

INSTALLATION, OPERATION, PARTS LIST,  
AND MAINTENANCE MANUAL

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A E J

December 18, 1979



***Power Take Off  
Self-Priming  
Centrifugal Pump  
Model 12B2-G***

THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO

GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA

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

This pump is a 10 Series, semi-open impeller, self-priming centrifugal model designed for pumping liquids with specified entrained solids.

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 write:

The Gorman-Rupp Company	or	Gorman-Rupp of Canada Limited
P.O. Box 1217		70 Burwell Road
Mansfield, Ohio 44902		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, or 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 describe the procedure required and the damage which could result from failure to follow the procedure.

#### WARNING

Instructions which must be followed to avoid causing injury or death to personnel. These describe the procedure required and the injury which could result from failure to follow the procedure.

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## WARNINGS

THESE WARNINGS APPLY TO ALL PUMPS WITH A POWER TAKE OFF. 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.

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.

Do not attempt to pump volatile or corrosive materials for which this pump has not been designed.

After the pump has been located in its operating position, make certain that the pump has been secured before attempting to operate it.

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

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.

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 restarting the pump.

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 servicing.

## INSTALLATION

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.

### PREINSTALLATION INSPECTION

The pump assembly was inspected and tested before it was shipped 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, cap screws, and other attaching hardware. Since gaskets tend to shrink after drying, check for and tighten loose nuts and cap screws 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

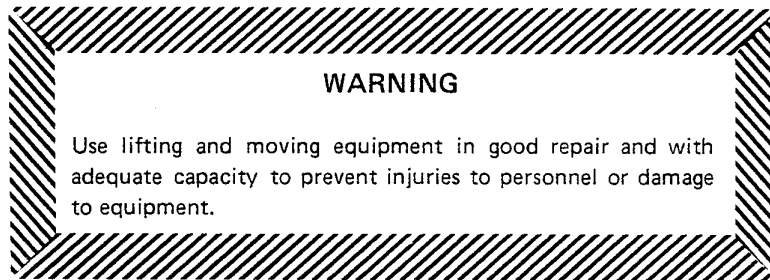
Only operate this pump in the direction indicated by the arrow on the pump body and on the accompanying decal. Otherwise, the impeller could become loosened from the shaft and seriously damage the pump.

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

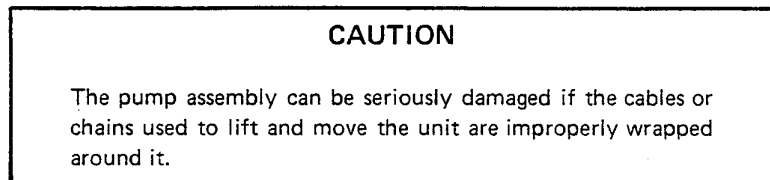
### POSITIONING THE PUMP

#### Mounting

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

**Lifting**

Make sure that hoists and other lifting equipment are of sufficient capacity to safely handle the pump assembly. Attach the lifting mechanism to the bail, eye bolt, or other specific lifting device provided on the pump. If no specific lifting device is provided and chains or cables must be used, make certain that they are positioned so that they will not damage the pump, and so that the load will be balanced.

**SUCTION AND DISCHARGE PIPING****Materials**

Either pipe or hose may be used for suction and discharge lines, but hose used in suction lines must be the rigid-wall, reinforced type to prevent collapse under suction. Using pipe 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**

Never pull a pipe line into place by tightening the flange bolts. The connecting flange must be aligned exactly with the pump port. Lines near the pump must be independently supported to avoid strain on the pump which could cause serious vibration, decreased bearing life, and increased shaft and seal wear. Hose-type lines should have supports strong enough to secure the line when it is 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 down or to either side to avoid air pockets.

### Strainers

Install a strainer at the end of the suction line to avoid possible clogging or damage to the pump. The total area of the openings in the strainer should be at least three or four times the cross section of the suction line, but no opening should be larger than the solids handling capability of the pump. Clean the strainer regularly during operation.

