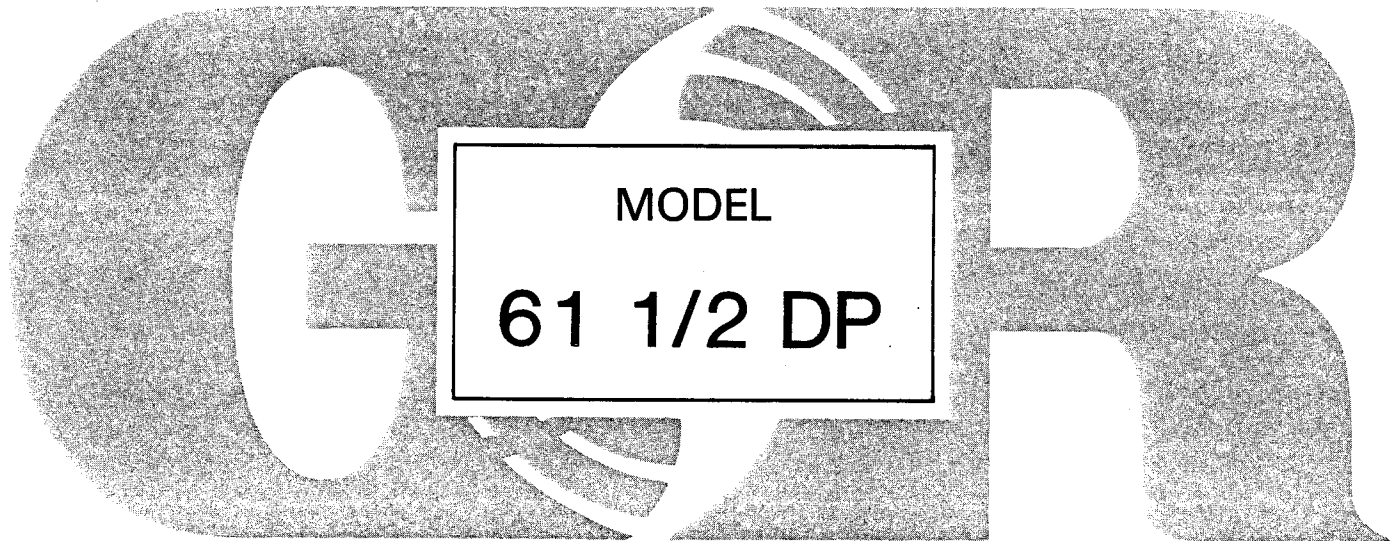

60SERIES

INSTALLATION, OPERATION, PARTS LIST, AND MAINTENANCE MANUAL



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

Printed in U.S.A.

TABLE OF CONTENTS

INTRODUCTION	I-1
WARNINGS - SECTION A	A-1
INSTALLATION - SECTION B	B-1
Pump Dimensions	B-1
PREINSTALLATION INSPECTION	B-2
POSITIONING PUMP	B-2
Mounting	B-2
SUCTION AND DISCHARGE PIPING	B-3
Materials	B-3
Line Configuration	B-3
Connections to Pump	B-3
Gauges	B-3
SUCTION LINES	B-3
Fittings	B-4
Sealing	B-4
Suction Lines In Sumps	B-4
Suction Line Positioning	B-4
DISCHARGE LINES	B-5
Siphoning	B-5
Valves	B-6
OPERATION - SECTION C	C-1
PRIMING	C-1
Hand-Operated Priming Pump	C-2
STARTING	C-2
OPERATION	C-3
Leakage	C-3
Liquid Temperature And Overheating	C-3
Strainer Check	C-3
Pump Vacuum Check	C-4
Automatic Controls	C-4
STOPPING	C-4
Cold Weather Preservation	C-4
PUMP TROUBLESHOOTING - SECTION D	D-1
PUMP MAINTENANCE AND REPAIR - SECTION E	E-1
PERFORMANCE CURVE	E-1
PUMP MODEL - PARTS LIST	E-3
PUMP AND SEAL DISASSEMBLY AND REASSEMBLY	E-4
Pump Disassembly	E-4
Seal Removal	E-5
Seal Installation	E-5
Pump Reassembly	E-6
LUBRICATION	E-7
Seal Assembly	E-7
Engine	E-7
Engine Maintenance And Repair	E-7

INTRODUCTION

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

This pump is a 60 Series, single-stage centrifugal model designed specifically for fire fighting service. The pump features compact, light weight design for backpack portability, as well as rugged construction for easy, low-cost maintenance. It is powered by a U.S. Marine (Chrysler/West Bend), model 82039 two-cycle gasoline engine. An automatic overspeed control protects the pump and engine from excessive speed due to loss of prime or engine malfunction.

