INSTALLATION, OPERATION & MAINTENANCE MANUAL

CUSTOMER:

CUSTOMER ORDER:

THOMAS PUMP ORDER:

MODEL NUMBER:

PUMP SERIAL NUMBER:

THOMAS PUMP & MACHINERY, INC.

Thomas Pump Louisiana 120 Industrial Drive	Thomas Pump Georgia 105 Enterprise Avenue	Thomas Pump Panama, S.A. RUC Urb. Bariloche, No.3
Slidell, LA 70460	Carrollton, GA 30117	Altos de Panama, Panama
Phone: 985-649-3000	Phone: 770-908-8000	Phone: 507-230-5523
Fax: 985-649-4300	Fax: 770-908-8008	Fax: 507-230-5523

Original Instructions

CE DECLARATION OF CONFORMITY OR DECLARATION OF INCORPORATION

Manufacturer:	Thomas Pump & Machinery
Address:	120 Industrial Dr. Slidell, LA. 70460 USA

Hereby declares that the equipment described below:

Description: ***GTO GATOR®*** or ***GTO RHINO®*** Centrifugal Pump

Model Number: AS SHOWN ON PUMP NAMEPLATE

Serial Number: AS SHOWN ON PUMP NAMEPLATE

For pumps with electric motors:

It is hereby certified that this equipment complies with the essential health and safety requirements of the 'Machinery Directive' and conforms to the relevant standards, listed below:

Directives:

Council Directive 98/37/EC and 2006/42/EC 'Machinery Directive'
Council Directive 2006/95/EC 'Low Voltage Directive'

Harmonized Standards:

BS EN 809:1998 – Pumps and pump units for liquids - Common safety requirements
BS EN 60204-1:2006 - Safety of Machinery – Electrical Equipment of machines Part 1: General Requirements
BS EN ISO 12100-1:2003 Safety of machinery - Basic concepts, general principles for design – Part 1: Basic terminology, methodology
BS EN ISO 12100-2:2003 Safety of machinery - Basic concepts, general principles for design – Part 2: Technical principles
BS EN ISO 13857:2006 – Safety Distances to prevent Hazard Zones being reached to prevent by upper and lower limbs
BS EN 349:1993 Safety of Machinery - Minimum gaps to avoid crushing parts of the human body

CE DECLARATION OF CONFORMITY OR DECLARATION OF INCORPORATION

For pumps supplied without motors

It is hereby certified that this equipment is intended to be incorporated into, or assembled with other machinery to constitute relevant machinery to comply with the essential health and safety requirements of the 'Council Directive' 98/37/EC and 2006/42/EC 'Machinery Directive'

The machinery covered by this declaration must not be put into service until the machinery
into which it is to be incorporated has been declared in conformity with the provisions of

Directives 98/37/EC and 2006/42/EC '–'The Machinery Directive'

Thomas Pump & Machinery Representative (Responsible Person)

Full Name: Position:

Signature: Date:

European Union Technical File Holder
ICPN HOLDING BV
NETHERLANDS HOLDING BV
KLAROENRING 54
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rudy@icpn.nl

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Temperature of touchable surfaces can reach as high as 180°F (82°C).

WARNING – THE OPERATION OF THIS EQUIPMENT REQUIRES THE USE OF PPE. (PERSONAL PROTECTION EQUIPMENT).

THIS IS THE USER CAUTION SYMBOL. IT INDICATES A CONDITION WHERE DAMAGE TO THE EQUIPMENT RESULTING IN INJURY TO THE OPERATOR COULD OCCUR IF OPERATIONAL PROCEDURES ARE NOT FOLLOWED.

LIFT POINT – IN ORDER TO REDUCE THE LIKLEHOOD OF DAMAGE TO THE EQUIPMENT, USE ONLY THE LIFT POINTS INDICATED IN THE INSTALLATION MANUAL.

CAUTION! – DO NOT USE NON-APPROVED LUBRICANTS IN THIS MACHINE.

DANGER! TO REDUCE THE RISK OF PERSONNEL OR EQUIPMENT DAMAGE, MAINTAIN PRESSURE AT SAFE LEVELS.