### Sealing

All connections in the suction line should be sealed with pipe dope to ensure an airtight seal. Even a slight leak will affect priming, head, and capacity, especially when operating with a high suction lift. After installation, inspect the suction line carefully for potential leaks.

## DISCHARGE LINES

### Throttling Valves

If a throttling valve is desired, install it 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 the suction line.

### Check Valves

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

With high discharge heads, install a throttling valve and a check valve 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 between the pump and the discharge check valve. The bypass line should be sized so that it does not affect pump discharge capacity.

Either a Gorman-Rupp automatic air release valve—which will automatically open to allow the pump to prime, and automatically close when priming is accomplished—or a hand-operated shutoff valve should be installed in the bypass line.

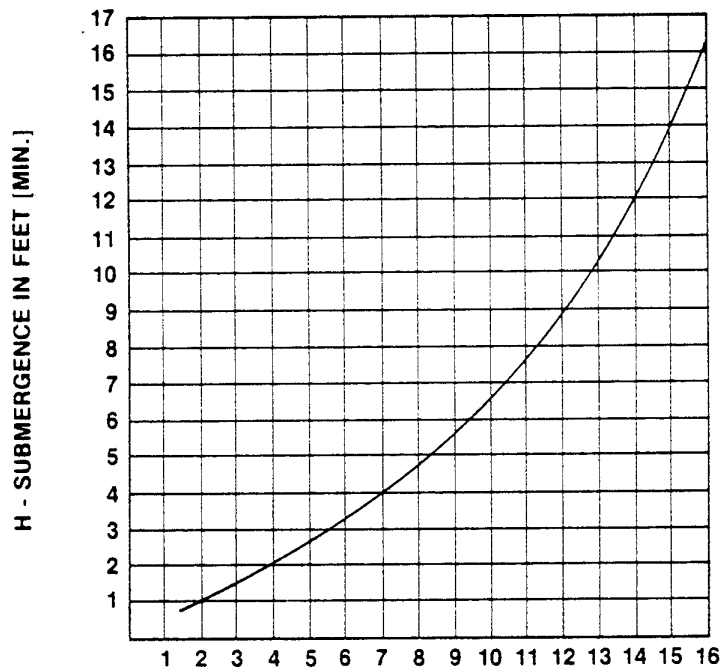
**NOTE**

The bypass line may clog frequently, particularly if the valve remains closed. If this condition occurs, either use a larger bypass line or leave the shutoff valve open during the pumping operation.

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 could result, causing damage to the pump.

**SUCTION LINE POSITIONING**

The depth of submergence of the suction line is critical to efficient pump operation. Figure 1 shows recommended minimum submergence vs. velocity.



$$\text{VELOCITY IN FEET PER SEC.} = \frac{\text{QUAN. [G.P.M.] x .321}}{\text{AREA}} \quad \text{OR} \quad \frac{\text{G.P.M. x .4085}}{D^2}$$

Figure 1. Recommended Minimum Suction Line Submergence Vs. Velocity



**WARNING**

When installing and/or aligning universal shaft assemblies, disconnect the power source to ensure that the pump will remain inoperative.

The alignment of the pump and its power source is critical for trouble-free mechanical operation. Before checking alignment, make sure that the gear box mounting bolts are tight.

When using a mobile power source, block the wheels of the power source, engage the braking system, or take other precautions to ensure that the power source will remain stationary.

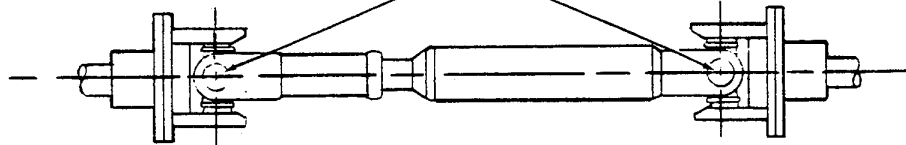
When using a universal joint drive shaft assembly to connect the pump to a PTO, install, support, and align the drive shaft in accordance with the manufacturer's instructions. The pump and the drive power source are generally positioned so that shaft centerlines are parallel and horizontal. The maximum operating angle should not exceed 15 degrees (see figure 1).

