OM-03309-OP01
November 7, 1989

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

WITH PARTS LIST

0 SERIES PUMPS

GORMAN-RUPP

MODELS
08C1-GA
08D1-GA

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

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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 manual covers 0 Series, enclosed impeller, centrifugal model pumps, with straight-in suction, without a suction check valve. Each pump is designed for vehicular mounting in petroleum service. The basic material of construction for wetted parts aluminum, with cast iron wearing parts.

The pump is close-coupled to a gearbox speed increaser with a 2.19:1 ratio. Power is transmitted to the gearbox through a customer-installed universal shaft assembly.

This manual covers the following models:

08C1-GA **08D1-GA**

Refer to the parts lists in Section E for specific parts for your model.

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 power source, contact the power source manufacturer's local dealer or representative.

The following are used to alert maintenance personnel to procedures which require special attention, to those which could damage equipment, and to those which could be dangerous to personnel:

NOTE

Instructions to aid in installation, operation, 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 INJURY OR DEATH TO PERSONNEL, AND DESCRIBE THE PROCEDURE REQUIRED AND THE INJURY WHICH COULD RESULT FROM FAILURE TO FOLLOW THE PROCEDURE.

WARNINGS - SECTION A

THESE WARNINGS APPLY TO 0 SERIES PUMPS. REFER TO THE MANUAL ACCOMPANYING THE POWER SOURCE BEFORE ATTEMPTING TO BEGIN OPERATION.

WARNING

BEFORE ATTEMPTING TO OPEN OR SERVICE THE PUMP:

1. FAMILIARIZE YOURSELF WITH THIS MANUAL.
2. TURN OFF THE VEHICLE IGNITION AND REMOVE THE KEY, OR TAKE OTHER ACTION TO ENSURE THAT THE PUMP WILL REMAIN INOPERATIVE.
3. ALLOW THE PUMP TO COOL IF OVERHEATED.
4. CHECK THE TEMPERATURE BEFORE OPENING ANY COVERS, PLATES, OR PLUGS.
5. CLOSE THE SUCTION AND DISCHARGE VALVES.
6. VENT THE PUMP SLOWLY AND CAUTIOUSLY.
7. DRAIN THE PUMP.

WARNING

THIS PUMP IS DESIGNED FOR VEHICULAR MOUNTING IN PETROLEUM SERVICE. DO NOT ATTEMPT TO PUMP CORROSIVE MATERIALS, OR ANY LIQUIDS WHICH MAY DAMAGE THE PUMP OR ENDANGER PERSONNEL AS A RESULT OF PUMP FAILURE.

WARNING

IF THIS PUMP IS USED WITH VOLATILE AND/OR FLAMMABLE LIQUIDS, BE CERTAIN PROPER SAFETY PRACTICES ARE FOLLOWED BEFORE OPERATING OR SERVICING THE PUMP. PROVIDE ADEQUATE VENTILATION, PROHIBIT SMOKING, WEAR STATIC-RESISTANT CLOTHING AND SHOES. CLEAN UP ALL FUEL SPILLS IMMEDIATELY AFTER OCCURRENCE.

WARNING

DO NOT OPERATE THE PUMP AGAINST A CLOSED DISCHARGE VALVE FOR LONG PERIODS OF TIME. IF OPERATED AGAINST A CLOSED DISCHARGE VALVE, PUMP COMPONENTS WILL DETERIORATE, AND THE LIQUID COULD COME TO A BOIL, BUILD PRESSURE, AND CAUSE THE PUMP CASING TO RUPTURE OR EXPLODE.

WARNING

IF THIS PUMP IS USED WITH VOLATILE AND/OR FLAMMABLE LIQUIDS, OVERHEATING MAY PRODUCE DANGEROUS FUMES. TAKE PRECAUTIONS TO ENSURE THE AREA SURROUNDING THE PUMP IS ADEQUATELY VENTILATED. ALLOW THE PUMP TO COOL AND USE EXTREME CAUTION WHEN VENTING THE PUMP, OR WHEN REMOVING COVERS, PLATES, PLUGS, OR FITTINGS.

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.

WARNING

AFTER THE VEHICLE IS POSITIONED FOR PUMP MAINTENANCE, BLOCK THE WHEELS AND SET THE EMERGENCY BRAKE BEFORE ATTEMPTING TO DISCONNECT THE DRIVE SHAFT OR REMOVE THE PUMP. BE SURE THE PUMP IS PROPERLY REINSTALLED AND SECURE BEFORE OPERATION.

WARNING

THE GEARBOX PROVIDED ON THIS PUMP IS DESIGNED FOR OPERATION AT A MAXIMUM INPUT SPEED OF 1800 RPM (08D1-GHH) OR 1850 RPM (08C1-GHH). IF OPERATED AT A HIGHER RPM, PUMP OR GEARBOX COMPONENTS MAY BE DESTROYED.

CAUTION

NEVER RUN THE PUMP DRY OF PUMPING MEDIUM. THERE MUST BE A SUPPLY OF LIQUID TO THE PUMP AT ALL TIMES TO PREVENT DESTRUCTION OF THE SHAFT SEAL FACES.

INSTALLATION - SECTION B

Review all WARNINGS in Section A.

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

WARNING

DO NOT TEST OR OPERATE YOUR PUMP AND INTEGRAL GEARBOX BEFORE READING THE INSTALLATION AND OPERATION INSTRUCTIONS IN THIS MANUAL.

These pumps are self-priming centrifugal models with an integral gearbox assembly. Each of the pumps covered by this manual is designed for vehicular mounting in petroleum service, where the liquid is supplied to the pump under pressure. The integral gearbox is designed to be driven through the vehicle transfer case by a customer-supplied power take-off shaft.

The pump casing and 8-inch victaulic suction flange may be rotated in 45° increments to assist with alignment with the vehicle tank. The gearbox, which encorporates an offset input drive shaft, may also be rotated to assist with alignment. However, some modifications must be made to the standard gearbox to ensure adequate lubrication. Consult the factory for details.

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

Pump Dimensions

See Figure 1 for the approximate physical dimensions of this pump.

OUTLINE DRAWING

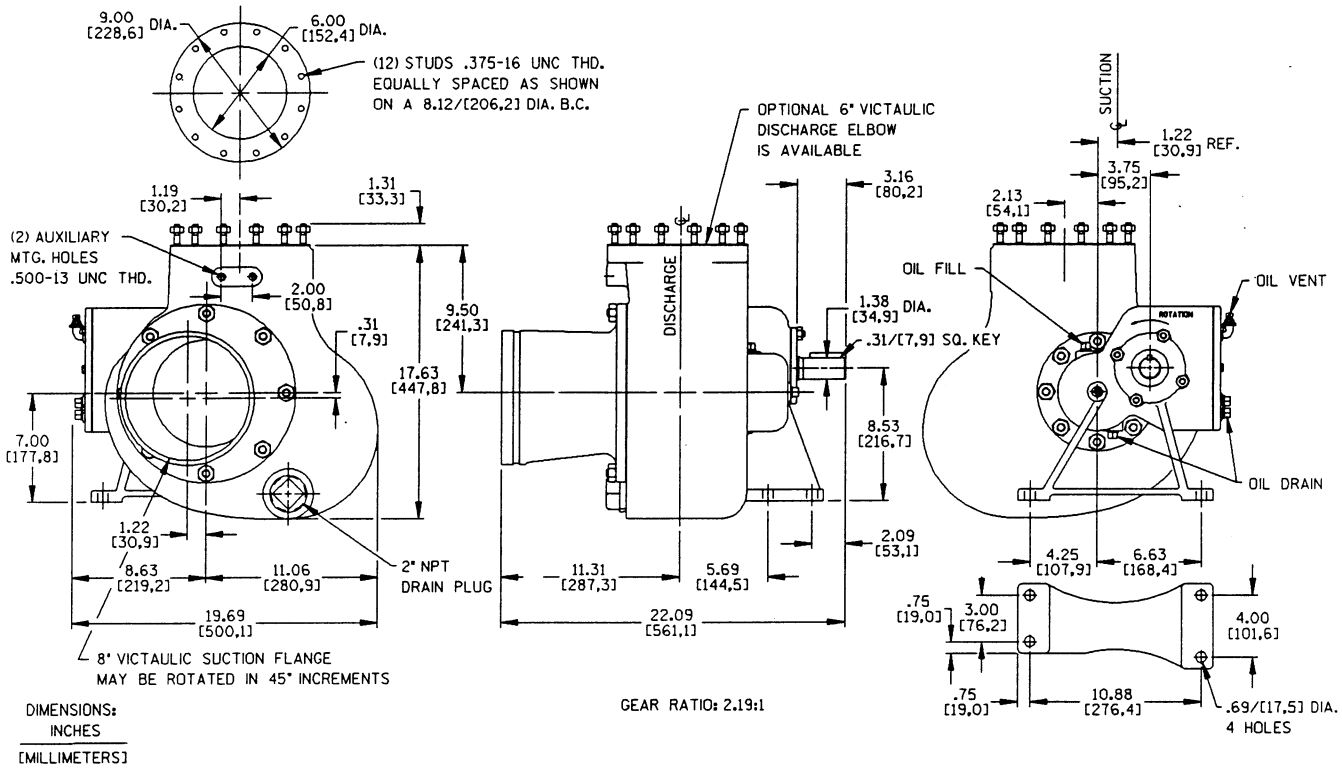


Figure 1. Pump Models 08C1-GA And 08D1-GA

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 and gearbox 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 perform all duties indicated. Note the direction of rotation indicated on the pump. Check that the pump shaft rotates in the required direction.