WARNING – HAZARDOUS MOVING PARTS ARE LOCATED BEHIND THIS ACCESS PANEL. DO NOT OPERATE THIS EQUIPMENT WITHOUT ALL GUARDS AND COVERS IN PLACE

Warning – Circuits Are Live –Lockout/Tagout The Upstream Disconnecting Means Prior To Opening for Service.

DANGER – CRUSH HAZARD FROM ABOVE – USE EXTREME CAUTION WHEN TRANSPORTING PUMP/PUMP UNIT WITH AN OVERHEAD CRANE OR FORKLIFT

POWER SOURCES – THIS PRODUCT SHOULD BE OPERATED ONLY FROM THE TYPE OF SOURCE INDICATED ON THE MANUFACTURER'S IDENTIFICATION LABEL. INSTALLATION SHOULD BE IN COMPLIANCE WITH APPLICABLE SECTIONS OF THE NATIONAL ELECTRIC CODE. CONSULT YOUR LOCAL BUILDING CODE BEFORE INSTALLING.

WARNING - Indicates a potentially hazardous situation, which if not avoided **could result in death or serious injury.** Warning should not be considered for property damage accidents unless personal injury risk appropriate to these levels is also involved.

CAUTION - Indicates a potentially hazardous situation which, if not avoided, **may result in minor or moderate injury.** It may also be used to alert against unsafe practices. Minor burns, pinch points that result in bruises and minor chemical irritation are some examples where CAUTION is chosen.

EMERGENCY STOP

DANGER - Indicates an imminently hazardous situation, which if not avoided, **will result in death or serious injury.** This signal word is to be limited to the most extreme situations. Danger should not be considered for property damage accidents unless personal injury risk appropriate to these levels is also involved

1.0 Introduction

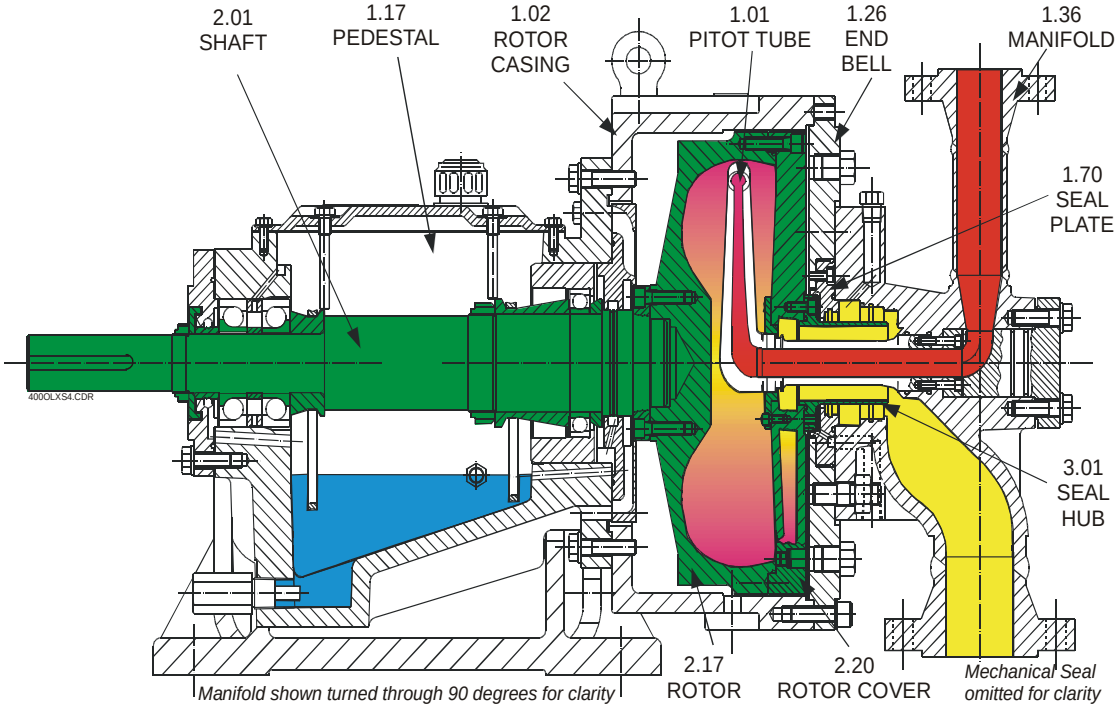
This manual gives the safety, installation, operation and maintenance instructions for Pumps.

