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INSTALLATION, OPERATION, PARTS LIST, AND MAINTENANCE MANUAL



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 an 80 series, self-priming centrifugal model with a suction check valve. The pump is close coupled to a 5 HP Briggs and Stratton engine, and protected by a wrap around roll cage with rubber mounting feet. Since the unit is very light weight and portable, it is ideally suited to many agricultural, construction, and industrial applications where high pressure delivery of liquid is required. The pump is constructed of die cast aluminum with a cast iron volute scroll. The self-lubricated shaft seal fits over a stainless steel shaft sleeve. The housing is coated with epoxy for added corrosion resistance while handling most nonvolatile, nonflammable clear liquids.

If there are any questions regarding the pump or its application 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 44901-1217

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

For information or technical assistance on the engine, contact the engine 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 80 SERIES ENGINE DRIVEN PUMPS. REFER TO THE MANUAL ACCOMPANYING THE ENGINE BEFORE ATTEMPTING TO BEGIN OPERATION.

WARNING

```
//////////////////////////////////////  
//  
// Before attempting to open or service the pump: //  
//  
// 1. Familiarize yourself with this manual. //  
// 2. Switch off the engine ignition or remove the //  
// spark plug 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

```
//////////////////////////////////////  
//  
// This pump is designed to handle clear water. Do not at- //  
// tempt to pump corrosive, volatile or flammable liquids //  
// which may damage the pump or endanger personnel as a re- //  
// sult of pump failure. //  
//  
//////////////////////////////////////
```

WARNING

```
//////////////////////////////////////  
//  
// After the pump has been installed, make certain that the //  
// pump and all piping or hose connections are tight, prop- //  
// erly supported and secure before operation. //  
//  
//////////////////////////////////////
```

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. //  
//  
//////////////////////////////////////
```

WARNINGS

WARNING

```
////////////////////////////////////  
//  
// Overheated pumps can cause severe burns and injury. If //  
// overheating of the pump 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. //  
//  
////////////////////////////////////
```

WARNING

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

WARNING

```
////////////////////////////////////  
//  
// Fuel used by internal combustion engines presents an ex- //  
// treme 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. //  
//  
////////////////////////////////////
```

WARNING

```
////////////////////////////////////  
//  
// Never tamper with the governor to gain more power. The //  
// governor establishes safe operating limits that should //  
// not be exceeded. The maximum continuous operating speed //  
// is 3800 RPM. //  
//  
////////////////////////////////////
```


