

**INSTALLATION, OPERATION, PARTS LIST,
AND MAINTENANCE MANUAL**



OM-00598-OE01

SEPTEMBER 5, 1979

Rev. - A

***Engine Driven
Self-Priming
Centrifugal Pump
Model 112A20-B-N855P***

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
P.O. Box 1217
Mansfield, Ohio 44902

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 ENGINE DRIVEN PUMPS. REFER TO THE MANUAL ACCOMPANYING THE ENGINE BEFORE ATTEMPTING TO START THE ENGINE.

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 flammable 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.

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.

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. Always use the correct type of fuel.

Never tamper with the governor to gain more power. The governor establishes safe operating limits that should not be exceeded.

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.
- 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**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. 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.

CAUTION

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

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.

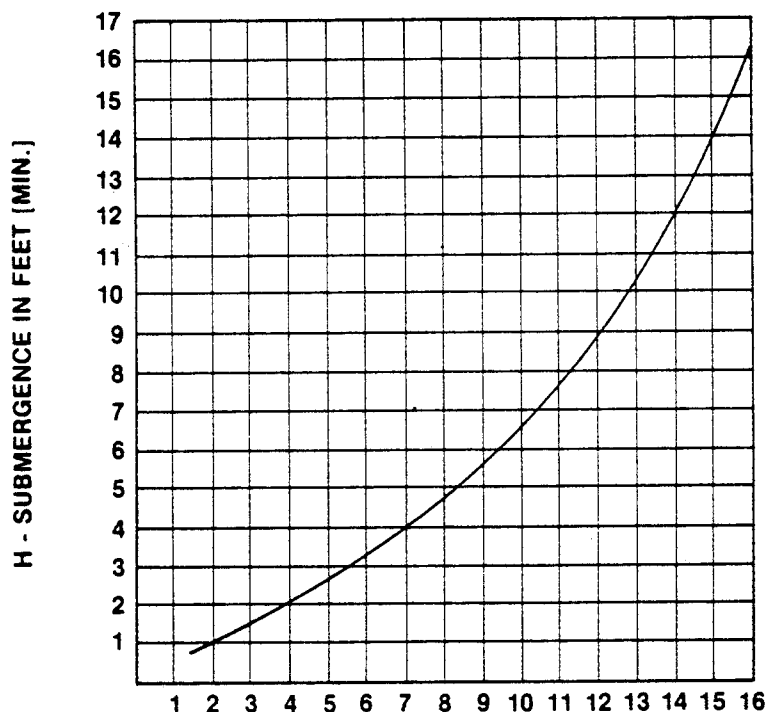
**NOTE**

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.



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

Figure 1. Recommended Minimum Suction Line Submergence Vs. Velocity

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.

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 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.

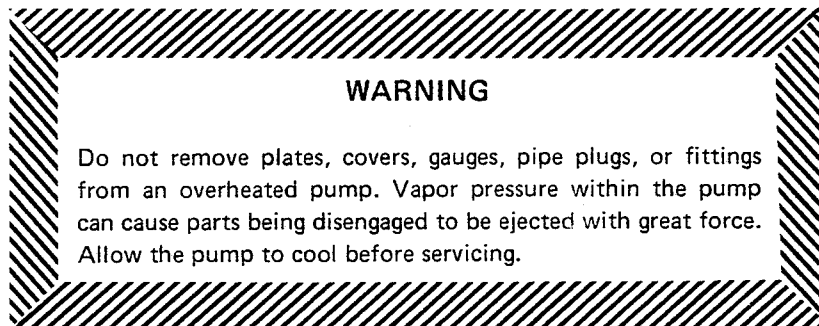
After the pump has been primed, partially close the discharge line throttling valve in order to fill the line slowly and guard against excessive shock pressure which could damage pipe ends, gaskets, sprinkler heads, and any other fixtures connected to the line. When the discharge line is completely filled,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



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 seals 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.

