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GORMAN-RUPP
PUMPS

4 AND 6 INCH MODEL HYDRAULIC SUBMERSIBLE PUMPS

MANUAL
PART 3 of 3

MAINTENANCE AND REPAIR WITH TROUBLESHOOTING

THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO
GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA Printed in U.S.A.

INTRODUCTION

Thank You for purchasing a Gorman-Rupp HS or HSV Series Hydraulic Submersible Pump. **Read this manual** carefully to learn how to safely maintain and service your pump. Failure to do so could result in personal injury or damage to the pump.

A set of three manuals accompanies your pump. The Installation/Operation Manual contains essential information on installing and operating the pump. The Parts List Manual provides a performance curve, a pump model cross-section drawing, and parts list for your pump.

This Maintenance and Repair Manual provides troubleshooting and maintenance instructions required to properly diagnose operational problems, and to service the pump hydraulic components. Pump hydraulic motor maintenance is not covered in this manual. The hydraulic motor is typically maintenance-free for the life of the pump. However, if hydraulic motor repair is required, contact the factory for the motor manufacturer's repair facility closest to you.

If there are any questions regarding the pump which are not covered in this manual or in other literature accompanying the unit, please contact your Gorman-Rupp distributor or the Gorman-Rupp Company:

The Gorman-Rupp Company
P.O. Box 1217
Mansfield, Ohio 44901—1217
Phone: (419) 755—1011
or:
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70 Burwell Road
St. Thomas, Ontario N5P 3R7
Phone: (519) 631—2870

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RECORDING MODEL AND SERIAL NUMBERS

Please record the model and serial number for your hydraulic submersible pump in the spaces provided below. Your Gorman-Rupp distributor needs this information when you require parts or service.

Model: _____

Serial Number: _____

WARRANTY INFORMATION

The warranty provided with your pump is part of Gorman-Rupp's support program for customers who operate and maintain their equipment as described in this and the other accompanying literature. Please note that should the equipment be abused or modified to change its performance beyond the original factory specifications, the warranty will become void and any claim will be denied.

The following are used to alert personnel to procedures which require special attention, to those which could damage equipment, and to those which could be dangerous to personnel:

Immediate hazards which WILL result in severe personal injury or death. These instructions describe the procedure required and the injury which will result from failure to follow the procedure.

Hazards or unsafe practices which COULD result in severe personal injury or death. These instructions describe the procedure required and the injury which could result from failure to follow the procedure.

Hazards or unsafe practices which COULD result in minor personal injury or product or property damage. These instructions describe the requirements and the possible damage which could result from failure to follow the procedure.

NOTE

Instructions to aid in installation, operation, and maintenance or which clarify a procedure.

SAFETY - SECTION A

This information applies to the Gorman-Rupp HS and HSV Series hydraulic submersible pumps covered in this manual.

WARNING!

Before attempting to service the hydraulic power unit or pump:

1. **Familiarize yourself with this manual.**
2. **Shut down the power source ignition and remove the key, or take other precautions to ensure that the power unit and pump will remain inoperative.**
3. **Allow the hydraulic oil to cool before attempting to disconnect or service the either the power unit or pump.**

WARNING!

This pump may be used to handle materials which could cause serious illness or injury through direct exposure or emitted fumes. Wear protective clothing, such as rubber gloves, face mask and rubber apron, as necessary, before disconnecting or servicing the pump or piping.

WARNING!

Use lifting and moving equipment in good repair and with adequate capacity to prevent injuries to personnel or damage to equipment. Attach adequate lifting equipment only to the lifting device on the power unit. Hydraulic hoses to the submersible pump must be removed before lifting. Make certain that all personnel are clear of the area and that the load is balanced before lifting.

WARNING!

After the unit has been installed, make certain that the pump and all piping or hose connections are tight, properly supported and secure before operation.

DANGER!

Do not operate an internal combustion engine in an explosive atmosphere. When operating internal combustion engines in an enclosed area, make certain that exhaust fumes are piped to the outside. These fumes contain carbon monoxide, a deadly gas that is colorless, tasteless, and odorless.

WARNING!

