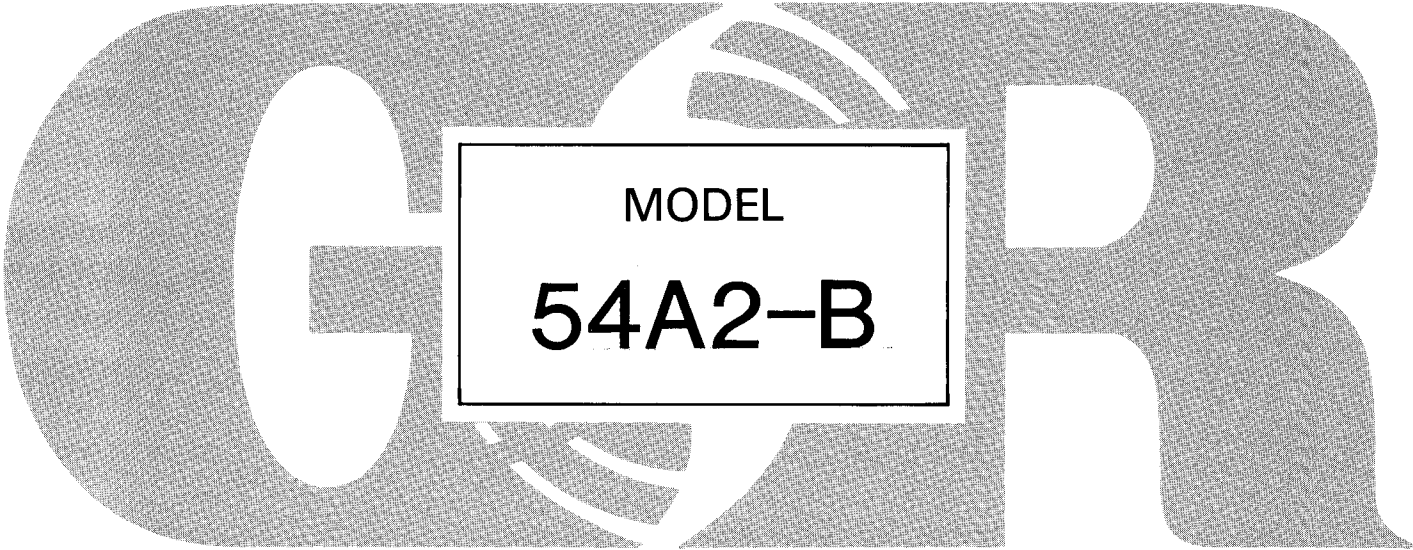


50SERIES

INSTALLATION, OPERATION, PARTS LIST, AND MAINTENANCE MANUAL



MODEL
54A2-B

THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO
GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA

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INTRODUCTION

This Installation, Operation, and Maintenance Manual is designed to help you achieve the best performance and longest life from your Gorman-Rupp pump.

This pump is a 50 Series, enclosed impeller, centrifugal model. It is specifically designed for the pumping of clean liquids at high heads and high discharge pressures.

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

The Gorman-Rupp Company
P.O. Box 1217
Mansfield, Ohio 44901

or Gorman-Rupp of Canada Limited
70 Burwell Road
St. Thomas, Ontario N5P 3R7

For information or technical assistance on the POWER SOURCE, contact the POWER SOURCE manufacturer's local dealer or representative.

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

NOTE

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

CAUTION

Instructions which must be followed to avoid causing damage to the product or other equipment incidental to the installation. These instructions describe the requirements and the possible damage which could result from failure to follow the procedures.

WARNING

```
////////////////////////////////////  
//  
// These instructions must be followed to avoid causing in-  
// jury or death to personnel, and describe the procedure  
// required and the injury which could result from failure  
// to follow the procedure.  
//  
////////////////////////////////////
```


WARNINGS

WARNINGS - SECTION A

THESE WARNINGS APPLY TO 50 SERIES BASIC PUMPS. GORMAN-RUPP HAS NO CONTROL OVER OR PARTICULAR KNOWLEDGE OF THE POWER SOURCE WHICH WILL BE USED. REFER TO THE MANUAL ACCOMPANYING THE POWER SOURCE. BEFORE ATTEMPTING TO START THE POWER SOURCE.

WARNING

```

////////////////////////////////////
//
// Before attempting to open or service the pump:
//
// 1. Familiarize yourself with this manual.
// 2. Disconnect the POWER SOURCE to ensure that the
//    pump will remain inoperative.
// 3. Allow the pump to cool if overheated.
// 4. Vent the pump slowly and cautiously.
// 5. Close the suction and discharge valves.
// 6. Check the temperature before opening any covers,
//    plates, or plugs.
// 7. Drain the pump.
//
////////////////////////////////////

```

WARNING

```

////////////////////////////////////
//
// Do not attempt to pump volatile, corrosive, or flammable
// materials, or any liquids for which this pump has not
// been designed.
//
////////////////////////////////////

```

WARNING

```

////////////////////////////////////
//
// After the pump has been installed, make certain that the
// pump and all piping connections are secure before at-
// tempting to operate the pump.
//
////////////////////////////////////

```

WARNING

```

////////////////////////////////////
//
// Do not operate the pump without shields and/or guards in
// place over the drive shafts, belts and/or couplings, or
// other rotating parts. Exposed rotating parts can catch
// clothing, fingers, or tools, causing severe injury to
// personnel.
//
////////////////////////////////////

```

WARNING

```
////////////////////////////////////  
//  
// Do not operate the pump against a closed discharge valve //  
// for long periods of time. This could bring the liquid //  
// to a boil, build pressure, and cause the pump to rupture //  
// or explode. //  
// //  
////////////////////////////////////
```

WARNING

```
////////////////////////////////////  
//  
// Overheated pumps can cause severe burns and injury. If //  
// overheating of the pump casing occurs: //  
// //  
// 1. Stop the pump immediately. //  
// 2. Allow the pump to cool. //  
// 3. Refer to instructions in this manual before re- //  
// starting the pump. //  
// //  
////////////////////////////////////
```

WARNING

```
////////////////////////////////////  
//  
// Do not remove plates, covers, gauges, pipe plugs, or //  
// fittings from an overheated pump. Vapor pressure within //  
// the pump can cause parts being disengaged to be ejected //  
// with great force. Allow the pump to cool before servic- //  
// ing. //  
// //  
////////////////////////////////////
```


INSTALLATION - SECTION B

Seldom are two pump installations identical. The information presented in this section is a summary of the recommended installation practices related to inspection, pump positioning, hardware, suction and discharge piping, and sumps. For further assistance, contact your Gorman-Rupp distributor or the Gorman-Rupp Company.

See Figure 1 for the approximate physical dimensions of this pump.