TROUBLESHOOTING

WARNING

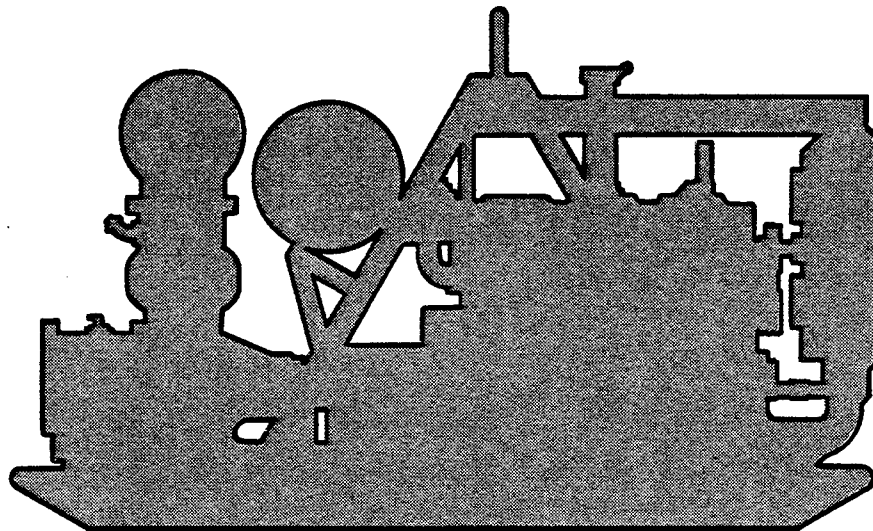
Before attempting to open or service the pump:

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	Air leak in suction line.	Correct leak.
	Lining of suction hose collapsed.	Replace suction hose.
	Suction check valve clogged or binding.	Clean valve.
	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.
	Suction strainer clogged.	Clean suction strainer.
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE	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, page 4).
	Lining of suction hose collapsed.	Replace suction hose.
	Impeller or other wearing parts worn or damaged.	Check impeller clearance. Replace worn parts as needed.
	Impeller clogged.	Free impeller of debris.
	Pump speed too slow.	Check driver output.
	Discharge head too high.	Install bypass line.
	Suction lift too high.	Reduce suction lift.

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.	Reduce speed of power source. 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.

Engine Driven Self-Priming Centrifugal Pump Model 112A20-B-N855P



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 without disturbing the piping. Maintenance and replacement of these three parts will maintain the peak operating efficiency of the pump.