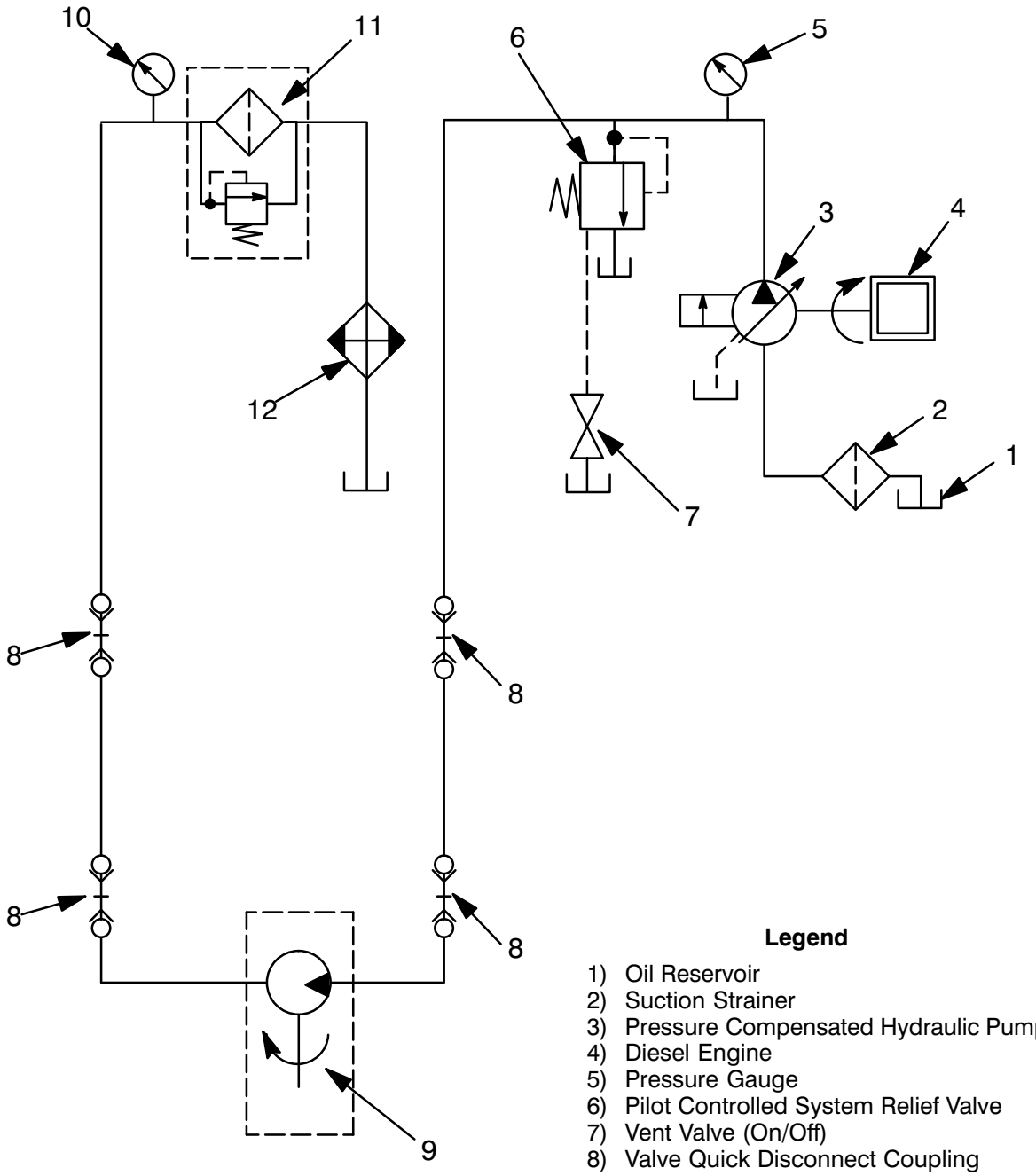
Fuel used by internal combustion engines presents an extreme explosion and fire hazard. Make certain that all fuel lines are securely connected and free of leaks. Never refuel a hot or running engine. Avoid overfilling the fuel tank, and clean up any fuel spills immediately. Always use the correct type of fuel.

TROUBLESHOOTING — SECTION B
(Including Hydraulic Power Source)

Review all SAFETY information in Section A.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP NOT PUMPING (HYDRAULIC PRESSURE BELOW 1000 PSI OR 70 KG/CM^2)	Hydraulic oil level low.	Check level, add oil as required.
	Hydraulic power unit malfunctioning.	Check unit with submersible pump disconnected to be sure unit is functioning properly.
	Lack of liquid in pump (pump inlet obstructed).	Check and clear debris from inlet or strainer.
	Lack of liquid in pump (pump not properly submerged).	Check pump submergence. Minimum submergence to oil fill plug on bearing housing.
	Air trapped in pump volute.	Check vent screw (if so equipped) to be sure it is not plugged.
	Air trapped in pump volute.	Lower pump into liquid while operating.
	Air trapped in pump volute.	Lay pump on its side with the discharge directed up to allow air to escape.
	Air trapped in pump volute.	Check for collapsed discharge hose.
	Hydraulic motor worn.	Check and replace as required.
PUMP NOT PUMPING (HYDRAULIC PRESSURE ABOVE 1000 PSI OR 70 KG/CM^2)	Impeller worn excessively.	Check and replace worn parts.
	Submersible pump won't run.	Hydraulic motor or bearing seized. Check and replace as required.
	Submersible pump won't run.	Impeller clogged. Check and clear debris from impeller.
	Submersible pump runs.	Discharge hose kinked, plugged or collapsed. Check and clear or replace discharge hose with rigid hose or pipe.
	Submersible pump runs.	Discharge head too high for pump. Consult pump performance curve for maximum discharge head.