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	or	Gorman-Rupp of Canada Limited
P.O. Box 1217		70 Burwell Road
Mansfield, Ohio 44901-1217		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 60 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 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 in
// firefighting service. Do not attempt to pump volatile
// or corrosive liquids which may damage the pump or endan-
// ger personnel as a result of pump failure.
//
////////////////////////////////////

```

WARNING

```

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

```

WARNING

```

////////////////////////////////////
//
// 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- //
// trem e 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. //
// //
////////////////////////////////////

```

WARNING

```

////////////////////////////////////
// Operating noise levels exceed 106 DbA. Ear protection //
// should be worn during operation. Prolonged exposure //
// without protection could result in hearing loss. //
// //
////////////////////////////////////

```


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

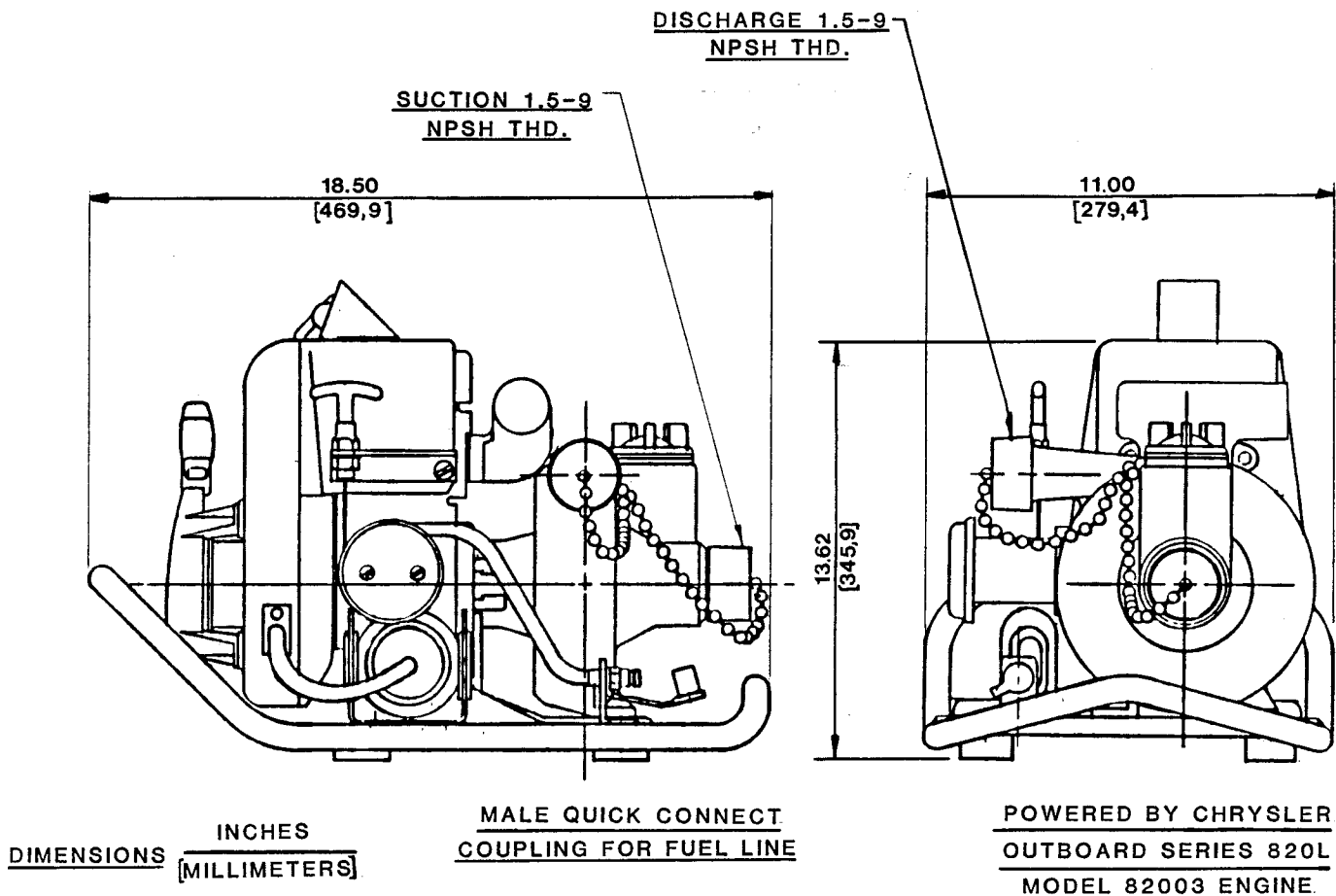


Figure 1. Pump Model 61 1/2 DP

PREINSTALLATION INSPECTION

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

- a. Inspect the pump 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.
- f. Check to ensure the following standard equipment items are included with the pump assembly:
 - Portable 5 gallon fuel tank complete with 8-foot fuel line with priming bulb and quick-connect fitting.