ONLY OPERATE THIS PUMP IN THE DIRECTION INDICATED ON THE PUMP BODY AND/OR THE ACCOMPANYING DECAL. REVERSE ROTATION OF THE SHAFT WILL ADVERSELY EFFECT PUMP PERFORMANCE, AND THE PUMP AND/OR GEARBOX COULD BE SERIOUSLY DAMAGED.

d. Check 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 gearbox 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.

VEHICLE REQUIREMENTS

The following instructions apply equally to new installations, rebuilds or retrofits.

Tank Preparation

It is **essential** that any tank scale, dirt, or other foreign material be removed from the tank and piping prior to pump installation. Failure to do so could result in clogging or damage to the pump.

DAMAGE TO THE PUMP RESULTING FROM DEBRIS IN THE SUCTION LINE WILL NOT BE COVERED BY THE PUMP WARRANTY. BEFORE CONNECTING THE SUCTION AND DISCHARGE PIPING, CAREFULLY CHECK THE STORAGE TANK AND PIPING FOR CONSTRUCTION DEBRIS SUCH AS NUTS, BOLTS, WIRE, WELD SLAG, AND OTHER FOREIGN MATERIAL. INSTALL A COMMERCIALLY AVAILABLE 80 MESH SCREEN AND A FILTER IN THE SUCTION LINE TO PREVENT DEBRIS FROM ENTERING THE PUMP.

POSITIONING PUMP

Lifting

Use lifting equipment with a capacity of at least **875 pounds (397 kg)**. This pump weighs approximately **175 pounds (79,4 kg)**, not including the weight of suction and discharge piping. Customer installed equipment such as suction and discharge piping **must** be removed before attempting to lift.

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.

DUE TO THE CONFINED MOUNTING LOCATION, SPECIALIZED EQUIPMENT SUCH AS A TRANSMISSION JACK WITH CUSTOM BRACKETS SHOULD BE USED TO LIFT AND POSITION THE PUMP AND GEARBOX.

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 is designed for single saddle truck mounting. The pump casing and 8-inch victaulic suction flange may be rotated in 45° increments to assist with alignment with the vehicle tank. The gearbox, which encorporates an offset input drive shaft, may also be rotated to assist with alignment. However, some modifications must be made to the standard gearbox to ensure adequate lubrication. Consult the factory for details.

Refer to the following outline drawing for standard gearbox, casing and suction flange positioning.

ALIGNMENT

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 connecting the universal joint drive shaft assembly to a PTO unit, 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 2).

Check the direction of rotation of the PTO unit 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.

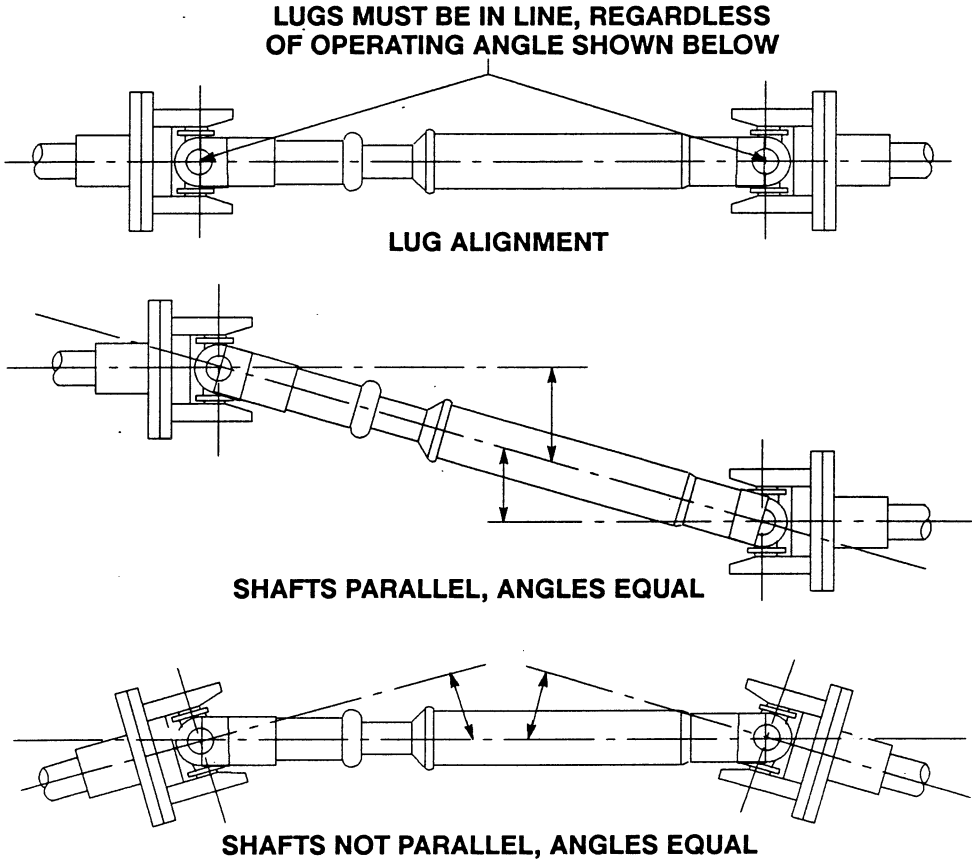


Figure 2. Drive Shaft Alignment

SUCTION AND DISCHARGE PIPING

Typical System Installation

Most petroleum handling vehicles perform both fueling and defueling functions. This requires a system utilizing flow-directing (FDF) valves, eductors, related piping and safety accessories. Some of the accessories are available from Gorman-Rupp as optional equipment.

Refer to Figures 3 and 4 for illustrations of typical piping systems used on refueling vehicles.

SCHEMATIC SYSTEM USING EDUCTOR FOR DISPENSING AND FILLING

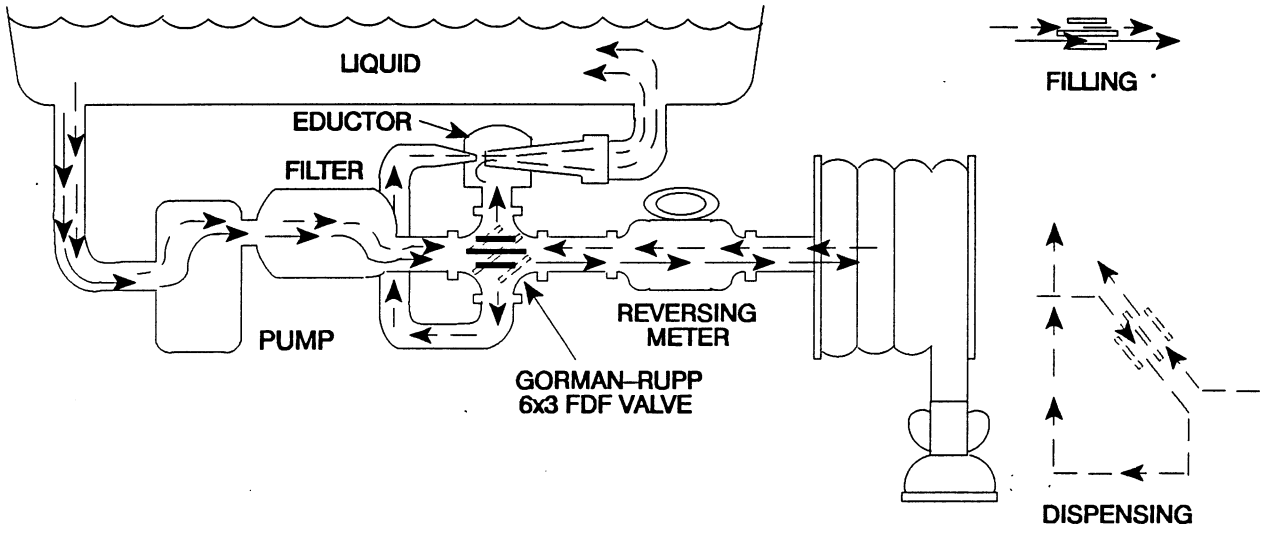
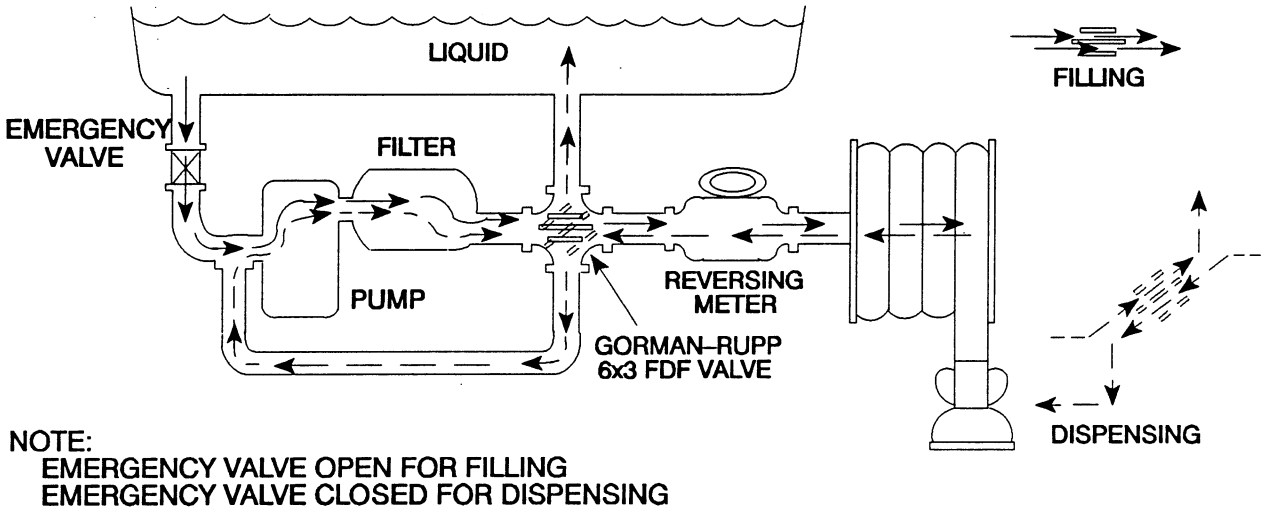


