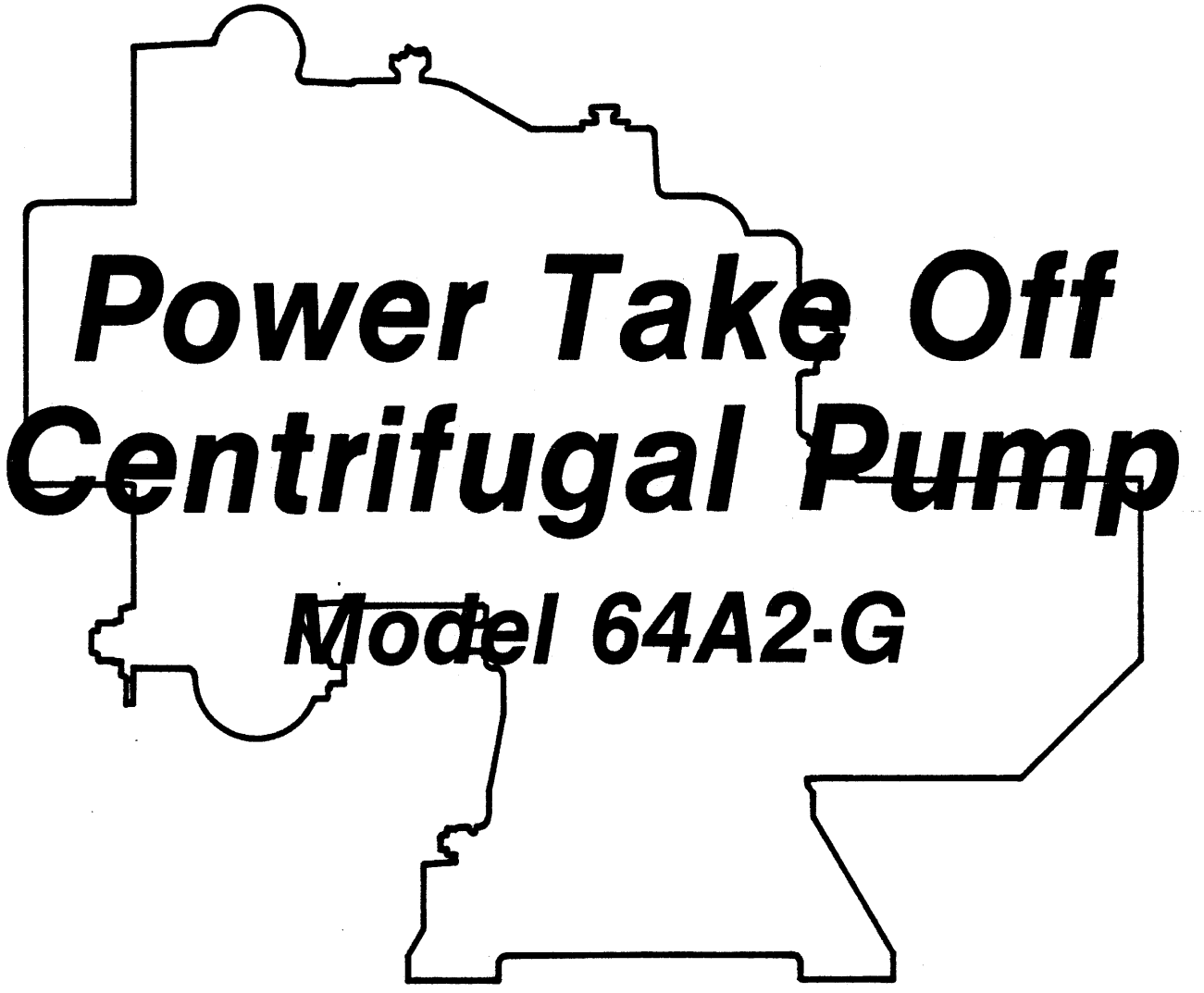
INSTALLATION, OPERATION, PARTS LIST, AND MAINTENANCE MANUAL

A E

GORMAN-RUPP

OM-01420-0P02

February 26, 1981



Power Take Off Centrifugal Pump

Model 64A2-G

THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO
GORMAN-RUPP OF CANADA LIMITED • ST. THOMAS, ONTARIO, CANADA Printed in U.S.A.

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

This pump is a 60 Series, semi-enclosed impeller, centrifugal model with straight-in suction without a suction check valve. This pump is suitable for pumping liquids which do not contain large entrained solids. For specific service, consult your Gorman-Rupp distributor or the Gorman-Rupp Company.

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

or

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

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.