Check the direction of PTO rotation before starting the pump. The drive shaft must rotate in the direction shown on the body of the pump, gear box, and/or decals, tags, and labels.

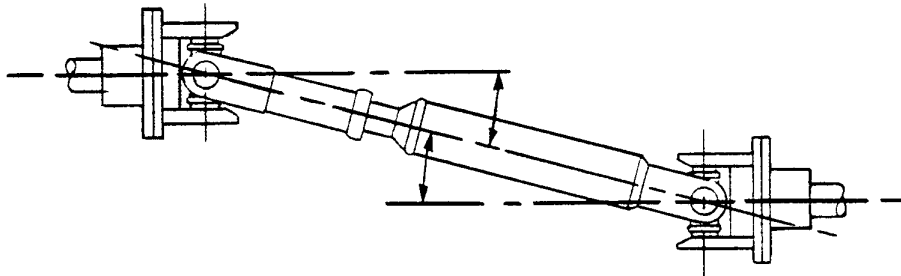
**WARNING**

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

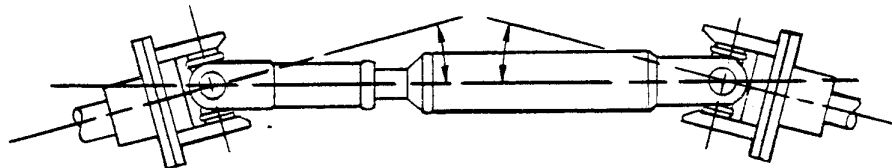
LUGS MUST BE IN LINE, REGARDLESS  
OF OPERATING ANGLE SHOWN BELOW



LUG ALIGNMENT



SHAFTS PARALLEL, ANGLES EQUAL



SHAFTS NOT PARALLEL, ANGLES EQUAL

Figure 4. Proper Installation and Alignment of Universal Assembly

## OPERATION

### WARNING

Do not attempt to pump volatile or corrosive materials 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 pump is self priming, but the pump volute casing must first be filled with liquid if:

1. The pump is being put into service for the first time.
2. The pump has not been used for a considerable length of time.
3. The liquid in the volute casing has evaporated.

Once the volute casing has been filled, the pump will prime and reprime as necessary.

### CAUTION

Never operate a self-priming pump unless the volute is filled with liquid. The pump will not prime when dry. Extended operation of a dry pump will destroy the seal assembly.

To fill the pump, remove the volute fill cover or fill plug at the top of the casing and add clean liquid until the pump is filled. Replace the fill cover or fill plug before operating the pump.

### STARTING

Consult the operating 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 and the pump damaged.

**CAUTION**

Only operate this pump in the direction indicated by the arrow on the pump body, gear box, and/or decals, tags, and labels.

Check the rotation of the pump by observing the PTO shaft. It should turn in the direction indicated on the pump body and/or gear box.

**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 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 discharge 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 casing 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 servicing.

**Strainer Check**

Check the suction strainer regularly during pump operation, or if the pump flow rate begins to drop, and clean it as necessary. Be especially alert for unusual noises when pumping liquids containing solids.

**Pump Vacuum Check**

Install a vacuum gauge in the system, using pipe dope on the threads.

The pump should pull a vacuum of 20 inches or more of mercury at operating speed with the suction line blocked. If it does not, check for air leaks in the seal or gaskets.

With the pump primed and at operating speed, and the suction line open, read the vacuum gauge. Shut off the pump, keep the vacuum line open, and read the gauge again to see if the vacuum remains at the maximum developed by the pump. If the vacuum falls off rapidly, an air leak exists. If the liquid level at the source of supply remains at a constant level, check to make certain that the air leak is not from the vacuum gauge connection.