SECTIONAL DRAWING

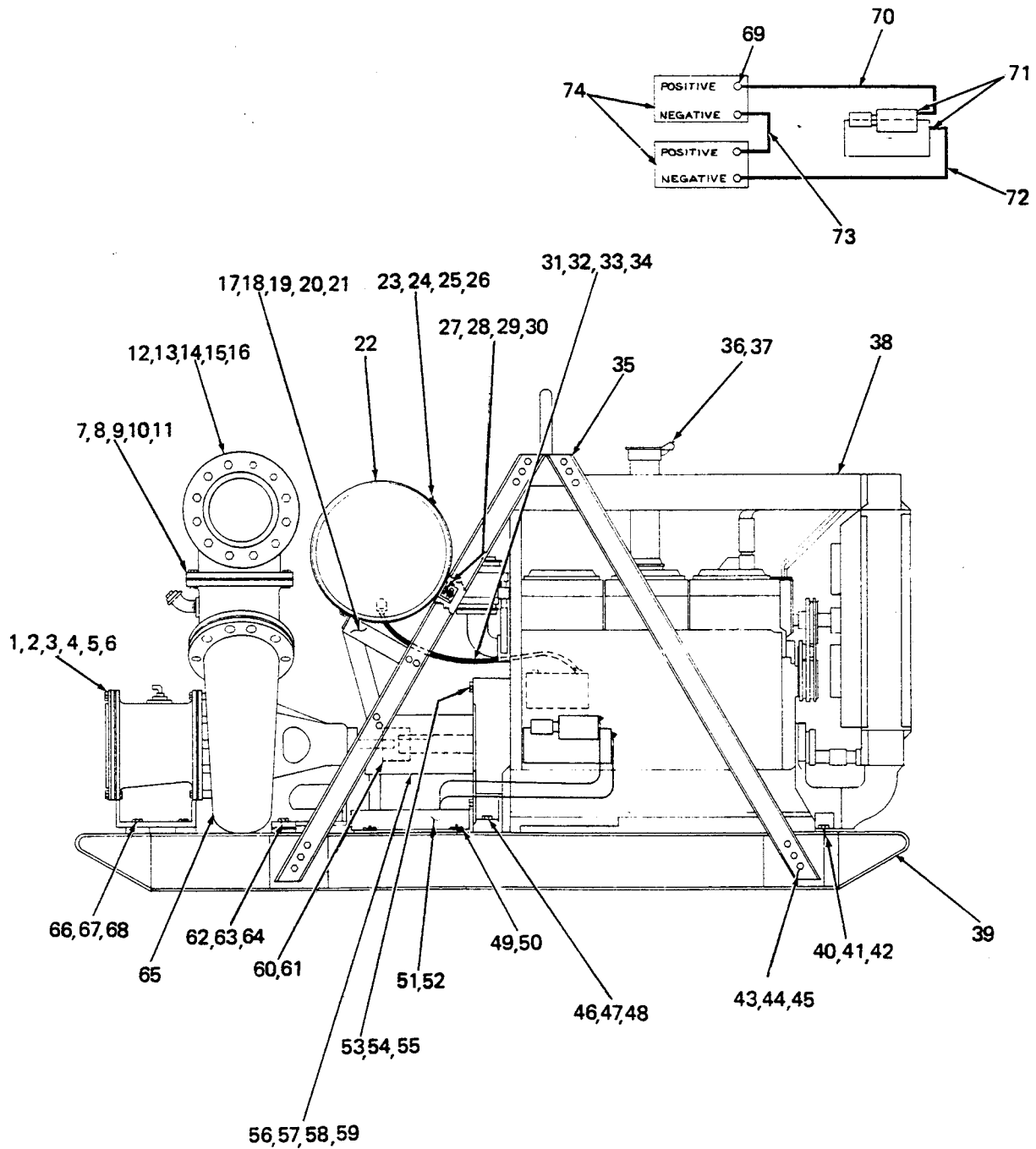


Figure 1. Engine Driven Pump Model 112A20-B-N855P

PARTS LIST

MODEL				MODEL			
ITEM NO.	112A20-B-N855P PART NAME	PART NUMBER	MATL CODE	ITEM NO.	112A20-B-N855P PART NAME	PART NUMBER	MATL CODE
1	LOCKWASHER	J-14	15991	37	NIPPLE TOE	31471-045	
2	HEX NUT	D-14	15991	38	CUMMINS N855P-190 ENGINE	29216-271	
3	HEX HD CAP SCREW	B-1414	15991	39	SKID BASE ASSEMBLY	14286	24000
4	HEX HD CAP SCREW	B-1410	15991	40	HEX HD CAP SCREW	B-1410	15991
5	★ SUCTION FLANGE GASKET	4991-G	18000	41	HEX NUT	D-14	15991
6	FLANGE	4991-A	10010	42	LOCKWASHER	J-14	15991
7	LOCKWASHER	J-14	15991	43	HEX HD CAP SCREW	B-1206	15991
8	HEX NUT	D-14	15991	44	HEX NUT	D-12	15991
9	HEX HD CAP SCREW	B-1416	15991	45	LOCKWASHER	J-12	15991
10	★ DISCHARGE FLANGE GASKET	4991-G	18000	46	HEX HD CAP SCREW	B-1414	15991
11	DISCHARGE ELBOW	RF-192	10990	47	HEX NUT	D-14	15991
12	LOCKWASHER	J-14	15991	48	LOCKWASHER	J-14	15991
13	HEX NUT	D-14	15991	49	WING NUT	BB-06	15990
14	HEX HD CAP SCREW	B-1415	15991	50	FLAT WASHER	K-06	15991
15	★ DISCHARGE ELBOW FLANGE GASKET	4991-G	18000	51	BATTERY	S-2287	
16	DISCHARGE ELBOW FLANGE	4991-A	10010	52	COVER	14301	24000
17	FLAT WASHER	K-08	15991	53	COVER PLATE	14276	15990
18	LOCKWASHER	J-08	15991	54	LOCKWASHER	J-07	15991
19	HEX NUT	D-08	15991	55	HEX HD CAP SCREW	B-0703	15991
20	HEX HD CAP SCREW	B-0806	15991	56	COUPLING GUARD	14287	24000
21	TANK SUPPORT	41441-401		57	LOCKWASHER	J-06	15991
22	FUEL TANK	S-562		58	FLAT WASHER	K-06	15991
23	LOCKWASHER	J-08	15991	59	HEX NUT	D-06	15991
24	HEX NUT	D-08	15991	60	FLEX COUPLING	48111-008	
25	HEX HD CAP SCREW	B-0808	15991	61	★ SHAFT KEY	N-1216	15990
26	TANK STRAP	41121-007		62	HEX NUT	B-1210	15991
27	FLAT WASHER	K-08	15991	63	HEX NUT	D-12	15991
28	LOCKWASHER	J-08	15991	64	LOCKWASHER	J-12	15991
29	HEX NUT	D-08	15991	65	PUMP (See fig. 2)	112A20-B	
30	TANK SUPPORT	41441-402		66	LOCKWASHER	J-12	15991
31	STREET ELBOW	RS-12	11990	67	HEX HD CAP SCREW	B-1207	15991
32	RED PIPE BUSHING	AP-1208	11990	68	HEX NUT	D-12	15991
33	CONDUIT CLAMP	22811-257		69	TERMINAL	S-1726	
34	FLEX HOSE ASSY	26543-445		70	CABLE 00 X 66	38741-507	
35	HOISTING BAIL ASSY	14288	24000	71	SOLDER LUG	S-1725	
36	WEATHER CAP	S-900		72	CABLE 00 X 56	38741-506	
				73	CABLE 00 X 38	38741-505	
				74	BATTERY	S-2287	