OUTLINE DRAWING

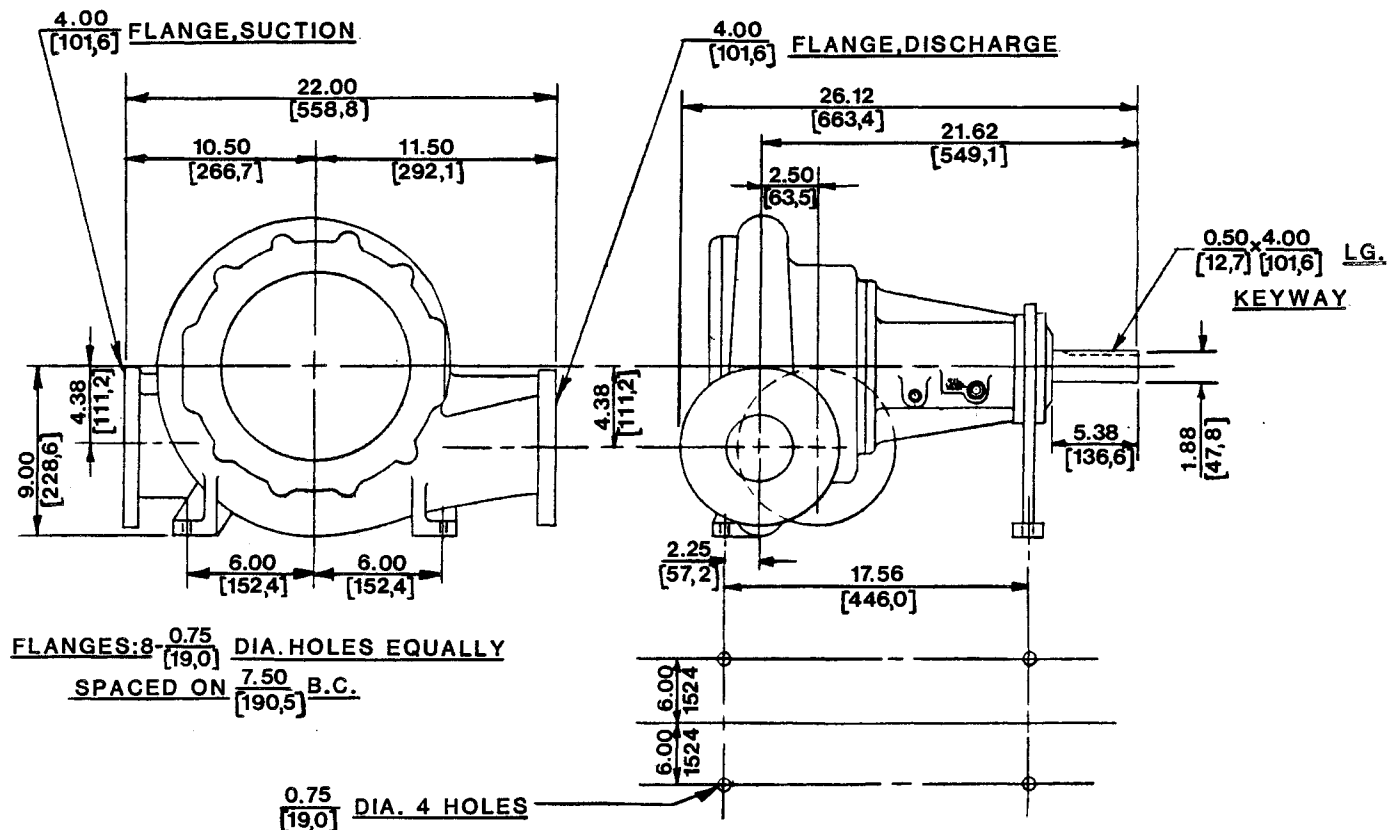


Figure 1. Pump Model 54A2-B

PREINSTALLATION INSPECTION

The pump assembly was inspected and tested before shipment from the factory. Before installation, inspect the pump for damage which may have occurred during

shipment. Check as follows:

- a. Inspect the pump assembly for cracks, dents, damaged threads, and other obvious damage.
- b. Check for and tighten loose bolts, nuts, capscrews, and other attaching hardware. Since gaskets tend to shrink after drying, check for and tighten loose nuts and capscrews securing mating surfaces.
- c. Carefully read all tags, decals, and markings on the pump assembly, and perform all duties indicated. Note the direction of rotation indicated on the pump. Check that the pump shaft rotates in the required direction.

CAUTION

Only operate this pump in the direction indicated by the arrow on the pump body and on the accompanying decal. Otherwise, the impeller could become loosened from the shaft and seriously damage the pump.

- d. Check all lubricant levels and lubricate as necessary. Refer to LUBRICATION in the MAINTENANCE AND REPAIR section of this manual and perform duties as instructed.

POSITIONING PUMP

Mounting

Locate the pump in an accessible place as close as practical to the liquid being pumped. Level mounting is essential for proper operation. The pump may have to be supported or shimmed to provide for level operation or to eliminate vibration.

Lifting

WARNING

```
////////////////////////////////////  
//  
// Use lifting and moving equipment in good repair and with //  
// adequate capacity to prevent injuries to personnel or //  
// damage to equipment. //  
// //  
////////////////////////////////////
```

Make sure that hoists and other lifting equipment are of sufficient capacity to safely handle the pump assembly. If chains and cables are used, make certain that they are positioned so that they will not damage the pump, and so that the load will be balanced.

CAUTION

The pump assembly can be seriously damaged if the cables or chains used to lift and move the unit are improperly wrapped around the pump.

SUCTION AND DISCHARGE PIPING

Materials

Either pipe or hose may be used for suction and discharge lines. Piping materials must be compatible with the liquid being pumped. If hose is used in suction lines, it must be the rigid-wall, reinforced type to prevent collapse under suction. Using piping couplings in suction lines is not recommended.

Line Configuration

Keep suction and discharge lines as straight as possible to minimize friction losses. Make minimum use of elbows and fittings, which substantially increase friction loss. If elbows are necessary, use the long-radius type to minimize friction loss.

Connections to Pump

Before tightening a connecting flange, align it exactly with the pump port. Never pull a pipe line into place by tightening the flange bolts and/or couplings.

Lines near the pump must be independently supported to avoid strain on the pump which could cause excessive vibration, decreased bearing life, and increased shaft and seal wear. If hose-type lines are used, they should have adequate support to secure them when filled with liquid and under pressure.

Gauges

Most pumps are drilled and tapped for installing discharge pressure and vacuum suction gauges. If these gauges are desired for pumps that are not tapped, drill and tap the suction and discharge lines close to the pump before installing the lines.

SUCTION LINES

To avoid air pockets which could affect pump priming, the suction line must be as short and direct as possible. When operation involves a suction lift, the line must always slope upward to the pump from the source of the liquid being pumped; if the line slopes down to the pump at any point along the suction run, air pockets will be created.

Fittings

Suction lines should be the same size as the pump inlet. If reducers are used in suction lines, they should be the eccentric type, and should be installed with the flat part of the reducers uppermost to avoid creating air pockets. Valves are not normally used in suction lines, but if a valve is used, install it with the stem horizontal to avoid air pockets.

