INSTALLATION, OPERATION AND MAINTENANCE MANUAL

WITH PARTS LIST

GP SERIES PUMP

MODEL

GP - 2

Thomas Pump & Machinery
120 Industrial Drive
Slidell, LA 70458

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INTRODUCTION

This Installation, Operation, and Maintenance manual is designed to help you get the best performance and longest life from your Gator Prime pump.

This pump is a GP Series, semi-open impeller, self priming centrifugal model with a suction check valve.

The pump is designed for handling mild industrial corrosives, mud or slurries containing large entrained solids. The basic material of construction is gray iron, with ductile iron impeller and steel wearing parts.

If there are any questions regarding the pump or its applications that are not covered in this manual or in other literature accompanying this unit, please contact Thomas Pump & Machinery:

Thomas Pump & Machinery
120 Industrial Dr.
Slidell, LA 70460
1-985-649-3000
1-985-649-4300 Fax

For information or technical assistance on the power source, contact the power source manufacture's local dealer or representative.

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

DANGER!

Immediate hazards that WILL result in severe personal injury or death. These instructions describe the procedure required and the injury that will result from failure to follow procedure.

CAUTION!

Hazards or unsafe practices that COULD result in minor personal injury or product or property damage. These instructions describe the requirements and the possible damage that could result from failure to follow the procedure.

NOTE

Instructions to aid in installation, operation, and maintenance or that clarify a procedure.

SAFETY – SECTION A

These warnings apply to GP series basic pumps. Thomas Pump has no control over or particular knowledge of the power source that will be used. 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. Disconnect or lock out 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

WARNING!

This pump is designed to handle mild industrial corrosives, mud or slurries containing large entrained solids. Do not attempt to pump volatile, corrosive, or flammable materials that may damage the pump or endanger personnel as result of pump failure.

WARNING!

After the pump has been positioned, make certain that the pump and all piping connections are tight, properly supported and secure before operation.

WARNING!

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

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!

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, pressure, and cause the pump casing to rupture or explode.

WARNING!

Use lifting and moving equipment in good repair and with adequate capacity to prevent injuries to personnel or damage to equipment. Suction and discharge hoses and piping must be removed form the before lifting

INSTALLATION – SECTION B

Review all SAFETY information 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.

Most of the information pertains to a standard **static lift application** where the pump is positioned above the 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 incoming pressure to **50%** of the maximum permissible operating pressure as shown on the pump performance curve.

For further assistance, contact your Gator Prime distributor or Thomas Pump & Machinery.

Pump Dimensions

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

OUTLINE DRAWING

DIMENSIONS: MILLIMETERS (INCHES)

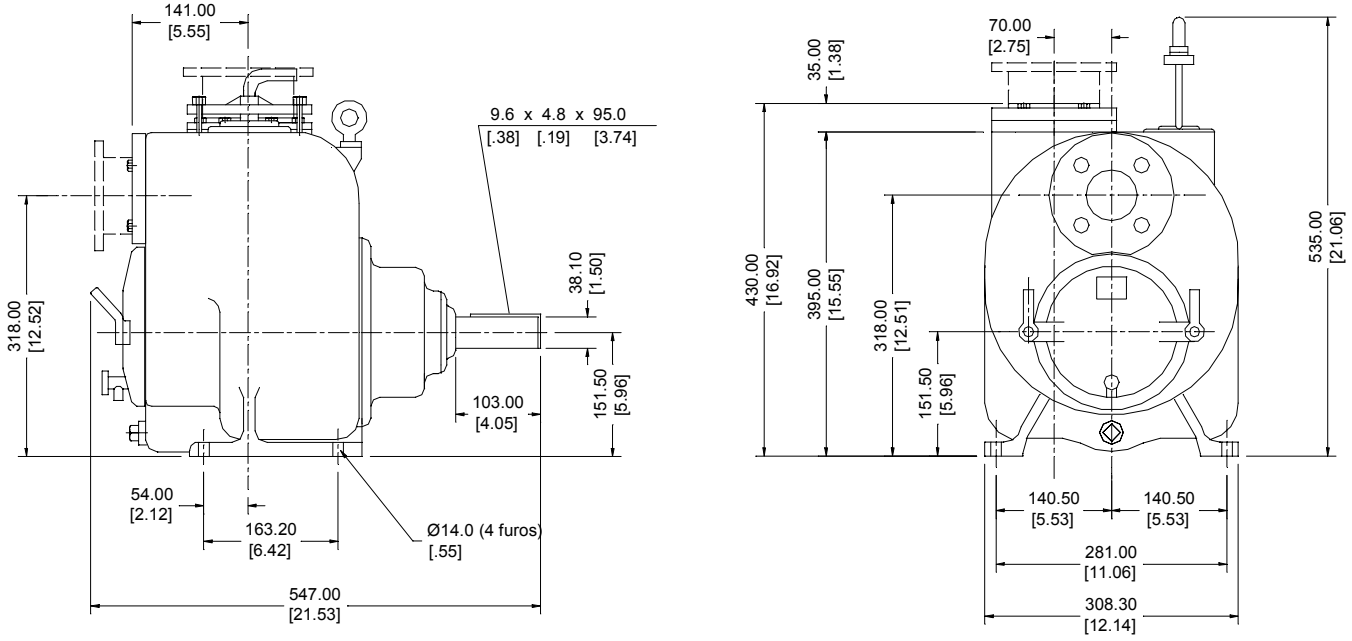


Figure 1. Pump Model GP - 2

PREINSTALLATION INSPECTION

The pump assembly was inspected and tested before from the factory. Before installation, inspect the pump for damage that 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 warnings and cautions contained in this manual or affixed to the pump, and perform all duties indicated. Note the direction of rotation indicated on the pump. Check that the pump shaft rotates counterclockwise when facing the back cover plate assembly/impeller end of the pump.

⇩ CAUTION!

Only operate this pump in the direction indicate by the arrow on the pump body and on the accompanying decal. Refer to ROTATION in OPERATION, Section C.

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 power source 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 Gator Prime distributor or the factory to determine the repair or updating policy. Do not put the pump into service until appropriate action has been taken.