This manual has been prepared to assist you in understanding the construction and the correct methods of installing, operating and maintaining your GTO GATOR™ / GTO RHINO® Pump.

The design, material, and workmanship incorporated in the construction of the GTO GATOR™ / GTO RHINO® makes it capable of giving long, trouble-free service. The life and satisfactory service of any mechanical unit, however, is dependent upon correct application, proper installation, periodic inspection and careful maintenance. For this reason, you are urged to read and follow the directions in this manual.

1.1 How does the GTO Rhino® / GTO Gator® Operate

The exclusive GTO GATOR® / GTO RHINO® has only two basic working parts...a rotating case and a stationary pick-up tube collector arm within the rotating case. The GTO GATOR® / GTO RHINO® design completely eliminates the need for packing glands, wear rings or multiple stages as used in conventional centrifugal pumps, and also eliminates the complex pistons, rods, valves and springs required in reciprocating pumps. The GTO GATOR® / GTO RHINO® operates in the following manner: liquid enters the intake manifold and passes into the rotating case where centrifugal force increases the velocity and pressure of the liquid. The velocity of the liquid in the rotor is converted into additional pressure as it jets into the pick-up tube



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Original Instructions

2.0 General Information and Safety Instructions

The products supplied by Thomas Pump have been designed with safety in mind. Where hazards cannot be eliminated, the risk has been minimized by the use of guards and other design features. Some hazards cannot be guarded against and the instructions below MUST BE COMPLIED WITH for safe operation. These instructions cannot cover all circumstances; YOU are responsible for using safe working practices at all times.

2.1 Installation Area

Thomas Pump products are designed for installation

In designated areas, which are to be kept clean and free of obstructions that may restrict safe access to the controls and maintenance access points. A **pump nameplate** is fitted to each unit and **must not be removed**. Loss of this plate could make identification impossible. This in turn could
affect safety and cause difficulty in obtaining spare parts. Should accidental loss or damage occur, contact Thomas Pump.

2.3 Installation Compliance

Thomas Pump requires all personnel that are responsible for installation, operation or maintenance of the equipment, have access to and study the product instruction manual BEFORE any work is done and that they comply with all local and industry based safety instructions and regulations.

2.5 Loose Clothing

Do NOT wear loose or frayed clothing or jewelry which could catch on the controls or become trapped in the equipment.

2.7 Operating Limits

Note any limits to the pump application specified in the contract documentation. Operation of the equipment outside these limits will increase the risk from hazards noted below and may lead to premature and hazardous pump failure.

2.9 IMPROPER INSTALLATION,OPERATION

OR MAINTENANCE OF THIS PUMP PRODUCT COULD RESULT IN INJURY OR DEATH. Refer to the manual. Read and follow instructions. Do not perform any of the actions indicated above if you are not qualified to do so.

2.2 Qualified Personnel

Access to the equipment should be restricted to the personnel responsible for installation, operation and maintenance and they must be trained, adequately qualified and supplied with the appropriate tools for their respective tasks.

2.4 Ear Protection

Ear plugs should be worn where the specified equipment noise level exceeds locally defined safe levels. Safety glasses or goggles should be worn where working with pressurized systems and hazardous substances.

2.6 Referenced Manual

Check and confirm that the manual is the relevant copy by comparing the serial number on the identification plate with that on the manual.

2.8 Equipment Access

Clear and easy access to all controls, gauges, and dials etc. MUST be maintained at all times. Hazardous or flammable materials must NOT be stored in pump rooms unless safe areas or racking and suitable containers have been provided.

3.0 TRANSPORT HANDLING AND STORAGE INSTRUCTIONS

3.1 Transport

GTO pumps are shipped fully assembled but for overseas orders the lubricating oil in the bearing Housing is drained. Pumps are protected against corrosion and packed for transport by normal road ,rail and sea carriers.