 - Strainer with built-in foot valve.
 - Suction and discharge thread protector with chains.
 - Spare spark plug, spark plug wrench and engine knock-off nut.
 - Pump back pack carry harness is available as **optional equipment**.
 - A hand primer pump assembly which can be stowed in the backpack frame is also available as **optional equipment**.

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

This pump is designed to be very light-weight and portable. The total pump weight is approximately 30 pounds, not including accessories or engine fuel. Customer installed equipment such as suction and discharge hoses **must** be removed before attempting to lift.

Mounting

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

SUCTION AND DISCHARGE PIPING

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 15 feet. 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.

A suction strainer with a built-in foot valve has been provided with the pump. The built-in foot valve holds water in the line while the pump is idle, eliminating the need to reprime.

Sealing

Since even a slight leak will affect priming, head, and capacity, especially when operating with a high suction lift, all connections in the suction line should be sealed with pipe dope to ensure an airtight seal. 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).

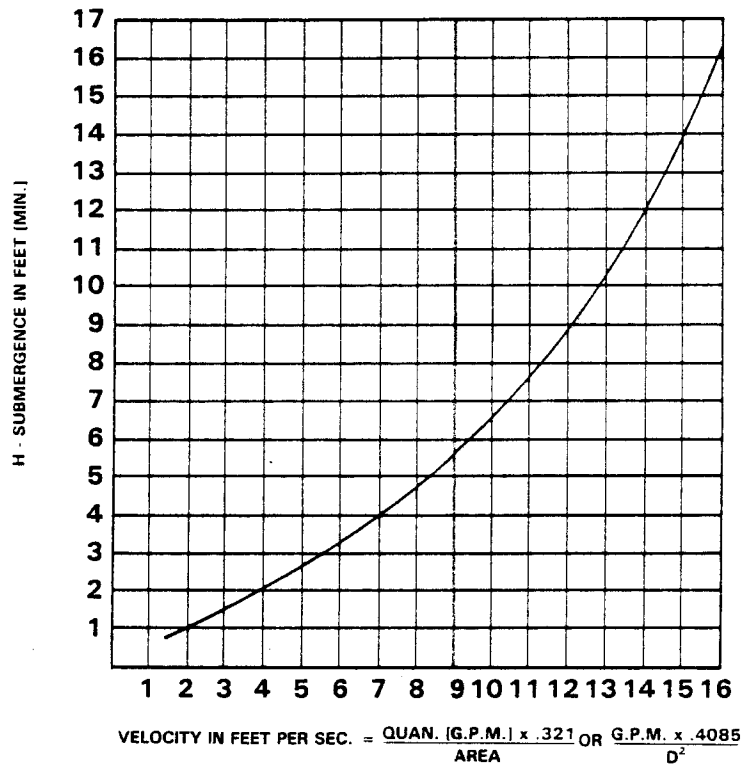


Figure 2. Recommended Minimum Suction Line Submergence Vs. Velocity

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

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.

OPERATION

OPERATION - SECTION C

WARNING