POSITIONING PUMP

Lifting

Use lifting equipment with a capacity of at least **2000 pounds (900 Kg**). This pump weighs approximately **220 pounds (100 Kg),** not including the weight of accessories and base. Customer installed equipment such as suction and discharge piping **must** be removed before attempting to lift.

⇩ CAUTION!

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

Mounting

Locate the pump in an accessible place as close as practical to the liquid being pumped. Level mounting is essential for proper operation.

The pump may have to be supported or shimmed to provide for level operation or to eliminate vibration.

Clearance

When positioning the pump, allow a minimum clearance of 18 inches (457mm) in front of the back cover to permit removal of the cover and easy access to the pump interior.

SUCTION AND DISCHARGE PIPING

Pump performance is adversely effected by increase suction lift, discharge elevation. And friction losses. See the performance curve and operating range shown on Page 21 to be sure your overall application allows pump to operate within the safe operation range.

Materials

Either pipe or hose maybe used for suction and discharge lines: however, the materials must be compatible with 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, that 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 that could cause excessive vibration, decrease 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 (457,2mm) 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 that could affect pump priming, the suction line must be as short and direct as possible. When operation pumped: if the line slopes down to the pump at any point along the suction run, air involves a suction lift, the line must always slope upward to the pump from the source of the liquid being 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 horizontal to avoid air pockets.

Strainers

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

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

This pump is designed to handle up to 1.3/4” inch (44 mm) diameter spherical solids.

Sealing

Since even a slight leak will affect priming, head, and capacity, especially when operating with a high suction lift, all connections in the suction line 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 1 ½ 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 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. Suction inlet at a distance 1 ½ 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.

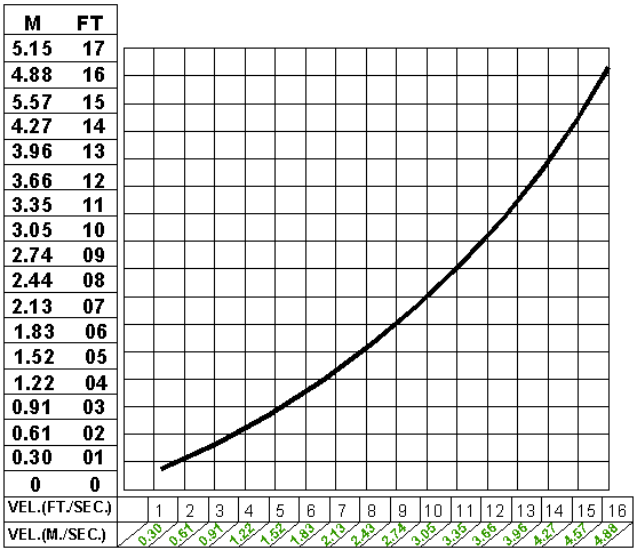
If two suction lines are installed a single sump, the flow paths may interact, reducing the efficiency of one or both pumps. To avoid this, position the suction inlets so that they are separated by a distance equal to at least 3 times the diameter of the suction pipe.

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).



$$\text{VELOCITY (FT./SEC.)} = \frac{\text{QUANT. (G.P.M)x.321}}{\text{AREA}} \quad \text{OR} \quad \frac{\text{G.P.M. x 4085}}{D^2}$$

$$\text{VELOCITY (M./SEC.)} = \frac{\text{FLOW (M./MIN)x21.22}}{\text{DIAMETER IN MM}^2} \quad \text{OR} \quad \frac{\text{FLOW (M}^3\text{/SEC.)}}{\text{AREA IN M}^2}$$

Figure 2. Recommended Minimum Suction Line Submergence vs. Velocity

DISCHARGE LINES

Siphoning

Do not terminate the discharge line at a level lower than 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.

CAUTION!

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

Bypass Lines

Self-priming pumps are not air compressors. During the priming cycle, air from the suction line must be vented to atmosphere on the discharge side. If the discharge line is open, this air a check valve has been installed in the discharge line, the discharge side of the pump must be opened to atmospheric pressure through a bypass line installed between the pump discharge an the check valve. A self-priming centrifugal pump **will not prime** if there is sufficient static liquid head to hold the discharge check valve closed.

NOTE
The bypass line should be sized so that it does not affect pump discharge capacity; however, the bypass line should be at least 1 inch in diameter to minimize the chance of plugging.

In **low discharge head applications** (less than 30 feet or 9 meters), it is recommended that the bypass line be run back to the wet well, and locate 6 inches below the water level or cut-off point of the level pump. In some installations, this bypass line may be terminated with a six-to-eight foot length of 1 ¼ inch ID. **smooth-bore** hose; air and liquid vented during the priming process will then agitate the hose and break up any solids, grease, or other substances likely to cause clogging.

CAUTION!

A bypass line that is returned to a wet well must be secured against being drawn into the pump suction inlet.
It is also recommended that pipe unions be installed at each 90º elbow in a bypass line to ease disassembly and maintenance.

In **high discharge head applications** (more than 30 feet), an excessive amount of liquid may be bypassed and forced back to the wet well under the full working pressure of the pump; this will reduce overall pumping efficiency. **Therefore, it is recommended that a Gator Prime Automatic Air Release Valve be installed in the bypass line**.

Gator Prime Automatic Air Release Valves are reliable, and require minimum maintenance. See **AUTOMATIC AIR RELEASE VALVE** in this section for installation and theory of operation of the Automatic Air Release Valve. Contact Thomas Pump & Mach. for selection of an Automatic Air Release Valve to fit your application.

If the installation involves a flooded suction such as below-ground lift station. A pipe union and manual shut-off valve may be installed in the bleed line to allow service of the valve without shutting down the station, and to eliminate the possibility of flooding. If a manual shut-off valve is installed anywhere in the air release piping, it must be a full-opening ball type valve to prevent plugging by solids.

DANGER!

If a manual shut-off valve is installed in a bypass line, it must not be left closed during operation. A closed manual shut-off valve may cause a pump that has lost prime to continue to operate without reaching prime, causing dangerous overheating and possible explosive rupture of the pump casing. Personnel could be severely injured.