INSTALLATION - SECTION B

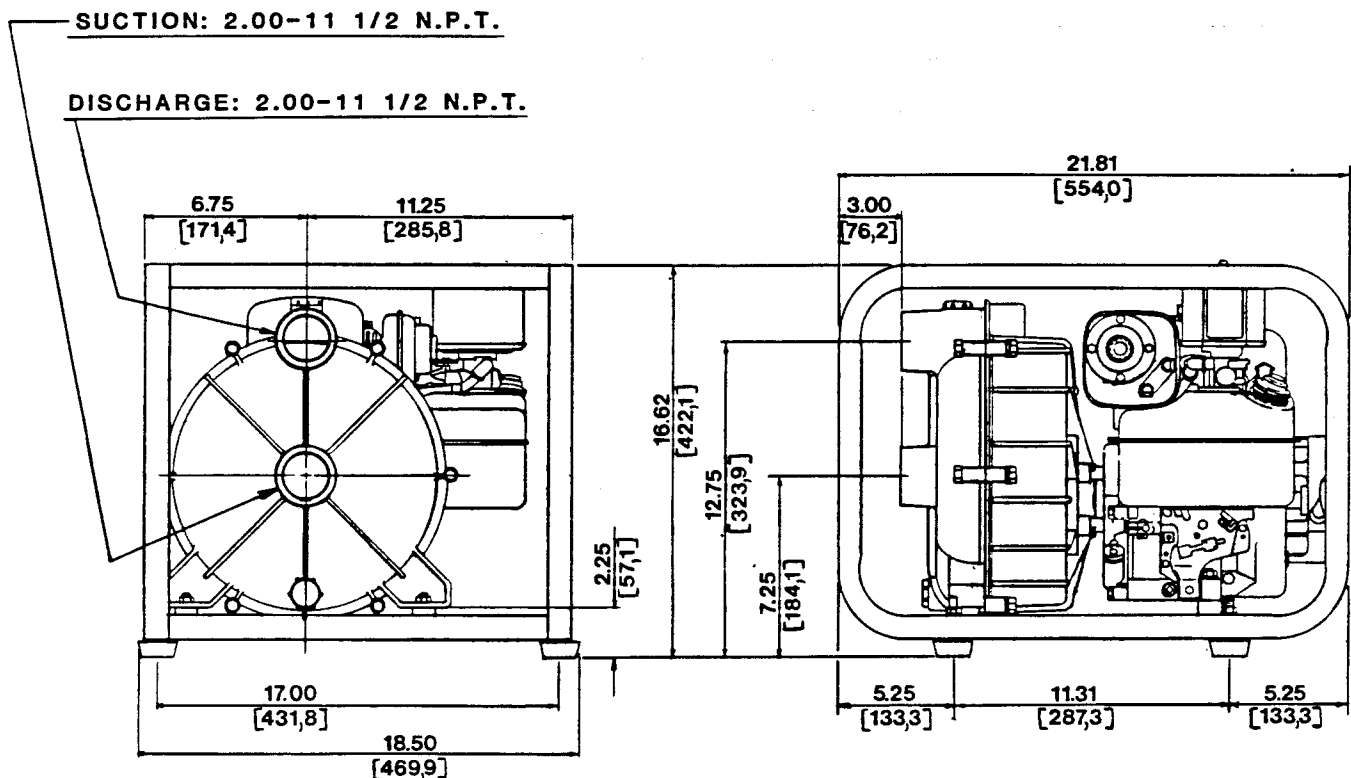
Since pump installations are seldom identical, this section offers only general recommendations and practices required to inspect, position, and arrange the pump and piping.

Most of the information pertains to a standard **static lift application** where the pump is positioned above the free level of liquid to be pumped.

If installed in a **flooded suction application** where the liquid is supplied to the pump under pressure, some of the information such as mounting, line configuration, and priming must be tailored to the specific application. Since the pressure supplied to the pump is critical to performance and safety, **be sure** to limit the incoming pressure to 50% of the maximum permissible operating pressure as shown on the pump performance curve.

For further assistance, contact your Gorman-Rupp distributor or the Gorman-Rupp Company.

Pump Dimensions



POWERED BY BRIGGS AND STRATTON ENGINE MODEL NO. 130232

DIMENSIONS:
INCHES
[MILLIMETERS]

Figure 1. Pump Model 82C1-13

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 unit for cracks, dents, damaged threads, and other obvious damage.
- b. Check for and tighten loose attaching hardware. Since gaskets tend to shrink after drying, check for loose hardware at mating surfaces.
- c. Carefully read all tags, decals, and markings on the pump assembly, and follow the instructions indicated.
- 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.
- e. If the pump and engine have been stored for more than 12 months, some of the components or lubricants may have exceeded their maximum shelf life. These **must be inspected or replaced** to ensure maximum pump service.

If the maximum shelf life has been exceeded, or if anything appears to be abnormal, contact your Gorman-Rupp distributor or the factory to determine the repair or updating policy. **Do not** put the pump into service until appropriate action has been taken.

POSITIONING PUMP

Lifting

This pump is designed to be light weight and portable. A two-man carry handle and roll cage has been provided. The total pump weight is approximately 85 pounds, not including accessories or hoses. Customer installed equipment such as suction hose with foot valve **must** be removed before attempting to lift.

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.

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

INSTALLATION

be supported or shimmed to provide for level operation or to eliminate vibration.

To ensure sufficient lubrication and fuel supply to the engine, **do not** position the pump and engine more than 15° off horizontal for continuous operation. The pump and engine may be positioned up to 30° off horizontal for **intermittent operation only**; however, the engine manufacturer should be consulted for continuous operation at angles greater than 15°.

SUCTION AND DISCHARGE PIPING

The size of the system piping is **not** always determined by the nominal suction and discharge port diameter. Factors such as suction lift, discharge elevation, and friction losses for the complete system must be considered to be sure your application allows the pump to operate within the safe operating range shown on page E-1. In any case, the suction line should never be smaller than the pump inlet.