NOT SHOWN:

OPTIONAL WHEEL KIT GRP30-10A

★ Indicates parts recommended for stock

Note: This parts list applies to pumps from serial no. 682070.

CANADIAN SERIAL NO. AND UP

SECTIONAL DRAWING

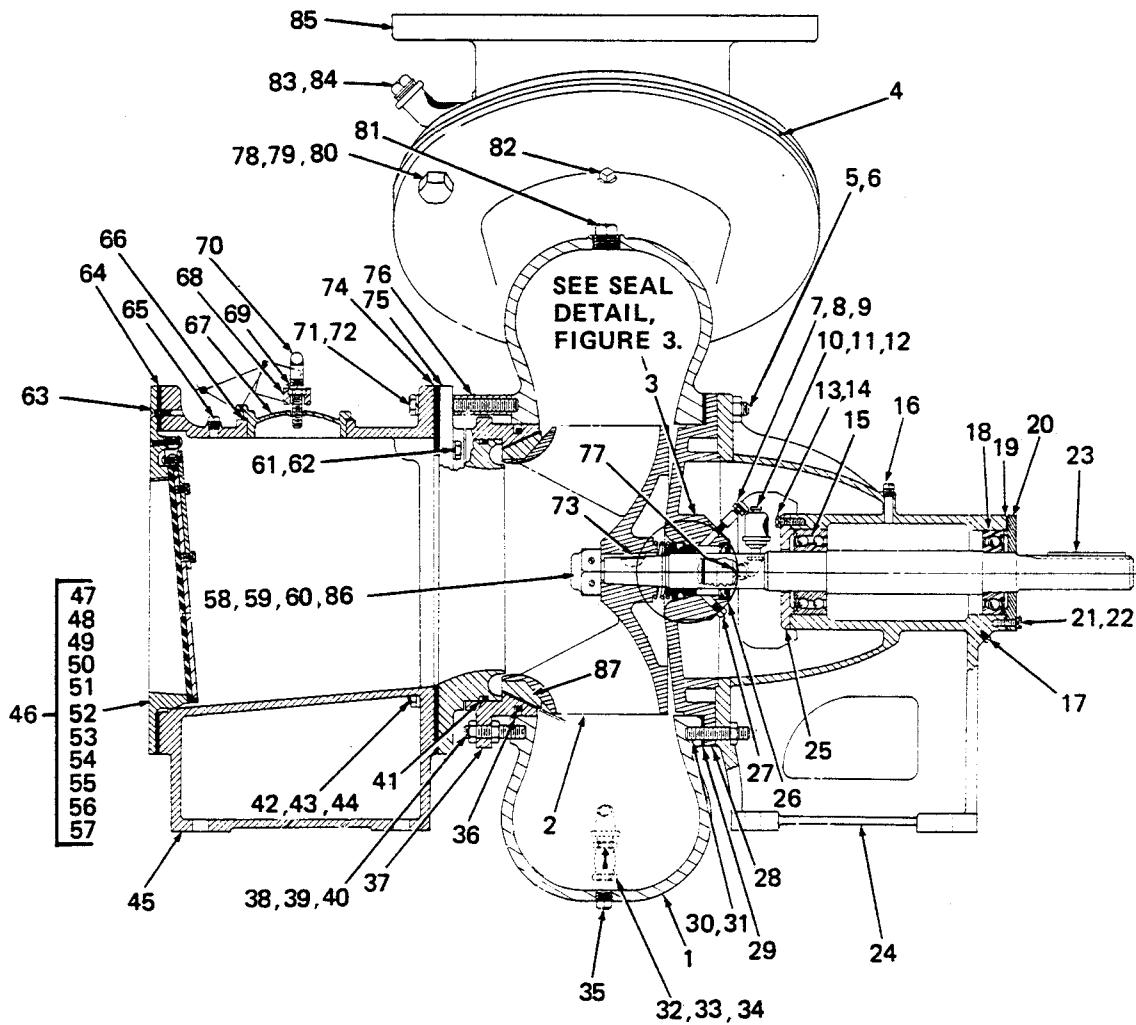


Figure 2. Pump End Only Model 112A20-B

PARTS LIST

ITEM NO.	MODEL 112A20-B PART NAME	PART NUMBER	MATL CODE	ITEM NO.	MODEL 112A20-B PART NAME	PART NUMBER	MATL CODE
1	VOLUTE CASING	4178	10010	47	FLAP VALVE SHAFT	14282	17010
2	IMPELLER	14272		48	BEARING PIVOT	14274	17070
3	SEAL ASSEMBLY	12590-B		49	DRY SLEEVE	S-2282	
4	DISCHARGE FLANGE	4991-G	18000		BEARING		
	GASKET			50	GROOVED PIN	21142-433	
5	STUD	C-1011	15991	51	FLANGED SEAT	14273-A	10010
6	HEX NUT	D-10	15991	52	BUTTON HEAD	CM-0404	15990
7	★ SEAL AIR VENT	S-2162			CAP SCREW		
	FITTING			53	BUTTON HEAD	CM-0403	15990
8	PIPE COUPLING	AE-02	11990		CAP SCREW		
9	CLOSE NIPPLE	T-02	15070	54	LOCKWASHER	J-04	15991
10	★ SEAL BOTTLE OILER	S-1933		55	HEX HD CAP SCREW	B-0402	15991
11	PIPE ELBOW	R-02	11990	56	VALVE PLATE	14283	15990
12	PIPE NIPPLE	T-0212	15070	57	VALVE ASSEMBLY	14281	24010
13	HEX HD CAP SCREW	B-0605	15991	58	★ IMPELLER SHAFT	38516-202	
14	LOCKWASHER	J-06	15991	59	★ IMPELLER NUT	GA-0601½	17090
15	★ BALL BEARING	S-1032			SET SCREW		
16	★ VENTED PEDESTAL	4823	11990	60	★ INSERT	31111-003	
	PLUG			61	HEX HD CAP SCREW	B-1006	15991
17	PIPE PLUG	P-04	11990	62	LOCKWASHER	J-10	15991
18	★ BALL BEARING	S-616		63	FLT SCH CAP SCREW	F-0404	15990
19	★ BEARING GASKET	5413-G	18000	64	★ FLAP VALVE	14273-G	20000
20	★ BEARING CAP	4185	10010		FLANGE GASKET		