Figure 3. Typical Installation Using Eductor For Filling And Dispensing

SCHEMATIC SYSTEM USING PUMP FOR DISPENSING AND FILLING



NOTE:
EMERGENCY VALVE OPEN FOR FILLING
EMERGENCY VALVE CLOSED FOR DISPENSING

Figure 4. Typical Installation Using Pump For Filling And Dispensing

Piping

All piping material 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.

Run the 8-inch suction piping from the tank sump to the pump inlet. The suction lines should be as short and straight as possible to minimize friction loss.

A suction strainer was not furnished with this pump since it is **not** designed to handle liquids containing solids. However, to protect the pump from accidental damage, a commercially available 80 mesh screen and a filter should be installed in the suction line between the pump and the tank. Make certain that the total open area of the screen is at least three or four times the cross section of the suction line to ensure adequate supply of liquid to the pump.

DAMAGE TO THE PUMP RESULTING FROM DEBRIS IN THE SUCTION LINE WILL NOT BE COVERED BY THE PUMP WARRANTY. BEFORE CONNECTING THE SUCTION AND DISCHARGE PIPING, CAREFULLY CHECK THE STORAGE TANK AND PIPING FOR CONSTRUCTION DEBRIS SUCH AS NUTS, BOLTS, WIRE, WELD SLAG, AND OTHER FOREIGN MATERIAL. INSTALL A COMMERCIALLY AVAILABLE 80 MESH SCREEN AND A FILTER IN THE SUCTION LINE TO PREVENT DEBRIS FROM ENTERING THE PUMP.

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.

The pump discharge is a 6-inch petroleum flange. The discharge should be mounted vertically just below the top of the chassis frame. It can easily be piped to the filter inlet, discharge manifold, valves, etc..

To avoid wracking, flexible connections such as "victaulic" or bellows **must** be installed at the pump suction and discharge.

Do not tighten connecting flanges unless they are properly aligned. Never pull a pipe into place by tightening the flange bolts.

VALVES

THE FDF VALVE IS DESIGNED FOR DIRECTING FLOW ONLY. IT WILL NOT SERVE AS A POSITIVE SHUTOFF OR THROTTLING VALVE.

See Figures 5 and 6 illustrating the installation dimensions and theory of operation for a typical FDF valve. Consult the factory for further assistance or other sizes.

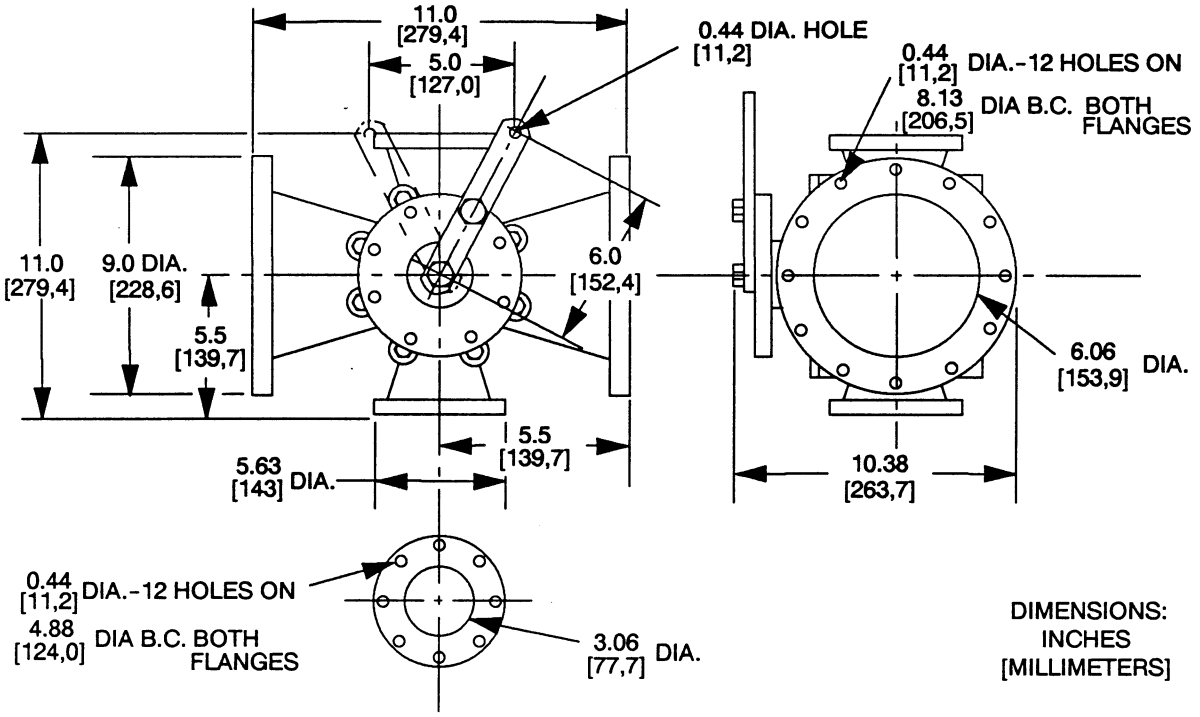


Figure 5. Typical FDF Valve Installation Dimensions

When the center web of the valve is aligned with the 6-inch ports (fueling position), the flow passes straight through. When the handle is turned to the defueling position, the web blocks the straight flow and opens two paths of flow through the 6-inch and 3-inch ports.

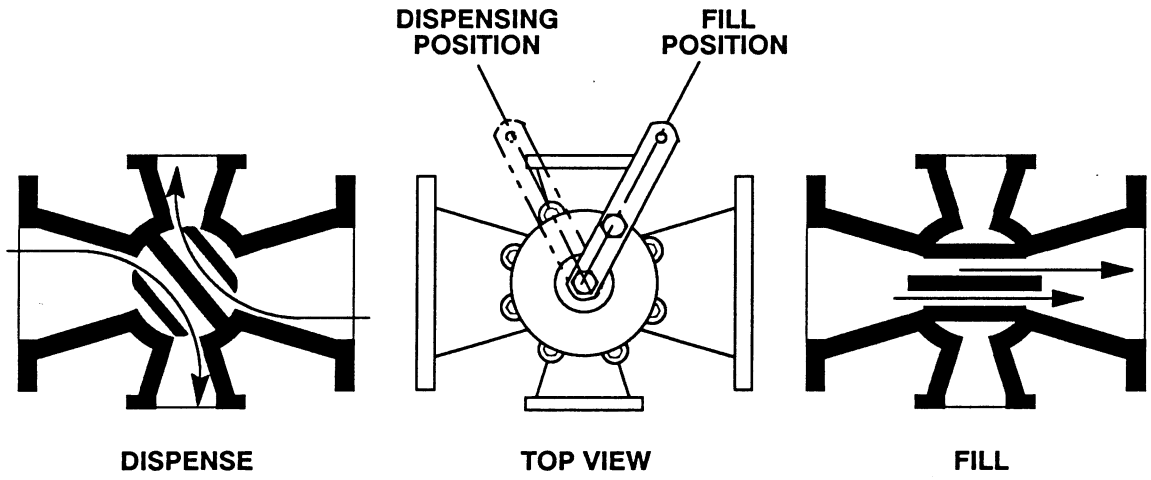


Figure 6. FDF Valve Theory of Operation

Eductors

An eductor is used in conjunction with an FDF valve to increase defueling rates and efficiency. An eductor can be used to collapse the service hose and provide hose defueling service.