Strainers

If a strainer is furnished with the pump, be certain to use it; any entrained solids which pass through a strainer furnished with the pump will also pass through the pump itself.

If a strainer is not furnished with the pump, but is installed by the pump user, make certain that the total area of the openings in the strainer is at least three or four times the cross section of the suction line, and that the openings will not permit passage of solids larger than the solids handling capability of the pump.

Sealing

Since even a slight leak will affect priming, head, and capacity, especially when operating with a high suction lift, all connections in the suction line should be sealed with pipe dope to ensure an airtight seal. In contamination controlled systems, the pipe dope should be compatible with the liquid being pumped.

Suction Lines In Sumps

If a single suction line is installed in a sump, it should be positioned away from the wall of the sump at a distance equal to one and one-half times the diameter of the suction line.

If there is a liquid flow from an open pipe into the sump, the flow should be kept away from the suction inlet because the inflow will carry air down into the sump, and air entering the suction line will reduce pump efficiency.

If it is necessary to position inflow close to the suction inlet, install a baffle between the inflow and the suction inlet at a distance one and one-half

times the diameter of the suction pipe. The baffle will allow entrained air to escape from the liquid before it is drawn into the suction inlet.

If two suction lines are installed in a single sump, the flow paths may interact, reducing the efficiency of one or both pumps. To avoid this, position the suction inlets so that they are separated by a distance equal to at least three times the diameter of the suction pipe.

Suction Line Positioning

The depth of submergence of the suction line is critical to efficient pump operation. Figure 2 shows recommended minimum submergence vs. velocity.

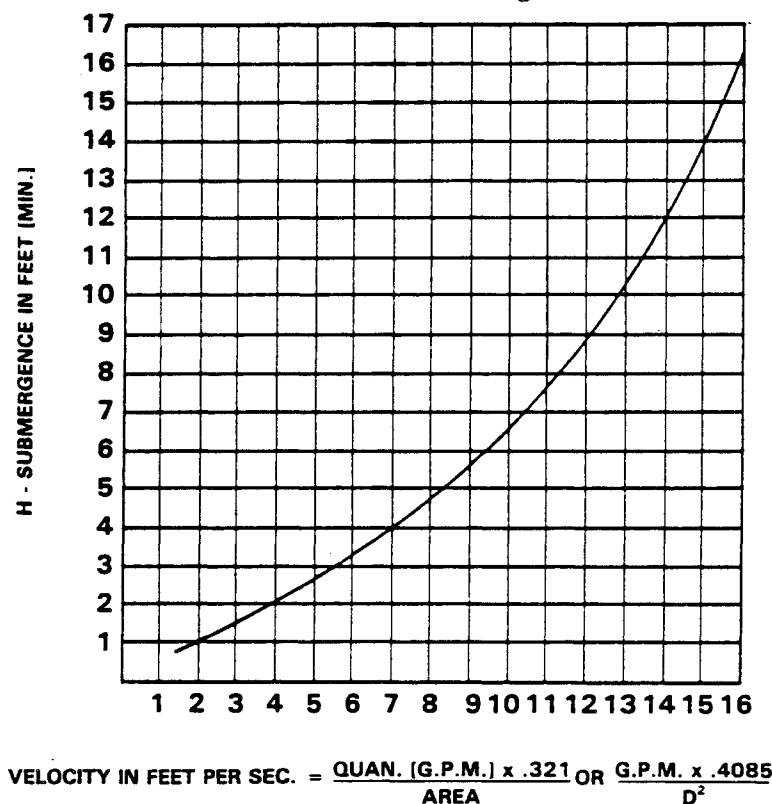


Figure 2. Recommended Minimum Suction Line Submergence Vs. Velocity

DISCHARGE LINES

Siphoning

Do not terminate the discharge line at a level lower than that of the liquid being pumped unless a siphon breaker is used in the line. Otherwise, a siphoning action causing damage to the pump could result.

Valves

If a throttling valve is desired in the discharge line, use a valve as large as the largest pipe in the line to minimize friction losses. Never install a throttling valve in a suction line.

A check valve in the discharge line is normally recommended, but is not necessary in low discharge head applications.

With high discharge heads, it is recommended that a throttling valve and a check valve be installed in the discharge line to protect the pump from excessive shock pressure and reverse rotation when it is stopped.

Bypass Lines

If it is necessary to permit the escape of air to atmosphere during initial priming or in the repriming cycle, install a bypass line - sized so that it will not affect pump discharge capacity - between the pump and the discharge check valve. Since this pump does not use a suction check valve, the discharge end of the bypass line must be submerged in the liquid being pumped in order to maintain suction.

ALIGNMENT

The alignment of the pump and its power source is critical for trouble-free mechanical operation. In either a flexible coupling or V-belt driven system, the driver and pump must be mounted so that their shafts are aligned with and parallel to each other. It is imperative that alignment be checked after the pump is installed, and before operation.

NOTE

Check **Rotation**, Section C, before final alignment of the pump.

When mounted at the Gorman-Rupp factory, driver and pump are aligned before shipment. Misalignment can occur in transit and handling. Pumps should be checked, and realigned if necessary, before being put into operation. Before checking alignment, tighten the foundation bolts. The pump casing feet and/or pedestal feet, and the driver mounting bolts should also be tightly secured.

WARNING

```
////////////////////////////////////  
//  
// When checking alignment, disconnect the power source to //  
// ensure that the pump will remain inoperative.           //  
//                                                           //  
////////////////////////////////////
```

CAUTION

Adjusting the alignment in one direction may alter the alignment in another direction. Check each procedure after altering alignment.

Coupled Drives

When using couplings, the axis of the power source must be aligned to the axis of the pump shaft in both the horizontal and vertical planes. Most couplings require a specific gap or clearance between the driving and the driven shafts. Refer to the coupling manufacturer's service literature.

Align spider insert type couplings by using calipers to measure the dimensions on the circumference of the outer ends of the coupling hub every 90 degrees. The coupling is in alignment when the hub ends are the same distance apart at all points (see figure 2A).

Align non-spider type couplings by using a feeler gauge or taper gauge between the coupling halves every 90 degrees. The coupling is in alignment when the hubs are the same distance apart at all points (see figure 2B).

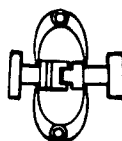


Figure 2A. Aligning Spider-Type Couplings



Figure 2B. Aligning Non-Spider Type Couplings

Check parallel adjustment by laying a straightedge across both coupling rims at the top, bottom, and side. When the straightedge rests evenly on both halves of the coupling, the coupling is in horizontal parallel alignment. If the coupling is misaligned, use a feeler gauge between the coupling and the straightedge to measure the amount of misalignment.

V-Belt Drives

When using V-belt drives, the power source and the pump must be parallel. Use a straightedge along the sides of the pulleys to ensure that the pulleys are properly aligned (see figure 2C). In drive systems using two or more belts, make certain that the belts are a matched set; unmatched sets will cause accelerated belt wear.

