Neptune™
Part of Pump Solutions Group
A DOVER™ COMPANY

IOM
Installation
Operation
Maintenance

ABAQUE
Instructions No. 1103-B00

Where Innovation Flows

www.neptune1.com

ABN25

ABN40

ABNX40

ABN65

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TECHNICAL CHARACTERISTICS

Maximum pump speed *:

- ABN25 – 160 RPM
- ABN40 – 140 RPM
- ABNX40 – 120 RPM
- ABN65 – 90 RPM

Maximum running temperature *:

- NR hose 70°C (158°F)
- BN hose 70°C (158°F)
- EPDM hose 80°C (176°F)

Maximum discharge pressure *: 15 bar (217.5 PSIG)

Minimum suction pressure*: -0.9 bar (-13 PSIG)

Pump displacement:

- ABN25 – 0.278 liters/rev (0.073 gal/rev)
- ABN40 – 0.861 liters/rev (0.227 gal/rev)
- ABNX40 – 1.335 liters/rev (0.353 gal/rev)
- ABN65 – 3.360 liters/rev (0.888 gal/rev)

* Functional limitations indicated are strictly dependent on each other, refer to 'CHARACTERISTIC CURVES' pages to define the limits of use for your installation.

NOTE: Numbers in parentheses following individual parts indicate reference numbers on Neptune Parts List.

Neptune pump manuals and parts lists may be obtained from Neptune's website (www.neptune1.com) or by contacting Neptune Customer Service.

INITIAL PUMP START UP INFORMATION

Model No.: _____

Serial No.: _____

ID No.: _____

Date of Installation: _____

Inlet Gauge Reading: _____

Discharge Gauge Reading: _____

Flow Rate: _____

SAFETY INFORMATION

This is a SAFETY ALERT SYMBOL

When you see this symbol on the product, or in the manual, look for one of the following signal words and be alert to the potential for personal injury, death or major property damage.

DANGER

Warns of hazards that WILL cause serious personal injury, death or major property damage

WARNING

Warns of hazards that CAN cause serious personal injury, death or major property damage.

CAUTION

Warns of hazards that CAN cause personal injury or property damage.

NOTICE:

Indicates special instructions which are very important and must be followed.

NOTICE:

Neptune power pumps MUST only be installed in systems which have been designed by qualified engineering personnel. The system MUST conform to all applicable local and national regulations and safety standards.

This manual is intended to assist in the installation and operation of the Neptune power pumps, and MUST be kept with the pump. Neptune power pump service shall be performed by qualified technicians ONLY. Service shall conform to all applicable local and national regulations and safety standards.

Thoroughly review this manual, all Instructions and hazard warnings, BEFORE performing any work on the Neptune power pumps.

Maintain ALL system and Neptune power pump operation and hazard warning decals.

TECHNICAL CHARACTERISTICS

SAFETY DATA

⚠WARNING

Hazardous pressure can cause personal injury or property damage

DISCONNECTING FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE

⚠CAUTION

Lubricant is slippery and can cause personal injury.

ALL LUBRICANT SPILLS SHOULD BE CLEANED PROPERLY TO PREVENT PERSONAL INJURY OR PROPERTY DAMAGE.

⚠WARNING

Hazardous voltage. Can shock, burn or cause death

FAILURE TO DISCONNECT AND LOCKOUT ELECTRICAL POWER BEFORE ATTEMPTING MAINTENANCE CAN CAUSE SHOCK, BURNS OR DEATH

⚠CAUTION

Heavy assemblies can cause personal injury or property damage.

ALWAYS USE A LIFTING DEVICE CAPABLE OF SUPPORTING THE FULL WEIGHT OF THE PUMP UNIT.

⚠WARNING

Hazardous machinery can cause serious personal injury.

FAILURE TO DISCONNECT AND LOCKOUT ELECTRICAL POWER OR ENGINE DRIVE BEFORE ATTEMPTING MAINTENANCE CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

⚠WARNING

Do not operate without guard in place

OPERATION WITHOUT GUARDS IN PLACE CAN CAUSE SERIOUS PERSONAL INJURY, MAJOR PROPERTY DAMAGE, OR DEATH.

⚠WARNING

Hazardous pressure can cause serious personal injury or property damage

FAILURE TO RELIEVE SYSTEM PRESSURE PRIOR TO PERFORMING PUMP SERVICE OR MAINTENANCE CAN CAUSE SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.

⚠CAUTION

Hazardous pressure can cause personal injury or property damage

PUMPS OPERATING AGAINST A CLOSED VALVE CAN CAUSE SYSTEM FAILURE, PERSONAL INJURY AND PROPERTY DAMAGE

⚠WARNING

Hazardous or toxic fluids can cause serious injury

IF PUMPING HAZARDOUS FLUIDS, SYSTEM MUST BE FLUSHED, PRIOR TO PERFORMING SERVICE OR MAINTENANCE

INSTALLATION

NOTICE:

Neptune pumps must only be installed in systems designed by qualified engineering personnel. System design must conform to all applicable regulations and codes and provide warning of all system hazards.

NOTICE:

This pump shall be installed in accordance with all applicable local, state and national regulations.

⚠WARNING

Hazardous pressure can cause personal injury or property damage

AN EXTERNAL BYPASS VALVE MUST BE INSTALLED IN THE SYSTEM TO PROTECT THE PUMP FROM EXCESSIVE PRESSURE.

⚠CAUTION

Hazardous pressure can cause personal injury or property damage

INCORRECT BYPASS VALVE SETTINGS CAN CAUSE PUMP COMPONENT FAILURE, PERSONAL INJURY, AND PROPERTY DAMAGE.