Contact the Gorman-Rupp Company for an authorized distributor for specifications and performance data.

OPERATION - SECTION C

Review all warnings in Section A.

Follow the instructions on all tags, labels and decals attached to the pump.

WARNING

THIS PUMP IS DESIGNED FOR VEHICULAR MOUNTING IN PETROLEUM SERVICE. DO NOT ATTEMPT TO PUMP CORROSIVE MATERIALS, OR ANY LIQUIDS WHICH MAY DAMAGE THE PUMP OR ENDANGER PERSONNEL AS A RESULT OF PUMP FAILURE.

WARNING

THE GEARBOX PROVIDED ON THIS PUMP IS DESIGNED FOR OPERATION AT A MAXIMUM INPUT SPEED OF 1800 RPM (08D1-GHH) OR 1850 RPM (08C1-GHH). IF OPERATED AT A HIGHER RPM, PUMP OR GEARBOX COMPONENTS MAY BE DESTROYED.

PRIMING

Install the pump and gearbox as described in **INSTALLATION**. Make sure that the piping connections are tight, and that the pump is securely mounted. Check that the pump and gearbox are 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 THIS 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 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.

When installed in a flooded suction application, simply open the system valves and permit the incoming liquid to evacuate the air. After the pump and piping system have completely filled, evacuate any remaining air pockets in the pump or suction line by loosening a pipe plug or opening bleeder valves.

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

GROUNDING

To eliminate electrostatic build-up by the liquid being pumped, the pump must be grounded by attaching a ground wire to a ground rod (grounding is not required when pumping water). Install the ground rod in accordance with the National Electrical Codes and all local codes. Be sure the clamp or fastener has made a tight electrical connection with the rod.

CAUTION

INSPECT AN TEST THE GROUND WIRE ASSEMBLY FOR CONDUCTIVITY. REPLACE BROKEN OR FRAYED WIRE BEFORE RESUMING OPERATION.

STARTING

Consult the operations manual furnished with the vehicle.

Rotation

The correct direction of pump rotation is counterclockwise when facing the input shaft. The pump could be damaged and performance adversely af-

fected by incorrect rotation. If pump performance is not within the specified limits (see the curve on page E-1), check the direction of rotation before further troubleshooting.

Drive

This pump is designed for operation with a power take-off unit coupled to the drive shaft on the gearbox. The gearbox assembly has a ratio of 2.19:1, and is designed for operation at a maximum input speed of 1800 RPM (08D1-GHH) or 1850 RPM (08C1-GHH). **Do not** operate at higher input speeds.

WARNING

THE GEARBOX PROVIDED ON THIS PUMP IS DESIGNED FOR OPERATION AT A MAXIMUM INPUT SPEED OF 1800 RPM (08D1-GHH) OR 1850 RPM (08C1-GHH). IF OPERATED AT A HIGHER RPM, PUMP COMPONENTS MAY BE DESTROYED.

OPERATION

Partially open the discharge throttling valve so that the discharge line fills slowly to prevent damage to piping, gaskets, and other devices in the line which could be affected by shock resulting from rapid filling of the line. When the discharge line is completely filled, adjust the discharge throttling valve to the desired 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 (71°C). 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

ALLOW AN OVER-HEATED PUMP TO COOL BEFORE SERVICING. DO NOT REMOVE PLATES, COVERS, GAUGES, OR FITTINGS FROM AN OVER-HEATED PUMP. LIQUID WITHIN THE PUMP CAN REACH BOILING TEMPERATURES, AND VAPOR PRESSURE WITHIN THE PUMP CAN CAUSE PARTS BEING DISENGAGED TO BE EJECTED WITH GREAT FORCE. AFTER THE PUMP COOLS, DRAIN THE LIQUID FROM THE PUMP BY REMOVING THE CASING DRAIN PLUG. USE CAUTION WHEN REMOVING THE PLUG TO PREVENT INJURY TO PERSONNEL FROM HOT LIQUID.

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 50% of the maximum permissible operating pressure shown on the pump performance curve.

Pump Vacuum Check

Since the 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 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 to 17 inches or more of mercury for petroleum. 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 operation 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.

NOTE

Petroleum products are very sensitive to changes in temperature. Warmer temperatures elevate the product vapor pressure resulting in low vacuum readings. Do not mistake temperature problems for faulty pump installation or performance.

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 THE APPLICATION INVOLVES A HIGH DISCHARGE HEAD, GRADUALLY CLOSE THE DISCHARGE THROTTLING VALVE BEFORE STOPPING THE PUMP.

After stopping the pump, disconnect the power source or take other action to ensure that the pump will remain inoperative.

Cold Weather Preservation

Normal freezing conditions will not damage the pump when pumping petroleum products. However, during extremely severe conditions, care should be exercised during start-up, especially if the pump has been idle for more than a few hours.

GEARBOX TEMPERATURE CHECK

The gearbox runs higher than ambient temperatures because of heat generated by friction. Temperatures of approximately 200°F (93°C) are considered normal, and can operate intermittently at 250°F (121°C).

Checking gearbox temperatures by hand is inaccurate. Place a contact-type thermometer against the housing and record this temperature for future reference.

A sudden increase in gearbox temperature is a warning that the bearings are at the point of failing. Make certain that the bearing lubricant is of the proper viscosity and at the correct level (see **LUBRICATION** in Section E). Bearing overheating can also be caused by shaft misalignment and/or excessive vibration.

When pumps are first started, the bearings may seem to run at temperatures above normal. Continued operation should bring the temperatures down to normal levels within 20 minutes or less.

TROUBLESHOOTING - SECTION D

Review all WARNINGS in Section A.

WARNING

BEFORE ATTEMPTING TO OPEN OR SERVICE THE PUMP:

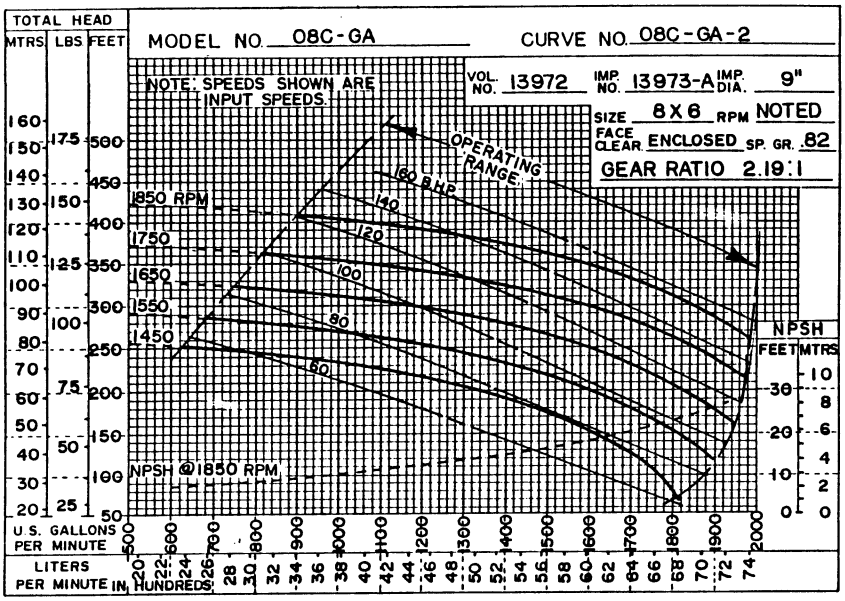
1. **FAMILIARIZE YOURSELF WITH THIS MANUAL.**
2. **DISCONNECT THE POWER SOURCE TO ENSURE THAT THE PUMP WILL REMAIN INOPERATIVE.**
3. **ALLOW THE PUMP TO COOL IF OVERHEATED.**
4. **CHECK THE TEMPERATURE BEFORE OPENING ANY COVERS, PLATES, OR PLUGS.**
5. **CLOSE THE SUCTION AND DISCHARGE VALVES.**
6. **VENT THE PUMP SLOWLY AND CAUTIOUSLY.**
7. **DRAIN THE PUMP.**