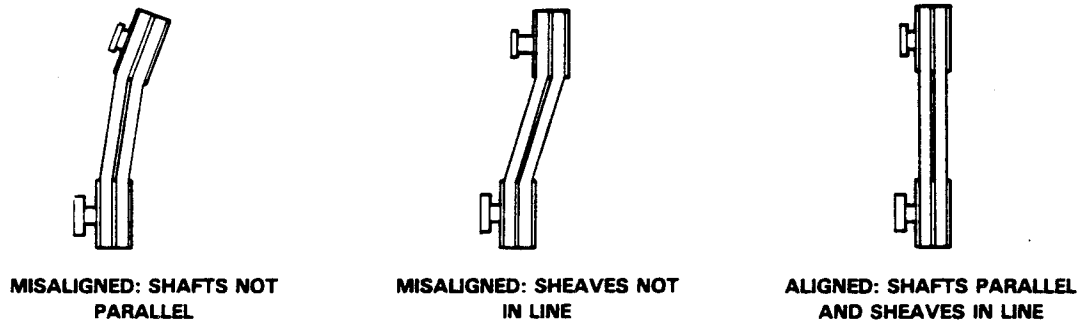


Figure 2C. Alignment of V-Belt Driven Pumps

Tighten the belts in accordance with the belt manufacturer's instructions. If the belts are too loose, they will slip; if the belts are too tight, there will be excessive power loss and possible bearing failure. Select pulleys that will match the proper speed ratio; overspeeding the pump may damage both pump and power source.

WARNING

```

////////////////////////////////////
//                               //
// Do not operate the pump without a guard over the rotat- //
// ing parts. Exposed rotating parts can catch clothing, //
// fingers, or tools, causing severe injury to personnel. //
//                               //
////////////////////////////////////

```


OPERATION

OPERATION - SECTION C

WARNING

```
////////////////////////////////////  
//  
// Do not attempt to pump volatile, corrosive, or flammable //  
// materials, or any liquids for which this pump has not //  
// been designed. //  
// //  
////////////////////////////////////
```

PRIMING

Install the pump and piping as described in INSTALLATION. Make sure that the piping connections are tight, and that the pump is securely mounted. Check that the pump is properly lubricated (see LUBRICATION in MAINTENANCE AND REPAIR).

This is not a self-priming pump and therefore will normally require an external priming device. Many Gorman-Rupp pumps are equipped with an exhaust primer or a hand operated vacuum pump for priming purposes. Pumps not equipped with either of these devices require the use of an external priming device such as an ejector or vacuum pump.

Normally, pumps are equipped with a spring-loaded check valve, and this valve should be closed before priming. Once the pump is primed, close the valve between the priming device and the pump so that the prime will not be lost.

Hand Primers

Hand-operated primers are usually mounted on the pump and, when operated, draw air out of the suction line and volute.

To prime a pump with a hand vacuum pump open the cock on the pump priming line. Operate the hand pump until liquid flows out of the check valve on the bottom of the primer pump. Once the pump is primed, close the valve located between the primer and the pump so that the prime will not be lost.

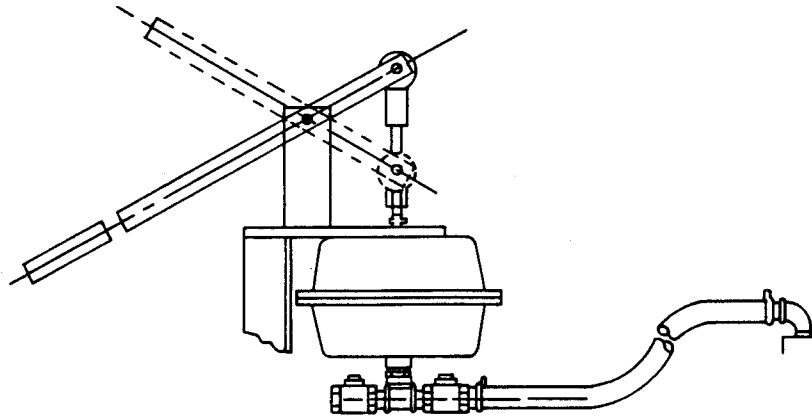


Figure 1. Hand Primer Assembly

Exhaust Primers

Engine driven pumps normally take advantage of the engine exhaust gases by using them to operate an exhaust primer. The exhaust is directed through a venturi which creates a vacuum in the pump volute in order to fill the suction line and volute with liquid.

To prime a pump using an exhaust primer, open the gas cock in the priming line and engage the exhaust primer until liquid is thrown out of the ejector nozzle.

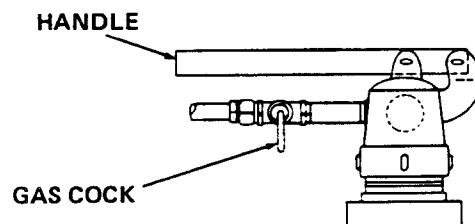


Figure 1. Exhaust Primer Assembly

Auxiliary Ejectors

Ejectors function much like exhaust primers. They may be operated by steam, compressed air, water or exhaust gases. To prime a pump using an ejector, open the gas cock in the priming line and operate the ejector until liquid is thrown out the ejector nozzle.

OPERATION

Vacuum Pumps

Air can be exhausted to prime a pump by using a vacuum pump. Either a wet type or a dry type vacuum pump may be used; however, a wet type is preferred since it will not be damaged if liquid enters it. If a dry vacuum pump is used, provisions must be made to keep liquid from entering it.

STARTING

Consult the operations manual furnished with the POWER SOURCE.

Rotation

The correct direction of pump rotation is indicated by an arrow on the pump body and on the accompanying decal. If the pump is operated in the wrong direction, the impeller could become loosened from the shaft and seriously damage the pump.

CAUTION

Only operate this pump in the direction indicated by the arrow on the pump body and on the accompanying decal. Otherwise, the impeller could become loosened from the shaft and seriously damage the pump.

Consult the operating manual furnished with the pump power source before attempting to start the power source.

If an electric motor is being used as a power source, remove V-belts, couplings, or otherwise disconnect the pump from the motor before checking motor rotation. Operate the motor independently, and check rotation. If incorrect, have the motor wiring checked by qualified personnel.

If a three-phase electric motor is being used, check rotation by starting the pump for a moment to see if the rotation is correct. If the shaft, coupling, or V-belt is not visible, rotation can usually be determined by observing the motor cooling fan. If the rotation is incorrect, have qualified personnel interchange any two of the three-phase wires to change direction.

OPERATION

Lines With a Bypass

Either a Gorman-Rupp automatic air release valve or a hand operated shutoff valve may be installed in a bypass line.

If a Gorman-Rupp automatic air release valve has been installed, close the throttling valve in the discharge line. The Gorman-Rupp valve will automatically open to allow the pump to prime, and automatically close when priming has been accomplished. After the pump has been primed, and liquid is flowing steadily from the bypass line, open the discharge throttling valve.