LOCATION AND PIPING

Pump life and performance can be significantly reduced when installed in an improperly designed system. Before starting the layout and installation of the piping system, review the following suggestions:

1. Locate the pump as near as possible to the source of supply to avoid excessive inlet pipe friction.
2. The inlet line should be at least as large as the intake port on the pump. It should slope downward to the pump, and should not contain any upward loops. Eliminate restrictions such as sharp bends; globe valves, unnecessary elbows, and undersized strainers.
3. Install a system bypass valve that returns excess flow to the supply tank or pump inlet piping as appropriate for the pumping system. Insure that the bypass valve pressure setting is appropriate for the pump and system component working pressures.
4. The intake system must be free of all leaks.
5. When pumping liquids at elevated temperature, provisions should be made to compensate for expansion and contraction of the pipes, especially when long pipe lines are necessary. Steel pipe expands approximately 3/4" (1.9 cm) per 100 feet (30.49 m) per 100°F (37.8°C) rise in temperature.
6. Expansion joints, placed at least 36" (0.9m) from the pump, will compensate for expansion and contraction of the pipes. Contact the flexible connector/hose manufacturer for required maintenance/care and design assistance in their use.
7. ALL piping and fittings MUST be properly supported to prevent any piping loads from being placed on the pump.
8. Where necessary, elbows must always have a large radius and must not be installed too close to the pump flanges.
9. Installing isolating valves close to the pump flanges will permit dismantling and replacement without having to drain the installation. These valves should have the same diameter as the pipes and be a full bore model.
10. If the liquid may freeze or solidify, install drain taps at the low points and air vents at the high points.
11. In the case of very high intake or to prevent the piping from emptying at shutdown, install a foot valve. It should have a large diameter so as not to generate additional head loss.
12. Install pressure gauges in the suction and discharge piping as close as possible to pump ports to check pump at start up.
13. Check alignment of pipes to pump to avoid strains which might later cause misalignment. See figure below. Unbolt flanges or break union joints. Pipes should not spring away or drop down. After pump has been in operation for a week or two, completely recheck alignment.

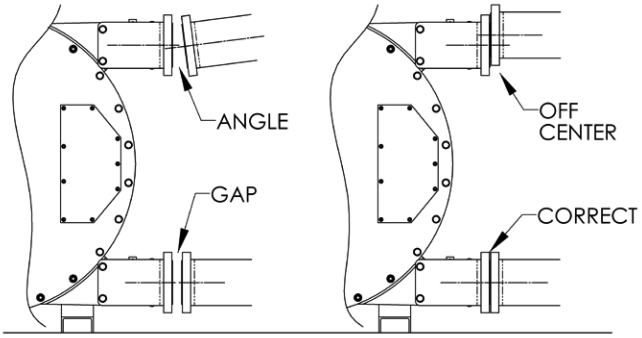


Figure 1

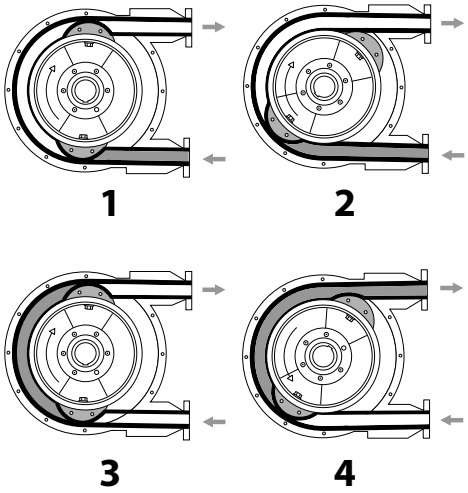
OPERATING PRINCIPLE

The pump operates by alternating contraction and relaxation of a specially designed elastomeric hose.

Two shoes attached 180° apart to a central wheel compress the hose against the pump body in a fluid tight manner.

Rotation of the wheel causes a flow by displacing the product in the hose.

The pump body is filled with a special lubricant allowing shoes to slide easily over the hose, which avoids overheating.



HOSE COMPRESSION

Performance and durability of the hose are guaranteed by inserting an adequate number of shims under the two shoes (see SECT. 4.5 SHIMMING THE SHOES).

PUMPED LIQUID

Under normal operation, the pumped liquid is only in contact with the hose and the inserts which must be compatible with it.

Three different quality elastomeric hoses are available:

- NR (natural rubber) White marking
- BN (perbunan or buna) Yellow marking
- EPDM Red marking

Inserts are available in ANSI 316 stainless steel, in polypropylene (PPH) and in polyfluoride vinylidene (PVDF).

This pumping technology is specially suited to handle abrasive products.

During the compression stage, abrasive particles may penetrate the hose wall without damaging it. Immediately after, these particles are released into the liquid (the size of incompressible particles should not exceed 15 % of the internal diameter of the hose and the size of compressible solids should not exceed 25% of the internal diameter of the hose).

DIRECTION OF ROTATION

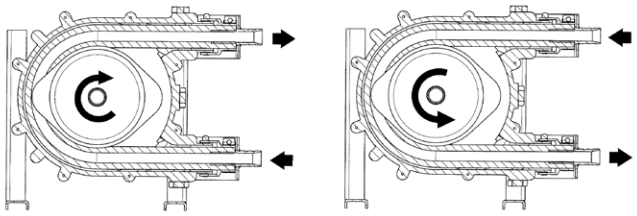
The Neptune Abaque pump is reversible. This allows it to always circulate the liquid in the desired direction by choosing the corresponding direction of rotation.

NOTICE:

When pumps are operated in reverse, a separate pressure relief valve must be installed to protect the pump from excessive pressure.

The intake and discharge sides are determined as follows :

When an observer faces the shaft, if rotation takes place clockwise, the intake is on the bottom, on the contrary if the rotation is counterclockwise, the intake is on the top.



LIQUIDS CONTAINING A HIGH PROPORTION OF PARTICLES

In the case where the pumped fluid contains particles, use the upper flange as the inlet flange.

This facilitates discharge of the sediments formed by the buildup of the particles contained in the fluid, so this reduces friction between the hose and the shoes.

Therefore, the pump may be re-started more easily.

WORKING WITH VACUUM ON THE SUCTION SIDE

Because of the operating principle of the pump, using it with suction pressure lower than the atmospheric pressure will cause a resulting loss of flow more or less in line with the conditions of the application (hose material, rotation speed, temperature, etc.).

In order for the pump to generate the flow per the Characteristic Curve, Neptune recommends using a vacuum draw kit inside the body of the pump.

When using a vacuum draw kit the suction pressure must not be lower than -0.6 bar (-8.7 PSIG) in order to avoid damage to the body lip seal.

If a vacuum draw kit is not used on a Neptune Abaque pump operating with suction pressure lower than atmospheric pressure, Neptune no longer guarantees the flow will be per the Characteristic Curve.

INSTALLATION

HANDLING

⚠CAUTION

Heavy assemblies can cause personal injury or property damage.

ALWAYS USE A LIFTING DEVICE CAPABLE OF SUPPORTING THE FULL WEIGHT OF THE PUMP UNIT.