TABLE OF CONTENTS

WARNINGS	Section A
INSTALLATION	Section B
OPERATION	Section C
TROUBLESHOOTING	Section D
MAINTENANCE AND REPAIR	Section E
WARRANTY	

WARNINGS

THESE WARNINGS APPLY TO 60 SERIES PUMPS WITH POWER TAKE OFF DRIVE.

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 any liquids for which this pump has not been designed.

After the pump has been installed, make certain that the pump and all piping connections are secure before attempting to operate it.

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

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

Overheated pumps can cause severe burns and injury. If overheating of the pump casing occurs:

1. Stop the pump immediately.
2. Allow the pump to cool.
3. Refer to instructions in this manual before restarting the pump.

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

INSTALLATION

Since pump installations vary, this section is intended only to summarize recommended installation practice. If there are any questions concerning a specific installation, 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.

a. Check the pump assembly for cracks, dents, damaged threads, and other obvious damage.

b. Check for and tighten loose bolts, nuts, capscrews, and other attaching hardware. Since gaskets tend to shrink after drying, check for and tighten loose nuts and capscrews securing mating surfaces.

c. Carefully read all tags, decals, and markings on the pump assembly, and perform all duties indicated. Note the direction of rotation indicated on the pump. Check that the pump shaft rotates in the required direction.

CAUTION

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

d. Check all lubricant levels and lubricate as necessary. Refer to 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 being pumped. Level mounting is essential for proper operation. It may be necessary to support or shim the pump for level operation.

Lifting

WARNING

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

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

CAUTION

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

SUCTION AND DISCHARGE PIPING

Materials

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

Line Configuration

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

Connections to Pump

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

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.

SUCTION LINES

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

Fittings

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

Strainers

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

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

Sealing

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

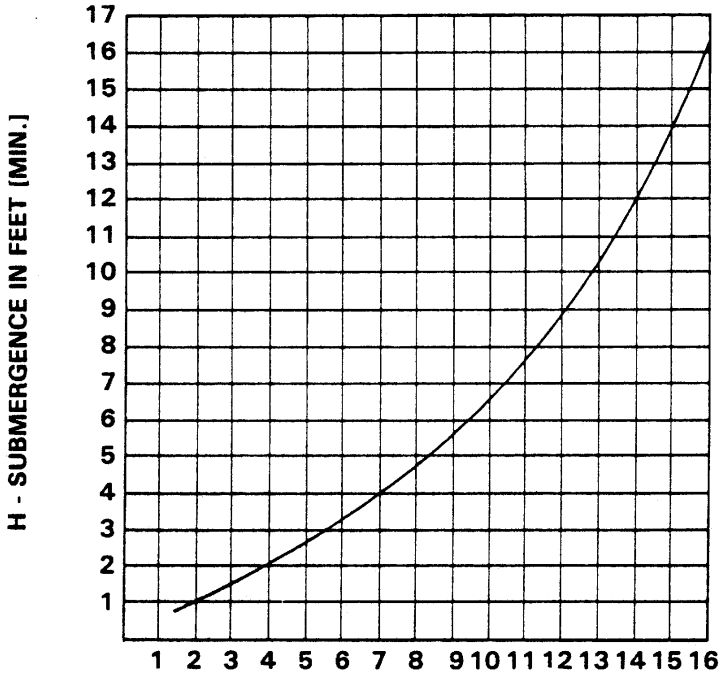
If there is a liquid flow from an open pipe into the sump, the flow should be kept away from the suction inlet because the inflow will carry air down into the sump, and air entering the suction line will reduce pump efficiency.

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 1 shows recommended minimum submergence vs. velocity.