If a hand operated shutoff valve has been installed, close the throttling valve in the discharge line, and open the bypass shutoff valve so that the pump will not have to prime against the weight of the liquid in the discharge line. When the pump has been primed, and liquid is flowing steadily from the bypass line, close the bypass shutoff valve and open the discharge throttling valve.

Lines Without a Bypass

Open all valves in the discharge line and start the power source. Priming is indicated by a positive reading on the discharge pressure gauge or by a quieter operation. The pump may not prime immediately because the suction line must first fill with liquid. If the pump fails to prime within five minutes, stop it and check the suction line for leaks.

After the pump has been primed, partially close the discharge line throttling valve in order to fill the line slowly and guard against excessive shock pressure which could damage pipe ends, gaskets, sprinkler heads, and any other fixtures connected to the line. When the discharge line is completely filled, adjust the throttling valve to the required flow rate.

Leakage

No leakage should be visible at pump mating surfaces, or at pump connections or fittings. Keep all line connections and fittings tight to maintain maximum pump efficiency.

Overheating

Overheating can occur if the valves in the suction or discharge lines are closed. Operating against closed valves could bring the liquid to a boil, build pressure, and cause the pump to rupture or explode. If overheating occurs, stop the pump and allow it to cool before servicing it. Refill the volute housing with cool liquid.

WARNING

```
////////////////////////////////////  
//  
// Do not remove plates, covers, gauges, pipe plugs, or //  
// fittings from an overheated pump. Vapor pressure within //  
// the pump can cause parts being disengaged to be ejected //  
// with great force. Allow the pump to cool before servic- //  
// ing. //  
//  
////////////////////////////////////
```

OPERATION

Strainer Check

If a suction strainer has been shipped with the pump or installed by the user, check the strainer regularly, and clean it as necessary. The strainer should also be checked if pump flow rate begins to drop.

Pump Vacuum Check

Since this pump does not have a suction check valve, the discharge line must be fitted with a check valve if a pump vacuum reading is to be taken.

With the pump inoperative, install a vacuum gauge in the system, using pipe dope on the threads. Block the suction line and start the pump. At operating speed the pump should pull a vacuum of 20 inches or more of mercury. If it does not, check for air leaks in the seal, gasket, or discharge valve.

Open the suction line, and read the vacuum gauge with the pump primed and at operation speed. Shut off the pump. The vacuum gauge reading will immediately drop proportionate to static suction lift, and should then stabilize. If the vacuum reading falls off rapidly after stabilization, an air leak exists. Before checking for the source of the leak, check the point of installation of the vacuum gauge.

STOPPING

After stopping the pump, disconnect the power source to ensure that the pump will remain inoperative.

In below freezing conditions, drain the pump to prevent damage from freezing. Also, clean out any solids by flushing with a hose. Operate the pump for approximately one minute; this will remove any remaining liquid that could freeze the pump rotating parts.

If the pump will be idle for more than a few hours, or if it has been pumping liquids containing a large amount of solids, drain the pump, and flush it thoroughly with clean water. To prevent large solids from clogging the drain port and preventing the pump from completely draining, insert a rod or stiff wire in the drain port, and agitate the liquid during the draining process. Clean out any remaining solids by flushing with a hose.

BEARING TEMPERATURE CHECK

Bearings normally run at higher than ambient temperatures because of heat generated by friction. Temperatures up to 160°F are considered normal for pedestal bearings, and they can operate safely to at least 180°F.

Checking bearing temperatures by hand is inaccurate. Bearing temperatures can be measured accurately by placing a contact-type thermometer against the housing. Record this temperature for future reference.

A sudden increase in bearing temperatures is a warning that the bearings are at the point of failing to operate properly. Make certain that the bearing lubricant is of the proper viscosity and at the correct level (see LUBRICATION in MAINTENANCE AND REPAIR). Bearing overheating can also be caused by shaft misalignment and/or excessive vibration.

When pumps are first started, the bearings may seem to run at temperatures above normal. Continued operation should bring the temperatures down to normal levels.

TROUBLESHOOTING - SECTION D

WARNING

```

////////////////////////////////////
//
// Before attempting to open or service the pump:
//
// 1. Familiarize yourself with this manual.
// 2. Disconnect the POWER SOURCE to ensure that the
//    pump will remain inoperative.
// 3. Allow the pump to cool if overheated.
// 4. Vent the pump slowly and cautiously.
// 5. Close the suction and discharge valves.
// 6. Check the temperature before opening any covers,
//    plates, or plugs.
// 7. Drain the pump.
//
////////////////////////////////////