Allow an over-heated pump to cool before servicing. Do not remove plates, covers, gauges, or fittings from an overheated 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.

AUTOMATIC AIR RELEASE VALVE

When properly installed and correctly adjusted to the specific hydraulic operating conditions of the application, the Gator Prime Automatic Air Release Valve will permit air to escape through the bypass line, and then close automatically when the pump is fully primed and pumping at full capacity.

Theory of Operation

Figures 3 and 4 show a cross-sectional view of the Automatic Air Release Valve, and a corresponding description of operation.

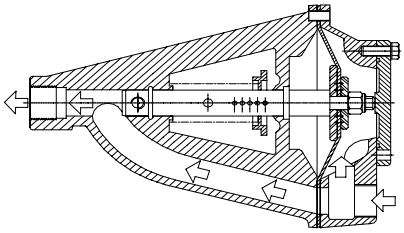


Figure 3. Valve in Open Position

During the priming cycle, air from the pump casing flows through the bypass line, and passes through the Air Release valve to the wet well (Figure 3).

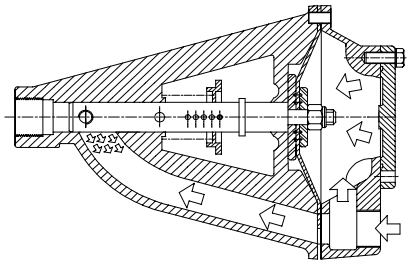


Figure 4. Valve in Closed Position

When the pump is fully primed, pressure resulting from flow against the valve diaphragm compresses the spring and closes the valve (Figure 4). The valve will remain closed, reducing the bypass of liquid to 1 to 5 gallons (3.8 to 19 liters) per minute, until the pump loses its prime or stops.

WARNING!

Some leakage (1 to 5 gallons [3.8 to 19 liters] per minute) will occur when the valve is fully closed. Be sure the bypass line is directed back to the wet well or tank to prevent hazardous spills.

When the pump shuts down, the spring returns the diaphragm to its original position. Any solids that may have accumulated in the diaphragm chamber settle to the bottom and are flushed out during the next priming cycle.

NOTE

The valve will remain open if the pump does not reach its designed capacity or head. Valve closing pressure is dependent upon the discharge head of the pump at full capacity. The range of the valve closing pressure is established by the tension rate of the spring as ordered from the factory. Valve closing pressure can be further adjusted to the exact system requirements by moving the spring retaining pin up or down the plunger rod to increase or decrease tension on the spring. Contact your Gator Prime distributor or Thomas Pump & Mach. for information about an Automatic Air Release Valve for your specific application.

Air Release Valve installation

The Automatic Air Release Valve must be independently mounted in a horizontal position and connected to the discharge line of the self-priming centrifugal pump (see Figure 5).

NOTE

If the Air Release Valve is to be installed on a staged pump application, contact the factory for specific installation instructions.

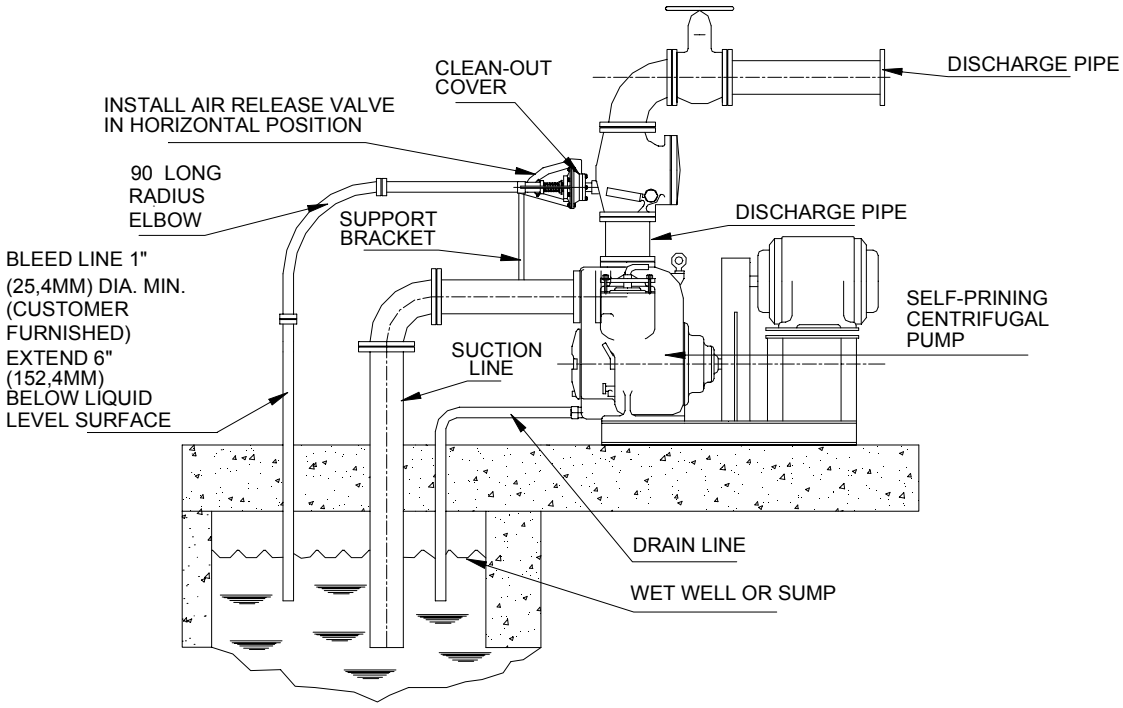


Figure 5. Typical Automatic Air Release Valve Installation

The valve inlet must be installed between the pump discharge port and the non-pressurized side of the discharge check valve. The valve inlet is it at the large end of the valve body, and is provided with standard 1-inch NPT pipe threads.

The valve outlet is located at the opposite end of the valve, and is also equipped with standard 1-inch NPT pipe threads. The outlet should be connected to a bleed line that slopes back to the wet well or sump. The bleed line must be the same size as the inlet piping, or larger. If piping is used for the bleed line, avoid the use of elbows whenever possible.