```

////////////////////////////////////
//
// This pump is designed to handle clear water in //
// firefighting service. Do not attempt to pump volatile //
// or corrosive liquids which may damage the pump or endan- //
// ger personnel as a result of pump failure. //
// //
////////////////////////////////////

```

WARNING

```

////////////////////////////////////
//
// Operating noise levels exceed 106 DbA. Ear protection //
// should be worn during operation. Prolonged exposure //
// without protection could result in hearing loss. //
// //
////////////////////////////////////

```

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

CAUTION

<p>Never operate this pump unless there is liquid in the casing. The pump will not prime when dry. Extended operation of a dry pump will destroy the seal assembly.</p>

Add liquid to the pump casing 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 pump casing has evaporated.

WARNING

```

////////////////////////////////////
//
// After filling the pump casing, 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. //
// //
////////////////////////////////////

```

Hand-Operated Priming Pump

This pump may be equipped with an optional hand-operated priming pump which is stowed on the backpack frame. It is designed to draw air out of the suction line and pump casing.

If a throttling valve has been installed in the discharge line, close the valve. Otherwise, the discharge line must be sealed by using a clamp or pinching the hose closed.

Remove the priming pump from the stowage carrier and connect the quick connect coupling on the priming assembly to the corresponding fitting on pump suction nozzle. Open the petcock in the priming line and operate the handle until water flows from the priming pump. Close the petcock and wait a few seconds before checking the water level at the fill plug opening. If the water level begins to lower it may be due to entrained air, a leak in the suction line, or a malfunction in the foot valve. Once the pump is fully primed, install the fill plug and tighten. Disengage the priming pump and stow in backpack frame.

STARTING

Consult the operations manual furnished with the engine.

Attach the fuel line to the quick-connect fitting located on the base frame. Position the portable fuel tank at the same level as the pump, or slightly higher. Squeeze the priming bulb until fuel can be seen in the transparent fuel line at the carburetor inlet. The transparent fuel line need not be completely full. Fuel will be pulled into the carburetor while cranking the engine with the choke on.

Set the ignition toggle switch to "ON" position.

Set the twist-lock throttle control at approximately half open position. Start the engine and follow engine manufacturer's recommendations for carburetor adjustments to obtain optimum performance.

NOTE

Hard starting may be experienced after connecting a new tank of fuel. This can be caused by air trapped in the fuel line. It is recommended that the fuel line be vented and filled by depressing the valve in the female quick connect fitting prior to installing it on the pump.

OPERATION

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 pump 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 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.

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 20 inches or more of mercury. If it does not, check for air leaks in the seal, gasket, or discharge valve.

Open the suction line, and read the vacuum gauge with the pump primed and at 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.

Automatic Controls

The automatic overspeed control protects the engine from excessive speed by utilizing a diaphragm pressure switch mounted on the base frame and connected to the engine fan housing. This switch senses engine fan air pressure and automatically grounds the engine ignition at approximately 9000 R.P.M.. The switch will automatically reset and be ready for restarting.

The automatic overspeed control also protects the pump from damage due to a loss of prime during unattended operation. With the throttle control in the full out position, the engine will automatically shut down when unloaded due to a loss of prime.

CAUTION

For unattended operation, the throttle control must be set in full out position. If throttle setting is less than full, the engine speed could remain less than 9000 R.P.M. and prohibit automatic overspeed protection.

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.

After stopping the pump, remove or ground 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 approx-

imately 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 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.
//
////////////////////////////////////
    
```