```

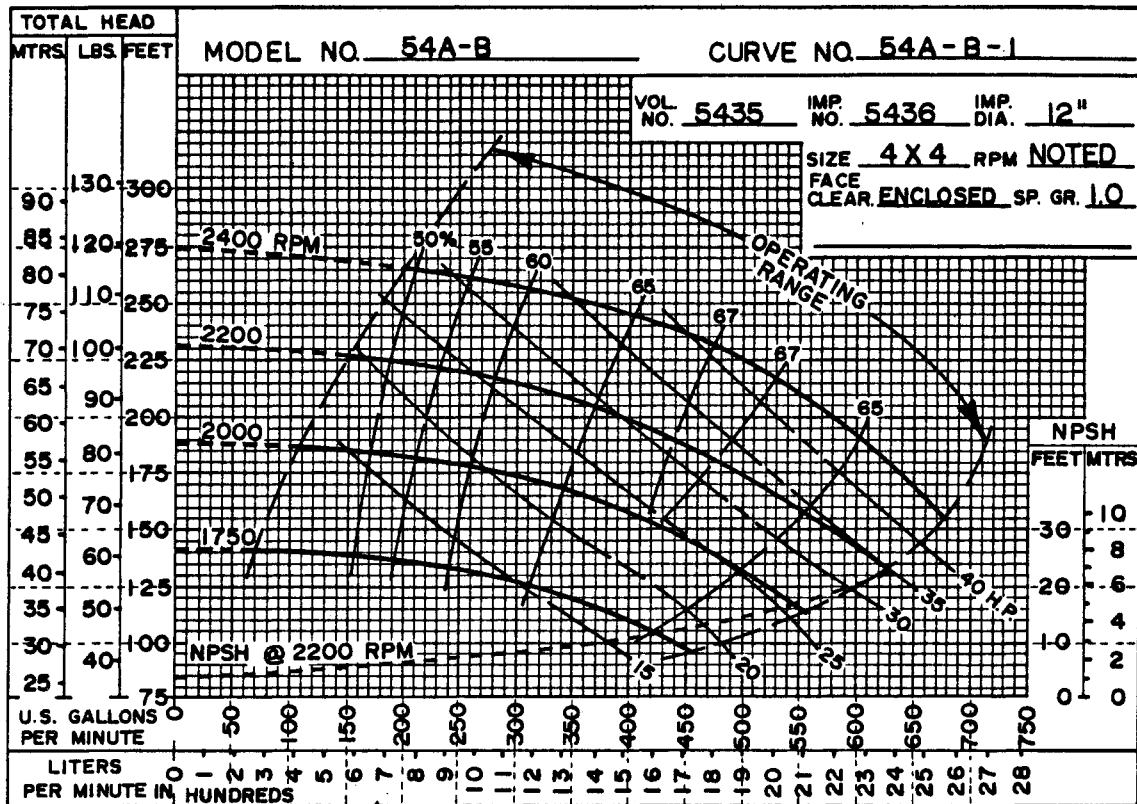
TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP FAILS TO PRIME	Air leak in suction line.	Correct leak.
	Lining of suction hose collapsed.	Replace suction hose.
	Leaking or worn seal or pump gasket.	Check pump vacuum. Replace leaking or worn seal or gasket.
	Suction lift or discharge head too high.	Check piping installation and install bypass line if needed. See INSTALLATION.
	Strainer clogged.	Check strainer and clean if necessary.
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRES-SURE	Air leak in suction line.	Correct leak.
	Suction intake not submerged at proper level or sump too small.	Check installation and correct as needed. Check submergence chart (Section B).
	Lining of suction hose collapsed.	Replace suction hose.
	Impeller or other wearing parts worn or damaged.	Replace worn or damaged parts. Check that impeller is properly centered and rotates freely.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE(cont.)	Impeller clogged. Pump speed too slow. Discharge head too high. Suction lift too high. Leaking or worn seal or pump gasket. Strainer clogged.	Free impeller of debris. Check driver output; check belts or couplings for slippage. Install bypass line. Reduce suction lift. Check pump vacuum. Replace leaking or worn seal or gasket. Check strainer and clean if necessary.
PUMP REQUIRES TOO MUCH POWER	Pump speed too high. Discharge head too low. Liquid solution too thick.	Check driver output; check that sheaves or couplings are correctly sized. Adjust discharge valve. Dilute if possible.
PUMP CLOGS FREQUENTLY	Discharge flow too slow.	Open discharge valve fully to increase flow rate, and run engine at maximum governed speed.
EXCESSIVE NOISE	Cavitation in pump. Pumping entrained air. Pump or drive not securely mounted. Impeller clogged or damaged.	Reduce suction lift and/or friction losses in suction line. Locate and eliminate source of air bubble. Secure mounting hardware. Clean out debris; replace damaged parts.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
BEARINGS RUN TOO HOT	Bearing temperature is high, but within limits.	Check bearing temperature regularly to monitor any increase.
	Low or incorrect lubricant.	Check for proper type and level of lubricant.
	Suction and discharge lines not properly supported.	Check piping installation for proper support.
	Drive misaligned.	Align drive properly.

MAINTENANCE AND REPAIR - SECTION E

MAINTENANCE AND REPAIR OF THE WEARING PARTS OF THE PUMP WILL MAINTAIN PEAK OPERATING PERFORMANCE.

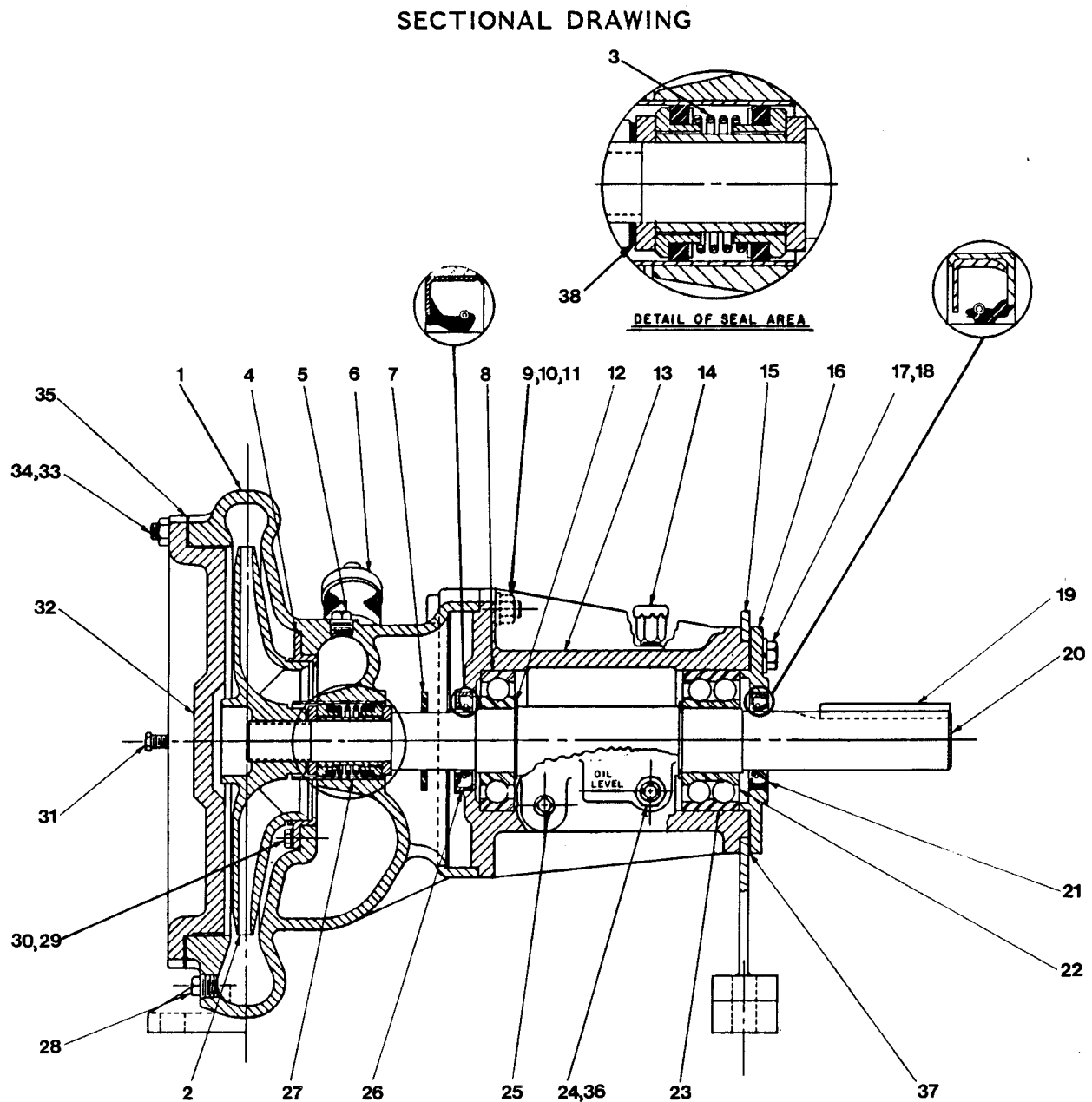


C-5-2-80 REV.

*STANDARD PERFORMANCE FOR PUMP MODEL 54A2-B

*Based on 70°F clear water at sea level with minimum suction lift. Since pump installations are seldom identical, your performance may be different due to such factors as viscosity, specific gravity, elevation, temperature, and impeller trim.