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

Figure 1. Recommended Minimum Suction Line Submergence Vs. Velocity

DISCHARGE LINES

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

Valves

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

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

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

WARNING

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

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

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

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

WARNING

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

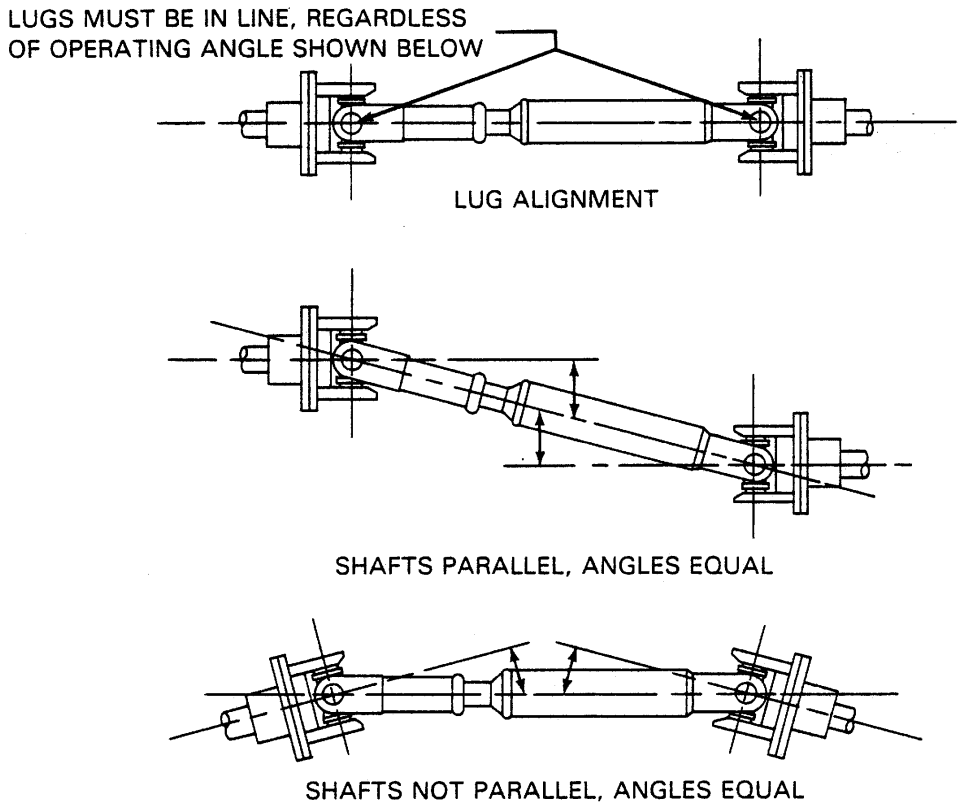


Figure 2. Proper Installation and Alignment of Universal Assembly

OPERATION

WARNING

Do not attempt to pump any liquids for which this pump has not been designed.

PRIMING

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

This pump should never be operated unless there is liquid in the volute.

CAUTION

Never operate this 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.

Add liquid to the volute housing:

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

WARNING

After filling the volute housing, 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.

STARTING

Rotation

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

CAUTION

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

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

Leakage

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

Overheating

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

WARNING

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

Strainer Check

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

Pump Vacuum Check

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

With the pump inoperative, install a vacuum gauge in the suction side of the pump, 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 or gasket.

Open the suction line, and read the vacuum gauge with the pump primed and at operating speed. Shut off the pump, and read the gauge again to determine if the vacuum remains at the maximum developed by the pump. If the vacuum falls off rapidly, an air leak exists; 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 pump rotating parts.

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

BEARING TEMPERATURE CHECK

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

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

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

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

TROUBLESHOOTING

WARNING

Before attempting to open or service the pump:

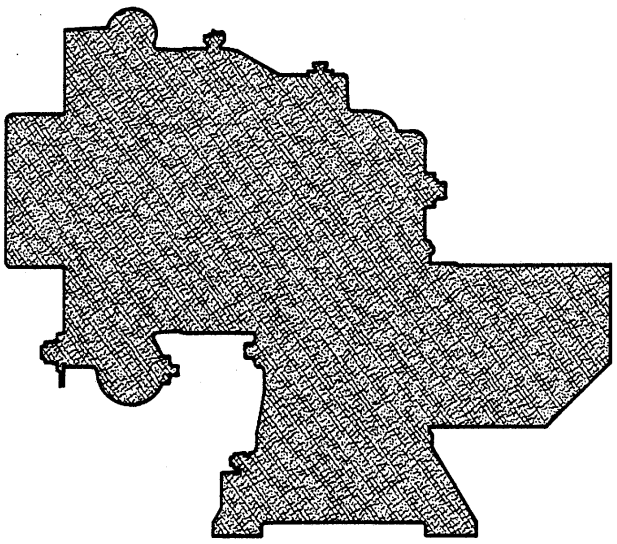
1. Consult pump service manual.
2. Disconnect the power source to ensure that the pump will remain inoperative.
3. Allow pump to cool if overheated.
4. Close suction and discharge valves.
5. Drain pump.

Trouble	Possible Cause	Probable Remedy
PUMP FAILS TO PRIME	Air leak in suction line.	Correct leak.
	Lining of suction hose collapsed.	Replace suction hose.
	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.
	Strainer clogged.	Check strainer and clean if necessary.
PUMP STOPS OR FAILS TO DE-LIVER RATED FLOW OR PRESSURE	Air leak in suction line.	Correct leak.
	Suction intake not sub-merged at proper level or sump too small.	Check installation and correct as needed. Check submergence chart, Section B.
	Lining of suction hose collapsed.	Replace suction hose.
	Impeller or other wearing parts worn or damaged.	Replace worn or damaged parts. Check that impeller is properly centered and rotates freely.
	Impeller clogged.	Free impeller of debris.
	Pump speed too slow.	Check driver output. Check universal joint drive for slippage.
	Discharge head too high.	Reduce head.
	Suction lift too high.	Reduce suction lift.
	Strainer clogged.	Check strainer and clean if necessary.