NOTE

It is recommended that each Air Release Valve be fitted with an independent bleeder line directed back to the wet well. However, if multiple air Release Valves are installed in a system, the bleeder lines may be directed to a common manifold pipe. Contact your Gator Prime distributor or Thomas Pump & Mach. for information about installation of an Automatic Air Release Valve for your specific application.

ALIGNMENT

The alignment of the pump and its power source is critical for trouble-free mechanical operation. In either a flexible coupling or V-belt driven system, the driver and pump must be mounted so that their shafts are aligned with and parallel to each other. It is imperative that alignment be checked after the pump and piping are installed, and before operation.

NOTE

*Check **Rotation**, Section C, before alignment of the pump.*

When mounted at the Gator Prime factory, driver and pump are aligned before shipment. Misalignment will occur in transit and handling. Pumps must be checking alignment, tighten the foundation bolts. The pump casing feet and/or pedestal feet, and the driver mounting bolts should also be tightly secured.

WARNING!

When checking alignment, disconnect the power source to ensure that the pump will remain inoperative.

CAUTION!

Adjusting the alignment in one direction may alter the alignment in another direction. Check each procedure after altering alignment.

Coupled Drives

When using couplings, the axis of the power source must be aligned the axis of the pump shaft in both the horizontal and vertical planes. Most couplings require a specific gap or clearance between the driving and the driven shafts. Refer to the coupling manufacturer's service literature.

Align spider insert type couplings by using calipers to measure the dimensions on the circumference of the outer ends of the coupling hub every 90 degrees. The coupling is in alignment when the hub ends are the same distance apart at all points (see Figure 6A).

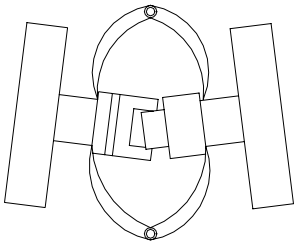
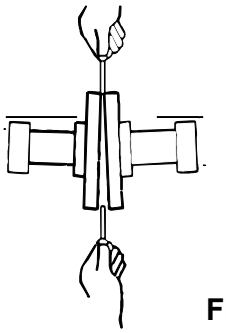


Figure 6A. Aligning Spider – Type Couplings



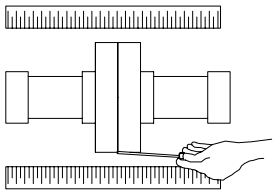


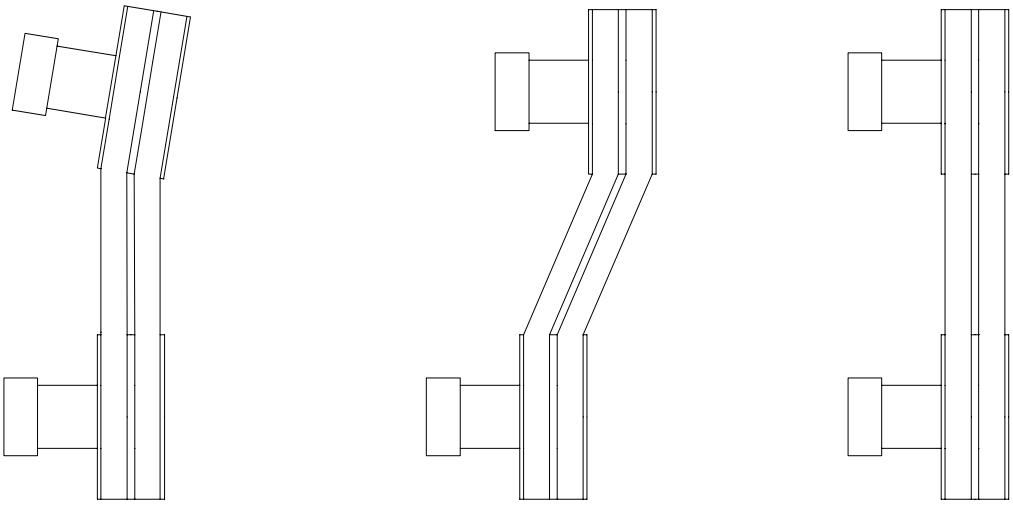
Figure 6B. Aligning Non-Spider Type Couplings

Align non-spider type couplings by using a feeler gauge or taper gauge between the coupling halves every 90 degrees. The coupling is in alignment when the hubs are the same distance apart at all points (see Figure 6B).

Check parallel adjustment by laying a straightedge across both coupling rims at the top, bottom, and side. When the straightedge rests evenly on both halves of the coupling, the coupling is in horizontal parallel alignment. If the coupling is misaligned use a feeler gauge between the coupling and the straightedge to measure the amount of misalignment.

V-Belt Drives

When using V-belt drives, the power source and the pump must be parallel. Use a straightedge along the sides of the pulleys to ensure that the pulleys are properly aligned (see Figure 6C). In drive systems using two pr more belts, make certain that the belts are a matched set; unmatched sets will cause accelerated belt wear.



MISALIGNED: SHAFTS NOT PARALLEL

MISALIGNED: SHAFTS NOT IN LINE

ALIGNED: SHAFTS PARALLEL AND SHEAVES IN LINE

Figure 6C. Alignment of V-Belt Driven Pumps

Tighten the belts in accordance with the belt manufacturer's instructions. If the belts are too loose, they will slip; if the belts are too tight, there will be excessive power loss and possible bearing failure. Select pulleys that will match the proper speed ratio; over speeding the pump may damage both pump and power source.

DANGER!

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

OPERATION – SECTION C

Review all SAFETY information in Section A.

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

WARNING!

This pump is designed to handle mild industrial corrosives, mud or slurries containing large entrained solids. Do not attempt to pump volatile; corrosive, or flammable liquids that may damage the pump or endanger personnel as a result of pump failure.

CAUTION!

Pump speed and operating conditions must be within the performance range shown on page 21.

PRIMING

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

This pump is self-priming, but the pump should never be operated unless there is liquid in the pump casing.

CAUTION!

Never operate this pump unless there is liquid in the pump casing. The pump will not prime when dry. Extend 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.