3.3 Receiving Inspection

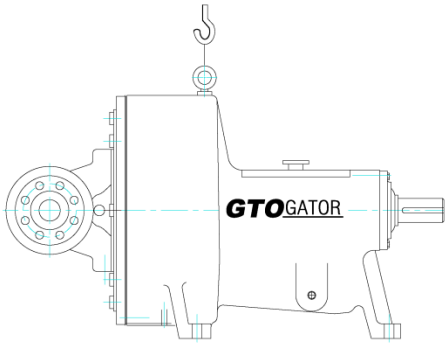
Prior to signing any shipping documents, visually inspect the shipment for shortages or damages and promptly report any to the carrier, noting damage on the freight bill, receipt, and bill of lading. **Make any claims to the transportation company promptly!**

Read this documentation carefully.
Do not remove any labels or shaft protection before having read all instructions. Instructions on various components as well as the Operation and Maintenance Manual for the pump are included in the shipment

3.2 Handling

The use of suitable forklift truck and four-chain crane sling equipment is recommended but locally approved equipment of suitable rating may be used

Equipment lifting tools such as chains. lifting eyes, hooks, etc. must be approved by local, state or federal safety codes. Lifting tools must be adequately sized to lift rated loads. Failure to use approved lifting tools may result in injury. When lifting pumps or pump units it is important to make sure that the chains and cables are fastened reliably to their retaining Hooks. Pumps are usually supplied on pallets for handling by forklift truck. To lift from the pallet the pump should be slung as shown.



4.0 Identification

Each pump is provided with a stainless steel nameplate with (at least) the following information noted:
Pump code
Pump serial number (unique number used to identify each pump)

This nameplate is to be mounted on the pump and has to be kept on the pump at all times. The information stated on the nameplate is essential and is needed for identification of the pump.
See Section 11.0

5.0 Temporary Storage for up to Six Weeks

If the pump is not to be used immediately, it should be stored carefully in a horizontal position, in a sheltered, dry location with a reasonably constant temperature. Do not remove the shaft protector until the pump has been installed and do not remove the inlet and discharge connection plugs until the unit is to be piped. Additional rust preventative should be applied to all unpainted carbon steel or cast iron parts, and should not be removed until final installation.
Parts subject to attack by moisture, such as bearings, shaft, suction and discharge threaded openings, and other finished parts should be inspected periodically and coated with lubricant or rust preventative. **If the pump is to be stored or not placed in operation within two weeks after receipt:**

Store pump in a clean, dry place free from vibration
and extremes in temperature.

Protect all exposed, unpainted surfaces from rust.

Every two weeks remove the pedestal cover and spray the bearings with a light coat of oil (Mobil Delvac 1). Rotate the pump shaft 2 or 3 revolutions by hand *every two weeks*. After prolonged storage, the bearing lubrication instructions in this Operation and Maintenance Manual must be followed.

Accessories such as drives, etc. should be protected in accordance with the accessory manufacturer's instructions.

Following these recommendations will help the pumps to operate without problems for long, trouble free service.

6.0 Installation

6.1 Location of Pump

As a minimum, leave sufficient room in front of the pump to remove the manifold for seal replacement at least 12" - 305mm.

Preferably, pump should be located where there is sufficient accessibility for inspection and maintenance. A clear space with ample room should be allowed for the use of an overhead crane or hoist.

Select a dry place above the floor level whenever possible. Take care to prevent the pump from freezing during cold weather.
The pump must be located relative to the system so as to insure that sufficient NPSH (Net Positive Suction Head) is provided at the pump inlet. Available NPSH must always equal or exceed the required NPSH.

Whenever possible, the pump should be located below reservoir fluid level to facilitate priming.

Installation on Concrete Foundation

6.2 Foundations:

Hydraulic Institute (HI) recommends a foundation capable of absorbing vibration at least five times the weight of the pumping set and to form a permanent, rigid support for the base plate. The key to a proper pump installation starts with a good foundation. The foundation is essential for a smooth running pump. Foundation bolts should be sized .125" less than the anchor holes in the base for clearance. The foundation bolts should be embedded in the concrete eight (8) to twelve (12) inches. The bolts should have a sleeve around them at least six (6) times the bolt diameter in length and at least two (2) bolt sizes larger in I.D.; with a nut and washer design the washer should have an O.D. two (2) sizes larger than the sleeve. The foundation should be at least 4" (100 mm) thick concrete slab floor or a 8" (200 mm) thick concrete pad, at least 2" (50 mm) wider and longer than the pump base plate, and should be steel reinforced according to local building codes.