Materials

Either pipe or hose may be used for suction and discharge lines; however, the 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 not less than 18 inches from the suction and discharge ports and install the lines. Installation closer to the pump may result in erratic readings.

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.

The **maximum** vertical suction lift for this pump is 25 ft. when fully primed and operating, however, the **maximum priming** lift must be limited to 15 ft. It is not designed to be operated at a higher lift.

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 spherical 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.

This pump is designed to handle up to 1/8 inch diameter spherical solids.

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

INSTALLATION

should be sealed with pipe dope to ensure an airtight seal. Follow the sealant manufacturer's recommendations when selecting and applying the pipe dope. 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.

NOTE

The pipe submergence required may be reduced by installing a standard pipe increaser fitting at the end of the suction line. The larger opening size will reduce the inlet velocity. Calculate the required submergence using the following formula based on the increased opening size (area or diameter).

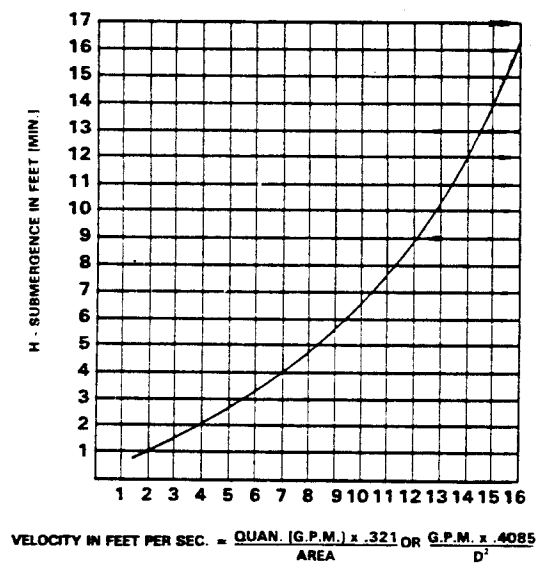


Figure 2. Recommended Minimum Suction Line Submergence Vs. Velocity

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

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

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

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

CAUTION

If application involves a high discharge head, gradually close the discharge throttling valve before stopping the pump.

Bypass Lines

If a system check valve is used due to high discharge head, it may be necessary to vent trapped air from the top of the pump during the priming process. This may be done by installing a bypass line from the top of the pump, back to the source of liquid. The end of the bypass line must be submerged. The line must be large enough to prevent clogging, but not so large as to affect pump discharge capacity. A hand operated shut off valve may be installed in the bypass line.

OPERATION - SECTION C**WARNING**

```
////////////////////////////////////  
//  
// This pump is designed to handle clear water. Do not at- //  
// tempt to pump corrosive, volatile or flammable liquids //  
// which may damage the pump or endanger personnel as a re- //  
// sult of pump failure. //  
// //  
////////////////////////////////////
```

WARNING

```
////////////////////////////////////  
//  
// Never tamper with the governor to gain more power. The //  
// governor establishes safe operating limits that should //  
// not be exceeded. The maximum continuous operating speed //  
// is 3800 RPM. //  
// //  
////////////////////////////////////
```

PRIMING

Position 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 should never be operated unless there is liquid in the pump casing.

CAUTION

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

Add liquid to the housing when:

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 housing has evaporated.

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

WARNING

```
////////////////////////////////////  
//  
// After filling the housing, reinstall and tighten the //  
// fill plug. Do not attempt to operate the pump unless //  
// all connecting piping is securely installed. Otherwise, //  
// liquid in the pump forced out under pressure could cause //  
// injury to personnel. //  
//  
////////////////////////////////////
```

To fill the pump, remove the pump casing 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.

NOTE

This pump is self-priming, however, it is **not** suited for unattended reprime applications. In the event of suction check valve failure and loss of prime, the pump casing **must** be refilled through the fill cover or fill plug.

Run the engine at maximum governed speed during the priming cycle. With a suction lift of 5 to 10 feet, the pump should prime within 2 minutes. The maximum suction lift of 15 feet (at sea level) should require no more than 4 minutes for initial prime. If the pump does not prime within this time, shut off the engine and determine the problem (see **TROUBLESHOOTING**).