Trouble	Possible Cause	Probable Remedy
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE (cont)	Leaking or worn seal or pump gaskets.	Check pump vacuum. Replace leaking or worn seal or pump gaskets.
PUMP REQUIRES TOO MUCH POWER	Pump speed too high.	Check driver output; check that the universal joint drive is properly installed.
	Discharge head too low.	Adjust discharge valve.
	Liquid solution too thick.	Dilute if possible.
PUMP CLOGS FREQUENTLY	Discharge flow too slow.	Open discharge valve fully to increase flow rate, and run power source at maximum governed speed.
EXCESSIVE NOISE	Cavitation in pump.	Reduce suction lift and/or friction losses in suction line.
	Pumping entrained air.	Locate and eliminate source of air bubble.
	Pump or drive not securely mounted.	Secure mounting hardware.
	Impeller clogged or damaged.	Clean out debris; replace damaged parts.
BEARINGS RUN TOO HOT	Bearing temperature is high, but within limits.	Check bearing temperature frequently to monitor any increase.
	Low or incorrect lubricant.	Check for proper type and level of lubricant.
	Suction and discharge lines not properly supported.	Check piping installation for proper support.
	Universal joint drive misaligned.	Align drive.

Power Take Off Centrifugal Pump

Model 64A2-G



Maintenance and replacement of the wearing parts will maintain the peak operating efficiency of the pump.