SCHEMATIC DRAWING



Legend

1) Oil Reservoir
2) Suction Strainer
3) Pressure Compensated Hydraulic Pump
4) Diesel Engine
5) Pressure Gauge
6) Pilot Controlled System Relief Valve
7) Vent Valve (On/Off)
8) Valve Quick Disconnect Coupling
9) Fixed Displacement Hydraulic Motor
10) Return Filter Wear Indicator Gauge
11) Return Filter w/Bypass Valve
12) Hydraulic Oil Cooler

Figure 1. Hydraulic Power Source Schematic (Including Hydraulic Pump)

PUMP MAINTENANCE AND REPAIR – SECTION C

GENERAL INFORMATION

Review all SAFETY information in Section A.

WARNING!

Do not attempt to service the pump unless the power source has been shut off, the hydraulic oil has been allowed to cool, and the hoses disconnected from the pump; otherwise, serious personal injury could result.

The maintenance and repair instructions in this manual are keyed to the sectional view, Figure 1, and the corresponding parts identification list. Refer to the separate Parts List Manual for replacement parts.

Select a suitable location, preferably indoors, to perform required maintenance. All work must be performed by qualified personnel.

This Maintenance and Repair Manual provides troubleshooting and maintenance instructions required to properly diagnose operational problems, and to service the pump hydraulic components. Pump hydraulic motor maintenance is not covered in this manual. The hydraulic motor is typically maintenance-free for the life of the pump. However, if hydraulic motor repair is required, contact the factory for the motor manufacturer's repair facility closest to you.

Check **TROUBLESHOOTING**, Section B to determine causes and remedies of pump problems. Disassemble the pump only as far as required.

Lifting

Use lifting and moving equipment with a capacity of at least **5 times** the weight of the pump, not including the weight of any customer installed accessories. Customer-installed equipment such as discharge piping **must** be removed before attempting to lift. Refer to the Pump Specification Data Sheet or contact the Gorman-Rupp Company for the approximate weight of your pump.

WARNING!

Do not attempt to lift the pump by the hydraulic hoses or the piping. Use lifting and moving equipment in good repair and with adequate capacity to prevent injuries to personnel or damage to equipment. Attach adequate lifting equipment only to the lifting device on the pump. Hydraulic hoses to the power source must be removed before lifting. Make certain that all personnel are clear of the area before lifting.