STARTING

Consult the operations manual furnished with the engine.

OPERATION**Lines With a Bypass**

A hand operated shutoff valve may be installed in a bypass line.

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.

Liquid Temperature And Overheating

The **maximum** liquid temperature for this pump is 160°F. Do not apply it at a higher operating temperature.

Overheating can occur if operated with the valves in the suction or discharge lines 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 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. //  
// //  
////////////////////////////////////
```

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. If a vacuum suction gauge has been installed, monitor and record the readings regularly to detect strainer blockage.

Never introduce air or steam pressure into the pump casing or piping to remove a blockage. This could result in personal injury or damage to the equipment. If backflushing is absolutely necessary, **liquid pressure** must be limited to 25% of the maximum permissible operating pressure shown on the pump performance curve.

Pump Vacuum Check

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 15 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 operating 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

Never halt the flow of liquid suddenly. If the liquid being pumped is stopped abruptly, damaging shock waves can be transmitted to the pump and piping system. Close all connecting valves slowly. On engine driven pumps, reduce the throttle speed slowly and allow the engine to idle briefly before stopping.

CAUTION

If application involves a high discharge head, gradually close the discharge throttling valve before stopping the pump.

After stopping the pump, switch off the engine ignition or remove the spark plug to ensure that the pump will remain inoperative.

Cold Weather Preservation

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.

PUMP TROUBLESHOOTING - SECTION D

WARNING

```

////////////////////////////////////
//
// Before attempting to open or service the pump:
//
// 1. Familiarize yourself with this manual.
// 2. Switch off the engine ignition or remove the
// spark plug 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.
//
////////////////////////////////////