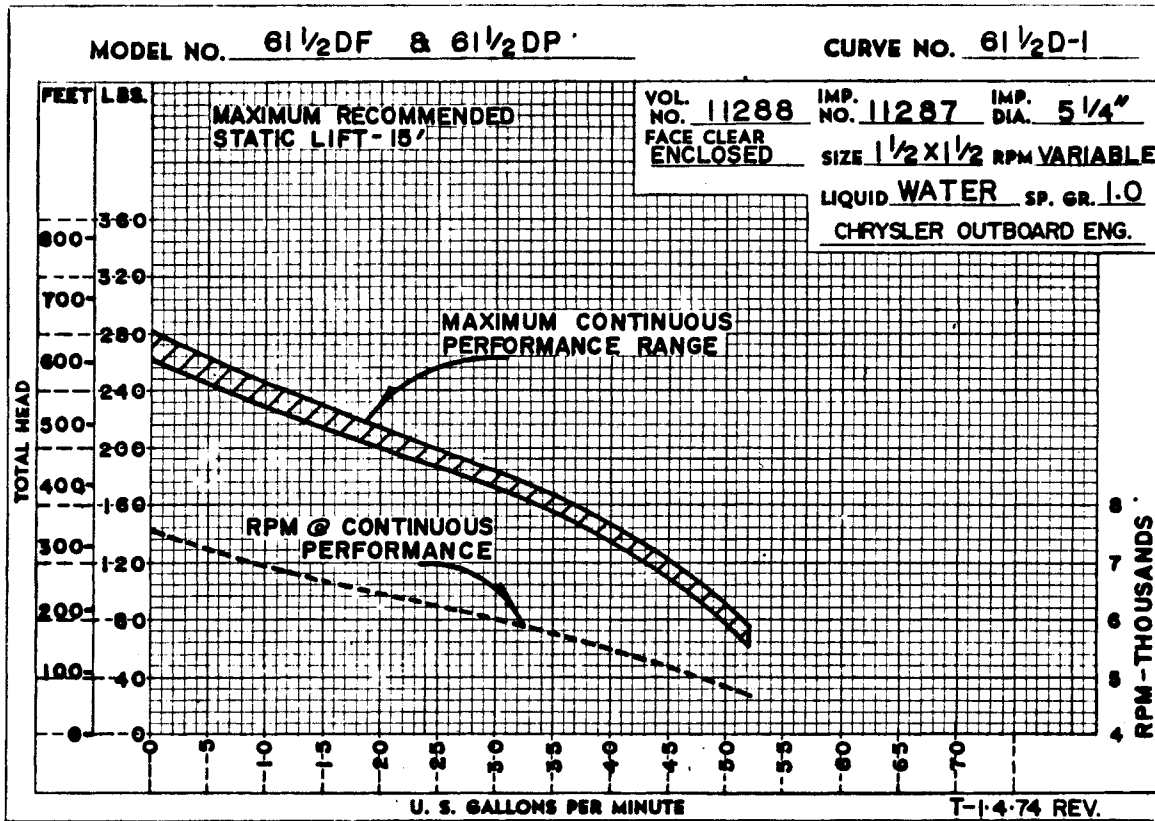
For specific instructions on engine troubleshooting or repair, see the engine manual.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
ENGINE FAILS TO START	Ignition switch off.	Move ignition switch to "on".
	Spark plug contaminated.	Clean or replace plug; reset gap.
	No fuel to engine or fuel contaminated.	Check fuel tank level; vent tank; purge air from fuel line; clean fuel filters. Check fuel for proper oil mix; check for contamination.
	Engine flooded.	Dry spark plug; adjust carburetor; see engine manual.
	Engine electrical system malfunctioning.	Check engine wiring. Remove fan housing and flywheel to check breaker points, coil, condenser, etc.
	Automatic overspeed switch malfunctioning.	Remove ground wire from switch and check for spark. Replace if spark is weak.
	Spark arrestor plugged.	Clean screen after each 10 hours of operation.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP FAILS TO PRIME	<p>Auxiliary priming device faulty or improperly installed.</p> <p>Air leak in suction line.</p> <p>Lining of suction hose collapsed.</p> <p>Leaking or worn seal or pump gasket.</p> <p>Suction lift or discharge head to high.</p> <p>Strainer clogged.</p>	<p>Repair priming device or check installation.</p> <p>Correct leak.</p> <p>Replace suction hose.</p> <p>Check pump vacuum. Replace leaking or worn seal or gasket.</p> <p>Check piping installation and reduce suction lift and/or discharge head.</p> <p>Check strainer and clean if necessary.</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>Discharge line clogged or restricted; hose kinked.</p> <p>Impeller or other wearing parts worn or damaged.</p> <p>Impeller clogged.</p> <p>Pump speed too slow.</p> <p>Suction lift or discharge head to high.</p> <p>Leaking or worn seal or pump gasket.</p>	<p>Correct leak.</p> <p>Check installation and correct submergence as needed.</p> <p>Replace suction hose.</p> <p>Check discharge lines; straighten hose.</p> <p>Replace worn or damaged parts. Check that impeller is properly centered and rotates freely.</p> <p>Free impeller of debris.</p> <p>Check engine output; consult engine operation manual.</p> <p>Check piping installation and reduce suction lift and/or discharge head.</p> <p>Check pump vacuum. Replace leaking or worn seal or gasket.</p>
PUMP REQUIRES TOO MUCH POWER	<p>Exceeding operating limits.</p> <p>Liquid solution too thick.</p>	<p>See performance curves in PUMP MAINTENANCE AND REPAIR.</p> <p>Dilute if possible.</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 61 1/2 DP

*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.