**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, operate the pump 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. They 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. Dynamic operation will bring the temperatures down to normal levels.

## TROUBLESHOOTING

### WARNING

Before attempting to open or service the pump:

1. Consult pump service manual.
2. Disconnect the power source to ensure that the pump will remain inoperative.
3. Allow pump to cool if overheated.
4. Close suction and discharge valves.
5. Drain pump.

Trouble	Possible Cause	Probable Remedy
PUMP FAILS TO PRIME	<p>Air leak in suction line.</p> <p>Lining of suction hose collapsed.</p> <p>Suction check valve clogged or binding.</p> <p>Leaking or worn seal or pump gasket.</p> <p>Suction lift or discharge head too high.</p> <p>Suction strainer clogged.</p>	<p>Correct leak.</p> <p>Replace suction hose.</p> <p>Clean valve.</p> <p>Check pump vacuum. Replace leaking or worn seal or gasket.</p> <p>Check piping installation and install bypass line if needed. See INSTALLATION.</p> <p>Clean suction strainer.</p>
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE	<p>Air leak in suction line.</p> <p>Suction intake not submerged at proper level or sump too small.</p> <p>Lining of suction hose collapsed.</p> <p>Impeller or other wearing parts worn or damaged.</p> <p>Impeller clogged.</p> <p>Pump speed too slow.</p> <p>Discharge head too high.</p> <p>Suction lift too high.</p>	<p>Correct leak.</p> <p>Check installation and correct as needed. Check submergence chart (Section B, page 4).</p> <p>Replace suction hose.</p> <p>Check impeller clearance. Replace worn parts as needed.</p> <p>Free impeller of debris.</p> <p>Check driver output; check belts or couplings for slippage.</p> <p>Install bypass line.</p> <p>Reduce suction lift.</p>

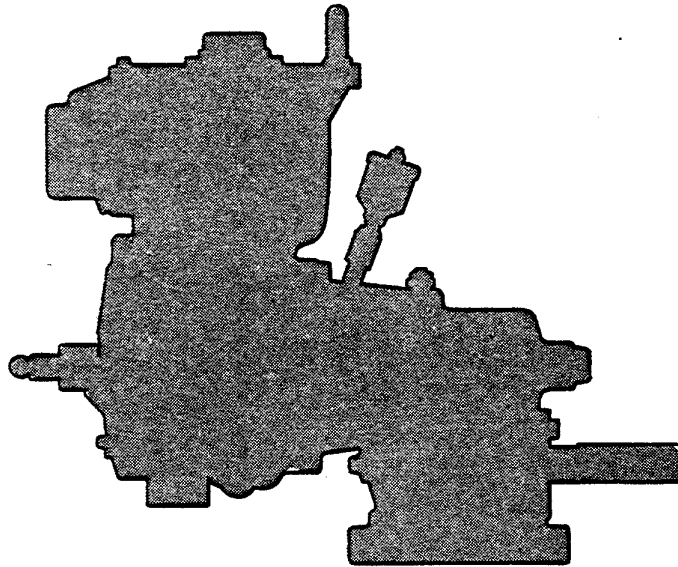


## TROUBLESHOOTING

Trouble	Possible Cause	Probable Remedy
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE (cont)	Leaking or worn seal or pump gaskets.  Suction strainer clogged.	Check pump vacuum. Replace leaking or worn seal or pump gaskets.  Clean suction strainer.
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.  Suction check valve clogged or binding.	Open discharge valve fully to increase flow rate, and run engine at maximum governed speed.  Free valve, and clean or replace it.
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.
BEARINGS RUN TOO HOT	Bearing temperature is high, but within limits.  Low or incorrect lubricant.  Suction and discharge lines not properly supported.  Drive misaligned.	Check bearing temperature.  Check for proper type and level of lubricant.  Check piping installation for proper support.  Align drive properly.