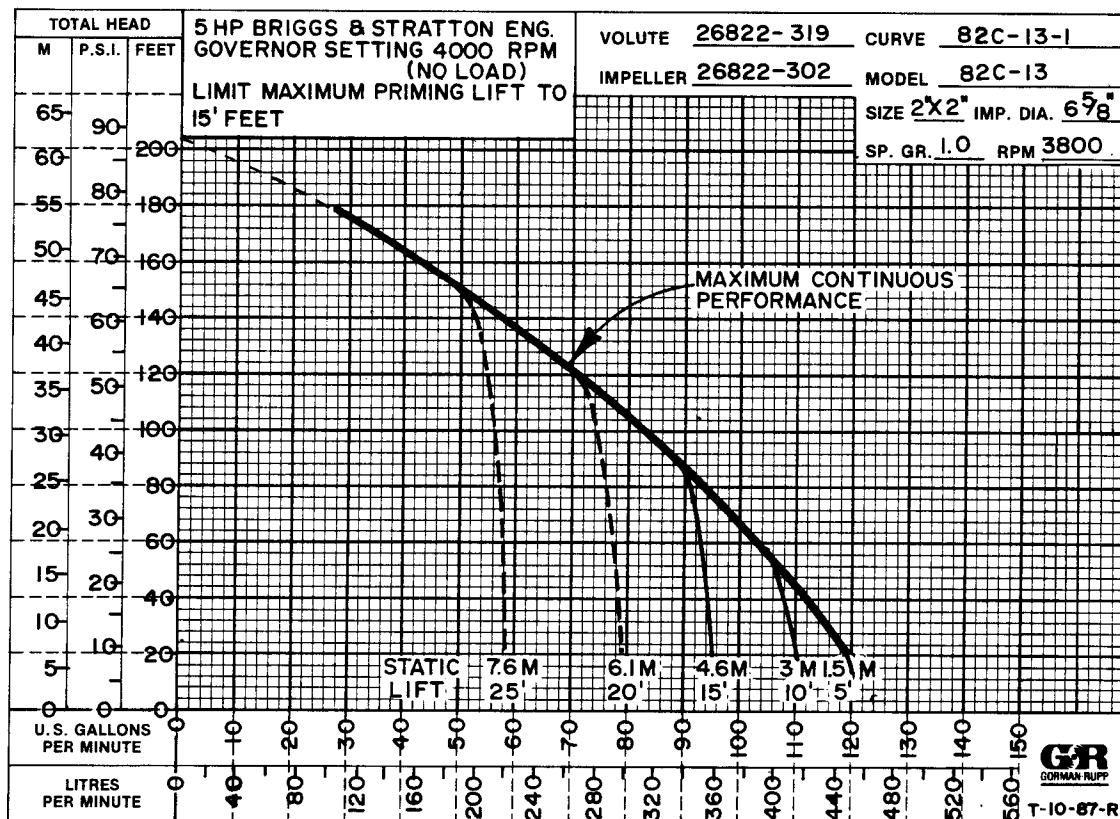
```

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP FAILS TO PRIME	Not enough liquid in casing.	Add liquid to casing. See PRIMING.
	Suction check valve contaminated or damaged.	Clean or replace check valve.
	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.
	Discharge head too high.	Install bypass line.
	Suction lift too high.	Measure lift w/vacuum gauge. Reduce lift and/or friction losses in suction line.
	Strainer clogged.	Check strainer and clean if necessary.
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 submergence as needed.
	Impeller clogged.	Free impeller of debris.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE(cont.)	<p>Impeller or other wearing parts worn or damaged.</p> <p>Pump speed too slow.</p> <p>Discharge throttling valve partially closed; check valve installed improperly.</p> <p>Discharge head too high.</p>	<p>Replace worn or damaged parts. Check that impeller is properly centered and rotates freely.</p> <p>Check engine output; consult engine operation manual.</p> <p>Open discharge valve fully; check piping installation.</p> <p>Reduce head.</p>
PUMP REQUIRES TOO MUCH POWER	<p>Pump speed too high.</p> <p>Discharge head too low.</p> <p>Liquid solution too thick.</p>	<p>Reduce speed of power source.</p> <p>Adjust discharge valve.</p> <p>Dilute if possible.</p>
PUMP CLOGS FREQUENTLY	<p>Discharge flow too slow.</p> <p>Strainer clogged.</p> <p>Liquid being pumped too thick.</p>	<p>Open discharge valve fully to increase flow rate, and run engine at maximum governed speed.</p> <p>Check strainer and clean if necessary.</p> <p>Dilute liquid if possible.</p>
EXCESSIVE NOISE	<p>Cavitation in pump.</p> <p>Pumping entrained air.</p> <p>Pump or drive not securely mounted.</p> <p>Impeller clogged or damaged.</p>	<p>Reduce suction lift and/or friction losses in suction line. Record vacuum and pressure gauge readings and consult local representative or factory.</p> <p>Locate and eliminate source of air bubble.</p> <p>Secure mounting hardware.</p> <p>Clean out debris; replace damaged parts.</p>

PUMP MAINTENANCE AND REPAIR - SECTION E

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



*STANDARD PERFORMANCE FOR PUMP MODEL 82C1-13

*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", your pump is **NOT** a standard production model. Contact the Gorman-Rupp Company to verify performance or part numbers.

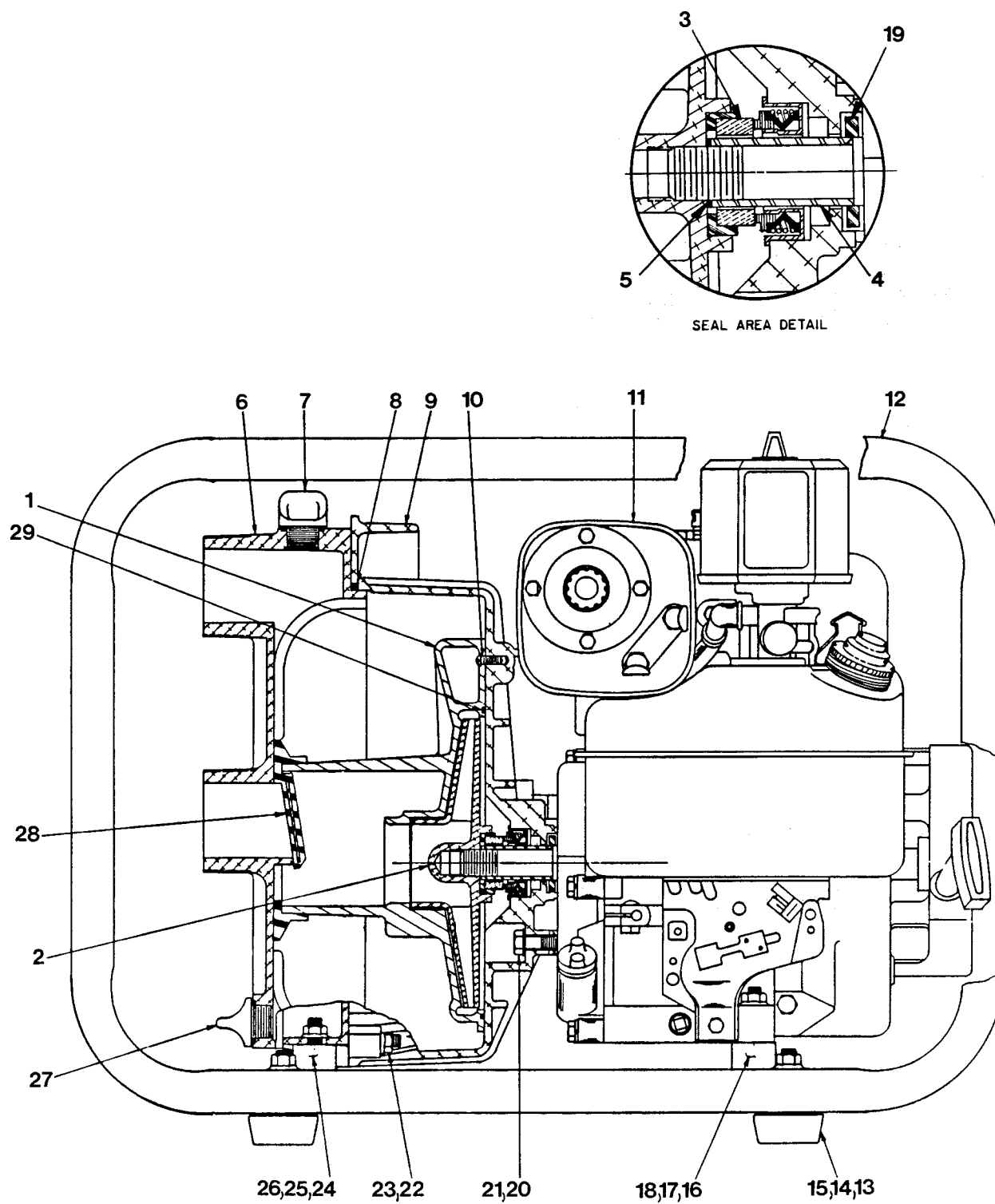
WARNING