SECTIONAL DRAWING

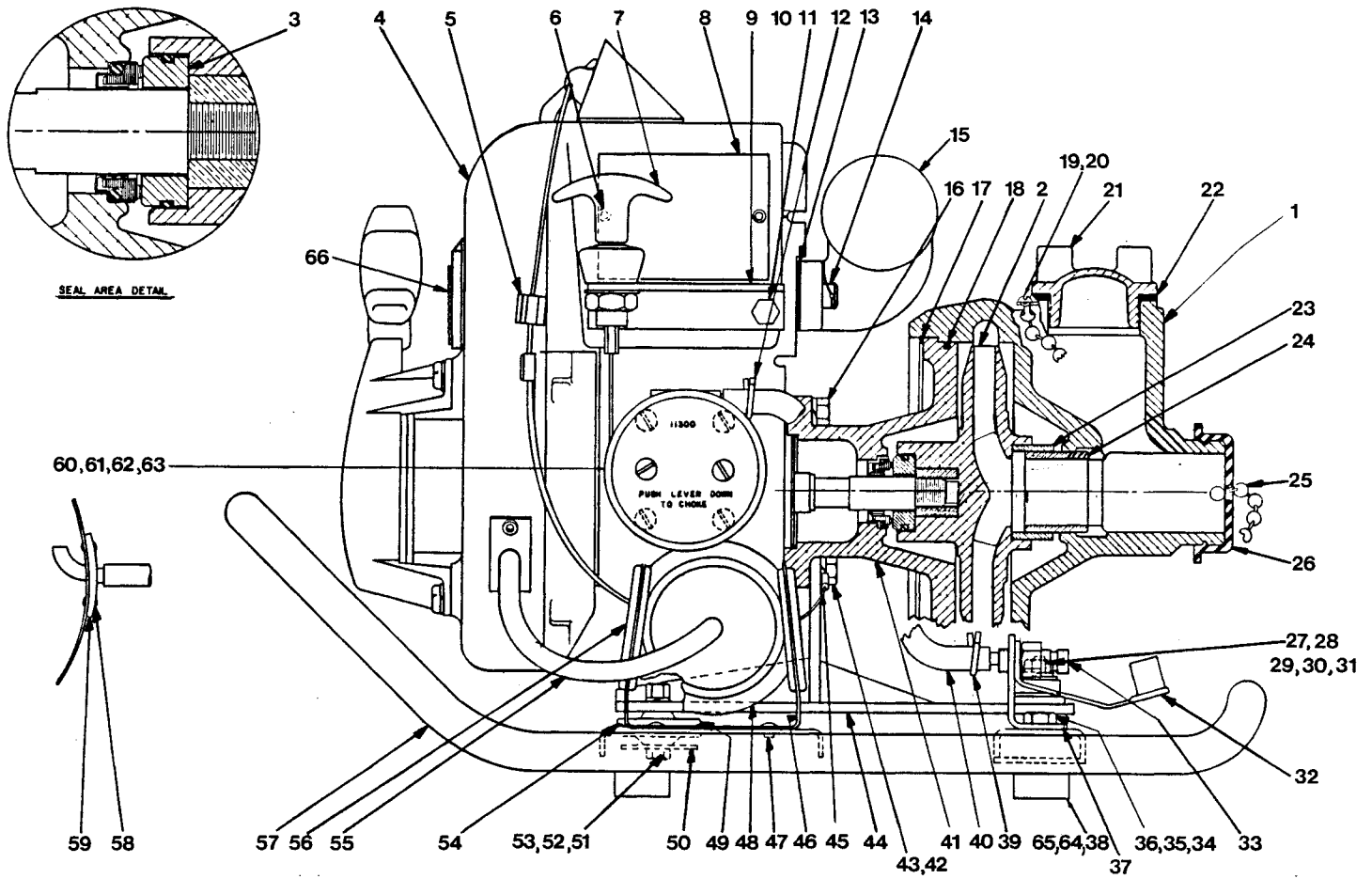


Figure 1. Pump Model 61 1/2 DP

**PARTS LIST
PUMP MODEL 61 1/2 DP
(From S/N 779048 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	ITEM NO.	PART NAME	PART NUMBER	MATL CODE	QTY
1	PUMP CASING	11288-A	1305E	1	45	WIRE ASSY	11713	-----	1
2	*IMPELLER	11287	13055	1	46	MOUNTING BRACKET	11723	15090	1
3	*SEAL ASSY	S01734	-----	1	47	POP RIVET	11703-A	13990	2
4	CHRYSLER ENG	29114-024	-----	1	48	PRESSURE SWITCH	11691	-----	1
5	WIRE CLIP	21183-501	-----	1	49	VIBRATION MOUNT	S01785	-----	1
6	POP RIVET	11703	13990	2	50	SNUBBING WASHER	S01786	-----	1
7	THROTTLE CONTROL	11298-A	-----	1	51	HEX HD CAPSCREW	B00405	15991	1
8	NAME PLATE	2613-CW	13990	1	52	LOCKWASHER	J00004	15991	1
9	THROTTLE BRKT	11295-A	13135	1	53	HEX NUT	D00004	15991	1
10	HEX HD CAPSCREW	B00404	15991	2	54	POP RIVET	11703-A	13990	4
11	LOCKWASHER	J00004	15991	2	55	FUEL LINE	11308-B	-----	1
12	HOSE CLAMP	S01788	-----	1	56	GROMMET	S01792	-----	2
13**	EXHAUST GASKET	29174-121	-----	1	57	FRAME	11697	24004	1
14	SOCKET HD CAPSCREW	21472-276	-----	2	58	POP RIVET	11703-A	13990	2
15	MUFFLER	38638-007	13055	1	59	ADAPTOR ASSY	11699	24030	1
16	HEX HD CAPSCREW	B00504	15991	2	60	CAP	11300	13050	1
17	RETAINING RING	S01750	-----	1	61	SCREEN	11300-A	15999	1
18	*INTERM O-RING	S01733	-----	1	62	RD HD MACH SCREW	X#10-03 1/2S	14990	2
19	ROUND HD MACH SCREW	X#10-02-S	15991	1	63	T TYPE LOCKWASHER	AK#00010	15991	2
20	LOCKWASHER	J#00010	15991	1	64	HEX NUTS	D00005	15991	4
21	FILL CAP	1322	13055	1	65	LOCKWASHER	J00005	15991	4
22	*FILL CAP GASKET	1322-G	19100	1	66	CAUTION DECAL	38816-135	-----	1
23	*IMP WEAR RING	11294	14050	1					
24	*VOL WEAR RING	11293	14050	1		NOT SHOWN:			
25	BEAD CHAIN	11290-A	14990	2		CONNECTOR	S01790	-----	1
26	PROTECTOR CAP	11392	19220	2		METALCAL	11411-A	00000	1
27	HEX HD CAPSCREW	B00407	15991	2		FUEL TANK	11424-B	-----	1
28	LOCKWASHER	J00004	15991	2		STRAINER	S01737	-----	1
29	FLAT WASHER	K00004	15991	6		SPARK PLUG	S01756	-----	1
30	HEX NUT	D00004	15991	2		HOSE GSKT	1459	19100	1
31	VIBRATION MOUNT	S01784	-----	2		WRENCH	11301	15991	1
32	PROTECTOR CAP	11393-B	19220	1		PIPE PLUG	P00004	11990	1
33	ADAPTOR BUSH	S01736-A	-----	1		WARNING DECAL	2613-FF	-----	1
34	HEX HD CAPSCREW	B00503	15991	1					
35	LOCKWASHER	J00005	15991	1		OPTIONAL:			
36	HEX NUT	D00005	15991	1		HAND PRIMER	13347	-----	1
37	FUEL LINE BRCKT	11309	15991	1		SILENCING MUFFLER	46211-011	-----	1