SECTIONAL DRAWING

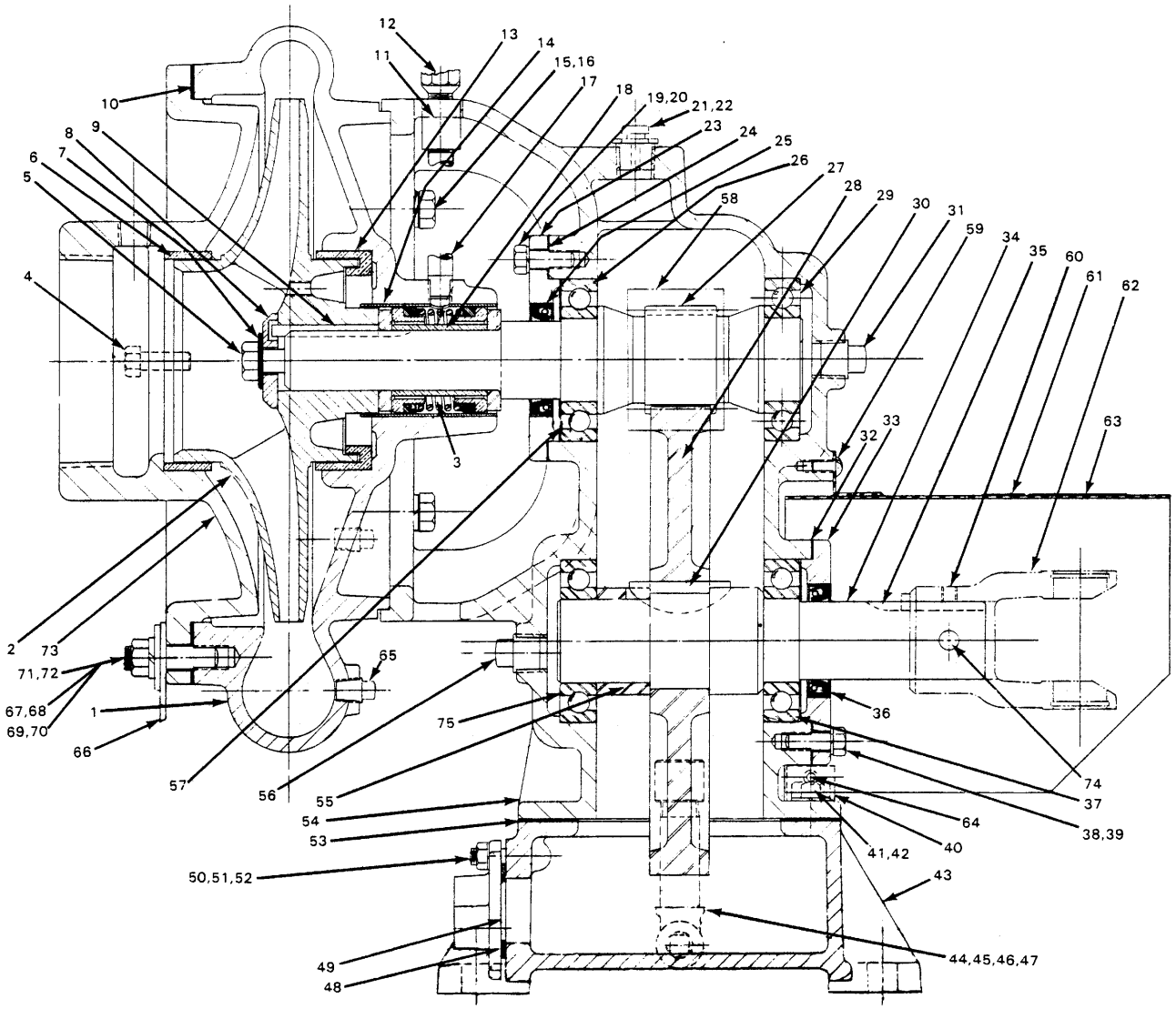


Figure 1. Pump Model 64A2-G

PARTS LIST

PUMP MODEL 64A2-G

(From S/N 847097 up)