```

////////////////////////////////////
//
//  Never tamper with the governor to gain more power.  The
//  governor establishes safe operating limits that should
//  not be exceeded.  The maximum continuous operating speed
//  is 3800 RPM.
//
////////////////////////////////////

```

SECTIONAL DRAWING



PARTS LIST
Pump Model 82C1-13
 (From S/N 863935 up)

If your pump serial number is followed by an "N", your pump is **NOT** a standard production model. Contact the Gorman-Rupp Company to verify part numbers.

ITEM NO.	PART NAME	PART NUMBER	MATL CODE	QTY
1	VOLUTE SCROLL	26822-319	10010	1
2 *	IMPELLER	26822-302	13000	1
3 *	SHAFT SEAL ASSY	26822-008	-----	1
4 *	SHAFT SLEEVE	26822-006	-----	1
5 *	IMPELLER SHIM SET	26822-033	-----	4
6	FRONT HOUSING	26822-018	-----	1
7	FILL PLUG W/O-RING	26822-017	-----	1
8 *	HOUSING O-RING	26822-015	-----	1
9	BACK HOUSING	26822-013	-----	1
10	SELF-TAPPING SCREW	26822-011	-----	3
11	B & S ENGINE 130232	26822-101	-----	1
12	ROLL CAGE	26822-030	-----	1
13	HEX HD CAPSCREW	B00508	15991	4
14	RUBBER FOOT PAD	24631-401	-----	4
15	LOCKNUT W/FLANGE	21765-312	-----	4
16	HEX HD CAPSCREW	B0506	15991	2
17	ROLL CASE SPACER	26822-031	-----	2
18	LOCKNUT W/FLANGE	21765-312	-----	2
19	SLINGER RING	26822-005	-----	1
20	HEX HD CAPSCREW	26822-004	-----	4
21 *	SEALING WASHER	26822-003	-----	4
22	HEX HD CAPSCREW	B00508	15991	6
23	LOCKNUT W/FLANGE	21765-312	-----	6
24	HEX HD CAPSCREW	B00503	15991	2
25	ROLL CAGE SPACER	26822-031	-----	2
26	LOCKNUT W/FLANGE	21765-312	-----	2
27	DRAIN PLUG W/O-RING	26822-017	-----	1
28 *	MOLDED CHECK VALVE	26822-020	-----	1
29 *	VOLUTE O-RING SEGMENT	26822-328	-----	1
NOT SHOWN:				
	NAME PLATE DECAL	38812-045	-----	1
	STRAINER	26841-025	-----	1
	PRIMING TAG	26822-026	-----	1
	CAUTION LABEL	26822-035	-----	1
OPTIONAL:				
	VITON SHAFT SEAL	26822-034	-----	1
	ENGINE OIL WARNING KIT	29172-301	-----	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. However, if it becomes necessary to inspect 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, make sure the engine will remain inoperative and remove the suction and discharge lines.

The pump is powered by a Briggs and Stratton model 130232 gasoline engine. For engine disassembly and repair, consult the literature supplied with the engine or contact your local Briggs and Stratton representative.

WARNING