21	HEX HD CAP SCREW	B-0605	15991	65	ACCESSORY PLUG	P-04	11990
22	LOCKWASHER	J-06	15991	66	★ COVER GASKET	12369-G	20000
23	SHAFT KEY	N-0616	15990	67	COVER ASSEMBLY	48271-020	
24	PEDESTAL	3233-B	10010	68	COVER CLAMP BAR	12370	11000
25	BEARING CAP	4184	10010	69	HEX HD CAP SCREW	B-0808	15991
26	OIL SEAL	S-1917		70	COVER CLAMP SCREW	8618	24000
27	SEAL DRAIN PLUG	P-02	11990	71	HEX HD CAP SCREW	14432	15990
28	SEAL PLATE	4179-E	10010	72	LOCKWASHER	J-10	15991
29	VOLUTE GASKET	4180-G	18000	73	★ IMPELLER SHAFT KEY	AV-1210	15990
30	STUD	C-1013	15991	74	★ SUCTION PLATE GSKT	4991-G	18000
31	HEX NUT	D-10	15991	75	SUCTION PLATE	12737-A	11010
32	CHECK VALVE	S-2283		76	SPACER	14278	15020
33	PIPE NIPPLE	T-12	15070	77	RD HEAD SET SCREW	X-0404	17090
34	STREET ELBOW	RS-12	11990	78	HEX HD CAP SCREW	B-1414	15991
35	VOLUTE DRAIN	P-12	11990	79	HEX NUT	D-14	15991
	PLUG			80	LOCKWASHER	J-14	15991
36	★ WEAR RING O-RING	S-1914		81	PIPE PLUG	P-24	11990
37	★ ADJ WEAR RING	12736	11010	82	PIPE PLUG	P-06	11990
38	STUD	12739	15010	83	STREET ELBOW	AGS-32	11990
39	HEX NUT	D-10	15991	84	PIPE PLUG	P-32	11990
40	JAM NUT	AT-10	15991	85	DISCHARGE ADAPTER	14275	10010
41	★ SUCTION PLATE	S-1991			FLANGE		
	O-RING			86	★ IMPELLER SHAFT NUT	4190-B	10090
42	HEX HD CAP SCREW	B-1009	15991	87	★ IMPELLER WEAR RING	12734	11010
43	LOCKWASHER	J-10	15991		NOT SHOWN:		
44	HEX NUT	D-10	15991		NAMEPLATE	2613-D	13990
45	FLAP VALVE FLANGE	14270	10010		ROTATION DECAL	2613-CU	00000
46	FLAP VALVE	14284			DRIVE SCREW	BM-4-03	
	ASSEMBLY				STRAINER 12 INCH	4990-A	