# ***Power Take Off Self-Priming Centrifugal Pump Model 12B2-G***



The only moving parts of this pump are the impeller, seal rotating elements, and the shaft. The wear plate, impeller, and seal, which receive the most wear, are easily accessible and can be replaced by removing the cover without disturbing the volute casing and piping. Maintenance and replacement of these three parts will maintain the peak operating efficiency of the pump.

# SECTIONAL DRAWING

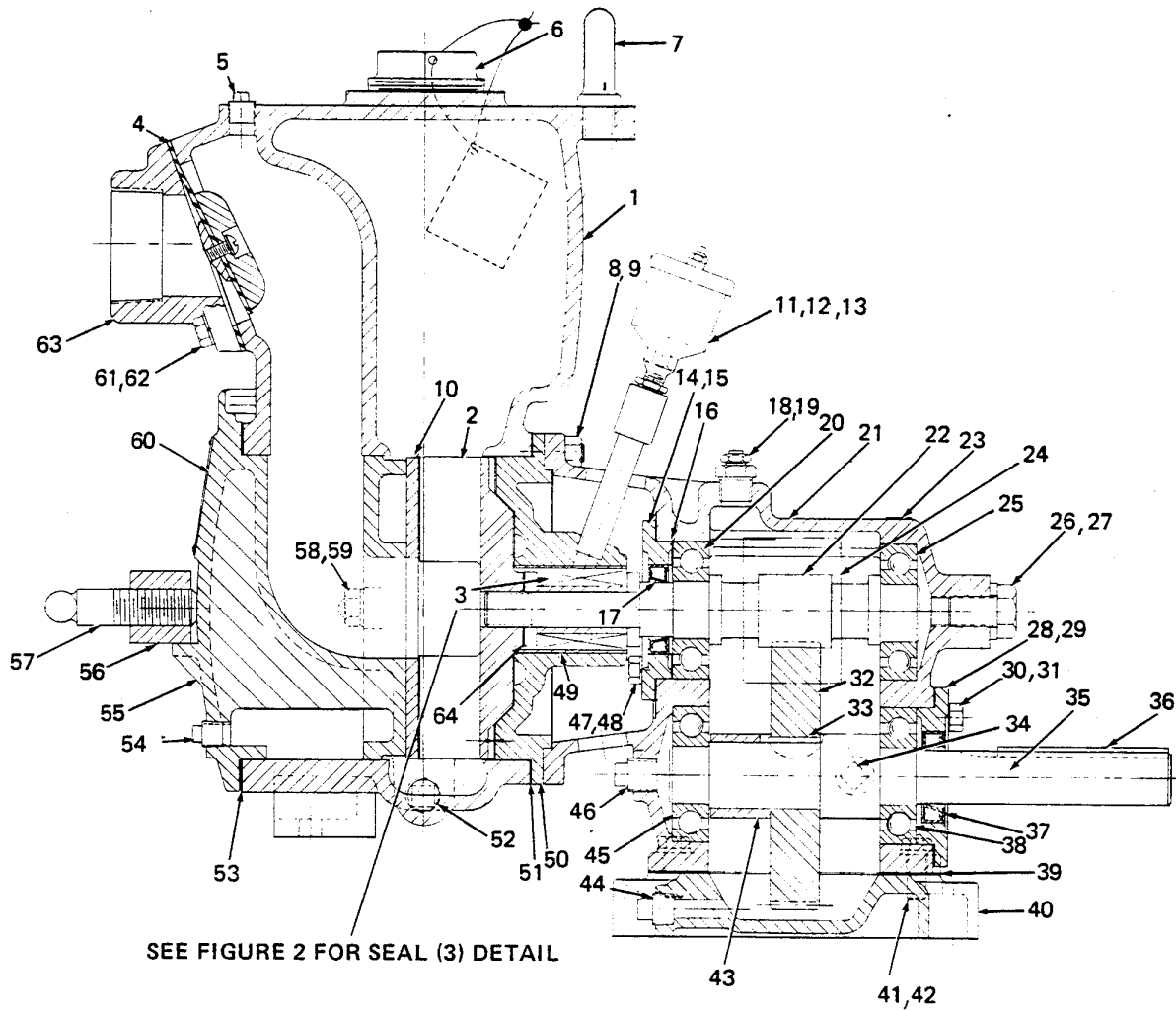


Figure 1. Pump Model 12B2-G



## PARTS LIST

ITEM NO.	MODEL 12B2-G PART NAME	PART NUMBER	MATL CODE	ITEM NO.	MODEL 12B2-G PART NAME	PART NUMBER	MATL CODE
1	VOLUTE CASING	8614	10010	31	HEX HD CAP SCREW	B-0503	15991
2	★ IMPELLER	8615	11000	32	★ DRIVE GEAR	11401	16060
3	★ SEAL ASSEMBLY	GS-750		33	★ GEAR SHAFT KEY	AV-1210	15990
4	FLAP VALVE ASSY	1361-A		34	OIL LEVEL PLUG	P-06	11990
	★ VALVE WEIGHT	19-B	10010	35	★ DRIVE SHAFT	9648-A	16040
	★ VALVE WEIGHT	1354	10010	36	★ SHAFT KEY	N-0414	15990
	★ FLAP VALVE	1361-G	19070	37	★ OIL SEAL	S-389	
	LOCKWASHER	J-04	17090	38	★ BALL BEARING	S-390	
	RD HD MACH SCREW	X-0403	17090	39	★ GEAR BOX GASKET	3814-G	18000
5	ACCESSORY PLUG	P-04	11990	40	BASE	3814	10010
6	FILL PLUG ASSY	48271-065		41	LOCKWASHER	J-06	15991
7	EYE BOLT	AR-1003½	15050	42	HEX HD CAP SCREW	B-0604	15991
8	STUD	C-0607	15991	43	SHAFT SPACER	5095	15030