SECTION DRAWING

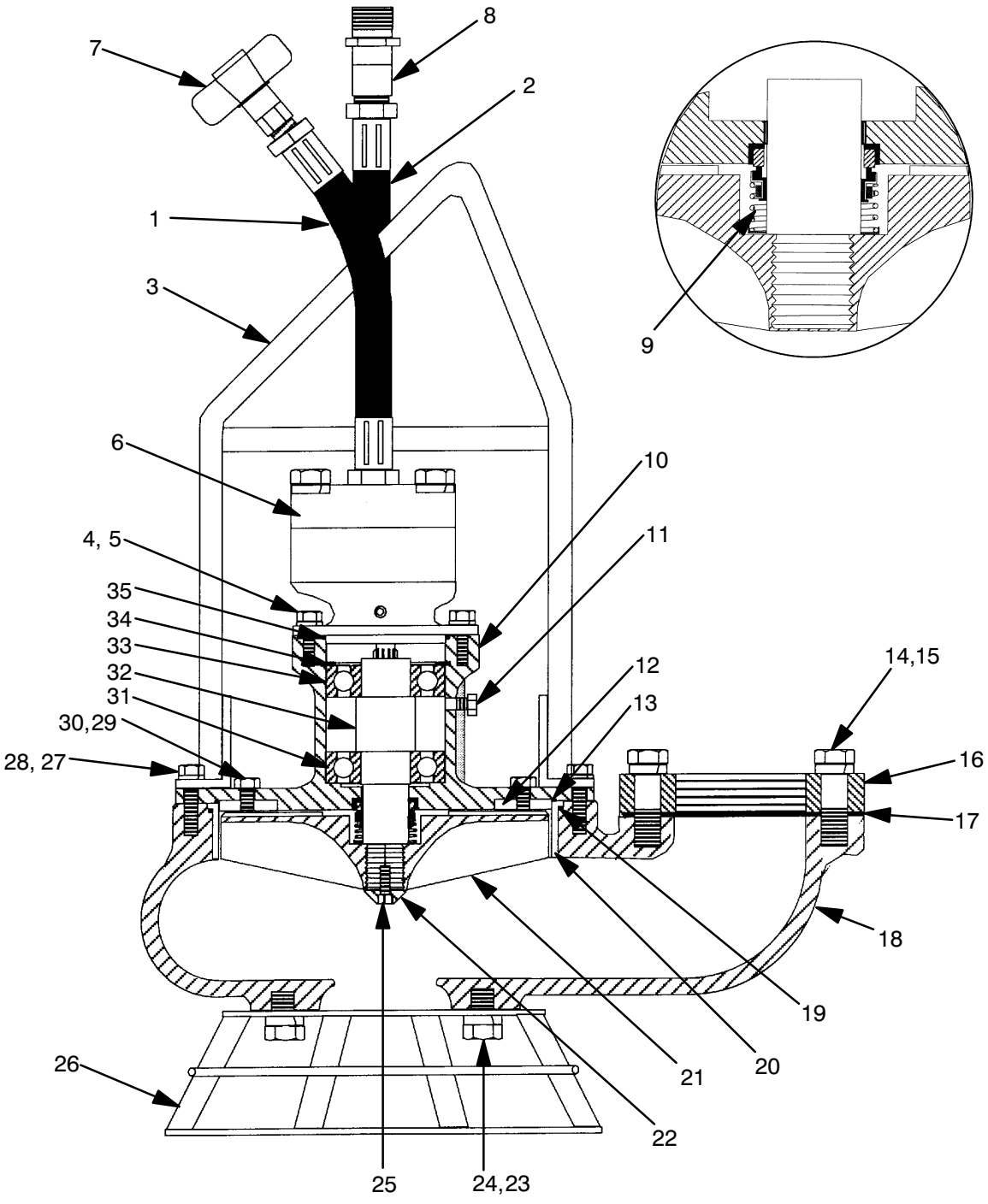


Figure C—1. Typical HS and HSV Series Hydraulic Submersible Pump

Typical HS and HSV Series Hydraulic Submersible Pump Part Identification List

Refer to the separate Parts List Manual for serviceable parts, part numbers and quantities.

ITEM NO.	PART NAME
1	PIGTAIL HOSE ASSEMBLY
2	PIGTAIL HOSE ASSEMBLY
3	LIFTING BRACKET
4	HEX HEAD CAPSCREW
5	LOCKWASHER
6	HYDRAULIC MOTOR
7	FEMALE HOSE COUPLER
8	MALE O.D. COUPLER
9	SEAL ASSEMBLY
10	BEARING HOUSING
11	HEX PLUG
12	WEAR PLATE
13	LOWER BEARING HOUSING O-RING
14	FLANGE MOUNTING HARDWARE
15	FLANGE MOUNTING HARDWARE
16	DISCHARGE FLANGE
17	DISCHARGE FLANGE GASKET
18	PUMP CASING
19	PUMP CASING O-RING
20	WEAR RING
21	IMPELLER
22	CONE WASHER
23	HEX HEAD CAPSCREW
24	LOCKWASHER
25	SOCKET HEAD CAPSCREW
26	PUMP STAND/STRAINER
27	HEX HEAD CAPSCREW
28	LOCKWASHER
29	HEX HEAD CAPSCREW
30	VENT SCREW
31	LOWER BEARING
32	SHAFT
33	UPPER BEARING
34	RETAINING RING
35	UPPER BEARING HOUSING O-RING

PUMP DISASSEMBLY

This Maintenance and Repair Manual provides troubleshooting and maintenance instructions required to properly diagnose operational problems, and to service the hydraulic pump components. Because of its extremely long life, close tolerances and high efficiency, the hydraulic motor is typically maintenance-free for the life of the pump. Also, due to its relatively low replacement cost, it is more economical to replace than to rebuild. Therefore, pump hydraulic motor maintenance is not covered in this manual. However, if hydraulic motor repair is desired, contact the factory for the motor manufacturer's repair facility closest to you.

Use a suitable lifting device to move the pump to a suitable location, preferably indoors, to perform required maintenance.

References are to Figure C−1.

Removing Pump From Stand/Strainer

1. Position the pump vertically, and remove the hardware (23 and 24) securing the pump casing (18) to the stand/strainer (16). Use a suitable lifting device to lift the pump off the stand/strainer. Position the pump horizontally on a work bench or other suitable surface for further disassembly.

2. If desired, remove the hardware (14 and 15), and separate the discharge flange (16) from the pump casing. Remove the discharge flange gasket (17).

Removing Pump Casing

1. Remove the hardware (27 and 28) securing the pump casing and lifting bracket (3) to the bearing housing (10). Lift the pump out of the pump casing, and position it horizontally on a work bench or other suitable surface for further disassembly.

2. Remove the O-ring (13) from the bearing housing.

3. Inspect the wear ring (20) for excessive wear or scoring. If replacement is required, position the pump casing with the suction opening facing up. Use a hammer and punch through the suction opening to tap the wear ring out of the pump casing.