```
////////////////////////////////////  
//  
// Before attempting to open or service the pump: //  
//  
// 1. Familiarize yourself with this manual. //  
// 2. Switch off the engine ignition or remove the //  
// spark plug 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. //  
//  
////////////////////////////////////
```

Suction Check Valve Removal

Remove the drain plug (27) to drain the housing. Clean the plug and inspect the O-ring before reinstalling.

Remove the hardware (24 and 26) securing the front housing (6) and spacer (25) to the roll cage (12).

For access to the check valve (28), remove the hardware (22 and 23) and separate the front housing. Pull the check valve from the end of the volute (1). Check the condition of the O-ring (8) and inspect the check valve sealing surface of the front housing. Replace the check valve and any part which prevents a good seal.

Impeller Removal

For access to the impeller (2), remove the screws (10) securing the volute to the back housing (9). Replace the O-ring segment (29) if worn or damaged.

Use a wide fabric strap wrench to remove the impeller. It will unscrew in a counter clockwise direction (when facing the impeller). Use caution when remov-

ing the impeller; tension on the seal spring will be released as the impeller is unscrewed.

Inspect the impeller, and replace if cracked or badly eroded. Slide the impeller adjusting shims (5) off the shaft. To ease reassembly, tie and tag the shims or measure and record their thickness.

Seal Removal

The rotating portion of the seal assembly (3) is pressed into the back of the impeller. If the seal must be replaced, use a screwdriver to pry the rotating element and rubber seat from the impeller bore.

Pull the sleeve (4) from the shaft and inspect it for wear or damage.

Remove the hardware (20 and 21) securing the back housing to the engine and carefully pull it, along with the stationary portion of the seal, from the shaft. Lay the housing on a clean, flat surface with the impeller side down and press the seal from the bore.

Seal Reassembly

(Figure 1 and 2)

Clean the seal cavity and shaft with a cloth soaked in fresh 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. //  
// //  
////////////////////////////////////
```

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

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

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 if there are cuts or nicks on either end.