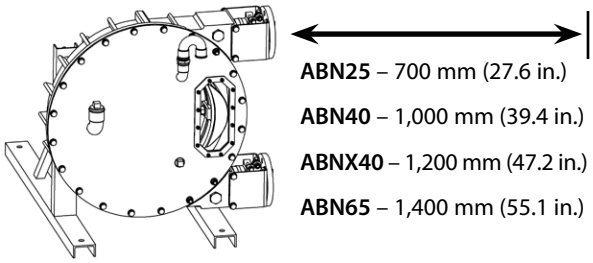
The maximum weight of the pump is:

- ABN25 Pump 50 kg (110 lb)
- ABN25 Unit 115 kg (253 lb)
- ABN40 Pump 90 kg (198 lb)
- ABN40 Unit 155 kg (341 lb)
- ABNX40 Pump 120 kg (264 lb)
- ABNX40 Unit 225 kg (495 lb)
- ABN65 Pump 230 kg (506 lb)
- ABN65 Unit 375 kg (825 lb)

PUMP LOCATION

Provide sufficient clearance around the pump for maintenance operations.

Particularly, make sure that there is sufficient clearance for replacing the hose; the distance between the pump flanges and the closest obstacle must allow the hose to be removed, as shown below:



ABN25 – 700 mm (27.6 in.)

ABN40 – 1,000 mm (39.4 in.)

ABNX40 – 1,200 mm (47.2 in.)

ABN65 – 1,400 mm (55.1 in.)

ANCHORING THE PUMP UNITS

The correct seating of the pump is vital for its efficient operation and its longevity.

The surface must be resistant enough to absorb the stresses due to the pump unit without deformation.

In the case where the unit is fastened by anchor lugs or bolts, it must be carefully shimmed between the bottom of the pump channel and foundation to prevent any deformation of the channel when tightening the bolts.

ELECTRIC MOTORS

⚠WARNING

Hazardous voltage. Can shock, burn or cause death

- ⚠ Install ground and wire to local and National Electrical Code requirements.
- ⚠ Install an all-leg disconnect switch near the unit motor.
- ⚠ Disconnect and lockout electrical power before installation or service
- ⚠ Electrical supply MUST match motor nameplate specifications.
- ⚠ Motors equipped with thermal protection automatically disconnect motor electrical circuit when overload exists. Motor can start unexpectedly and without warning.

Check that the supply voltage matches the indications on the motor rating plate.

Comply with the wiring diagram, make sure the wires are rated for the power and take care with the contacts which must be thoroughly tightened.

The motors must be protected by appropriate circuit breakers and fuses.

Connect the regulatory ground connections.

CHECK THE DIRECTION OF ROTATION (SEE 2.5 DIRECTION OF ROTATION)

This fundamental checking of the pump must be done without any product, with the inlet and outlet circuit open to the air, to avoid any risk of an unexpected pressure rise. Start the pump empty to check the correct operation of the connections and check that the direction of rotation corresponds to installation's inlet and outlet direction. Follow the instructions below if necessary to change the direction of rotation.

Three phase motor: switch any two wires of the current supply.

Two phase motor: switch the two wires of the same phase.

Single phase motor: comply with the instructions of the manual supplied with the motor.

OPERATION

⚠WARNING

Hazardous pressure can cause personal injury or property damage

DISCONNECTING FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE

⚠WARNING

Hazardous pressure can cause serious personal injury or property damage

FAILURE TO RELIEVE SYSTEM PRESSURE PRIOR TO PERFORMING PUMP SERVICE OR MAINTENANCE CAN CAUSE SERIOUS PERSONAL INJURY OR PROPERTY DAMAGE.

⚠CAUTION

Lubricant is slippery and can cause personal injury.

ALL LUBRICANT SPILLS SHOULD BE CLEANED PROPERLY TO PREVENT PERSONAL INJURY OR PROPERTY DAMAGE.

⚠WARNING

Do not operate without guard in place

OPERATION WITHOUT GUARDS IN PLACE CAN CAUSE SERIOUS PERSONAL INJURY, MAJOR PROPERTY DAMAGE, OR DEATH.

⚠CAUTION

Hazardous pressure can cause personal injury or property damage

PUMPS OPERATING AGAINST A CLOSED VALVE CAN CAUSE SYSTEM FAILURE, PERSONAL INJURY AND PROPERTY DAMAGE

PRE-START UP CHECK LIST

1. Check the alignment of the pipes to the pump. Pipes must be supported so that they do not spring away or drop down when pump flanges or union joints are disconnected.
2. Check the entire pumping system to verify that the proper inlet and discharge valves are fully open, and that the drain valves and other auxiliary valves are closed.
3. Install inlet and discharge pressure gauges in the suction and discharge piping as close as possible to the pump ports. These can be used to check actual suction and discharge conditions after pump start-up.
4. Check the wiring of the motor, and briefly turn on the power to make sure that the pump rotates in the proper direction.

START UP PROCEDURES

NOTICE:

Consult the TROUBLESHOOTING section of this manual if difficulties during start up are experienced.

1. Start the motor. Priming should occur within one minute.
2. Check the suction and discharge pressure gauges to see if the pump is operating within the expected conditions.
3. Check for leakage from the piping and equipment.
4. Check for overheating of the pump, reducer, and motor.
5. If possible, check the flow rate.
6. Check the pressure setting of the system bypass valve by slowly restricting a valve in the discharge line and reading the pressure gauge. This pressure should be 20 psi (1.4 bar) higher than the intended operating pressure.

RUNNING THE PUMP IN REVERSE

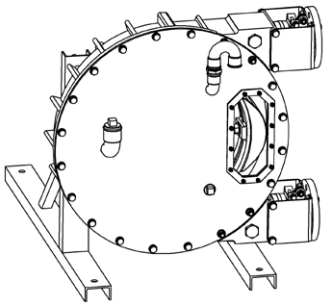
NOTICE:

When pumps are operated in reverse, a separate pressure relief valve must be installed to protect the pump from excessive pressure.

PUMP STORAGE

If the pump is inactive for more than 3 months, remove the hose or the shoes.

If you do not wish to remove the hose, operate the pump for 5 minutes once a week.



NOTICE:

Check that the wheel is always in such a position that one of the shoes can be seen through the window to insure both shoes remain lubricated.

HOSE STORAGE

Hose shelf life is limited to two years from the date of purchase.

The hoses must be stored in a cool place protected from light. Exposure to ultraviolet rays accelerates deterioration of the material, thus reducing shelf life.

PUMPING HOT PRODUCTS

⚠ CAUTION

Extreme heat can cause injury or property damage.