38	BUMPER	1325-B	24010	4		DRAIN COCK	S00298	-----	1
39	HOSE CLAMP	S01788	-----	1		BACK PACK HARNESS	S01745-A	-----	1
40	FUEL LINE	11308	-----	1		BALL VALVE	S01866	-----	1
41	INTERMED BRACKET	11286-A	13055	1		(1 1/2" NPSH)			
42	HEX HD CAPSCREW	B00505	15991	2		QUICK CONN PLUG	S02096	-----	1
43	LOCKWASHER	J00005	15991	4		FUEL LINE	S02106	-----	1
44	MOUNTING BRACKET	11289-A	13135	1					

**Furnished with the engine.

*INDICATES PARTS RECOMMENDED FOR STOCK

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

CANADIAN SERIAL NO AND UP

PUMP AND SEAL DISASSEMBLY AND REASSEMBLY

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

The pump is powered by a U.S. Marine Corp. (Chrysler/West Bend), model 82039 two-cycle gasoline engine. For maintenance or service information on the engine, see the engine manual provided.

Pump Disassembly

WARNING

```

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

```

Switch off the engine ignition and disconnect the suction and discharge hoses.

For access to the impeller (2), and seal assembly (3), remove the hardware (27, 28, 29 and 30) securing the pump casing to the mounting bracket (44).

Use a small screwdriver, or snap ring pliers to remove the snap ring (17) which secures the pump casing to the intermediate bracket (41) and separate the assemblies. The impeller is now accessible.

To remove the impeller, insert a drift pin or similar tool between the vanes and turn the impeller counter-clockwise while holding the engine shaft stationary with a 5/8" open end wrench. Openings in the intermediate bracket provide access to the engine shaft. Be careful not to damage the impeller vanes with the drift pin. Use caution when unscrewing the impeller; tension on the seal spring will be released as the impeller is removed.

Remove the hardware (16, 42, and 43) and pull the intermediate bracket from the engine.

Seal Removal

Place the intermediate bracket on a clean working surface (impeller side down) and press the stationary seal seat from the bore. Use a stiff wire with a hooked end to pull the rotating element from the impeller hub.

Seal Installation

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.**

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 the rotating element o-ring with water or a very **small** amount of oil, and apply a drop of light lubricating oil on the finished faces. Assemble the seal as follows, (see Figure 2).