If your pump serial number is followed by an "N" or if you have a question on performance, contact The Gorman-Rupp Company.



PARTS LIST
Pump Model 54A2-B
 (From S/N 767005 up)

ITEM NO.	PART NAME	PART NUMBER	MATL CODE	QTY	ITEM NO.	PART NAME	PART NUMBER	MATL CODE	QTY
1	VOLUTE CASING	5435	10010	1	27	*SEAL LINER	2205-A	14080	1
2	*IMPELLER	5436	10010	1	28	VOL DRAIN PLUG	P00006	11990	1
3	*SEAL ASSY	GS01250	-----	1	29	HEX HD CAPSCREW	B00503	14990	2
4	*IMP WEAR RING	4869	14000	1	30	LOCKWASHER	J00005	15991	2
5	ACCESSORY PLUG	P00006	11990	1	31	JACKING SCREWS	B00604	15991	2
6	*SEAL GREASE CUP	S01509	-----	1	32	COVER PLATE	1215-B	10010	1
7	*DEFLECTOR RING	3209	19120	1	33	STUDS	C00807	15991	12
8	*BALL BEARING	S01077	-----	1	34	HEX NUTS	D00008	15991	12
9	HEX HD CAPSCREW	B01011	15991	4	35	*COVER GSKT	1215-G	18000	1
10	LOCKWASHER	J00010	15991	4	36	PIPE PLUG	P00006	11990	1
11	HEX NUT	D00010	15991	4	37	*BRG CAP GSKT	5558-G	18000	1
12	*BRG RETAINING RING	S01164	-----	2	38	*IMP SHIM SET	37-J	17090	1
13	PEDESTAL	5557-C	10010	1	NOT SHOWN:				
14	AIR VENT	S01703	-----	1		STRAINER	S01528	-----	1
15	PEDESTAL FOOT	5562	15990	1		VOL DRAIN PLUG	P00008	11990	1
16	*BEARING CAP	5558-A	10010	1		NAME PLATE	2613-D	13990	1
17	HEX HD CAPSCREW	B00805	15991	4		ROTATION DECAL	2613-CU	00000	1
18	LOCKWASHER	J00008	15991	4	OPTIONAL:				
19	*SHAFT KEY	N00816	15991	1		SUCT/DISCH FLANGE	1756	10010	2
20	*IMP SHAFT	5561	16040	1		SUCT/DISCH FLANGE	1676-A	18000	2
21	*OIL SEAL	S01917	-----	1		GASKET			
22	*BRG SHIM SET	8546	15990	1		HEX HD CAPSCREW	B01010	15991	16
23	*BALL BEARING	S01169	-----	1		HEX NUT	D00010	15991	16
24	SIGHT GAUGE	26714-011	-----	1		DISCH CHECK VALVE	GRP14-4A	-----	1
25	PED DRAIN PLUG	P00006	11990	1		HAND PRIMER	GRP43-2	-----	1
26	*OIL SEAL	S00181	-----	1					

*INDICATES PARTS RECOMMENDED FOR STOCK

Above Serial Numbers Do Not Apply To Pumps Made In Canada.

CANADIAN SERIAL NO AND UP

PUMP AND SEAL DISASSEMBLY AND REASSEMBLY

This pump requires little service due to its rugged, minimum-maintenance design. If it becomes necessary to inspect and/or replace the wearing parts follow these instructions, which are keyed to the sectional view (see figure 1) and the accompanying parts list.

Before attempting to service the pump, disconnect the power source, and close all connecting valves.

Pump Disassembly

Remove the volute drain plug (28 and not shown) to drain the pump. Clean and reinstall plugs.

Remove the cover plate (32) from the volute casing (1) by disengaging the hex nuts (34) and tighten jacking screws (31) evenly. Remove the volute gasket (35) and clean the gasket surfaces of the cover plate and volute.

To remove the impeller, block the shaft (20) to prevent rotation, and use an impeller wrench to turn the impeller in the direction of pump rotation. Unscrew the impeller and replace it if scored or badly worn.

Remove the impeller adjusting shims (38). For ease of reassembly, tag and tie the shims, or measure and record their thickness.

To remove the wear ring (4), remove capscrews and lockwashers (29 and 30). Inspect the wear ring, and replace it if scored or worn.

Seal Disassembly

Before removing the seal assembly, turn the cross arm on the seal grease cup (6) clockwise until it rests against the cover (see figure 3). This will prevent the grease in the cup from escaping after the seal is removed.

Carefully remove the seal spring, the shaft sleeve, and the stationary and rotating seal elements, using a stiff wire with a hooked end if necessary. Remove the seal liner (27), which is a press fit.

Clean the seal cavity and impeller shaft with a soft cloth soaked in cleaning solvent.

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 prec- //  
// autions printed on solvent containers. //  
// //  
////////////////////////////////////
```

If no further disassembly is required, refer to **Seal Reassembly**.

Impeller Shaft And Bearing Disassembly

Remove power source and pedestal mounting hardware.

Remove capscrews (9), lockwashers (10), and nuts (11), securing pedestal (13) to the volute casing.

Separate the pedestal from the volute casing.

Remove the slinger ring (7) and the shaft key (19).

Drain the bearing lubricant by removing pedestal drain plug (25). Clean and reinstall the drain plug.

Remove capscrews and lockwashers (17 and 18) securing the bearing cap (16) to the pedestal. Remove the oil seal (21) from the bearing cap. Remove the bearing cap gasket (37).

Remove pedestal foot (15) from the pedestal.

Remove the bearing shim set (22). Tag and tie the shims, or measure and record their thickness.

Place a block of wood against the impeller end of the shaft (20) and drive the shaft along with the assembled bearings from the bore of the pedestal. Be careful not to damage shaft threads during removal. Press the inboard oil seal (26) from the pedestal.

Use a bearing puller to remove the inboard bearing (8) and outboard bearing (23) from the impeller shaft. Inspect the retaining rings (12) for wear and replace if required.

Impeller Shaft And Bearing Reassembly

Clean the bore of the pedestal, impeller shaft, and bearing cap with a cloth soaked in cleaning solvent. Inspect the parts for wear, 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 prec- //  
// autions printed on solvent containers.                //  
//                               //  
////////////////////////////////////
```

Soak the bearings in cleaning solvent, free of grit or metallic particles. Inspect the bearings, and replace as necessary.

Press the inboard and outboard bearings onto the impeller shaft until they seat squarely against the bearing retaining rings.

NOTE

Install the outboard bearing onto the impeller shaft with the loading groove facing toward the threaded end of the shaft.

Clean and install the inboard oil seal (26) in the pedestal body with the lip positioned as shown in figure 1.

Press the shaft and assembled bearings into the pedestal bore until the inboard bearing seats squarely against the pedestal shoulder.

Reinstall the required number of bearing shims.

NOTE

Impeller shaft endplay should be between .002 and .010 inch.

Install the pedestal foot onto the pedestal body.

Replace the bearing cap gasket. Clean and install the outboard oil seal (21) into the bearing cap, position the lip as shown in figure 1.