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

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.

To fill the pump, remove the pump casing fill cover or fill plug in the top of the casing, and add clean liquid until the casing is filled. Replace the fill cover or fill plug before operating the pump.

STARTING

Consult the operations manual furnished with the power source.

Rotation

The correct direction of pump rotation is counterclockwise when facing the impeller. The pump could be damaged and performance adversely affected by incorrect rotation. If pump performance is not within the specified limits (see the curve on page 21), check the direction of power source rotation before further troubleshooting.

If an electric motor is used to drive the pump, remove V-belts, couplings, or otherwise disconnect the pump from the motor before checking motor rotation. Operate the motor independently while observing the direction of the motor shaft, or cooling fan.

If rotation is incorrect on a three-phase motor, have a qualified electrician interchange any of the Phase wires to change direction. If rotation is incorrect on a single-phase motor, consult the literature supplied with the motor for specific instructions.

OPERATION

Lines With a Bypass

If a Gator Prime Automatic Air Release Valve has been installed, the valve will automatically open to allow the pump to prime, and automatically close after priming is complete (see **INSTALLATION** for Air Release Valve operation.

Lines Without a Bypass

Open all valves in the discharge line and start the power source. Priming is indicated by a positive reading on the o the discharge pressure gauge or by a quieter operation. The pump may not prime immediately because the suction line must first fill with liquid. If the pump fails to prime within five minutes, stop it and check the suction line for leaks.

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

WARNING!

Do not operate the pump against a closed discharge throttling valve for long periods of time. If operated against a closed discharge throttling valve, pump components will deteriorate, and the liquid could come to a boil, build pressure, and cause the pump casing to rupture or explode.

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 160º F(71º 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.

DANGER!

Allow an over-heath pump to cool before servicing. Do not remove plates, covers, gauges, or fittings from an overheated 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.

As safeguard against rupture or explosion due to heat, this pump is equipped with a pressure relief valve that will open if vapor pressure within the pump casing reaches a critical point. If overheating does occur, stop the pump immediately and allow it to cool before servicing it. Approach any overheated pump cautiously. It is recommended that the pressure relief valve assembly be replaced at each overhaul, or any time the pump casing overheats and activates the valve. Never replace this valve with a substitute that has not been specified or provided by Thomas Pump & Machinery.

Strainer Check

If s 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 back flushing is absolutely necessary, liquid pressure **must** be limited to 50% of the maximum permissible operating pressure show on the pump performance curve.

Pump Vacuum Check

With the pump inoperative, install a vacuum gauge in the system, using pipe dope on the threads. Block the suction line and start the pump. At operating speed the pump should pull a vacuum of 20 inches (508,0mm) 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 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.

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, lock out or disconnect the power source to ensure that the pump will remain inoperative.

WARNING!

Do not operate the pump against a closed discharge throttling valve for long periods of time. If operated against a closed discharge throttling valve, pump components will deteriorate, and the liquid could come to a boil, build pressure, and cause the pump casing to rupture or explode.

Cold Weather Preservation

In below freezing conditions, drain the pump to prevent damage from freezing. Also, clean out any solids by flushing with a hose. Operate the pump for approximately one minute; this will remove any remaining liquid that could freeze the pump rotating parts. If the pump will be idle for more than a few hours, or if it has been pumping liquids containing a large amount of solids, drain the pump, and flush it thoroughly with clean water. To prevent large solids from clogging the drain port and preventing the pump from completely draining, insert a rod or stiff wire in the drain port, and agitate the liquid during the draining process. Clean out any remaining solids by flushing with a hose.

BEARING TEMPERATURE CHECK

Bearings normally run at higher than ambient temperatures because of heat generated by friction. Temperatures up to 160º F(71º C) are considered normal for bearings, and they can operate safely to at least 180º F(82º C).

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

A sudden increase in bearing temperature 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 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.

TROUBLESHOOTING - SECTION D

Review all SAFETY information in Section A.

WARNING!

Before attempting to open or service the pump:

1. **Familiarize yourself with this manual.**
2. **Lock out or 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	Not enough liquid in casing.	Add liquid to casing. See **PRIMING.**
	Suction check valve contaminated or damaged.	Clean or replace check valve.
	Air leak in suction line.	Correct leak.
	Lining of suction hose collapsed.	Replace suction Hose.
	Leaking or worn seal or pump gasket.	Check pump vacuum. Replace leaking Or worn seal or gasket.
	Suction lift or discharge head too high.	Check piping installation and install bypass line if needed. See INSTALLATION.
	Strainer clogged.	Check strainer and clean if necessary.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
PUMP STOPS OR FAILS TO DELIVER RATED FLOW OR PRESSURE	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.
	Suction intake not submerged at proper level or sump too small.	Check installation and correct submergence as needed.
	Impeller or other wearing parts worn or damaged.	Replace worn or damaged parts. Check that impeller is properly centered and rotates.
	Impeller clogged.	Free impeller of debris.
	Pump speed too slow.	Check driver output; check belts or couplings for slippage.
	Discharge head too high.	Install bypass line.
	Suction lift too high.	Measure lift w/vacuum gauge. Reduce lift and/or friction losses in suction line.
PUMP REQUIRES TOO MUCH POWER	Pump speed too high	Check driver output; check that sheaves or motor rpm are correctly sized.
	Discharge head too low.	Adjust discharge valve.
	Liquid solution too thick.	Dilute if possible.
	Bearing(s) frozen.	Disassemble pump and check bearing(s).
PUMP CLOGS FREQUENTLY	Liquid solution too thick.	Dilute if possible.
	Discharge flow too slow.	Open discharge valve fully to increase flow rate, and run power source at maximum governed speed.
	Suction check valve or foot valve Clogged or binding.	Clean valve.

TROUBLE	POSSIBLE CAUSE	PROBABLE REMEDY
EXCESSIVE NOISE	Cavitation in pump.	Reduce suction lift and/or friction losses in suction line. Record vacuum and pressure gauge readings and consult local representative or factory.
	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 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.	Align drive properly.