9	HEX NUT	D-06	15991	44	GEAR BOX DRAIN PLUG	PM-06	11990
10	★ WEAR PLATE	2917	15990	45	★ BALL BEARING	S-390	
11	PIPE COUPLING	AE-04	11990	46	OIL LEVEL PLUG	P-06	11990
12	PIPE NIPPLE	T-0406	15070	47	LOCKWASHER	J-05	15991
13	★ SEAL GREASE CUP	S-36		48	HEX HD CAP SCREW	B-0503	15991
14	★ BEARING CAP	3815	10010	49	★ SEAL LINER	82	14080
15	★ CAP GASKET	3815-G	18000	50	★ SEAL PLATE	388	10010
16	★ BEARING SHIM SET	S-464		51	★ VOLUTE GASKET SET	229-G	18000
17	★ OIL SEAL	S-389		52	VOLUTE DRAIN PLUG	P-08	11990
18	GEAR BOX BUSHING	AP-0602	15990	53	★ COVER GASKET	8616-G	19090
19	★ PRESSURE RELIEF FITTING	S-1523		54	COVER DRAIN PLUG	P-04	11990
20	★ BALL BEARING	S-390		55	★ COVER	8616	10010
21	GEAR BOX	9647	10010	56	COVER CLAMP BAR	8617	11000
22	★ PINION SHAFT	11465	16020	57	COVER CLAMP SCREW	8618	24000
23	RPM INPUT PLATE	2613-EV	00000	58	LOCKWASHER	J-06	15991
24	WARNING PLATE	38816-063		59	HEX NUT	D-06	15991
25	★ BALL BEARING	S-390		60	WARNING PLATE	2613-EV	13990
26	LOCKWASHER	J-10	15991	61	LOCKWASHER	J-06	15991
27	HEX HD CAP SCREW	B-1004	15991	62	HEX HD CAP SCREW	B-0604	15991
28	★ BEARING CAP	3815	10010	63	SUCTION FLANGE	1361	10010
29	★ CAP GASKET	3815-G	18000	64	★ IMPELLER SHIM SET	2Y	17090
30	LOCKWASHER	J-05	15991	NOT SHOWN:			
					STRAINER	9026	24000

★ Indicates parts recommended for stock

Note: This parts list applies to pumps from serial no. 316673.