4. Remove the O-ring (19) from the pump casing.

Separating Hydraulic Motor From Bearing Housing

1. Before attempting to separate the hydraulic motor assembly (6) from the bearing housing (10), drain the bearing housing as described in **LUBRICATION** at the end of this section.

2. Remove the hardware (4 and 5) and pry or tap the hydraulic motor assembly (6) from the bearing housing (10). Remove the upper bearing housing O-ring (35).

Removing Impeller

1. Use the retaining tool (G-R P/N 26832−323) to block shaft rotation. Remove the impeller screw (25) and washer (22).

2. Use a soft-faced mallet to tap the impeller (21) in a counterclockwise direction until it breaks free. Remove the retaining tool and unscrew the impeller from the shaft. Use caution when removing the impeller; tension on the seal spring will be released as the impeller is unscrewed.

3. Inspect the wear ring (12) for excessive wear or scoring. If replacement is required, remove the hardware (29 and 30) and use a screwdriver to pry it from the bearing housing.

Removing Seal Assembly

References are to Figures C−1 and C−2.

To maintain peak operating efficiency, it is **strongly** recommended that the seal be replaced any time the pump is disassembled. In the event that the seal will be reused, handle seal parts with extreme caution to prevent damage. Use care not to contaminate the precision-finished faces; even fingerprints on the faces can shorten seal life.

1. Remove the spring centering washer and seal spring.

2. Apply oil to the shaft and work it up under the bellows. Slide the rotating portion of the seal off the shaft.

3. Slide a pair of stiff wires with hooked ends between the shaft and the stationary element, and hook the element from the back side. Pull the element and stationary seat from the bearing housing.

If no further disassembly is required, refer to **INSPECTION AND CLEANING**, followed by **PUMP REASSEMBLY**.

Bearing Housing Disassembly

CAUTION

Shaft and bearing disassembly in the field is not recommended. These operations should be performed only in a properly-equipped shop by qualified personnel.

1. Remove the retaining ring (34) from the groove in the bearing housing. Apply heat evenly to the bearing housing, and slide the shaft (32) and assembled bearings (31 and 33) out of the housing as a unit.

NOTE

If heating the bearing housing is not practical, place a block of wood against the impeller end of the shaft, and tap the shaft and bearings from the bearing housing. Use caution not to damage the shaft threads.

2. After removing the shaft and bearings, clean and inspect the bearings as described in **INSPECTION AND CLEANING**.

3. If bearing replacement is required, use a bearing puller or an arbor (or hydraulic) press to remove the bearings from the shaft.

INSPECTION AND CLEANING

Carefully inspect all O-ring seating areas to determine if they formed a proper seal. If sealing was faulty, determine the cause before reassembling the pump. After inspection, remove and discard all O-rings.

WARNING!

Most cleaning solvents are toxic and flammable. Use them only in a well-ventilated area free from flame, sparks, and excessive heat. Read and follow all precautions printed on solvent containers.

Shaft and Bearings

1. After removing the shaft and bearings, clean and inspect the bearings **in place** as follows.

CAUTION

To prevent damage during removal from the shaft, it is recommended that bearings be cleaned and inspected **in place**. It is **strongly** recommended that the bearings be replaced **any** time the shaft and bearings are removed.

2. Clean the bearing housing, shaft and all component parts (except the bearings) with a soft cloth soaked in cleaning solvent. Inspect the parts for wear or damage and replace as necessary.

WARNING!

Most cleaning solvents are toxic and flammable. Use them only in a well ventilated area free from excessive heat, sparks, and flame. Read and follow all precautions printed on solvent containers.

3. Clean the bearings thoroughly in **fresh** cleaning solvent. Dry the bearings with filtered compressed air and coat with light oil.

CAUTION

Bearings must be kept free of all dirt and foreign material. Failure to do so will greatly shorten bearing life. **Do not** spin dry bearings. This may scratch the balls or

races and cause premature bearing failure.

4. Rotate the bearings by hand to check for roughness or binding and inspect the bearing balls. If rotation is rough or the bearing balls are discolored, replace the bearings.

5. The bearing tolerances provide a tight press fit onto the shaft and a snug slip fit into the pedestal. Replace the bearings, shaft, or pedestal if the proper bearing fit is not achieved.

Other Reusable Parts (Except Seal Assembly)

1. Thoroughly clean all reusable parts.

2. Inspect all mating surfaces for nicks or burrs, and restore to original contours with emery cloth or a fine file. If the surface cannot be restored, replace the part.

Cleaning Seal Assembly

CAUTION

Seal faces are precision-finished and subject to wear patterns which cannot be realigned during assembly. The seal assembly should be replaced completely at each overhaul to ensure trouble-free operation. If necessary to use an old seal in an emergency, **never** mix old and new seal parts; seal performance will be severely affected.