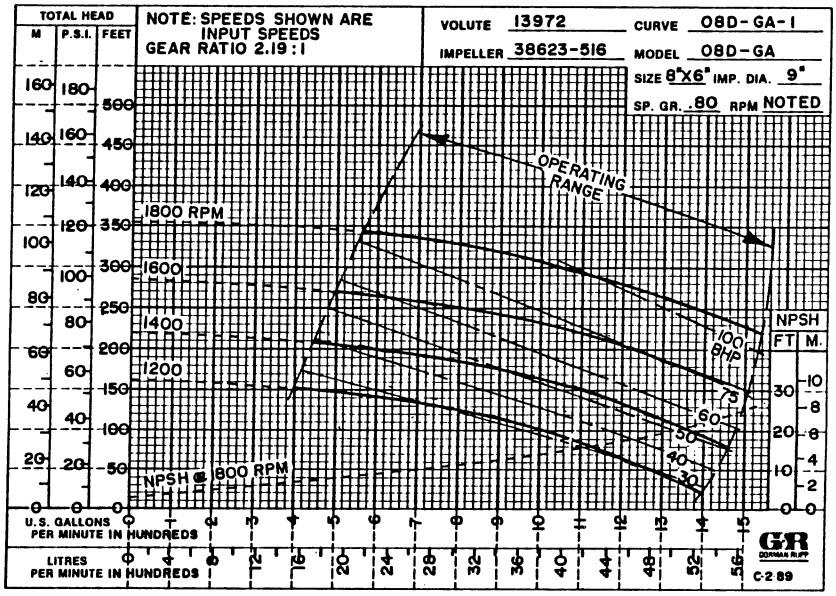
TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP FAILS TO PRIME	Air leak in suction line.	Correct leak.
	Lining of suction hose collapsed.	Replace suction hose.
	Leaking or worn seal or pump gasket.	Check pump vacuum. Replace leaking or worn seal or gasket.
	Strainer clogged.	Check strainer and clean if necessary
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE	Air leak in suction line.	Correct leak.
	Strainer clogged.	Check strainer and clean if necessary
	Pump speed too slow.	Check driver speed.
	Lining of suction hose collapsed.	Replace suction hose.
	Discharge line clogged or restricted; hose kinked.	Check discharge lines; straighten hose.
	Impeller or other wearing parts worn or damaged.	Replace worn or damaged parts. Check that impeller is properly centered and rotates freely.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP REQUIRES TOO MUCH POWER	Universal joint drive misaligned.	Align drive.
	Pump speed too high.	Check driver output; check that sheaves or couplings are correctly sized.
	Discharge head too low.	Adjust discharge valve.
EXCESSIVE NOISE	Cavitation in pump.	Reduce discharge pressure and/or pump speed.
	Pumping entrained air.	Locate and eliminate source of air bubble.
	Pump or drive not securely mounted.	Secure mounting hardware.
	Universal joint drive misaligned.	Align drive.
	Low or incorrect lubricant.	Check for proper type and level of lubricant.
BEARINGS RUN TOO HOT	Bearing temperature is high, but within limits.	Check bearing temperature regularly 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.
	Drive misaligned; piping improperly installed.	Realign drive and piping at operating temperature. Add expansion joints if required.
	Bearings in power source or gearbox worn or binding.	Check bearings.

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 MODELS 08C1-GA AND 08D1-GA**

* Based on 70° F (21 ° C) clear water at sea level, corrected to 0.80 specific gravity, with minimum suction lift. Since pump installations are seldom identical, your performance may be difference 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.

CAUTION

PUMP SPEED AND OPERATING CONDITION POINTS MUST BE WITHIN THE CONTINUOUS PERFORMANCE RANGE SHOWN ON THE CURVE.