FAILURE TO ALLOW PUMP TO COOL BEFORE ATTEMPTING MAINTENANCE CAN CAUSE SERIOUS PERSONAL INJURY.

When pumping products at high temperatures, take care when starting the pump for the first time, tighten the bolts to compensate for expansion effects.

PUMP FILLED WITH PRODUCT AT SHUTDOWN

In the case where the pumping circuit is situated between isolating valves and/or has a check valve, bear in mind the variations in temperature that can occur, leading in particular to the expansion of the product in the circuit. In this case, provide a means of releasing the expansion volume. The use of a relief valve can suffice for this function. The opening pressure of this valve must be compatible with the pressure allowed by the parts composing the circuit.

With products including particles that settle at shutdown, ensure that the consistency of the deposited products will not affect the start-up of the pump.

SHUTTING DOWN THE PUMP

When shutting down the pump, wait for the pump to stop completely before closing the valves, especially the inlet valve.

If the pump will not be in use when filled with lubricant and temperatures will be below 0°C (32°F), a heating system must be used, or a 5% volume of ethylene glycol may be added to the Neptune lubricant. With the addition of ethylene glycol the pump can be stored in temperatures down to -200C (-40F).

IN THE EVENT OF THE HOSE BREAKING

Before opening the pump:

1. Close the isolation valves.
2. Release any pressure in the pump
3. Drain the pump.

If pump hose bursts, the following may occur:

1. The casing may fill up with the pumped fluid.
2. The pumped fluid under pressure may flow out through the vent.
3. If there is positive pressure on the pump inlet, all fluid may drain from the inlet line.
4. If the discharge line is under pressure, it may exhaust into the pump.

When the hose breaks, the lubricant will be contaminated by the pumped liquid. The old lubricant must be replaced.

MAINTENANCE

⚠WARNING

Hazardous pressure can cause personal injury or property damage

DISCONNECTING FLUID OR PRESSURE CONTAINMENT COMPONENTS DURING PUMP OPERATION CAN CAUSE SERIOUS PERSONAL INJURY, DEATH OR MAJOR PROPERTY DAMAGE

⚠CAUTION

Lubricant is slippery and can cause personal injury.

ALL LUBRICANT SPILLS SHOULD BE CLEANED PROPERLY TO PREVENT PERSONAL INJURY OR PROPERTY DAMAGE.

⚠WARNING

Hazardous voltage. Can shock, burn or cause death

FAILURE TO DISCONNECT AND LOCKOUT ELECTRICAL POWER BEFORE ATTEMPTING MAINTENANCE CAN CAUSE SHOCK, BURNS OR DEATH

⚠CAUTION

Heavy assemblies can cause personal injury or property damage.

ALWAYS USE A LIFTING DEVICE CAPABLE OF SUPPORTING THE FULL WEIGHT OF THE PUMP UNIT.

⚠WARNING

Hazardous machinery can cause serious personal injury.

FAILURE TO DISCONNECT AND LOCKOUT ELECTRICAL POWER OR ENGINE DRIVE BEFORE ATTEMPTING MAINTENANCE CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

⚠WARNING

Do not operate without guard in place

OPERATION WITHOUT GUARDS IN PLACE CAN CAUSE SERIOUS PERSONAL INJURY, MAJOR PROPERTY DAMAGE, OR DEATH.

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PUMPS OPERATING AGAINST A CLOSED VALVE CAN CAUSE SYSTEM FAILURE, PERSONAL INJURY AND PROPERTY DAMAGE

⚠WARNING

IF PUMPING HAZARDOUS FLUIDS, SYSTEM MUST BE FLUSHED, PRIOR TO PERFORMING SERVICE OR MAINTENANCE

REPLACING THE HOSE

NOTICE:

To insure an optimal life cycle of the hose, replace the used lubricant with new during any replacement of hose.

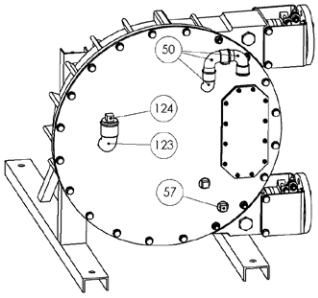
The hose may contain a certain volume of the pumped fluid, so proper precaution must be exercised when handling the used hose.

REMOVING THE HOSE

Disconnect the pump from inlet and discharge piping.

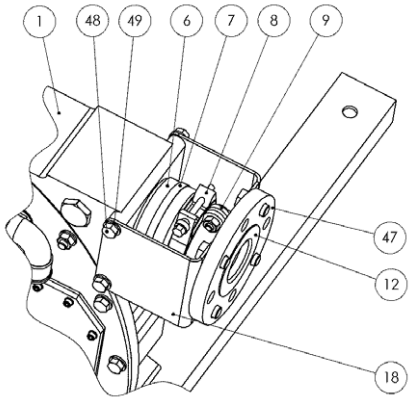
If the pump is equipped with the optional "leak detection kit", which allows the pump to be stopped in the event of the hose breaking, first the capacitive sensor must be removed by unscrewing the large PVC ring. Also, if the pump is equipped with an optional vacuum assist kit, it will need to be removed. See the appropriate kit instructions for further information.

1. Provide sufficient clearance as described in SECT. 2.9 PUMP LOCATION.
2. Drain the lubricant by removing the level plug (57) and collect the lubricant in a tub.
3. Put the lubricant level plug (57) back in place.



BOTTOM PORT

1. Place a tub under the hose boot (6) so that the residual lubricant in the pump body (1) is collected.
2. Loosen the hose clamp (9).
3. Loosen the hose clamp (8).
4. Loosen the hose clamp (7).
5. Remove the insert (12) with the flange (47), by pulling the flange (47).
6. Remove the 4 screws (48), remove the washers (49) and the brackets (18).
7. Remove the hose clamp (9).
8. Remove the hose clamp (8).
9. Remove the hose clamp (7).
10. Remove the hose boot (6).



TOP PORT

Repeat the steps described above from 2 to 10.

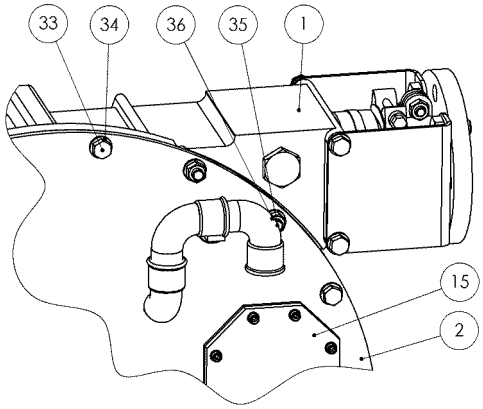
⚠WARNING

Hazardous machinery can cause serious personal injury.