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 GP - 2

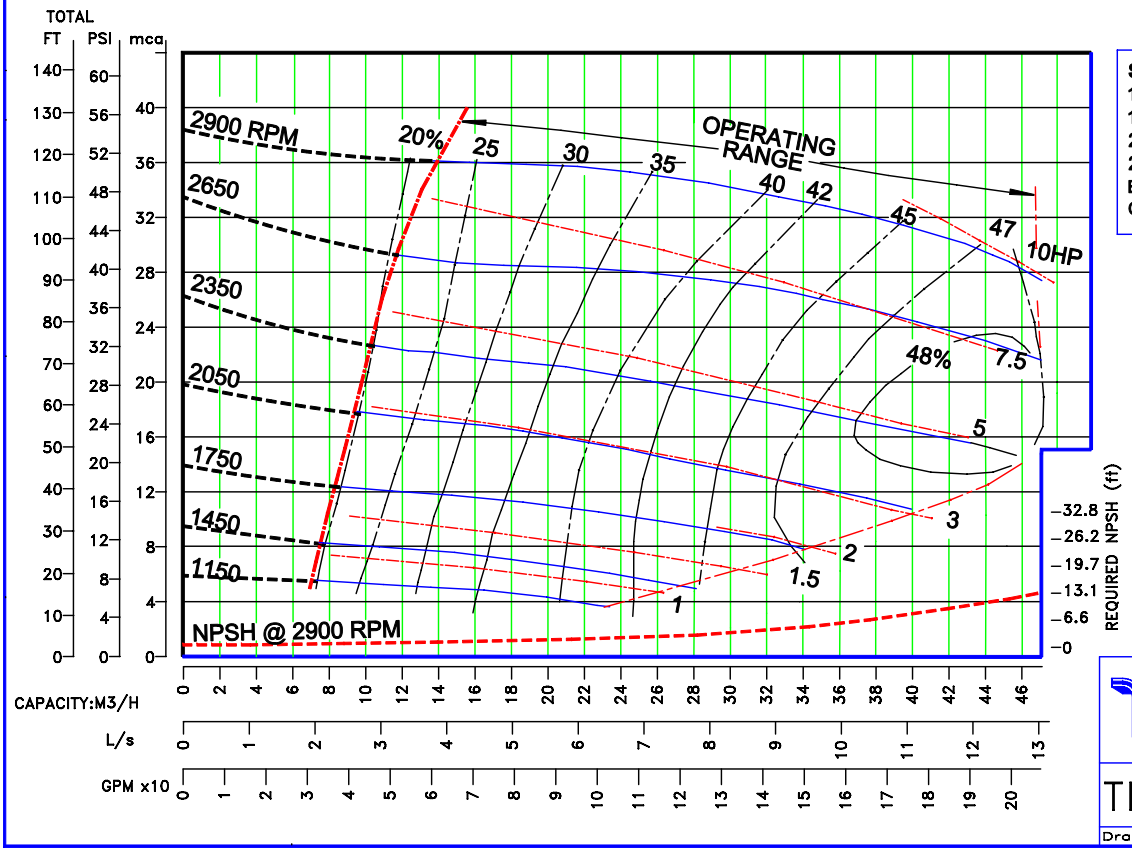
SERIES :

GATOR PRIME

PERFORMANCE CURVE

MODEL GP2 2"x2"

DATA
Impeller ø6 1/4"
RPM Various
Max. Solids ø1 3/4"



SELF PRIMING
1150 rpm 24ft (7,3m) -1450 rpm 25ft (7,6m)
1750 rpm 25ft (7,6m) -2050 rpm 25ft (7,6m)
2350 rpm 25ft (7,6m) -2650 rpm 25ft (7,6m)
2650 rpm 25ft (7,6m) -2900 rpm 25ft (7,6m)
BEFORE USING THIS TABLE,
CHECK THE NPSH.

DESCRIPTION
GP2 GATOR PRIME CURVE

THOMAS PUMP & MACHINERY, INC.
120 Industrial Drive, Slidell, LA 70460
(985) 649-3000 fax (985) 649-4300 1-800-256-7867
e-mail tpump@thomaspump.com
www.thomaspump.com

TP08–GP2–CURVE–0
Drawing Number Rev.

Based on 70º F(21º C) clear water at sea level 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.

CAUTION!

Pump speed and operating condition points must be within the continuous performance range shown on the curve.