1. Inspect the seal assembly for wear, scoring, grooves, and other damage that might cause leakage.

2. Wash all seal parts in fresh cleaning solvent and allow to dry thoroughly. Re-inspect the parts after cleaning.

3. If needed, clean the seal faces with a clean, lint-free cloth. Wipe lightly in a concentric pattern to avoid scratching the faces.

PUMP REASSEMBLY

Bearing Housing Reassembly

1. Clean and inspect the bearings (31 and 33) as indicated in **INSPECTION AND CLEANING**.

CAUTION

To prevent damage during removal from the shaft, it is recommended that bearings be cleaned and inspected **in place**. It is **strongly** recommended that the bearings be replaced **any** time the shaft and bearings are removed.

2. Inspect the shaft (32) for distortion, nicks or scratches, or for thread damage on the impeller end. Dress small nicks and burrs with a fine file or emery cloth. Replace the shaft if defective.

3. The bearings may be heated to ease installation. An induction heater, hot oil bath, electric oven, or hot plate may be used to heat the bearings. Bearings should **never** be heated with a direct flame or directly on a hot plate.

NOTE

*If a hot oil bath is used to heat the bearings, both the oil and the container must be **absolutely** clean. If the oil has been previously used, it must be **thoroughly** filtered.*

4. Heat the bearings to a uniform temperature **no higher than** 250°F (120°C), and slide the bearings onto the shaft, one at a time, until they are fully seated. This should be done quickly, in one continuous motion, to prevent the bearings from cooling and sticking on the shaft.

WARNING!

Use caution when handling hot bearings to prevent burns.

5. After the bearings have been installed and allowed to cool, check to ensure that they have not moved away from the shaft shoulders in shrinking. If movement has occurred, use a

suitable sized sleeve and a press to reposition the bearings against the shaft shoulders.

6. If heating the bearings is not practical, use a suitable sized sleeve and arbor (or hydraulic) press to position the bearings on the shaft until fully seated against the shaft shoulders.

CAUTION

When installing the bearings onto the shaft, **never** press or hit against the outer race, balls, or ball cage. Press **only** on the inner race.

7. Slide the shaft and assembled bearings into the bearing housing until the inboard bearing seats against the housing bore.

CAUTION

When installing the shaft and bearings into the bearing bore, push against the outer race. **Never** hit the balls or ball cage.

8. Secure the shaft and bearings in the bearing housing with the retaining ring (35).

Securing Hydraulic Motor To Bearing Housing

1. Install the upper bearing housing O-ring (35). Position the hydraulic motor assembly (6) on top of the bearing housing and rotate until the motor shaft seats in the impeller shaft. Align the mounting holes and secure the hydraulic motor to the bearing housing with the hardware (4 and 5).

Installing Seal Assembly

References are to Figures C–1 and C–2.

1. Clean the seal cavity and shaft as indicated in **INSPECTION AND CLEANING**.

WARNING!

Most cleaning solvents are toxic and flammable. Use them only in a well ventilated area free from excessive heat, sparks, and flame. Read and follow all precautions printed on solvent containers.

2. Inspect the impeller shaft for damage. Small scratches or nicks may be removed with a fine file or emery cloth. If excessive wear exists, the shaft will have to be replaced.

3. If removed, install a new wear ring (12), apply "Never-Seez" or equivalent compound to the hardware (29 and 30) and secure the wear ring to the bearing housing. Lubricate a new O-ring (13) with grease, and install it over the wear ring.

NOTE

The pump is equipped with a vented screw (item 30) which is designed to relieve trapped air in the pump casing. The pump will not operate if this trapped air is not removed. Before reassembly, check to ensure that the hole in the vented screw is not clogged.

4. The seal is not normally reused because wear patterns on the finished faces cannot be realigned during reassembly. This could result in premature failure. If necessary to reuse an old seal in an emergency, **carefully** wash all metallic parts in **fresh** cleaning solvent and allow to dry thoroughly.

5. Handle the seal parts with extreme care to prevent damage. Be careful not to contaminate precision finished faces; even fingerprints on the faces can shorten seal life. If necessary, clean the faces with a non-oil based solvent and a clean, lint-free tissue. Wipe **lightly** in a concentric pattern to avoid scratching the faces.

6. Inspect the seal components for wear, scoring, grooves, and other damage that might cause leakage. If any components are worn, replace the complete seal; **never mix old and new seal parts**.

CAUTION

If a new seal is being installed, do not unwrap it until ready to install; seal components **must** be kept clean. Handle seal parts with extreme caution to prevent damage. Use care not to contaminate the preci-

sion-finished faces; even fingerprints on the faces can shorten seal life.

7. If a replacement seal is being used, remove it from the container just before installation and inspect the precision-finished faces to ensure that they are free of any foreign matter.

8. To ease installation of the seal, lubricate the bellows and stationary seat with water or a very **small** amount of oil, and apply a drop of light lubricating oil on the finished faces. Assemble the seal as follows, (see Figure C—2).