SECTION DRAWING

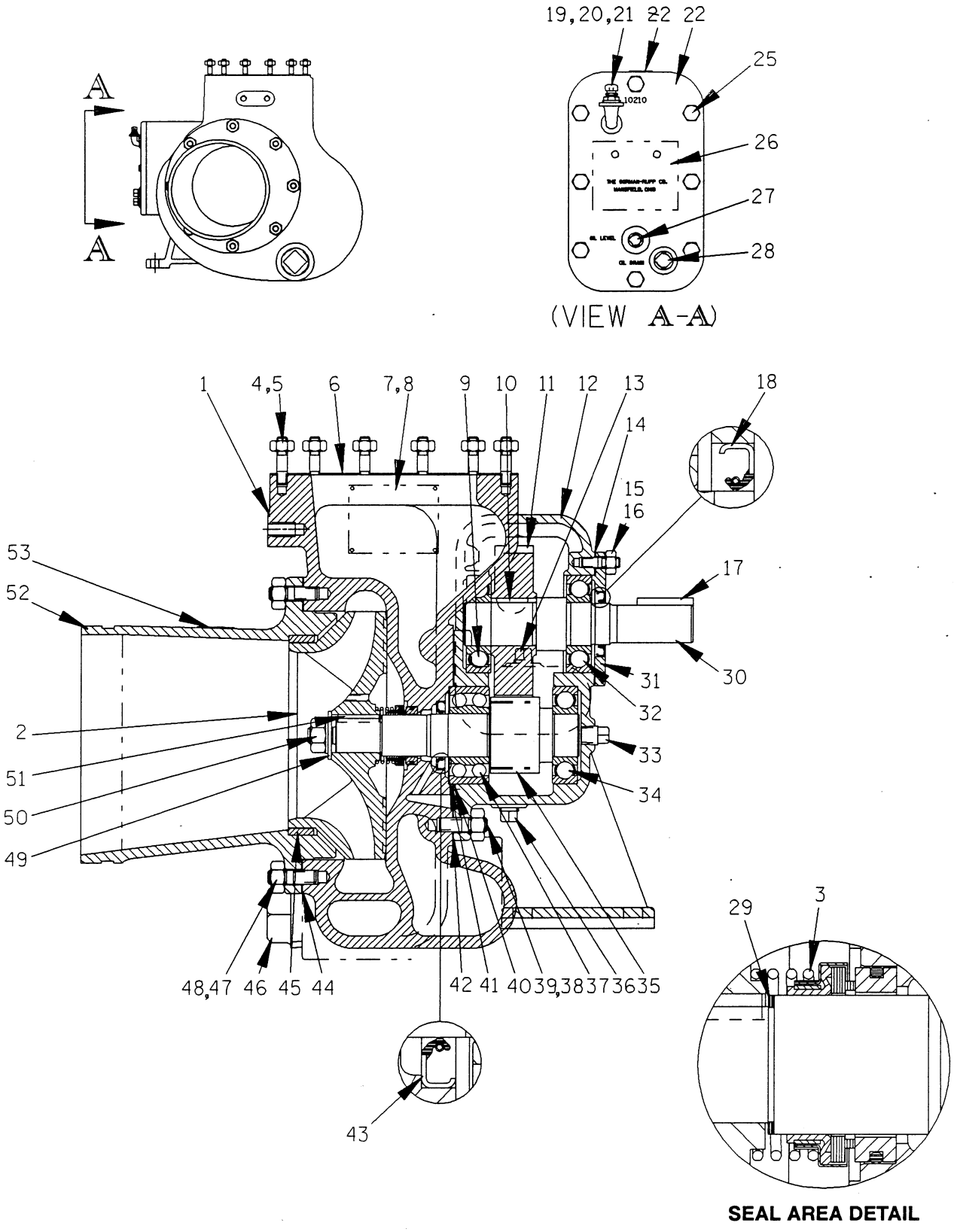


Figure 1. Pump Models 08C1-GA AND 08D1-GA

PARTS LIST
Pump Models 08C1-GA AND 08D1-GA
(From S/N 454736 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	MAT'L CODE	QTY
1	PUMP CASING	13972	13040	1
2	IMPELLER - 08C1-GA	13973A	14000	1
	IMPELLER - 08C1-GA	38623-516	1304R	1
3	MECHANICAL SEAL	25271-903	-----	1
4	STUD	C0607	15991	12
5	HEX NUT	D06	15991	12
6	DISCH FLANGE GASKET	11037G	20000	1
7	NAME PLATE	38818-020	13990	1
8	DRIVE SCREW	BM#04-03	15990	4
9	BALL BEARING	S1080	-----	1
10	WOODRUFF KEY	AV1009	15990	1
11	DRIVE GEAR	10203	16070	1
12	GEARBOX HOUSING	10200A	10010	1
13	PIPE PLUG	P06	11990	1
14	BEARING CAP GASKET	10213G	18000	1
15	STUD	C0605	15991	4
16	HEX NUT	D06	15991	4
17	KEY	N0508	15990	1
18	BEARING CAP OIL SEAL	S506	-----	1
19	SHIPPING PLUG	11495C	11990	1
20	STREET ELBOW	RS02	11991	1
21	AIR VENT	S1530	-----	1
22	ROTATION DECAL	2613BM	-----	1
23	COVER PLATE ASSY	10210A	24020	1
24	COVER PLATE GASKET	10210G	18000	1
25	HEX HD CAPSCREW	B0503	15991	8
26	GEARBOX LUBE DECAL	38816-077	-----	1
27	OIL LEVEL PLUG	P04	11991	1
28	OIL DRAIN PLUG	P06	11991	1
29	IMPELLER ADJ SHIM SET	37J	17090	1
30	DRIVE SHAFT	10209	16040	1
31	BEARING CAP	10213	10010	1
32	BALL BEARING	S1080	-----	1
33	PIPE PLUG	P06	11991	1
34	BALL BEARING	S1080	-----	1
35	PINION SHAFT	13974	16070	1
36	MAGNETIC PIPE PLUG	PM06	11991	1
37	BALL BEARING	S1495	-----	1
38	STUD	C0807	15991	6
39	HEX NUT	D08	15991	6
40	GEARBOX HSG O-RING	S2085	-----	1
41	BEARING SHIM SET	8543	15990	1
42	GEARBOX HSG GASKET	8377G	18000	1
43	PINION SHAFT OIL SEAL	S2007	-----	1
44	SUCTION HEAD GASKET	13977	20000	1
45	WEAR RING - 08C1-GA	13976A	14000	1
	WEAR RING - 08D1-GA	13976A	10018	1
46	PIPE PLUG	P32	11991	1
47	STUD	C0807	15991	8
48	HEX NUT	D08	15991	8
49	IMPELLER WASHER	K10	15991	1
50	IMPELLER NUT	S2202	-----	1
51	IMPELLER KEY	N0406	15990	1
52	SUCTION HEAD	13975A	13040	1
53	SUCTION STICKER	6588AG	-----	1
NOT SHOWN:				
	DISCHARGE STICKER	6588BJ	-----	1
OPTIONAL:				
	08C1-GA 'COPPER-FREE' PARTS			
	IMPELLER	13973A	1304R	1
	WEAR RING	13976A	1304R	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

Review all warnings in Section A.

Follow the instructions on all tags, label and decals attached to the pump.

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 views (see Figure 1) and the accompanying parts lists.

Most service functions, such as wear ring, impeller, and seal replacement, may be performed by draining the pump and removing the suction head. However, the following instructions assume complete disassembly is required.

If the gearbox requires repair, proceed with **PUMP DISASSEMBLY** followed by **GEARBOX DISASSEMBLY AND REASSEMBLY.**

Before attempting to service the pump, disconnect the power source or take other action to ensure that it will remain inoperative. Close all valves in the suction and discharge lines.

WARNING

BEFORE ATTEMPTING TO OPEN OR SERVICE THE PUMP:

1. **FAMILIARIZE YOURSELF WITH THIS MANUAL.**
2. **DISCONNECT THE POWER SOURCE OR TAKE OTHER ACTION ENSURE THAT THE PUMP WILL REMAIN INOPERATIVE.**
3. **ALLOW THE PUMP TO COOL IF OVERHEATED.**
4. **CHECK THE TEMPERATURE BEFORE OPENING ANY COVERS, PLATES, OR PLUGS.**
5. **CLOSE THE SUCTION AND DISCHARGE VALVES.**
6. **VENT THE PUMP SLOWLY AND CAUTIOUSLY.**
7. **DRAIN THE PUMP.**

WARNING

USE LIFTING AND MOVING EQUIPMENT IN GOOD REPAIR AND WITH ADEQUATE CAPACITY TO PREVENT INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

Suction Head And Wear Ring Removal

Before attempting to service the pump, remove the suction and discharge piping. Remove the casing drain plug (46) and drain the pump. Clean and reinstall the drain plug. The wear ring (45) and impeller (2) are easily accessible and may be serviced by removing the suction head (52).

Remove the nuts (48) and pull the suction head and wear ring out of the pump casing. Remove the suction head gasket (44).

Inspect the wear ring for excessive wear or scoring. If replacement is required, use a chisel or other suitable tool to cut it from the suction head. **Be careful** not to damage the suction head bore.

CAUTION

USE CAUTION NOT TO DAMAGE THE SUCTION HEAD WHEN REMOVING THE WEAR RING.

Impeller Removal

Immobilize the impeller (3) by inserting a brass rod through the discharge port and wedging it in the impeller vanes. **Be careful** not to damage the impeller. Remove the impeller nut and washer (49 and 50). Remove the brass rod. Install three 3/8-16 UNC x 2-1/2 inch long capscrews in the tapped holes in the impeller, and use a suitable puller to remove the impeller from the shaft. Retain the shaft key (51). Remove the impeller adjusting shims (29).

Seal Removal And Disassembly

Remove the seal spring. Lubricate the shaft adjacent to the seal, and work oil up under the rubber bellows. Slide the rotating portion of the seal off the shaft.

Use a stiff wire with a hooked end to remove the stationary seat and O-ring from the casing bore.

Pump Casing Removal

If the oil seal (43), O-ring (40), or casing gasket (42) require replacement, or if the gearbox is to be disassembled, remove the nuts (39) and slide the pump casing (1) off the shaft. Remove the pump casing gasket and O-ring.

Remove the bearing shims (41). Tie and tag the shims, or measure and record their thickness for ease of reassembly.

Place the pump casing on a clean surface, and press the oil seal from the casing.

If no further disassembly is required, proceed with **PUMP AND SEAL REASSEMBLY**. If the gearbox requires disassembly, do not reassemble the pump components at this time. Refer to **GEARBOX DISASSEMBLY AND REASSEMBLY**, followed by **PUMP AND SEAL REASSEMBLY**.

PUMP AND SEAL REASSEMBLY

If the gearbox requires disassembly, refer to **GEARBOX DISASSEMBLY** and **GEARBOX REASSEMBLY**, followed by **PUMP AND SEAL REASSEMBLY**.

Pump Casing Installation

Position the oil seal (43) in the casing bore with the lip positioned as shown in Figure 1. Press the oil seal into the bore until fully seated against the bore shoulder.

Lubricate the O-ring (40) and install it in the groove in the gearbox housing (12). Install the same thickness of bearing adjusting shims (41) as previously removed in the pump casing bore.

NOTE

Shaft endplay should be between .005 and .012 inch (0,127 to 0,305 mm). Add or remove bearing shims to achieve the correct endplay.

Install the pump casing gasket (42) over the pump casing studs (38). Carefully slide the pump casing over the shaft until fully seated against the gearbox housing. **Be careful** not to damage the lip of the oil seal on the shaft keyway. **Make sure** the bearing shims remain in position in the casing bore.

Apply 'Loctite Primer Grade T' followed by 'Loctite Pipe Sealant HVV' or equivalent compounds on the casing studs (38), and secure the casing to the gearbox with the nuts (39).

Seal Reassembly And Installation

(Figures 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 PRECAUTIONS 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 shaft, bellows and stationary seat 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).