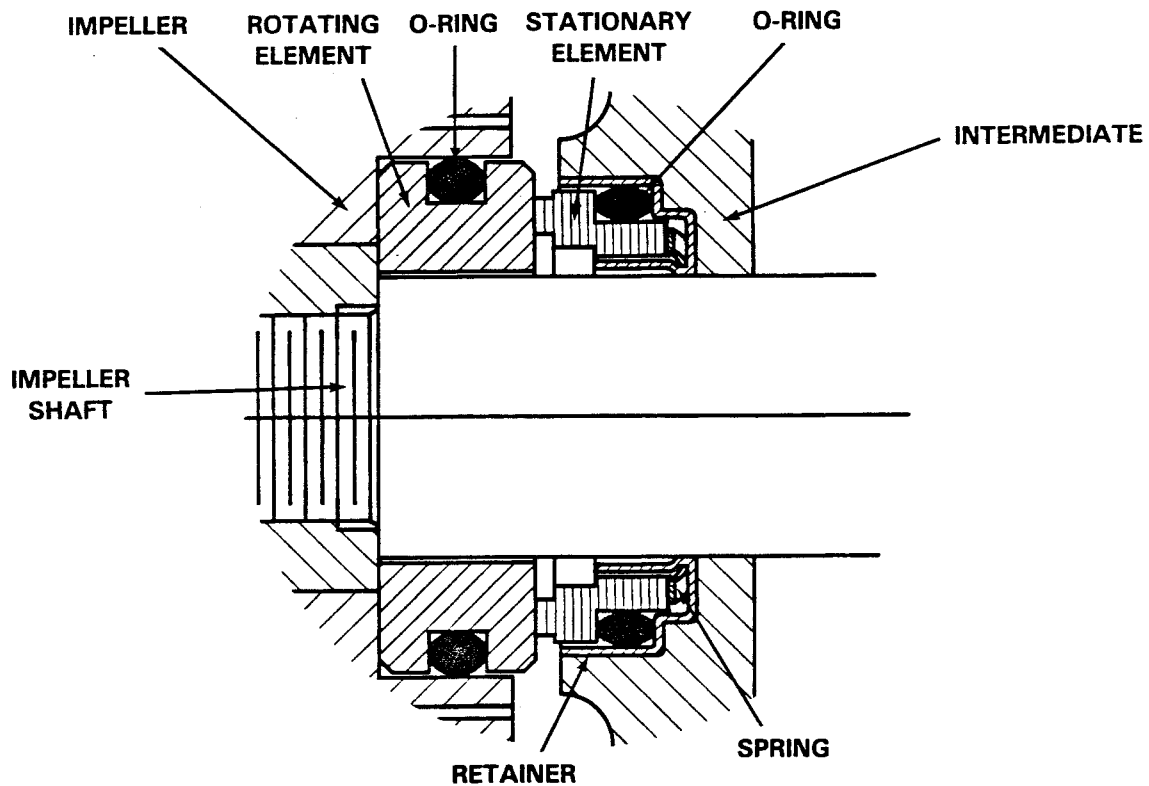


Figure 2. S01734 Seal Assembly

CAUTION

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

Remove the rotating element and related components from the stationary retainer. Apply a light coat of Primer-T and Loctite Pipe Sealant HVV (or equivalent compound) on the inside diameter of the intermediate bracket and press the stationary retainer into the bore. After it is fully seated, install the wavy washer, lubricate the O-ring, and align the notch in the stationary element with the lug in the retainer.

Lubricate the rotating element O-ring with light oil and carefully press the rotating element into the impeller hub. Apply a drop of light oil to the finished seal faces.

Pump Reassembly

Secure the intermediate bracket to the engine.

Inspect the impeller wear ring (23), which is a press fit in the impeller. Inspect wear ring (24), which is a press fit in the pump casing. Replace them if cracked or badly worn.

Inspect the impeller, and replace it if cracked or badly worn. Secure the impeller on the shaft, making certain that all the seal components are seated squarely.

Install the intermediate bracket O-ring (18) and lubricate it with light oil.

Slide the pump casing over the intermediate bracket and secure the pump with the snap ring (17).

When tightening the front mounting hardware (27, 28, 29, and 30), loosen the bracket bolts at the engine. Press the pump bracket foot against the frame allowing the rubber vibration mount (31) to bellow out between the bracket and the washer.

Tighten all the mounting hardware and the capscrews securing the pump to the engine.

Turn the shaft to ensure that the impeller rotates freely.

Remove fill cap (21) and fill the casing with clean liquid and tighten hose connections before starting the pump.

LUBRICATION

Seal Assembly

The seal assembly is lubricated by the medium being pumped.

Engine

The engine is lubricated by oil mixed in the fuel. Make certain the fuel and oil are thoroughly mixed prior to use. Consult engine manual for proper mixing ratio.

Engine Maintenance And Repair

Consult the operation manual furnished with the engine for normal maintenance requirements.

Clean the air filter screen (61) as required by service conditions.

**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**