THE HOSE CAN BE EXPELLED VIOLENTLY. BE SURE NO ONE IS IN FRONT OF PUMP PORTS.

11. Operate the pump intermittently until the hose is completely out.
12. Disconnect the pump.

REMOVING THE COVER



1. Remove screws (33) and remove the washers (34).
2. Remove nuts (36) and remove the washers (35).
3. Remove the cover (2), be careful with the weight of the cover.

CAUTION

Heavy assemblies can cause personal injury or property damage.

BE CAREFUL WITH THE WEIGHT OF THE COVER WHEN IT IS BEING REMOVED.

4. Wash the inside of the pump body (1) and the cover (2) with water or a cleaning product that is compatible with the pump materials. Also wash the wheel (front + back)

NOTICE:

If the pump is not re-assembled immediately, dry unpainted surfaces and coat them with the pump lubricant in order to protect them against corrosion.

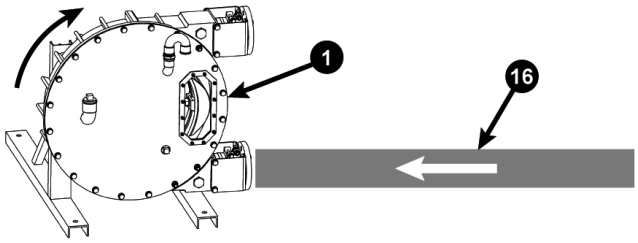
Dispose of the drained products in accordance with the rules and regulations in force.

INSTALLING THE COVER

1. After a visual inspection of the inside of the body and the wheel, lubricate all the internal parts of the casing with pump lubricant.
2. Install the cover (2).
3. Place the washers (35).
4. Tighten the nuts (36).
5. Place the washers (34) and tighten the screws (33).

INSTALLING THE HOSE

1. Mount the brackets (18) with the washers (49) and the screws (48) to the discharge port.



2. Mount discharge flange (47) onto brackets (18) with the 2 screws (98) and 2 nuts (99) 180° apart to use as a stop for the hose.
3. Clean the hose (16) to eliminate any particles that may have adhered to it (gravel, etc.).
4. Generously coat the hose with lubricant.
5. Insert one end of the hose (16) in the inlet port of the pump body (1).
6. Operate the pump intermittently until the hose (16) is completely inserted in the body (1) and the end of the hose contacts the discharge flange.
7. Remove discharge flange (47) and brackets (18).

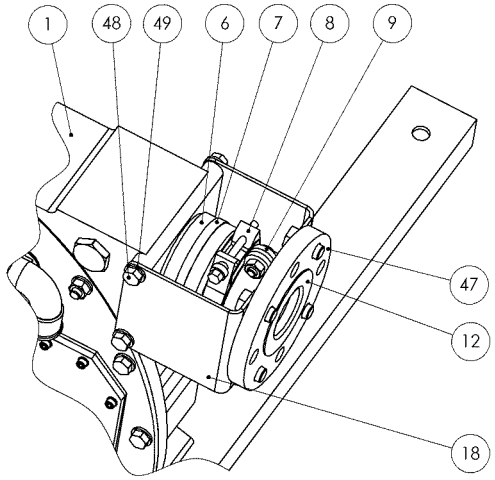
WARNING

Do not operate without guard in place

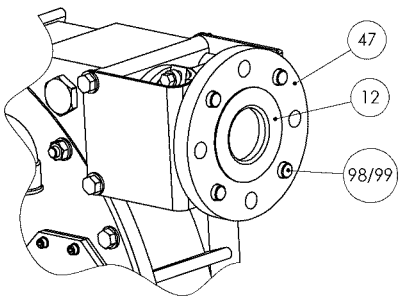
NEVER INSERT THE HOSE OR RUN THE PUMP WITHOUT ITS COVER IN PLACE.

BOTTOM PORT

1. Check the state of the hose boot (6) and replace it if necessary.
2. Coat the hose boot (6) with pump lubricant.
3. Slide the hose boot (6) on the body port (1).
4. Tighten the hose clamp (7) (take care on the direction of assembly of the hose clamp: the screw should be positioned vertically so the head is accessible from the top of the pump). Slide on the hose clamp (8).
5. Slide on the hose clamp (9).



6. Mount the brackets (18) with the washers (49) and the screws (48).
7. Mount flange (47) onto brackets (18) with the 2 screws (98) and 2 nuts (99) 180° apart.
8. Coat the outside of insert (12) with pump lubricant.
9. Coat the inside of hose (16) with pump lubricant.
10. Insert the insert (12) in the flange (47) and the hose (16) until the insert (12) is flat against the flange (47).



11. Tighten the hose clamp (8) (the screw should be tightened to the stop) onto the hose boot (6).
12. Tighten the hose clamp (9) (the screw should be tightened to the stop) onto the hose (16).

TOP PORT

Repeat the previous steps from 1 to 12.

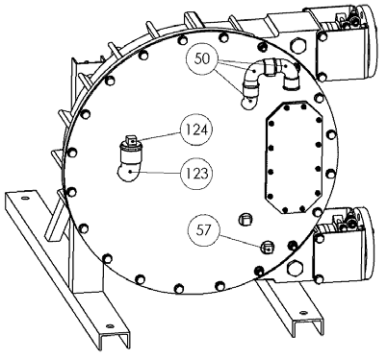
FILLING WITH LUBRICANT

⚠CAUTION

Lubricant is slippery and can cause personal injury.

ALL LUBRICANT SPILLS SHOULD BE CLEANED PROPERLY TO PREVENT PERSONAL INJURY OR PROPERTY DAMAGE.

1. Remove the plug (124).
2. Fill the pump body with the lubricant (see SECT. 4.6 LUBRICATION).
3. Install the plug (124).



NOTICE:

Handle the lubricant with care.

Wear suitable clothes and protect yourself from pump lubricant spatters.