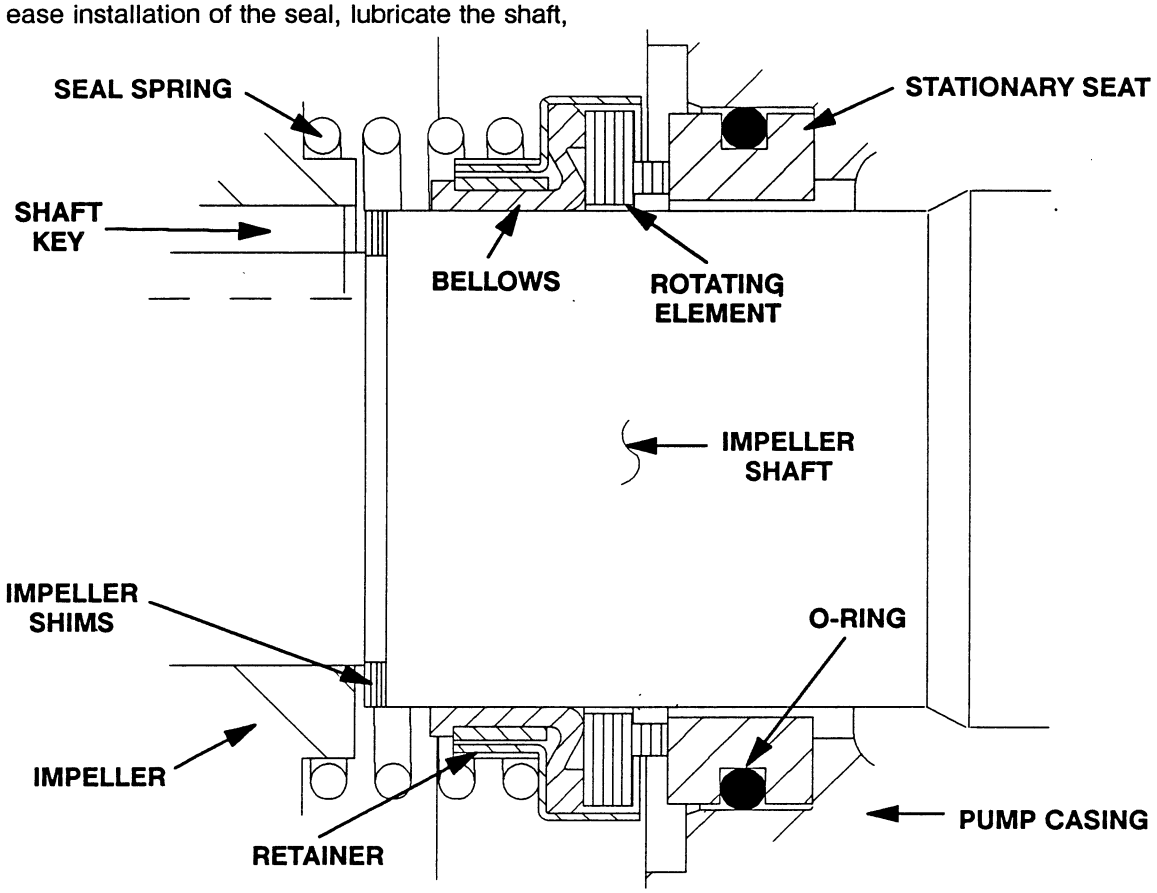


Figure 2. 25271-903 Seal Assembly

CAUTION

THIS SEAL IS NOT DESIGNED FOR OPERATION AT TEMPERATURES ABOVE 160° F (71° C). DO NOT USE AT HIGHER OPERATING TEMPERATURES.

Inspect the impeller shaft for distortion, nicks, scratches, or damage to the shaft keyway. Dress small nicks and burrs with a fine file or emery cloth. If the shaft is defective, refer to **GEARBOX DISASSEMBLY** and replace the shaft.

Lubricate the O-ring with a light coat of oil and install it in the stationary seat. Use thumb pressure to press the seat and O-ring into the pump casing until fully seated. Be careful not to damage the seal face. After installation, wipe the seal face in a concentric pattern with a clean, lint-free cloth to remove any fingerprints.

NOTE

It is recommended that a tapered sleeve (see Figure 3) be installed over the shaft keyway to ease installation of the rotating portion of the seal. This tool can be made from steel tubing or black pipe.

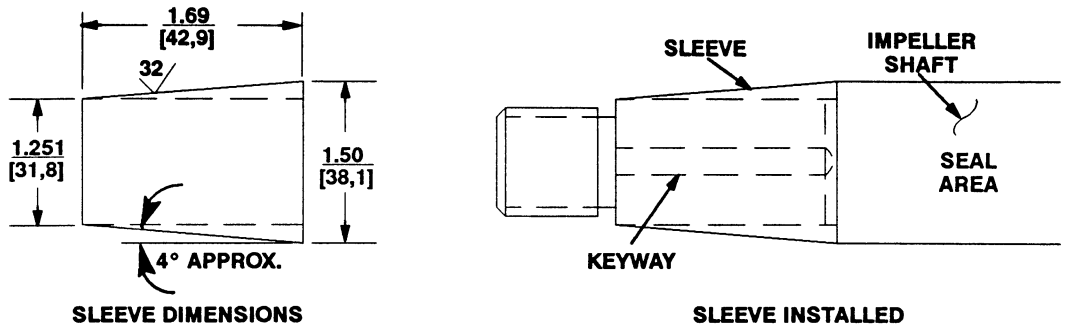


Figure 3. Seal Installation Sleeve

Lubricate the tapered sleeve and position it on the shaft. Position the rotating portion of the seal (consisting of the retainer, bellows and rotating element) on the sleeve, and apply even pressure against the shoulder of the seal retainer until the rotating subassembly slides onto the shaft and the seal faces contact. A push tube cut from a piece of plastic tubing would aid this installation. The I.D. of the tube should be approximately the same diameter as the I.D. of the seal spring.

Remove the tapered sleeve and install the seal spring.

Impeller Installation

Inspect the impeller and replace it if cracked or badly worn.

For maximum pump efficiency, the impeller must be centered within the volute scroll. Center the impeller by adding or removing adjusting shims (29).

To verify impeller positioning, measure the pump casing and impeller as shown in Figure 4. Use these measurements to calculate the required impeller location (dimension E). Add or remove impeller adjusting shims until dimension E is obtained.

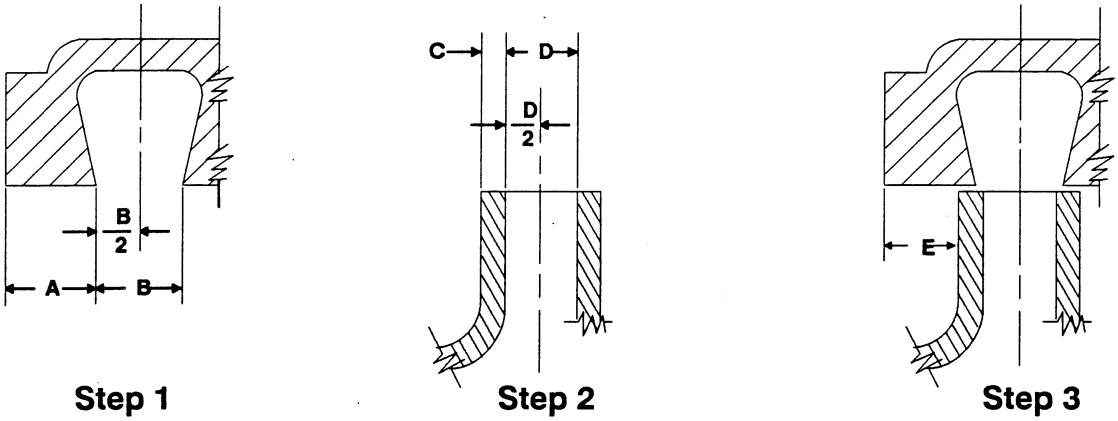


Figure 4. Centering Impeller Within Volute Scroll

NOTE

After the impeller has been properly positioned, check for free rotation. Correct any scraping or binding before further reassembly.

With the correct thickness of impeller adjusting shims installed, apply 'Loctite Primer Grade T' to the keyway, key (51) and shaft threads. Apply 'Loctite Keyfit CVV' to the key and keyway, and press the impeller onto the shaft until fully seated.

NOTE

*It is not recommended that substitute locking materials be used in this application. Use **only** the recommended 'Loctite' products.*

After the impeller is installed, install the impeller washer (49) and secure the impeller by torquing the impeller nut (50) to 125 ft. lbs. (1500 in. lbs. or 17,3 m. kg.).

Suction Head And Wear Ring Installation

If the wear ring (45) was removed, position the replacement ring in the suction head with the chamfered end toward the bore shoulder. Press the wear ring into the suction head until fully seated.

NOTE

*The wear ring **must** seat squarely in the suction head; otherwise, binding and/or excessive wear will occur as the shaft turns.*

Replace the suction head gasket (44). Apply 'Loctite Primer Grade T', followed by 'Loctite Pipe Sealant HVV' or equivalent to the studs (47), and secure the suction head to the pump casing with the nuts (48).

Final Pump Assembly

Install the suction and discharge lines and open all valves. Make certain that all piping connections are tight, properly supported and secure.

Be sure the gearbox has been properly lubricated, see **LUBRICATION**.

Refer to **OPERATION**, Section C, and start the pump.

GEARBOX DISASSEMBLY

When the pump is properly operated and maintained, the gearbox should not require disassembly. Disassemble the gearbox **only** when there is evidence of wear or damage.

CAUTION

GEARBOX DISASSEMBLY IN THE FIELD IS NOT RECOMMENDED. THESE OPERATIONS SHOULD BE PERFORMED ONLY IN A PROPERLY-EQUIPPED SHOP BY QUALIFIED PERSONNEL.

If the gearbox requires disassembly, first disassemble the pump components as indicated in **PUMP AND SEAL DISASSEMBLY.**

Gearbox Disassembly

Before attempting to disassemble the gearbox, remove the drain plug (36) and drain the gearbox lubricant. Clean and reinstall the drain plug.

With the pump end removed, remove the pipe plug (33) and use a drift pin to tap the pinion shaft (35) and bearings (34 and 37) out of the bearing housing.

Remove the shaft key (17). Remove the nuts (16) securing the bearing cap (31) to the gearbox housing (12). Slide the bearing cap and assembled oil seal (18) off the shaft. Remove the bearing cap gasket (14).

Inspect the oil seal (18) and, if replacement is required, press it from the bearing cap.

Position two spacer bars on the drive side of the helical gear (11) to prevent it from moving as the drive shaft (30) is removed.

Install a standard 5/8-11 UNC x 1-1/4 inch long capscrew (not supplied) in the tapped hole in the drive shaft (30) and use a suitable puller to remove the drive shaft and assembled bearing (32) from the gearbox housing, retaining the woodruff key (10) and helical gear as they come free of the shaft.