★ Indicates parts recommended for stock

Note: This parts list applies to pumps from serial no. 682070.

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 2) and the accompanying parts list.

WARNING

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

Pump Disassembly

Disconnect the power source, and close all connecting valves. Remove the volute drain plug (35) to drain the pump.

Remove the hex head cap screws (71) securing the flap valve flange (45) and suction plate (75) to the volute casing (1), retaining each of the spacers (76) as the cap screws are removed.

Separate the volute casing, removing the suction plate O-ring (41), for access to the adjustable wear ring (37), impeller wear ring (87), impeller (2), and seal assembly (3).

To remove the impeller, loosen the set screws (59) on the shaft nut (86), and unscrew the shaft nut. Slide the impeller off the impeller shaft (58), retaining the shaft woodruff key (73).

Seal Disassembly

Before removing the seal assembly, remove the seal drain plug (27) to drain the seal cavity. Clean and reinstall the seal drain plug.

Carefully remove the spring, retainer, and rotating and stationary seal elements, using a stiff wire with a hooked end if necessary.

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 precautions printed on solvent containers.

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.

CAUTION

This seal is not designed for operation at temperatures above 160°F. Do not use at higher operating temperatures.

Install the replacement seal as a complete unit.

Lubricate the bellows and O-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 3.

Before starting the pump, fill the seal bottle oiler (10) with SAE No. 30 non-detergent motor oil. Remove the air vent fitting (7) when filling the seal bottle oiler.