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, however, follow these instructions, which are keyed to the sectional view (see figure 1) and the accompanying parts list.

### Pump Disassembly

Disconnect the power source, and close all connecting valves. Remove the volute drain plug (52) to drain the pump. Loosen the cover clamp screw (57) and release the cover clamp bar (56) to remove the cover (55) for access to the wear plate (10), impeller (2), and seal assembly (3). After removing the cover, inspect the wear plate, and replace it if scored or worn.

To loosen the impeller, immobilize it by placing a block of wood between the vanes, and hand turn the drive shaft (35) counter to the direction of pump rotation. Unscrew the impeller, and replace it if cracked or badly worn.

Remove the impeller adjusting shims (64). For ease of reassembly, tag and tie the shims, or measure and record their thickness.

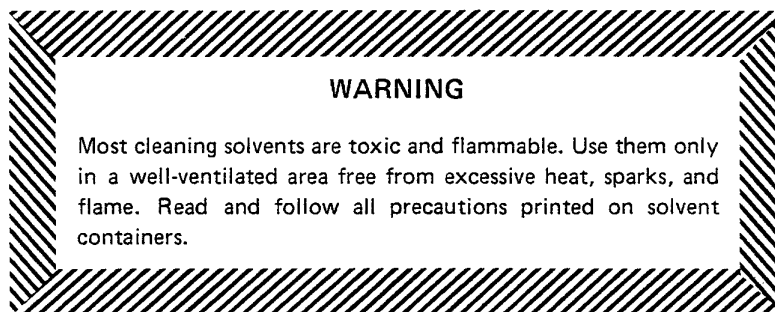
### Seal Disassembly

Before removing the seal assembly, turn the cross arm on the seal grease cup (13) 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 rotating and stationary seal elements, and the shaft sleeve, using a stiff wire with a hooked end if necessary.

The seal liner (49) is a press fit, and can only be removed from the seal plate (50) by separating the gear box (21) from the volute casing (1) and forcing the seal liner out of the seal plate cavity. To separate the gear box and volute casing, remove the hex nuts (9) securing the two assemblies.

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



### Seal Reassembly

The seal is not normally reused because of the high polish on its lapped face, 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.

