Q.ty by Pump*	HHP2750	HHP3650	HHP4150	HHP5040
32	0206.07	Chiavetta / *Crankshaft key*	1				
33	1800.12	Golfare M12 / *Eyebolt*	1				
34	0001.14	Anello radiale / *Crankshaft seal*	1	■	■	■	■
35	0301.12	Distanziale / *Shim*	1				
36	0500.97	Flangia aperta / *Bearing housing*	1				
****37***	1800.11	Vite pistone / *Plunger bolt*	3				
****38***	0601.15	"O" Ring Ø1,78x11,11 / *"O" Ring Ø1.78x11.11*	3				
****39***	1200.29	Pistone Ø20 / *Plunger 20 mm*	3				
****40***	1400.55	Rosetta rame pistone / *Copper spacer*	3				
41	0003.22	Asta pattino / *Plunger rod*	3				
42	1501.05	Anello Ø22 / *Ring Ø22*	6				
43	1502.05	Spinotto / *Connecting rod pin*	3				
44	0100.09	Biella / *Connecting rod*	3				
45	1403.05	Rosetta elastica Ø8 / *Spring washer Ø8*	6				
46	1800.13	Vite biella / *Connecting rod screw*	6	■	■	■	■
47	0601.11	"O" ring Ø 2,62x209,23 / *"O" ring Ø 2.62x209.23*	1				
48	0203.55	Coperchio carter / *Cranckcase cover*	1				
49	0601.19	"O" ring Ø 2,62x17,13 / *"O" ring Ø 2.62x17,13*	1				
50	1601.20	Tappo G 1/2" ottone / *Brass plug G 1/2"*	1				
51	0700.06	Spia livello olio G 1" / *Sight glass G 1"*	1				
52	1600.13	Tappo sfiato olio G 3/4" / *Oil dip stick G 3/4"*	1				
53	1801.26	Vite TCEI M6x22 UNI 5931 / *Screw TCEI M6x22 UNI 5931*	8				
54	1601.67	Tappo valvola / *Valve plug*	3				

		Particolare disponibile solo in kit / *Part available in kit only*
*		Particolare disponibile anche in kit / *Part available in kit also*