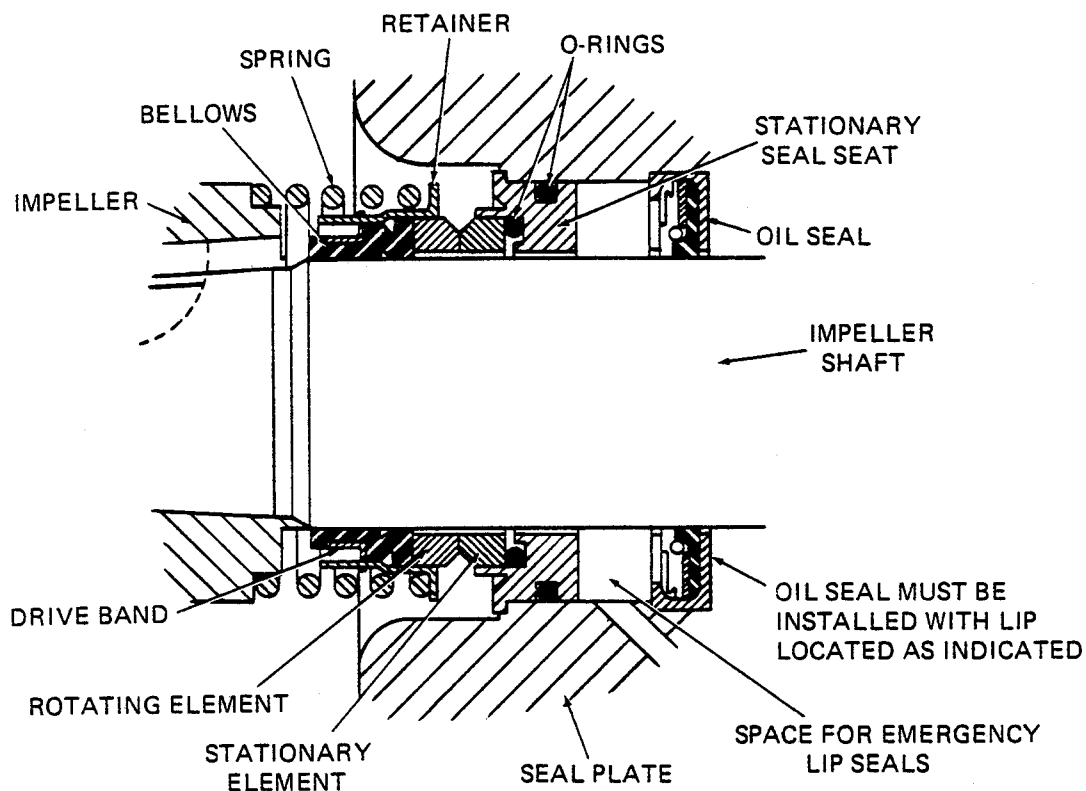


Figure 3. 12590-B Seal Assembly

Pump Reassembly

Before reinstalling the impeller, inspect the adjustable wear ring (37), and replace it if the interior surface is scored or worn. If the adjustable wear ring is replaced, replace the O-ring (36).

Inspect the impeller, and replace it if cracked or badly worn. Replace the impeller wear ring if scored or worn.

Reinstall the impeller shaft woodruff key, and slide the impeller onto the shaft. Use "Never-Seez" or equivalent on the threads of the impeller shaft nut, and torque the nut to 300 ft-lbs. Use "Loctite" No. 35 or equivalent on the impeller nut set screws, and torque the screws to 18 ft-lbs.

Reinstall the hex head cap screws, lockwashers, and spacers to reassemble the check valve flange and suction plate to the volute casing. Replace the suction plate O-ring (41) and gasket (74).

Impeller Face Clearance

A clearance of approximately .015 inch between the impeller wear ring and the adjustable wear ring is necessary for maximum pump efficiency.

If the seal assembly, impeller, or wear rings was not replaced, this clearance should be correct after reassembling the pump.

If the seal assembly, impeller, or wear rings was replaced, this clearance must be reset. Loosen all the adjustable wear ring hex nuts (39). Tighten all the jam nuts (40) until the adjustable wear ring is completely in contact with the suction plate face. Next, tighten all the hex nuts evenly, maintaining each in the same position relative to the others.

To eliminate interference with adjustment, back off the jam nuts until they are in contact with the volute casing. Now tighten all the hex nuts evenly, no more than one-half turn at a time, while rotating the impeller by hand. When the adjustable wear ring makes contact with the impeller wear ring, back off each hex nut one-half turn. This will set the proper clearance. Tighten all the jam nuts to secure the adjustable wear ring.

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

LUBRICATION

Bearings

When shipped from the factory, the pump contains sufficient grease to lubricate the bearings for approximately 5,000 operating hours. Do not lubricate sooner than required. When additional grease is required, remove the vented pedestal plug (16) and fill the cavity with No. 0 pressure gun grease until the cavity is one third full, or just below the shaft. Clean and reinstall the vented pedestal plug.

**For U.S. and International Warranty Information,
Please Visit www.grpumps.com/warranty
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