4. Run the pump for a few minutes to check correct operation.
5. Connect the suction and discharge ports of the pump to the installation.
6. Put the puncture detection kit or vacuum assist kit back in place, if the pump is equipped with one.
7. In the event that the breathing vent has been removed, check the installation direction for the existing back flow valve (71) (ABN65 only). The valve must allow air out and block it from entering.
8. Check that there is no leakage next to the hose boot (6). Tighten again the hose clamp (7) if needed.
9. Proceed to 'Pre-Start Up Check List' and 'Startup Procedures'.

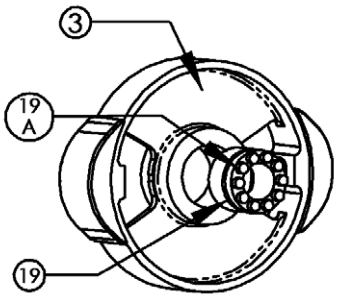
REPLACING THE WHEEL

Removal and installation of the wheel (3) are required when:

- Replacing the shaft seal (26).
- Performing a complete overhaul.
- Removing or replacing the gear reducer/gear motor.

To remove the wheel (3), the pump hose must be removed (see SECT. 4.1 REPLACING THE HOSE).

REMOVING THE WHEEL



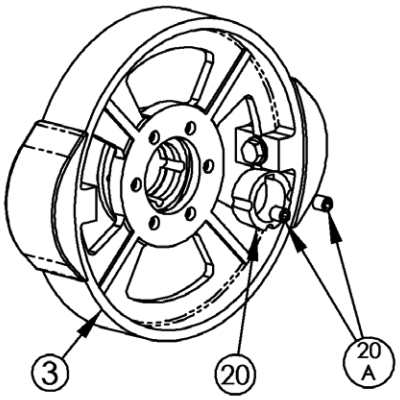
MODELS ABN25 AND ABN40

1. Loosen screws (19A) in the locking assembly (19).
2. Remove one screw (19A) and tighten into the tapped hole of the locking assembly (19) provided to pull out the cone.
3. Remove the wheel (3) by sliding it along the central axis.

⚠CAUTION

Heavy assemblies can cause personal injury or property damage.

BE CAREFUL WITH THE WEIGHT OF THE PARTS WHEN THEY ARE BEING REMOVED.



MODELS ABNX40 AND ABN65

1. Loosen screws (20A) in the hub (20).
2. Tighten one of the screws (20A) into the tapped hole of the hub (20) provided to pull out the cone.
3. Remove the wheel (3) by sliding it along the central axis.

INSTALLING THE WHEEL

1. Check the shaft seal (26). Replace when necessary, making sure that it is installed so that the spring can be seen inside the pump body.
2. Check that the shoes have no dents or deep scratches that may quickly deteriorate the hose.
3. Insert the parts of the locking assembly (19) (Models ABN25 and ABN40) or hub (20) (Models ABNX40 and ABN65) in the wheel center.
4. Lightly tighten screws (19a) (Models ABN25 and ABN40) or screws (20a) (Models ABNX40 and ABN65).

NOTICE:

Screws 19a or 20a must not be tightened so the wheel assembly can freely slide along the axis.

5. Slide wheel (3) with its locking assembly (19) (Models ABN25 and ABN40) or hub (20) (Models ABNX40 or ABN65) on the axis.
6. Align wheel (3) with pump body (1) while keeping setting distance as indicated in the following table:

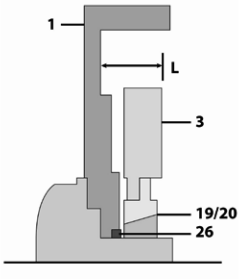
Setting Distance (L):

ABN25 - 60.5 ± 1 mm (2.382 ± 0.039 in.)

ABN40 – 74 ± 1 mm (2.931 ± 0.039 in.)

ABNX40 – 80 ± 2 mm (3.150 ± 0.079 in.)

ABN65 – 102 ± 2 mm (4.016 ± 0.079 in.)



7. After checking that the locking assembly or hub is properly centered with regard to the wheel thickness, gradually tighten screws (19A) or (20A) while keeping wheel alignment correct.

REPLACING THE SHOES

To replace the shoes (5), the pump hose must be removed (see SECT. 4.1 REPLACING THE HOSE).

REMOVING THE SHOES

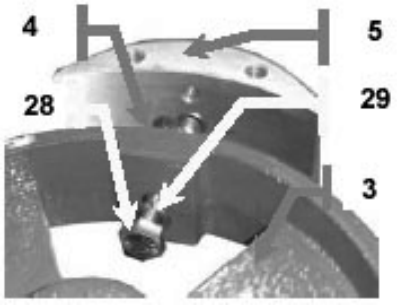
1. Partially loosen screw (28).
2. Remove the shims (4) from the shoe (5).

NOTICE:

Some shims cannot be removed (models ABNX40 and ABN65 only) by sliding them towards the outside. These special shims are installed by the manufacturer and must be kept for reassembly.

These shims can be recognized as they have 2 holes and have no notch like the other shims.

3. Completely loosen screw (28) and remove the washer (29).
4. Remove the shoe (5).

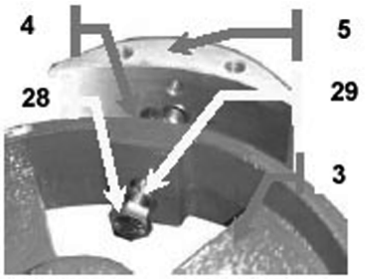


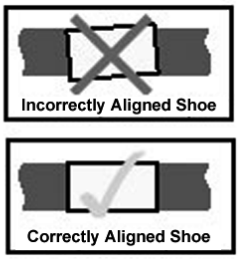
5. Remove the special shims (4).

INSTALLING THE SHOES

1. Check that the shoes have no dents or deep scratches that may quickly deteriorate the hose.
2. Position the screw (28) with its washer (29) around the wheel (3).
3. Slide the special shims (4) over the screw (28).
4. Position the shoe (5).

5. Partially tighten the screw (28).
6. Insert a suitable number of shims in accordance with the desired service pressure (see SECT. 4.5 SHIMMING THE SHOES).
7. Tighten the screw (28), check that the shoe (5) is correctly aligned with the wheel (3).





SETTING OF PUMP AT SERVICE PRESSURE NEEDED

Shims may have to be added under the shoes (see SECT. 4.5 SHIMMING THE SHOES).

The cover (2) need not be removed.