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

ITEM NO.	PART NAME	PART NUMBER	MATL CODE	QTY
1	VOLUTE HOUSING	6411	10010	1
2	★IMPELLER	6371	10010	1
3	★SEAL ASSEMBLY	GS-1250	–	1
4	HEX HEAD CAPSCREW	B-0604	15991	2
5	IMPELLER CAPSCREW	BT-0806	15990	1
6	★SUCTION HEAD WEAR RING	6402	14000	1
7	IMPELLER LOCKWASHER	J-08	15991	1
8	IMPELLER WASHER	6403	15991	1
9	IMPELLER KEY	N-0409	15990	1
10	★VOLUTE HOUSING GASKET	2202-G	18000	1
11	PIPE COUPLING	AE-04	11990	1
12	GREASE CUP	S-1509	–	1
13	★VOLUTE HOUSING WEAR RING	6520	14000	1
14	★SEAL LINER	2205-A	14080	1
15	HEX HEAD CAPSCREW	B-0805	15991	4
16	LOCKWASHER	J-08	15991	4
17	PIPE NIPPLE	T-0412	15070	1
18	DOES NOT APPLY			
	GEARBOX ASSEMBLY	GRP44-05	–	1
19	HEX HEAD CAPSCREW	B-0603	15991	4
20	LOCKWASHER	J-06	15991	4
21	AIR VENT FITTING	S-2162	–	1
22	REDUCER PIPE BUSHING	AP-0602	15990	1
23	BEARING CAP	6404	10010	1
24	★BEARING CAP GASKET	6404-G	18000	1
25	★OIL SEAL	S-959	–	1
26	★BALL BEARING	S-1096	–	1
27	★PINION SHAFT	6364	10090	1
28	★DRIVE GEAR	6420	–	1
29	★BALL BEARING	S-1096	–	1
30	DRIVE GEAR KEY	AV-1622	15990	1
31	PIPE PLUG	P-06	11990	1
32	★BEARING CAP GASKET	6404-G	18000	1
33	BEARING CAP	6404	10010	1
34	★DRIVE SHAFT	6405	16040	1
35	SHAFT KEY	N-0608	15990	1
36	★OIL SEAL	S-959	–	1
37	★BALL BEARING	S-1096	–	1
38	HEX HEAD CAPSCREW	B-0603	15991	4
39	LOCKWASHER	J-06	15991	4
40	BRACKET	6408-C	15990	1
41	HEX HEAD CAPSCREW	B-0804	15991	8
42	LOCKWASHER	J-08	15991	8
43	BASE	6409	10010	1
44	SERVICE TEE	US-08	11990	1
45	GEARBOX DRAIN PLUG	P-08	11990	1
46	PIPE NIPPLE	T-0812	15070	1
47	DIP STICK	42111-319	–	1
48	★COVER PLATE GASKET	6518-G	18000	1
49	COVER PLATE	6518-A	15020	1
50	STUD	C-0505	15991	6
51	LOCKWASHER	J-05	15991	6
52	HEX NUT	D-05	15991	6
53	★GEARBOX GASKET	6409-G	18000	1
54	GEARBOX HOUSING	6412	10010	1
55	SPACER SLEEVE	6414	15990	1
56	PIPE PLUG	P-06	11990	1
57	★SHAFT SHIMS	8544	15990	2
58	GUARD WARNING	38816-063	–	1
59	ROUND HEAD MACHINE SCREW	X-0402	15991	1
60	ALLEN HEAD SETSCREW	GA-0601½	15990	1
61	UNIVERSAL GUARD	6408	15990	1
62	UNIVERSAL ASSEMBLY	S-1413-A	–	1
63	GUARD WARNING	38816-062	–	1
64	PAN HEAD TAPSCREW	BP#14-02	15990	2
65	VOLUTE DRAIN PLUG	P-04	11990	1
66	VOLUTE SUPPORT	6415	15990	1
67	LOCKWASHER	J-08	15991	4
68	FLAT WASHER	K-08	15991	8
69	STUD	C-0807	15991	8
70	STUD	C-0809	15991	4
71	HEX NUT	D-08	15991	12
72	DOES NOT APPLY			
73	SUCTION HEAD	6407	10010	1
74	COTTER PIN	M-0616	15990	1
75	BALL BEARING	S-1096	–	1
NOT SHOWN:				
	NAME PLATE	2613-R	13990	1
	AXLE BRACKET	6417-A	15990	1
	AXLE BRACKET	6417-B	15990	1
	BASE	6419	24000	1
	AXLE	6423	15000	1
	MOUNTING HARDWARE			
	HEX HEAD CAPSCREW	B-0807	15991	4
	HEX NUT	D-08	15991	4
	LOCKWASHER	J-08	15991	4
	FLAT WASHER	K-08	15991	6
	HEX HEAD CAPSCREW	B-0805	15991	6
	HEX NUT	D-08	15991	6
	SQUARE HEAD SETSCREW	G-0604	15990	2
	LOCKWASHER	J-04	15991	1
	LOCKWASHER	J-08	15991	6
	FLAT WASHER	K-08	15991	2
	COTTER PIN	M-0306	15990	2
	PIPE PLUG	P-06	11990	1
	PRESSURE GAUGE	S-0180	–	1
	STRAINER	S-1528	–	1
	FLAT WASHER	S-1532	–	4
	PNEU WHEEL	S-2005	–	2
	STREET ELBOW	RS-04	11990	1
	STREET ELBOW	RS-06	11990	1
	SERVICE TEE	US-06	11990	1
	CHECK VALVE ASSEMBLY	GRP14-12-A	–	1
	ADJUSTING SHIM SET	669-A	17000	1
	SPRING BRACKET	3844	14000	1
	SPACER	3855	15070	1
	PACKING NUT	5252	14100	1
	★GASKET	5252-G	18000	1
	ARM WEIGHT	5253-A	15990	1
	SHAFT	5263	17010	1
	★EXTERNAL SPRING	6270	16080	1
	HANDLE	6334	11000	1
	★BUSHING	11573	15030	1
	CHECK VALVE BODY	6837	10010	1
	VALVE WEIGHT	11588	10010	1
	★CHECK VALVE GASKET	11589-G	18000	1
	★CHECK VALVE MOLD	12391	24010	1
	HEX HEAD CAPSCREW	B-0603½	15991	2
	HEX HEAD CAPSCREW	B-0606	15991	2
	STUD	C-1009	15991	4
	HEX NUT	D-10	15991	4
	LOCKWASHER	J-06	15991	4
	FLAT WASHER	K-06	15991	2
	PIPE PLUG	P-04	11990	2
	ROLL PIN	S-0630	–	2
	★O-RING	S-0942	–	1
	NYLOCK CAPSCREW	BT-0806½	15991	1
	FLAT WASHER	KE-08	15991	2
	DRIV-LOK PIN	21142-445	–	1
	HAND PRIMER ASSEMBLY	GRP43-02-A	–	1
	PRIMING BRACKET	7723	15990	1
	PIPE NIPPLE	2434	15070	2
	HEX HEAD CAPSCREW	B-0602½	15991	4
	LOCKWASHER	J-06	15991	4
	HOSE CLAMP	S-0887	–	2
	DIAPHRAGM PRIMER	S-1252	–	1
	REDUCER PIPE BUSHING	AP-0806	11990	1
	HOSE 5/8 x 22	31412-113	–	1
	IMPELLER SHIM SET	37-J	17090	1

★INDICATES PARTS RECOMMENDED FOR STOCK

PUMP, SEAL, AND GEARBOX DISASSEMBLY AND REASSEMBLY

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

Pump Disassembly

WARNING

Before attempting to open or service the pump:

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

Disconnect the power source, making certain that it will remain inoperative while the pump is being serviced, and close all connecting valves.

Remove the volute housing drain plug (65) to drain the pump. Clean and reinstall the drain plug.

For access to the impeller (2) and seal assembly (3), disconnect the suction piping, and disengage the hex nuts (71) securing the suction head (73) to the volute housing (1). Remove the suction head.

To remove the impeller, disengage the impeller capscrew (5) and impeller washers (7 and 8). Slide the impeller off the shaft, retaining the impeller key (9). Use caution when sliding the impeller off the shaft; pressure on the seal spring will be released as the impeller is removed.