NOTE

Use hand pressure only to install seal components. A push tube cut from plastic pipe approximately the same O.D. as the stationary seat is a useful aid when installing these components. It is recommended that the bearing housing be inverted during seal assembly.

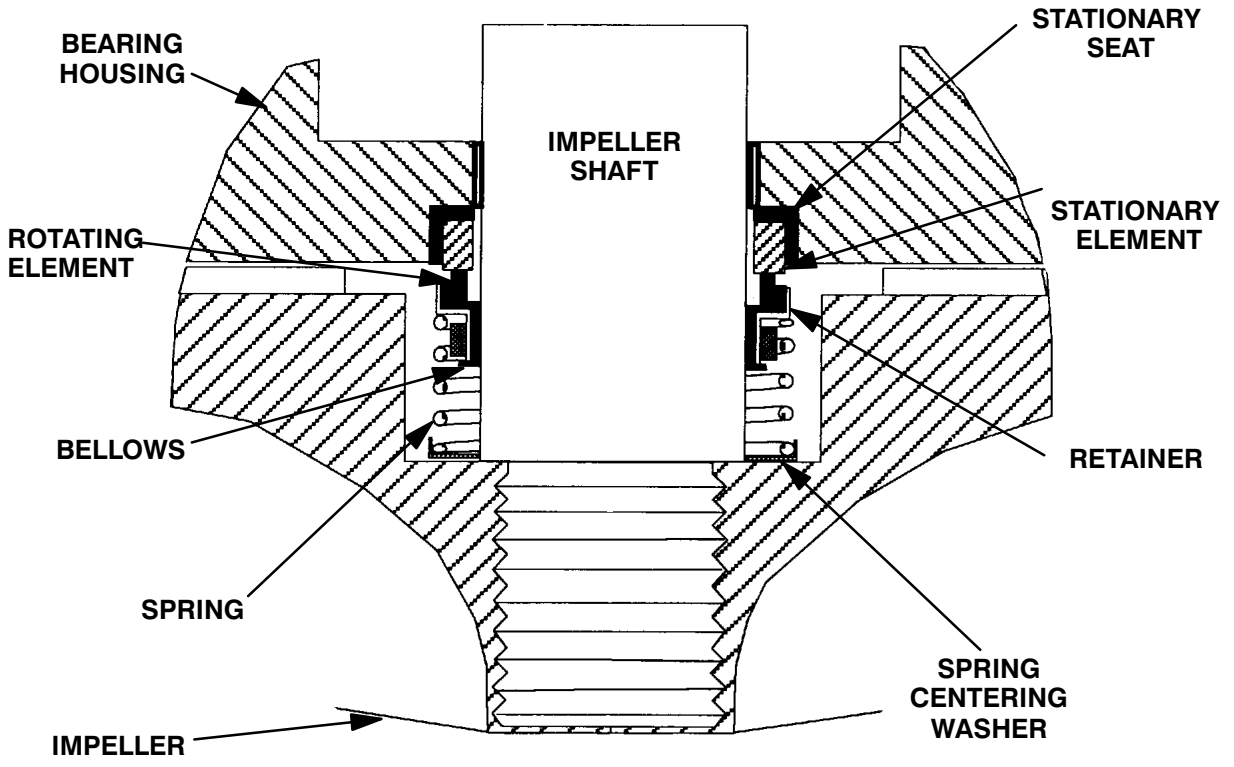


Figure C—2. Seal Assembly

9. Position the bearing housing with the impeller side up. Press the stationary seat into the bearing housing until fully seated. Press the stationary element into the stationary seat.

10. Slide the rotating subassembly (consisting of the rotating element, retainer and bellows) onto the lubricated shaft until the seal elements contact. Use caution not to damage the bellows on the shaft threads.

11. Install the seal spring and centering washer.

Installing Impeller

References are to Figure C—1.

1. Check the impeller (21) for broken vanes, cracks, or excessive wear, and replace as necessary.

2. Use the retaining tool to immobilize the shaft, and screw the impeller onto the shaft until fully seated. **Be sure** the spring centering washer and spring seat squarely in the recess in the back of the impeller.

3. Apply “Never-Seez” or equivalent compound to the threads of the impeller capscrew (25). Install the impeller washer (22) and torque the impeller capscrew to 40 ft. lbs. (480 in. lbs. or 5,5 m. kg.).

Installing Pump Casing

1. If the wear ring (20) was removed, lubricate a new O-ring (19) and install it in the pump casing. Press a new wear ring into the volute until fully seated. The wear ring **must** seat squarely in the pump casing or binding and excessive wear will occur.

2. Position the rotating portion of the pump in the pump casing. For proper operation, the rotating portion of the pump must be positioned with the "overhang" on the hydraulic motor directed **away** from the pump discharge (see Figure 2). Use caution not to damage the O-ring (13) and to make sure it is squarely seated.