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

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

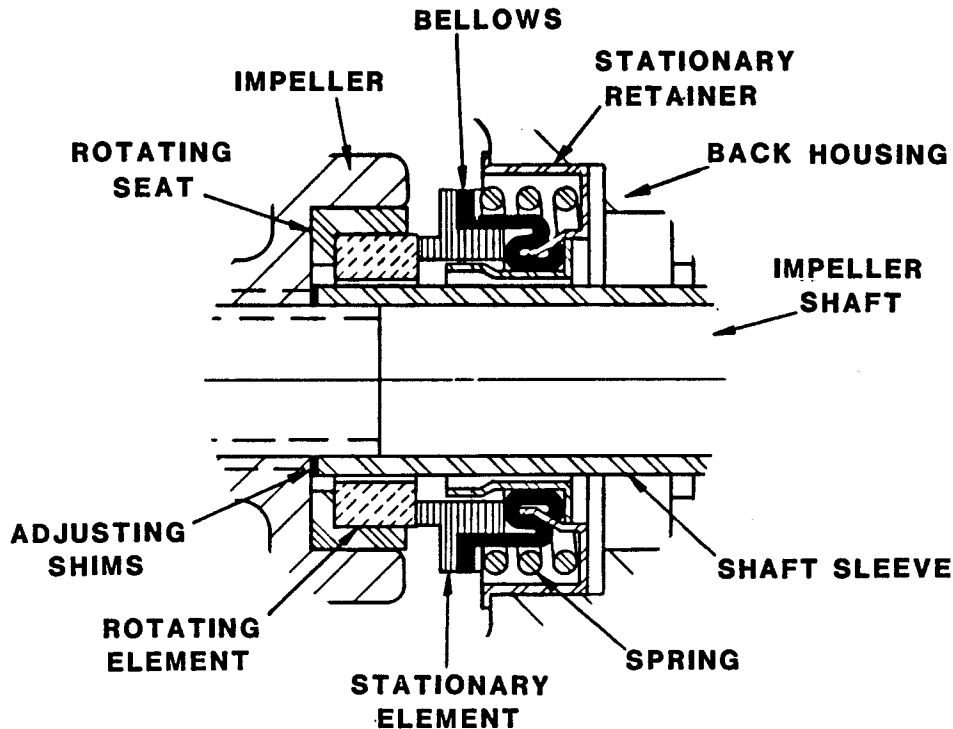


Figure 2. 26822-008 Seal Assembly

CAUTION

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

Make sure the slinger ring (19) is properly positioned on the shaft. Apply 'Loctite No. 242' on the four capscrews (20) and secure the back housing to the engine. **Be sure** to use new sealing washers (21) to prevent leaks. Torque the capscrews to 100 inch lbs.

Apply a **small** amount of liquid gasket material (permatex or equivalent) to the seal bore in the back housing. Use hand pressure **only** to press the stationary seal components into the back housing. A push tube cut from a length of plastic pipe will aid in this installation. The tube must fit against the seal retainer flange, **not** against the precision finished seal face. Press the retainer into the bore until completely seated. Apply a drop of oil on the seal face. **Never** use grease.

Subassemble the rotating element into the rubber seat. Apply a **small** amount of vegetable oil on the O.D. of the seat and press this assembly into the impeller until it seats.

Lubricate the engine shaft extension with vegetable oil and slide the shaft sleeve onto the shaft. The chamfered end must face toward to the shaft shoulder.

Impeller Reassembly

Slide the same number of impeller adjusting shims (5) as were previously removed onto the shaft, and screw the impeller on until tight.

Lubricate the O-ring (29) with vegetable oil or glycerin (do not use petroleum products), and install the O-ring segment with the split located at the bottom. Align the holes in the volute over the holes in the back housing and secure with screws (10). **Do not** over tighten the screws (23 inch lbs. maximum). The threads in the back housing are easily stripped out.

Rotate the impeller to be sure it is not binding on the volute scroll.

Check Valve Reassembly

Slide the mounting flange of the check valve onto the end of the volute so that the valve hangs straight down.

Replace the housing O-ring (8). Apply vegetable oil or glycerin to the O-ring and pilot flange of the front housing and carefully slide the two housings together. Torque the hardware (22 and 23) to approximately 100 inch lbs. Check the valve for free movement.

Secure the housing and spacer (25) to the roll bar with hardware (24 and 26).

Final Pump Reassembly

Be sure all hardware and drain plugs are tight.

Check the oil and fuel level in the engine.

Install the suction and discharge lines and open all valves. Make certain that all connections are tight, and that the weight of the lines is independently supported.

Fill the pump housing with clean liquid. Apply vegetable oil or glycerin on the fill plug O-ring before reinstalling the plug (7).

Refer to **OPERATION**, Section C, before putting the pump back into service.

LUBRICATION

Seal Assembly

The shaft seal is lubricated by the liquid being pumped.

Engine

Consult the literature supplied with the engine, or contact your local Briggs and Stratton representative.

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

or call:

U.S.: 419-755-1280

International: +1-419-755-1352

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

or call:

519-631-2870

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