The inboard bearing (9) will remain in the gearbox housing. To remove the bearing, disengage the capscrews (25) and remove the cover plate and gasket (23 and 24). Reach into the gearbox housing and remove the bearing.

Remove the capscrew from the tapped hole in the end of the drive shaft.

After removing the shafts and bearings, clean and inspect the bearings **in place** as follows.

CAUTION

TO PREVENT DAMAGE DURING REMOVAL FROM THE SHAFT, IT IS RECOMMENDED THAT BEARINGS BE CLEANED AND INSPECTED **IN PLACE**. IT IS **STRONGLY** RECOMMENDED THAT THE BEARINGS BE REPLACED **ANY** TIME THE SHAFT AND BEARINGS ARE REMOVED.

Clean the bearings thoroughly in **fresh** cleaning solvent. Dry the bearings with filtered compressed air and coat with light oil.

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.

Rotate the bearings by hand to check for roughness or binding. If rotation is rough, replace the bearings.

CAUTION

THESE BEARINGS ARE PERMANENTLY SEALED AND REQUIRE NO ADDITIONAL LUBRICATION EXCEPT A COATING OF LIGHT OIL ON EXTERNAL SURFACES TO EASE REASSEMBLY. EXTERNAL SURFACES MUST BE KEPT FREE OF ALL DIRT AND FOREIGN MATERIAL. FAILURE TO DO SO COULD DAMAGE THE BEARINGS OR THEIR MATING SURFACES.

The bearing tolerances provide a tight press fit onto the shaft and a snug slip fit into the gearbox housing. Replace the shaft or gearbox housing if the proper bearing fit is not achieved.

If the bearings require replacement, use a suitable puller to remove them from the shafts.

GEARBOX REASSEMBLY

Bearing Cleaning And Inspection

Clean and inspect the bearings as indicated in **Shaft and Bearing Removal and Disassembly**.

CAUTION

TO PREVENT DAMAGE DURING REMOVAL FROM THE SHAFT, IT IS RECOMMENDED THAT BEARINGS BE CLEANED AND INSPECTED **IN PLACE**. IT IS **STRONGLY** RECOMMENDED THAT THE BEARINGS BE REPLACED **ANY** TIME THE SHAFT AND AND BEARINGS ARE REMOVED.

NOTE

*The inboard drive shaft bearing (9) **should not** be heated and installed on the shaft prior to reassembling the gearbox (see **Gearbox Reassembly**).*

The remaining bearings (32, 34 and 37) may be heated to ease installation. An induction heater, hot oil bath, electric oven, or hot plate may be used to heat the bearings. Bearings should **never** be heated with a direct flame or directly on a hot plate.

NOTE

If a hot oil bath is used to heat the bearings, both the oil and the container must be **absolutely** *clean. If the oil has been previously used, it must be* **thoroughly** *filtered.*

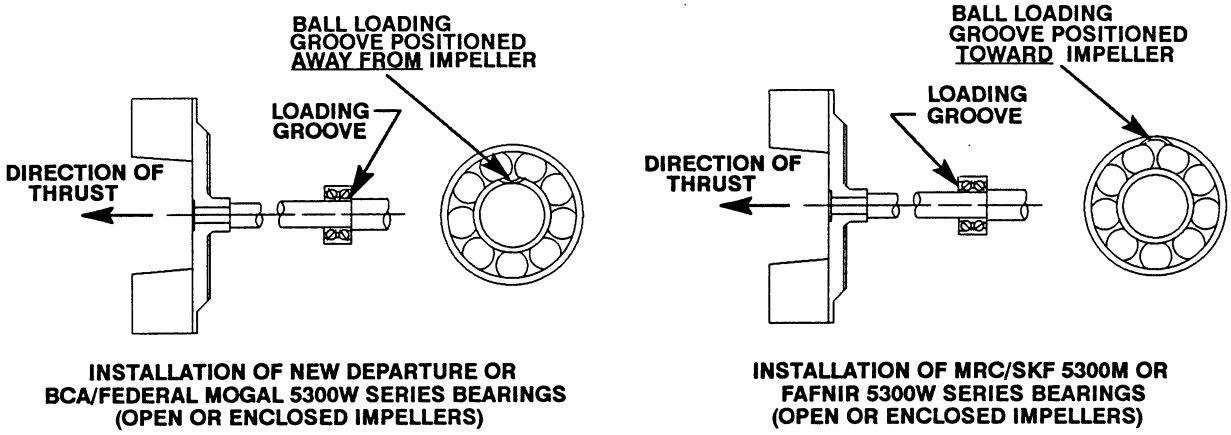
Heat the bearings to a uniform temperature **no higher than** 250°F (120°C), and slide the bearings onto the shaft, one at a time, until they are fully seated. This should be done quickly, in one continuous motion, to prevent the bearings from cooling and sticking on the shaft.

WARNING

USE CAUTION WHEN HANDLING HOT BEARINGS TO PREVENT BURNS.

NOTE

Position the bearing (37) on the shaft as indicated by the following illustrations.



INSTALLATION OF NEW DEPARTURE OR BCA/FEDERAL MOGAL 5300W SERIES BEARINGS (OPEN OR ENCLOSED IMPELLERS)

INSTALLATION OF MRC/SKF 5300M OR FAFNIR 5300W SERIES BEARINGS (OPEN OR ENCLOSED IMPELLERS)

Figure 5. Double Row Bearing Installation

After the bearings have been installed and allowed to cool, check to ensure that they have not moved away from the shaft shoulders in shrinking. If movement has occurred, use a suitable sized sleeve and a press to reposition the bearings against the shaft shoulders.

If heating the bearings is not practical, use a suitable sized sleeve and an arbor (or hydraulic) press to install the bearings on the shaft.

CAUTION

WHEN INSTALLING THE BEARINGS ONTO THE SHAFT, **NEVER** PRESS OR HIT AGAINST THE OUTER RACE, BALLS, OR BALL CAGE. PRESS **ONLY** ON THE INNER RACE.

Gearbox Reassembly

(Figure 3)

Inspect the shafts for distortion, chipped teeth, damaged keyways, nicks or scratches, or for damage on the impeller or drive ends. Dress small nicks and burrs with a fine file or emery cloth. Replace the shafts if defective.

NOTE

The bearings (9, 32 and 34) used in the gearbox are identical parts.

Lubricate the inboard drive shaft bearing (9) and slide it into the gearbox housing bore until fully seated. Reinstall the cover plate and gasket (23 and 24) and secure with the capscrews (25).

Lay the gearbox housing on a flat surface with the pump side down. Align the woodruff key (10) and helical gear (11), and press the drive shaft through the parts until the gear is firmly seated against the inner race of the bearing (9).

Apply a light coating of oil to the lip of the oil seal (18), and press it into the bearing cap (31) with the lip positioned as shown in Figure 1. The face of the oil seal should be just flush with the outer face of the bearing cap.

Install the bearing cap gasket (14), and slide the bearing cap over the shaft, being careful not to damage or roll the oil seal lip. Secure the bearing cap with the nuts (16).

Invert the bearing housing and support it so it is level and stable.

Slide the pinion shaft into the gearbox housing until the gear teeth mesh with those of the helical gear, and the inboard bearing (34) seats squarely against the bearing bore.

Reinstall the pipe plug (33) in the gearbox housing.

NOTE

Shaft endplay should be between .005 and .012 inch (0,127 to 0,305 mm). Add or remove bearing shims to achieve the correct endplay.

Refer to **PUMP AND SEAL REASSEMBLY** and install the remaining pump end components. After the pump end is reinstalled, lubricate the gearbox as indicated in **LUBRICATION** at the end of this section.

LUBRICATION

Seal Assembly

The seal assembly is lubricated by the medium being pumped. No additional lubrication is required.

Gearbox

The gearbox was fully lubricated when shipped from the factory. Check the oil level regularly at the oil level pipe plug (27) and maintain it at the bottom of the pipe plug opening. When lubrication is required, remove the air vent (21) and add SAE No. 90 non-detergent oil through the pipe elbow (25). **Do not** over-lubricate. Over-lubrication can cause the bearings to over-heat, resulting in premature bearing failure.

Under normal conditions, drain the gearbox once each year. Add two ounces (60 ml) of "Molykote 'M' Gear Guard", and then refill with clean oil to the proper level. Change the oil more frequently if the pump is operated continuously or installed in an environment with rapid temperature change.

MONITOR THE CONDITION OF THE GEARBOX LUBRICANT REGULARLY FOR EVIDENCE OF RUST OR MOISTURE CONDENSATION. THIS IS ESPECIALLY IMPORTANT IN AREAS WHERE VARIABLE HOT AND COLD TEMPERATURES ARE COMMON.

For cold weather operation, consult the factory or a lubricant supplier for the recommended grade of oil.

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