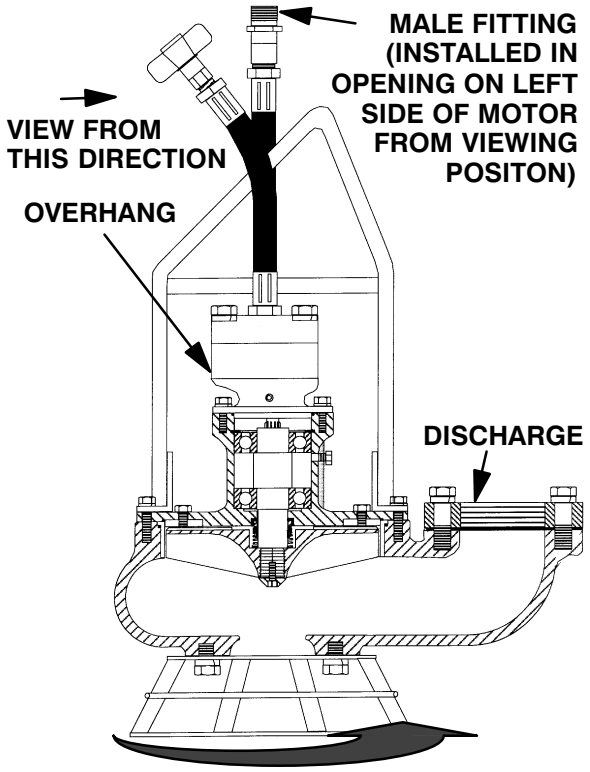


Figure 2. Hydraulic Motor And Hose Positioning/Kickback Direction

3. Align the mounting holes and position the lifting bracket (3) so the apex of the bracket is closest to the discharge opening. Apply "Never-Seez" or equivalent compound to the threads of the capscrews (27), and secure the bearing housing and lifting bracket to the pump casing with the hardware (27 and 28).

4. If the discharge flange (16) was removed, install a new gasket, and secure the discharge flange to the pump casing with the hardware (14 and 15).

Installing Pump on Stand

1. Use a suitable lifting device to lower the pump assembly onto the stand (26). Apply "Never-Seez" or equivalent compound to the threads of the capscrews (23) and secure with the hardware (23 and 24).

2. Lubricate the pump hydraulic motor as indicated in **LUBRICATION** before returning the pump to service.

Final Assembly

1. If removed, make sure the hydraulic motor is positioned as shown in Figure 2 with the "overhang" directed **away** from the pump discharge. Pigtail hoses (7 and 8) must also be installed in the hydraulic motor as shown in Figure 2. **This is critical to ensure proper rotation and prevent damage to the pump**. The hose with the male fitting **must** be positoned in the opening to the left (may be stamped "PRESS") when viewing the pump as shown in the figure.

CAUTION

The hydraulic motor and hoses must be positioned as shown in Figure 2; otherwise, severe damage to the pump will occur.

2. After lubricating the pump and before putting the pump back into service, check pump rotation.

CAUTION

While checking impeller rotation, secure the pump to prevent rolling.

3. Suspend the pump by the lifting handle. **Quickly** apply power and note the direction of pump kickback. **As viewed from the top**, the pump should kickback in a **counterclockwise** direction; this will indicate that impeller rotation is correct.

4. If the pump kicks back in a clockwise direction, impeller rotation is incorrect. Switch the pigtail hoses in the hydraulic motor ports. Recheck pump kickback; it should now be in a counter-clockwise direction.

LUBRICATION

All references are to Figure C—1.

Before removing or installing the plug (11), always clean the area around the plug to prevent contamination of the oil.

The seal assembly (9) is lubricated by the reservoir of oil in the bearing housing (10).

Draining Oil

1. Lay the pump on a work surface with the plug (11) in the bearing housing (11) facing up and remove the plug.
2. Place a clean container under the plug and roll the pump on its side to drain the housing. Reinstall the drain plug.

Condition Of Oil

1. Check the condition of the oil drained from the pump.
2. If the oil is clear, the bearing housing may be refilled and pump put back into service.
3. If the oil is milky, this indicates that the seal is leaking, and the seal should be replaced before putting the pump back into service.

Adding Oil

1. With the pump positioned vertically on a flat surface, add approximately 1 oz. (30 cc) of Penzoil AW46 or equivalent 20W hydraulic oil through the hole for the plug (11) until it is up to the bottom of the hole. Apply “Never-Seez” or equivalent compound to the plug before reinstalling it in the bearing housing.

For U.S. and International Warranty Information,
Please Visit www.grpumps.com/warranty
or call:
U.S.: 419—755—1280
International: +1—419—755—1352

For Canadian Warranty Information,
Please Visit www.grcanada.com/warranty
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