Seal Disassembly

Before removing the seal assembly, turn the cross arm on the seal grease cup (12) clockwise until it rests against the cover (see figure 3). This will prevent the grease in the cup from escaping after the seal is removed.

Using a stiff wire with a hooked end if necessary, remove the seal components, and the shaft sleeve (18).

Clean the seal cavity and 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

If the gearbox is to be serviced or disassembled, do not reassemble the seal or the pump at this time.

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

Inspect the seal components for wear, scoring, grooves, and other damage that might cause leakage. If any components are worn, replace the complete seal; never mix old and new seal parts.

CAUTION

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

See figure 2 for the correct order of installation of seal components.

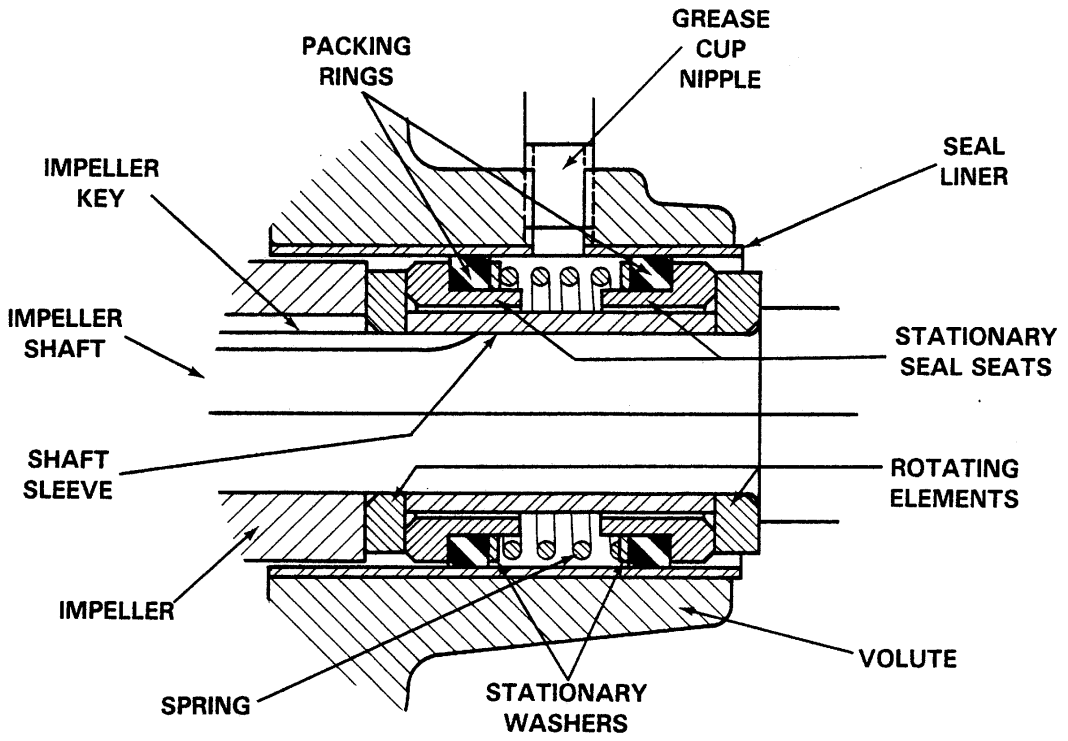


Figure 2. GS-1250 Seal Assembly

Inspect the seal liner (14), which is a press fit, and replace it if worn or grooved. If the seal liner is replaced, a hole must be drilled in it after installation to permit the flow of lubricant from the grease cup to the seal assembly. Deburr the hole after drilling, and clean the seal liner.

Clean and polish the shaft sleeve (18),

Install the shaft sleeve. Place a drop of light lubricating oil on the lapped faces of the seal, and lubricate the packing rings with soft grease or oil. Install the seal as a complete unit.

Pump Reassembly

Inspect the volute housing wear ring (13) and the suction head wear ring (6), both of which are press fits, and replace them if scored or worn.

Inspect the impeller, and replace it if cracked or badly worn. Reinstall the impeller key, and position the impeller on the shaft. Reinstall the impeller washers; reinstall and tighten the impeller capscrew.

For maximum pump efficiency, the impeller must be centered with the volute scroll.

Secure the suction flange to the volute housing.

Turn the shaft to check that the impeller rotates freely. If the impeller binds, add or remove volute housing gaskets (10) until the impeller rotates freely.

If the pump is to be put into service at this time, see LUBRICATION.

Fill the volute, connect the suction piping, and open all connecting valves. Make certain that all piping connections are tight before starting the pump.

Gearbox Disassembly

Refer to **Pump Disassembly** and **Seal Disassembly**. Close all connecting valves, drain the pump, and disconnect the suction piping. Remove the suction flange, impeller, and seal assembly.