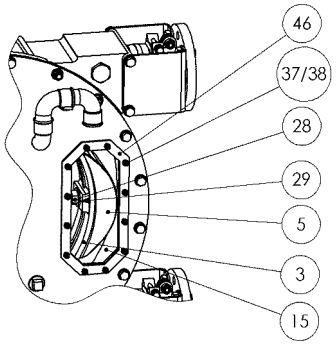
ADDING OR TAKING OFF SHIMS

FIRST SHOE:

1. Position the shoe (5) facing the window (15). If the shoe is not correctly positioned, operate the pump intermittently until the shoe (5) can be seen through the window (15).
2. Switch off the electric power supply and safety lock before any operation in order to prevent the pump starting unexpectedly.
3. Drain the pump of lubricant following the instructions of the SECT. 4.1.1 REMOVING THE HOSE.
4. Remove the screws (37) and remove the washers (38).
5. Remove the window (15).
6. Remove the window seal (46).
7. Partially loosen the screw (28).

NOTICE:

Do not loosen the shoe screw (28) completely.



8. Place the suitable number of shims (4) (see SECT. 4.5 SHIMMING THE SHOES).
9. Tighten the screw (28), check that the shoe (5) is correctly aligned with the wheel (3) (see SECT. 4.3.2 INSTALLING THE SHOES).
10. Check the window seal (46), change it if necessary.
11. Position the window (15) with its seal (46).
12. Tighten the screws (37), with their washers (38). Once the screws are tightened, the seal must be squeezed all over.
13. Switch on electric power supply.

SECOND SHOE:

Repeat the previous steps from 1 to 13.

NOTICE:

There must be the same number of shims under each shoe.

SHIMMING THE SHOES

Suitable shimming of the shoes lengthens the service life of the hose.

SERVICE PRESSURE SPECIFIED AT ORDER

If the service pressure has been specified at order, the pump is shimmed in the factory to allow pump running at specified service pressure. No additional shimming is needed.

SERVICE PRESSURE NOT SPECIFIED AT ORDER

If the service pressure has not been specified at order, the pump is pre-configured by the manufacturer for a service pressure up to 5 bar (72.5 PSI).

For higher pressure values, one or more shims must be placed under the shoes, as indicated in the instructions 1103-M00 "INSTALLING Neptune PERISTALTIC HOSES".

For adding the shims, see SECT. 4.4 SETTING OF PUMP AT SERVICE PRESSURE NEEDED.

LUBRICATION

The hose is lubricated with a special mixture. Neptune lubricant is recommended to lengthen the service life of the hose.

It is recommended to change the lubricant when:

- Replacing the hose.
- After 2000 hours of operation.

Amount of lubricant required:

- ABN25 - 1.5 quarts (1.4 liters)
- ABN40 – 2.7 quarts (2.5 liters)
- ABNX40 – 5.3 quarts (5 liters)
- ABN65 – 2.7 gallons (10 liters)

The minimum working or storage temperature for the pump lubricant is 0°C (32°F).

If the temperature is lower, a heating system must be used or a 5% volume ethylene glycol may be added to the Neptune lubricant. With the addition of ethylene glycol the pump can be stored or operated in temperatures down to -200C (-40F).

HOSES AND SEALS

HOSE

Some pumped liquids require the hose to be cleaned after each operation to prevent solidification of the fluid inside the hose.

The hose can be easily washed with a cleaning agent that is compatible with the hose material and the pumped product.

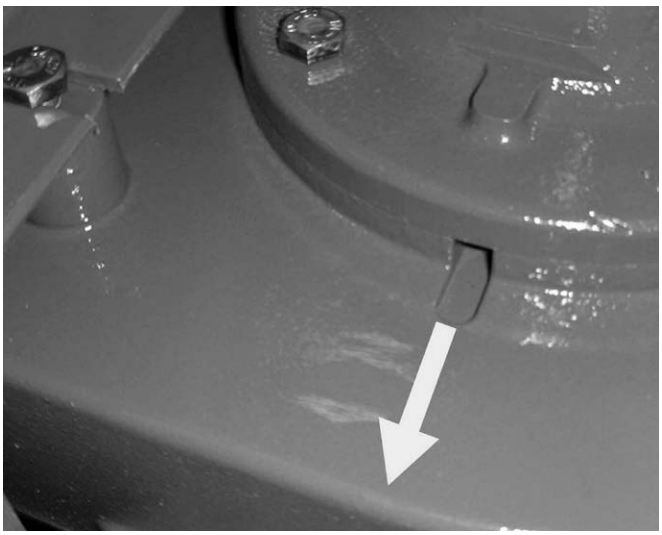
It is recommended that the hose be monitored so that it can be replaced before any breakdown should occur. Preventive replacement is advisable.

Temperature threshold values for the liquid pumped depend directly on the materials that make up the hose. Refer to TECHNICAL CHARACTERISTICS on page 3 for the corresponding values.

It is important to note that the temperature of the pumped liquid influences the limits of use of the pump and that a rise of the temperature of the pumped liquid has to come along with a modification of the service pressure or the speed of rotation so as to respect the limits defined in TECHNICAL CHARACTERISTICS and the pump CHARACTERISTIC CURVE and if necessary a modification of the shimming of the shoe as specified in the SECT. 4.5 SHIMMING THE SHOES.

SHAFT SEAL 26

The shaft seal (26) must be replaced if lubricant leakage is observed near the drip strip, located on the rear side of the pump body 1.



COVER SEAL 10

The cover seal (10) must be checked when removing the cover (2) and replaced if necessary (see SECT. 4.1.2 REMOVING THE COVER).

WINDOW SEAL 46

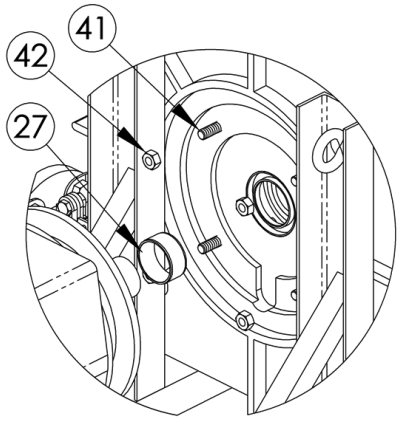
The window seal (46) must be checked when removing the window (15) and replaced if necessary (see SECT. 4.4 SETTING OF PUMP AT SERVICE PRESSURE NEEDED).