SECTION DRAWING

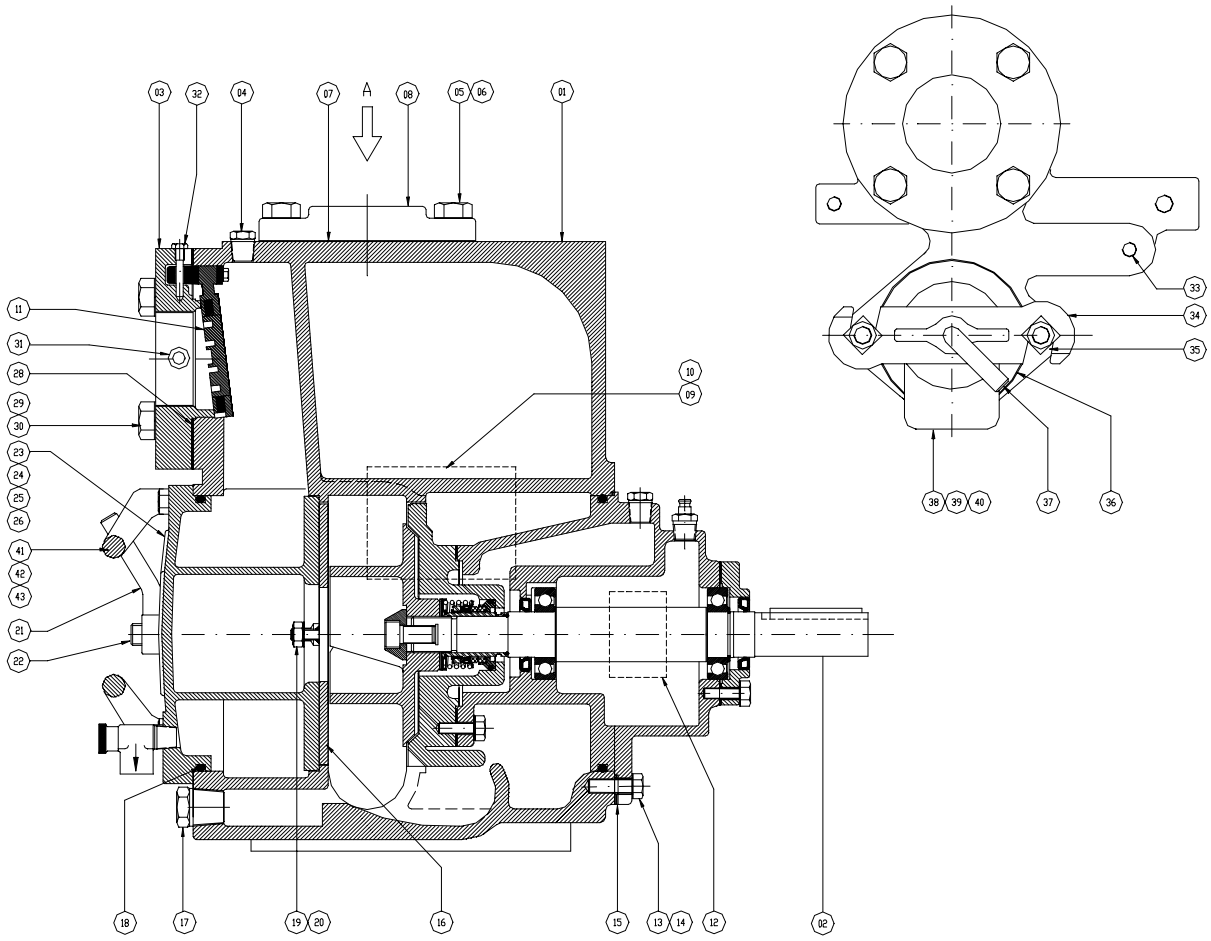


Figure 1. Pump Model

PARTS LIST

Pump Model GP - 2

ITEM NO.		PART NAME	QTY	PART NUMBER
01		**PUMP CASING**	**01**	**9600333000**
02	*	REPAIR ROTATING ASSY	01	9700869000
03		**SUCTION FLANGE**	**01**	**9802153000**
04		PIPE PLUG	01	3310271020
05		**HEX HD CAPSCREW**	**04**	**2101265080**
06		LOCKWASHER	04	2321080880
07	*	**DISCH FLANGE GSKT**	**01**	**9902159000**
08		DISCHARGE FLANGE	01	3354211140
09		**NAME PLATE**	**01**	**9901325000**
10		DRIVE SCREW	04	2750201200
11		**VALVE ASSEMBLY**	**01**	**9801929000**
12		ROTATION DECAL	01	9901433000
13		**HEX HD CAPSCREW**	**04**	**2101263890**
14		LOCKWASHER	04	2321080840
15		**ROT ASSY SCREW SET**	**04**	**2102133870**
16	*	WEAR PLATE ASSY	01	9902155000
17		**CASING DRAIN PLUG**	**01**	**3310271080**
18	*	BACK COVER O'RING	01	3606222600
19		**HEX NUT**	**04**	**2211270030**
20		LOCKWASHER	04	2321080800
21		**HAND NUT**	**02**	**9901345000**
22		STUD	02	2105302250
23		**BACK CVR PLATE ASSY**	**01**	**9700902000**
24		WARNING PLATE	01	9901328000
25		**DRIVE SCREW**	**04**	**2750201200**
26		CAUTION DECAL	01	9901329000
27		**PRESS RELIEF VALVE**	**01**	**3768500300**
28		SUCTION FLANGE GASKET	01	9902161000
29		**HEX HD CAPSCREW**	**04**	**2101265080**
30		LOCKWASHER	04	2321080880
31		**PIPE PLUG**	**01**	**3310271020**
32		CHECK VALVE PIN	01	9902273000
33		**PIPE PLUG**	**01**	**3310271020**
34		CLAMP BAR	01	9800868000
35		**HEX HD CAPSCREW**	**02**	**2102565150**
36		FILL COVER GASKET	01	9902160000
37		**MACHINE BOLT**	**01**	**9911311000**
38		FILL COVER ASSY	01	9901299000
39		**WARNING PLATE**	**01**	**9901331000**
40		HEX NUT	02	2750201200
41		**BACK COVER PLATE**	**02**	**9802080000**
42		HEX HD CAPSCREW	04	2101262570
43		**LOCKWASHER**	**04**	**2321080800**