Drain the gearbox by removing the drain plug (45). Clean and reinstall the plug after draining.

To separate the gearbox from the pump, disengage the hex head capscrews (15) securing the assemblies.

Remove the universal guard (61) by disengaging the round head machine screw (59) and pan head tapscrew (64) securing the guard to the gearbox. To remove the universal assembly (62), disengage the allen head setscrew (60) and the cotter pin (74), and slide the assembly off the drive shaft (34), retaining the shaft key (35).

Disengage hex head capscrews (41) securing the gearbox to the base (43), and remove the base.

Disengage the hex head capscrews (38) securing the outboard bearing cap (33) to the gearbox housing (54), and remove the bearing cap and oil seal (36).

Remove the pipe plug (56) at the inboard end of the gearbox, and use an arbor press to force the drive shaft (34) and bearings from the gearbox. Retain the drive shaft spacer sleeve (55), drive gear (28), and drive gear key (30) as the shaft comes free.

Disengage hex head capscrews (19) securing the inboard bearing cap (23) to the gearbox housing, and remove the bearing cap, oil seal (25) and shaft shims (57).

Remove the pipe plug (31) at the outboard end of the gearbox, and use an arbor press to force the pinion shaft (27) and bearings from the gearbox.

Gearbox Reassembly

Inspect the shafts, bearings, and drive gear, and replace as necessary.

Clean the shafts and the bearings 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.

Reinstall the pinion shaft and bearings in the gearbox housing, making certain that the bearings seat squarely in their respective bores.

Install the shaft shim set. Inspect the inboard oil seal, and replace as necessary. Reinstall the oil seal in the inboard bearing cap, positioning the lip as shown in figure 2. Replace the bearing cap gasket (24), and secure the bearing cap to the gearbox housing.

Recommended shaft end play is .005 to .012 inch. Measure the end play, and add or remove shaft shims as necessary.

Reinstall the pipe plug at the outboard end of the gearbox.

Install the inboard drive shaft bearing in its respective bore in the gearbox housing, making certain that it seats squarely. Install the drive gear key, position the drive shaft in the gearbox housing, and reinstall the drive shaft, drive gear, and drive shaft spacer, making certain that the drive gear engages the pinion shaft.

Reinstall the outboard bearing snugly against the shoulder of the drive shaft. Inspect the outboard oil seal, and replace as necessary. Reinstall the oil seal in the outboard bearing cap, positioning the lip as shown in figure 2.

Replace the bearing cap gasket (32), and secure the bearing cap to the gearbox housing.

Position the drive shaft key, and reinstall the universal assembly on the drive shaft. Secure the cotter pin, and tighten the allen head setscrew. Install the universal guard, and tighten the round head machine screw and pan head setscrew.

Replace the gearbox gasket (53), and secure the base to the gearbox assembly. Secure the volute housing to the gearbox assembly.

Refer to **Seal Reassembly** and **Pump Reassembly**, and reinstall the seal assembly, impeller and suction flange.

Refer to LUBRICATION, and lubricate the gearbox assembly.

Fill the volute, connect the suction piping, open all connecting valves, and make certain that all piping connections are tight before starting the pump.

LUBRICATION

Seal Assembly

The seal is lubricated by the medium being pumped.

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

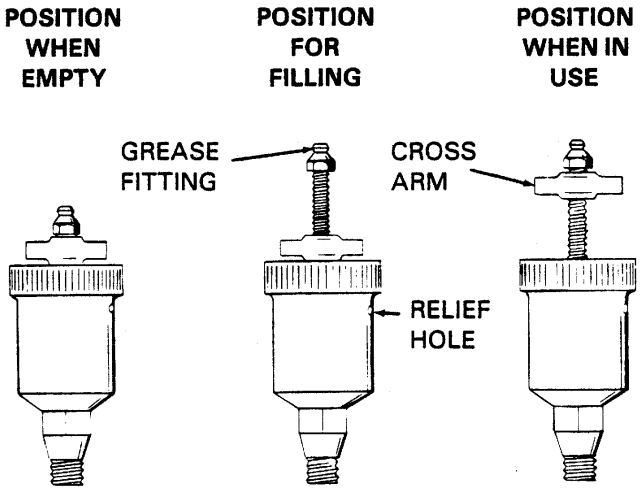


Figure 3. Automatic Lubricating Grease Cup

Gearbox

Remove the bushing and air vent (21 and 22) at the top of the gearbox, and add 4 ounces of Molykote M or equivalent gear lubricant to the gearbox. Add SAE No. 90 non-detergent motor oil until the dip stick (47) indicates the proper lubrication level. Clean and reinstall the bushing and air vent.

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

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