REPLACING THE DRIVE

REMOVING THE DRIVE

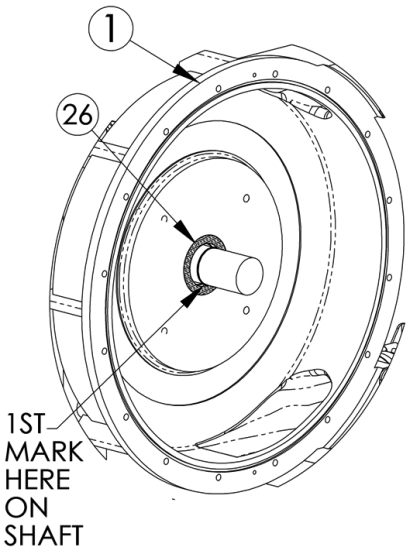
To remove the drive the pump wheel must be removed (see SECT. 4.2 REPLACING THE WHEEL).

1. Remove nuts (42) and pull gear reducer/gear motor off of studs (41).
2. Seal ring (27) can be removed from the gear reducer/gear motor shaft using a suitable gear puller using care not to damage the shaft.

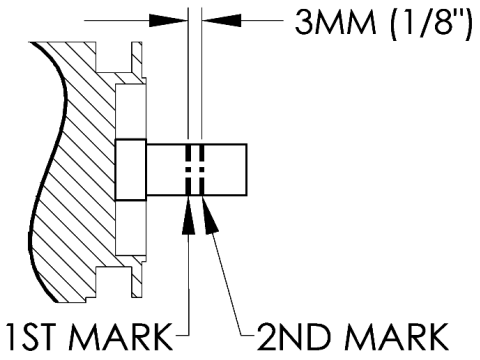


INSTALLING THE DRIVE

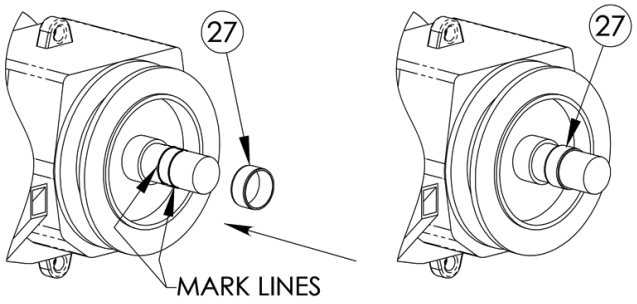
1. Temporarily mount gear reducer/gear motor to pump body (1) using studs (41) and nuts (42). From the inside of the pump body (1) mark the location of lip seal (26) on the shaft.



2. Remove the gear reducer/gear motor. Measure 3 mm (1/8″) from mark on shaft towards end of shaft (pump side) and make new mark.



3. Heat seal ring (27) to 110 0C (230 0F) and slide on to the gear reducer/gear motor shaft locating the end of the seal ring (27) with the second mark on the shaft. This will insure the seal ring (27) is positioned on the shaft so the lip seal (26) in the pump body (1) will ride on the seal ring (27). Take care to position before seal ring (27) cools as once cold it can not easily be repositioned. Verify the keyway on the shaft is completely covered on the gear reducer/gear motor side. The seal ring (27) must be heated using a bearing installation heater, oven or heat gun to insure uniform heating. Flame heating may affect the heat treatment of the seal ring (27).



4. Mount gear reducer/gear motor to pump body (1) using studs (41) and nuts (42).

TROUBLESHOOTING

NOTICE:

Maintenance shall be performed by qualified technicians only.

Follow the appropriate procedures and warnings as presented in this manual.

PROBLEM	POSSIBLE CAUSE	SOLUTION
PUMP NOT WORKING	Defective power supply	Check electrical connections: - Presence of all phases - Connectors are appropriate for line voltage (see motor wiring diagram). - If applicable, check the characteristics of the variable frequency drive (starting torque, power available).
	During an extended shutdown period, one of the shoes may have remained out of lubricant. If shoe is no longer lubricated, there will be an increased starting resistance.	Remove the hose and reassemble (see SECT. 4.1 REPLACING THE HOSE). DO NOT force the pump to start - if the motor has excessive power, there is strong risk of damaging the hose or reducer.
	Some sediments or foreign matter may remain in the hose, thus jamming the pump.	Reverse direction of rotation of the pump or remove the hose.
LOW FLOW RATE	The inlet or discharge valve is partially closed.	Open inlet or discharge valve fully.
	Air leaks in the inlet piping.	Check inlet piping for leaks.
	Shimming is insufficient.	Refer to SECT. 4.5 SHIMMING THE SHOES.
	The product pumped is too viscous. High head loss at inlet.	Check inlet line (see SECT. 2.1 LOCATION AND PIPING). Install a Neptune vacuum assist system.
	Pump Hose is damaged.	Replace pump hose (see SECT. 4.1 REPLACING THE HOSE).
LUBRICANT TEMPERATURE TOO HIGH	The lubricant is not adequate.	Drain pump casing. Use only Neptune recommended lubricant (see SECT. 4.6 LUBRICATION).
	The lubricant is dirty or old.	Drain pump body and replace with new lubricant (see SECT. 4.6 LUBRICATION).
	The lubricant level is too low.	Add lubricant (see SECT. 4.6 LUBRICATION).
	Temperature of fluid pumped is too high.	Check the maximum allowable temperature of the fluids pumped with the materials of the pump hose.
	Over shimming of the shoes.	Refer to SECT. 4.5 SHIMMING THE SHOES.
	The pump speed is too high.	Reduce pump speed.
SERVICE LIFE OF HOSE IS TOO SHORT	The Lubricant is not adequate.	Drain pump body. Use only Neptune recommended lubricant (see SECT. 4.6 LUBRICATION).
	Chemical incompatibility between hose and the fluid being pumped.	Check the chemical compatibility of hose and fluid pumped. Replace hose with proper compatibility.
	The temperature of fluid pumped is too high.	Check maximum allowable temperature of pump hose.
	The discharge pressure is too high.	Check maximum allowable discharge pressure of pump. Minimize the head losses at discharge.
	Inadequate shimming of the shoes.	Refer to SECT. 4.5 SHIMMING THE SHOES.
	The speed of the pump is too high.	Reduce pump speed.
HOSE IS BEING DRIVEN INTO PUMP CASING ON THE INLET SIDE	Not enough lubricant.	Check level of lubricant and adjust as required (see SECT. 4.6 LUBRICATION).
	Over shimming of shoes.	Refer to SECT. 4.5 SHIMMING THE SHOES.
	Foreign matter or fluid sediments in hose.	Reverse the direction of pump rotation (inlet side up).

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