*** INDICATES PARTS RECOMMENDED FOR STOCK**

SECTION DRAWING

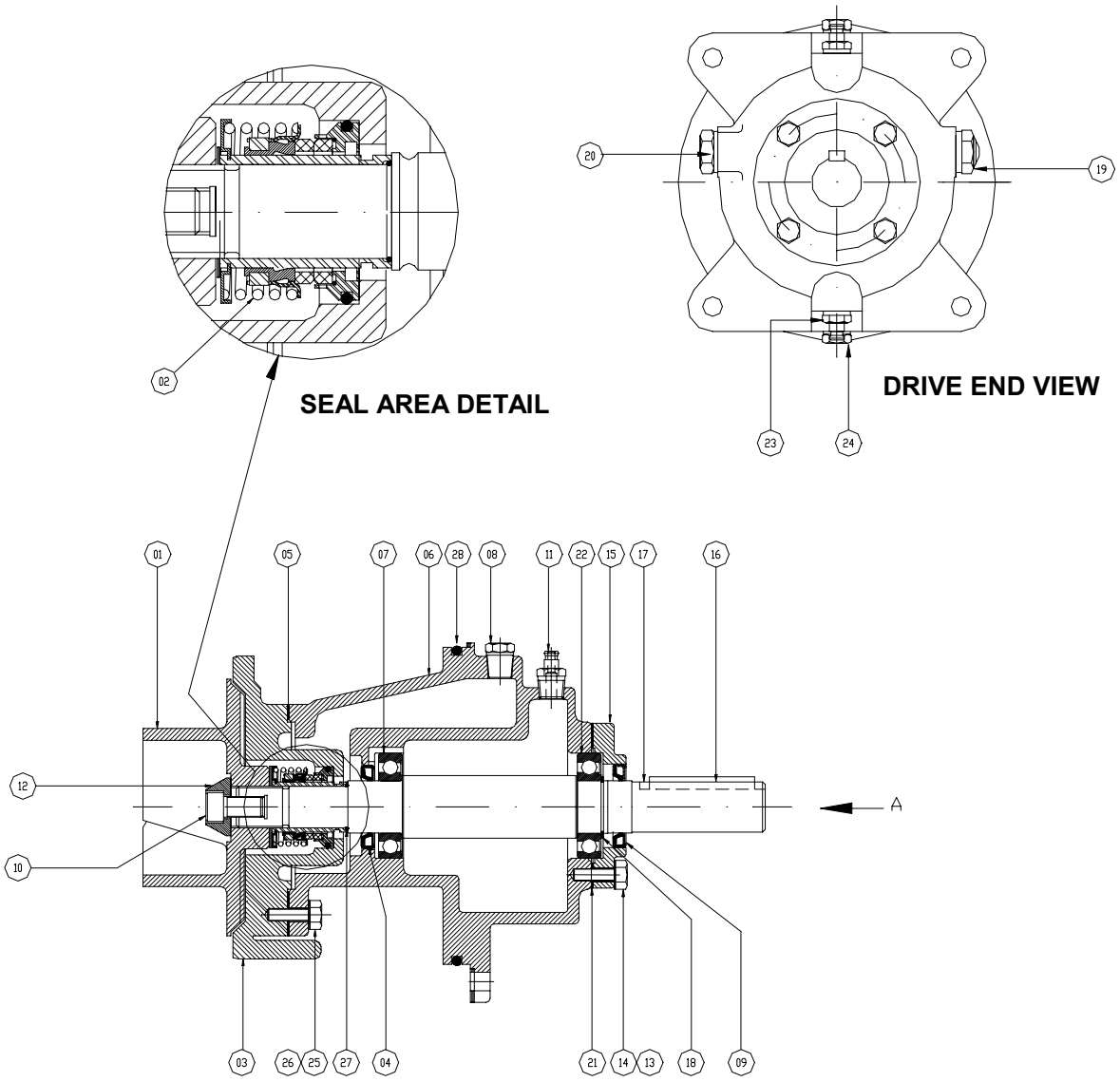


Figure 2. Repair Rotating Assembly

PART LIST
Repair Rotating Assembly

ITEM NO.		PART NAME	QTY	PART NUMBER
01	*	**IMPELLER**	**01**	**9700899000**
02	*	SEAL ASSEMBLY	01	9800906000
03		**SEAL PLATE**	**01**	**9700919000**
04	*	INBOARD OIL SEAL	01	3680047800
05	*	**SEAL PLATE GASKET**	**01**	**9902272000**
06		BEARING HOUSE	01	9700934000
07	*	**INBOARD BALL BEARING**	**01**	**3180011970**
08		VENTED PLUG	01	9901335000
09	*	**BEARING CAP OIL SEAL**	**01**	**3680047800**
10		SOCKET HD CAPSCREW	01	2102141950
11		**AIR VENT**	**01**	**3310990060**
12		IMPELLER WASHER	01	9902274000
13		**HEX HD CAPSCREW**	**04**	**2101262580**
14		LOCKWASHER	04	2321080800
15		**BEARING CAP**	**01**	**9802215000**
16	*	SHAFT KEY	01	9901351000
17		**IMPELLER SHAFT**	**01**	**9802209000**
18		BEARING RETAINING RING	01	3921501041
19		**SIGHT GAUGE**	**01**	**3480500200**
20		PIPE PLUG	01	3310271080
21	*	**BEARING CAP GASKET**	**01**	**9901352000**
22	*	OUTBOARD BALL BEARING	01	3180011940
23		**BEARING HOUSING DRAIN PLUG**	**01**	**3310271060**
24		SEAL CAVITY DRAIN PLUG	01	3310271060
25		**HEX HD CAPSCREW**	**04**	**2101263890**
26		LOCKWASHER	04	2321080840
27		**SEAL PLATE O-RING**	**01**	**3606220240**
28		ROTATING ASSY O-RING	02	3606127530

*** INDICATES PARTS RECOMMENDED FOR STOCK**

PUMP AND SEAL DISASSEMBLY AND REASSEMBLY

Review all SAFETY Information 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 Figures 1 and 2) and the accompanying parts lists.

Many service functions may be performed by draining the pump and removing the back cover assembly. If major repair is required, the piping and/or power source must be disconnected. The following instructions assume complete disassembly is required.

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

For power source disassembly and repair, consult the literature supplied with the power source, or contact your local power source representative.

⇩ WARNING!

Before attempting to open or service the pump:

1. **Familiarize yourself with this manual.**
2. **Disconnect or lock out 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.**

⇩ WARNING!

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

Back Cover And Wear Plate Removal

(Figure 1)

The wear plate (16) is easily accessible and may be serviced by removing the back cover assembly (23). Before attempting to service the pump, remove the pump casing drain plug (17) and drain the pump. Clean and reinstall the drain plug.

Remove the hand nuts (21) and pull the back cover and assembled wear plate from the pump casing (1). Inspected the wear plate, and replace it if badly scored or worn. To remove the wear plate, disengage the hardware (19 and 20).
Inspect the back cover O-ring (18) and replace it if damaged or worn.

Suction Check Valve Removal

(Figure 1)

If the check valve assembly (11) is to serviced, remove the check valve pin (32), reach through the back cover opening and pull the complete assembly from the suction flange (3).

NOTE

Further disassembly of the check valve is not required since it must be replaced as a complete unit. Individual parts are not sold separately.

Rotating Assembly Removal

(Figure 2)

The rotating assembly may be serviced without disconnecting the suction or discharge piping; however, the power source must removed to provide clearance.


GATOR PRIME
TM
www.thomaspump.com
Thomas Pump & Machinery 985-649-3000