Install the bearing cap and secure using capscrews and lockwashers (17 and 18).

Install the slinger ring and shaft key onto the impeller shaft.

Secure the pedestal assembly to the volute casing with capscrews (9), lockwashers (10), and hex nuts (11).

Install pedestal mounting hardware and connect the power source.

Lubricate the pedestal as indicated in the **LUBRICATION** section.

Seal Reassembly

The seal is not normally reused because of the high polish on its lapped faces, but if it is necessary to reuse the old seal, wash all metallic parts in cleaning solvent and dry thoroughly.

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. Clean and polish the shaft sleeve, or replace it if there are nicks or cuts on the end.

Replace the seal liner if worn or grooved. If the seal liner is replaced, a hole must be drilled in it after installation to permit the flow of lubricant from the grease cup to the seal assembly. Deburr the hole after drilling, and clean the seal liner.

CAUTION

This seal is not designed for operation at temperatures above 110° F. Do not use at higher operating temperatures.

Lubricate the packing rings with petroleum jelly or oil when installing the seal, and place a drop of light lubricating oil on the lapped faces. Assemble the seal as shown in figure 2.

Install the seal as a complete unit.

Install the wear ring and secure with capscrews and lockwashers (29 and 30).

For lubrication of the seal assembly refer to the **LUBRICATION** section.

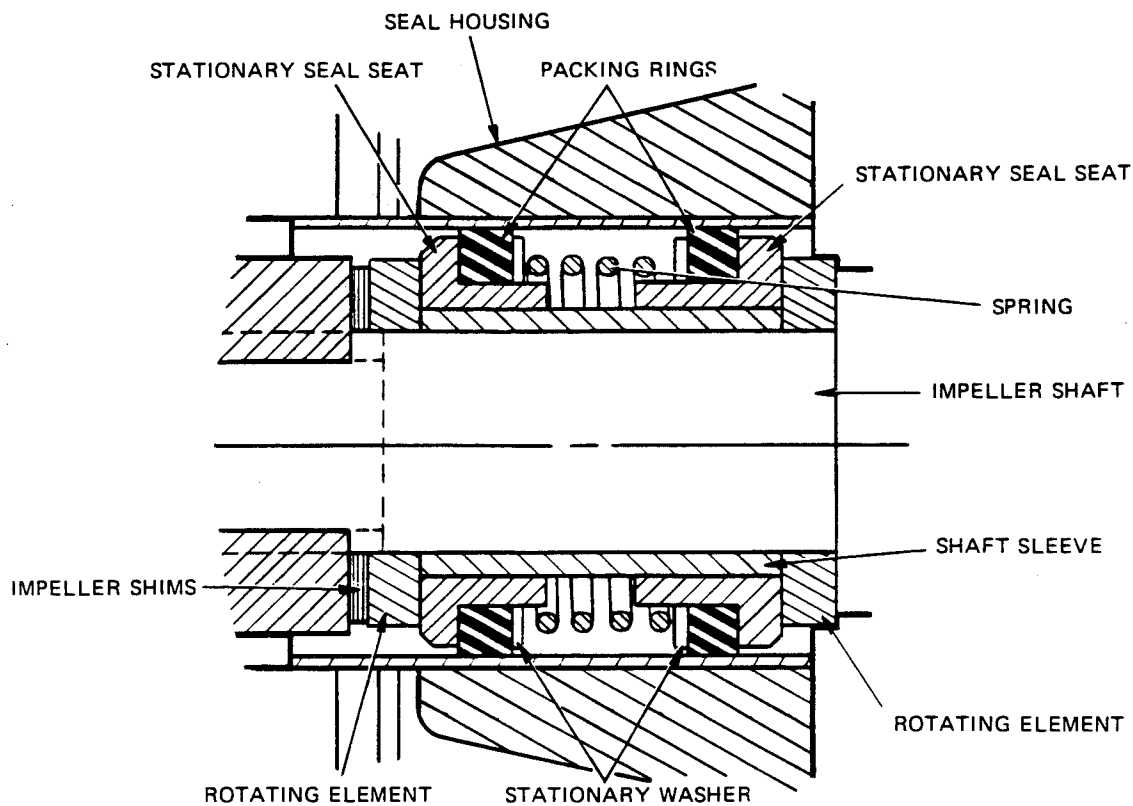


Figure 2. GS-1250 Seal Assembly

Pump Reassembly

Reinstall the correct number of impeller adjusting shims and screw the impeller onto the shaft. It is necessary for the impeller to be centered in the volute scroll for maximum pump efficiency. Measure this clearance, and add or subtract impeller shims until it is reached.

Replace cover gasket (35).

Reassemble the cover plate to the volute casing, make sure the jacking screws (31) do not interfere with the cover gasket seating.

Before starting the pump, turn the impeller shaft to be sure the impeller does not bind or scrape.

LUBRICATION

Seal Assembly

Before starting the pump, fill the grease cup through the grease fitting with a good grade of No.2 pressure gun grease until grease escapes from the relief hole. Turn the grease cup arm counterclockwise until it is at the top of the stem; this will release the spring to apply grease to the seal (see figure 3).

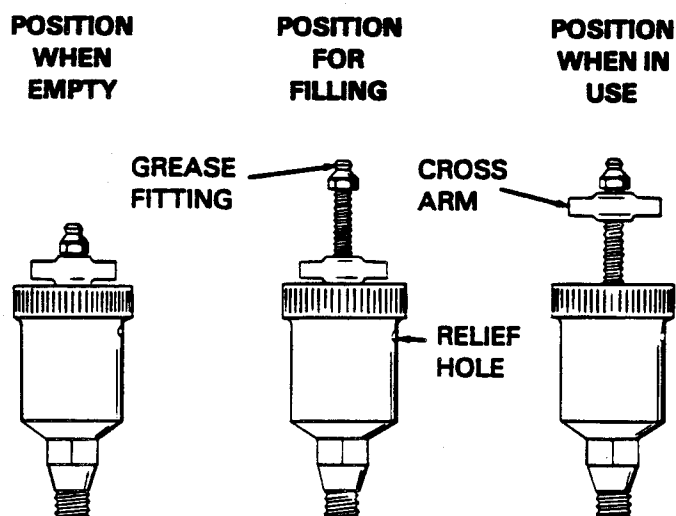


Figure 3. Automatic Lubricating Grease Cup

Bearings

Oil-lubricated bearings should be drained and filled yearly under normal operating conditions, but the oil level should be checked regularly. Do not add oil sooner than required; over-oiling will cause excessive preloading and overheating which will shorten bearing life.

When lubrication is required, remove the pedestal air vent (14) and fill the bearing housing with a good grade of non-detergent SAE No. 30 motor oil to the midpoint of the oil level sight gauge (24). Do not overfill the housing. Clean and reinstall the pedestal air vent.

**For U.S. and International Warranty Information,
Please Visit www.grpumps.com/warranty
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U.S.: 419–755–1280
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