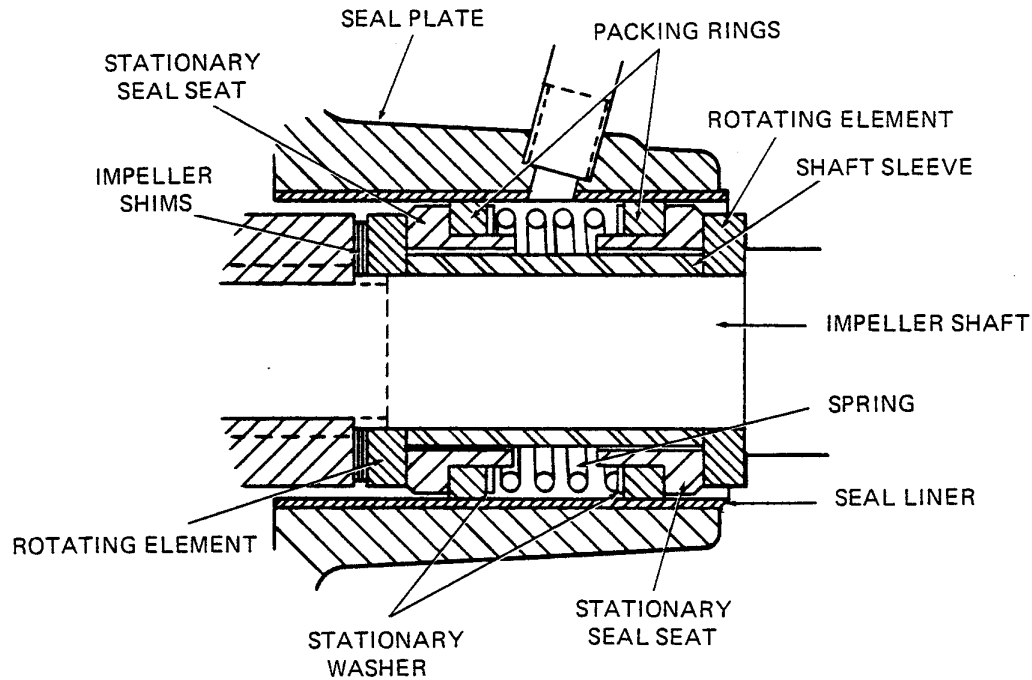


Figure 2. GS-750 Seal Assembly

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. Reassemble the gear box, seal plate, and volute casing, replacing the volute gasket set (51).

### CAUTION

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

Reinstall the shaft sleeve, and install the replacement seal as a complete unit.

Lubricate the packing rings with soft grease 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.

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).

### Pump Reassembly

A clearance of .008 to .015 inch between the impeller and the wear plate, and of .020 to .040 inch between the impeller and the seal plate, is necessary for maximum pump efficiency. These clearances can be reached by adjusting the impeller shims.

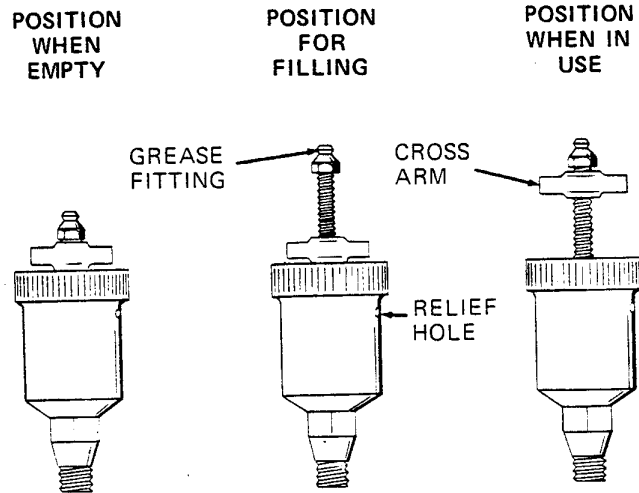


Figure 3. Automatic Lubricating Grease Cup

If the shaft sleeve, seal assembly, adjusting shims, impeller, or wear plate was not replaced, this clearance should be correct after reassembling the impeller shims, impeller, and cover. Replace the cover gasket (53) when reinstalling the cover.

If the shaft sleeve, seal assembly, adjusting shims, impeller, or wear plate was replaced, the clearance between the impeller and the wear plate must be checked after reassembling the pump.

Rotate the shaft by hand, and add or subtract impeller shims until the shaft binds. After the shaft binds, remove .010 inch of impeller shims, then reassemble the pump. The clearance should now be correct.

Before starting the pump, clean and reinstall the volute drain plug and fill the volute with liquid.

## LUBRICATION

### Bearings

Check the oil level in the gear box every 40 hours of operation or once a week, whichever comes first. Remove the gear box oil level plug (34 and 46). The oil level should be just at the bottom of the plug hole. If the level is low, remove the gear box relief fitting (19), and fill to the proper level with the appropriate oil. Clean and reinstall the bushing.

For normal operation at temperatures between 40° and 100° F, use a good brand of SAE No. 90 gear oil; for temperatures below 40° F, use SAE No. 80; for temperatures above 100° F, use SAE No. 120. Change oil every 2,500 hours of operation or every six months, whichever comes first. Unusual operating conditions may require more frequent oil changes.

When breaking in a new unit, change the oil in the first 50 to 100 hours of operation, and flush the unit with a lightweight cleaning oil to remove any particles accumulated. Refill the case with the appropriate oil.

**For U.S. and International Warranty Information,  
Please Visit [www.grpumps.com/warranty](http://www.grpumps.com/warranty)  
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U.S.: 419-755-1280  
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