6.3 Setting the Baseplate:

It is important to install **GTO GATOR® / GTO RHINO®** pumps -before installing the suction and discharge pipe. Piping should always be run to the pump. This insures that the pipes are aligned to the pump nozzle so that no strain is transmitted to the pump when the flange bolts are tightened on the manifold and casing. For direct drive pumps, remove the coupling guard to provide access to the shaft and coupling. The coupling halves should be disconnected.

Using proper lifting equipment set the pump baseplate on the foundation bolts being careful not to twist the baseplate.

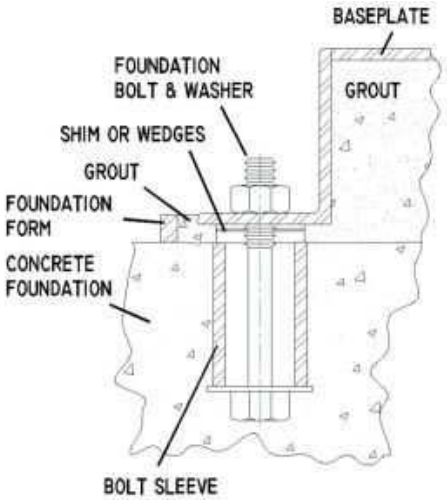
Adjust the height with shims or leveling wedges in each position until the **shaft** is horizontal and the pump **flanges** are vertical, do not level from the baseplate as this may not be true to the shaft and flanges.

6.3.5 Installation of a Replacement Pump

When installing a replacement pump to an existing base check for a soft foot condition. The pump's feet are machined flat but soft foot is a condition in which one of the feet does not sit flat on the base. The foot or the base may have been warped are an inordinate amount of rust or debris is present as well as any lost of original shims. If soft feet exist, when you tighten the bolt on the foot, the machinery will distort. This distortion can cause premature bearing failure and equipment vibration. (See Annex A for correcting a Soft Foot and a Report Sheet)

⚠ CAUTION Do not exceed six (6) shims, using as thick of shim as possible, otherwise "sponginess or "softfoot" will result. Place thin shims between thick shims

Insure that the foundation bolts are vertical
to permit easy lifting of the pump unit. Lightly tighten foundation bolts check to be sure the equipment is still aligned and the base was not distorted. If alignment is correct snug foundation bolts then grout in with approved non-shrinking grout. Allow sufficient time for the grout to harden, usually 24 hours. Refer to the grout manufacturer's instructions for recommended cure time and tighten the nuts to the torque recommended.



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6.4 Suction and Discharge Piping

Make sure suction and discharge piping is installed without any stress. When suction and/or discharge piping is not installed 100% stress free, pump may be damaged due to heavy forces on pump. Both suction and discharge piping should be supported independently and close to the pump so that no strain is transmitted to the pump when the flange bolts are tightened. Use pipe hangers or other supports at intervals necessary to provide support. When expansion joints are used in the piping system, they must be installed beyond the piping supports closest to the pump. Install piping as straight as possible, a minimum of five (5) pipe diameters between any elbow or tee avoiding unnecessary bends. Where necessary, use 45°L or long sweep 90°L fitting to decrease friction losses. Make sure that all piping joints are airtight. Where reducers are used, eccentric or 'flat top' reducers are to be fitted in suction lines and concentric or straight taper reducers in discharge and vertical lines. Undulations in the pipe runs are also to be avoided. Failure to comply with this may cause the formation of air pockets in the pipe and thus prevent the correct operation of the pump. The suction pipe should be as short and direct as possible, and should be flushed clean before connecting to the pump.

6.5 Bypass

Like other centrifugal type pumps, the GTO loses a certain amount of power in churning the fluid within the pump. This lost power is converted to heat. If the pump is operated at or near shut-off (no flow), the temperature of the fluid within the pump will rise to unacceptable levels, and could cause seal failure or various other problems.

It is therefore (necessary) to have a fluid bypass to remove this heat and insure adequate seal lubrication.

The minimum recommended bypass flow should be approximately 10% of the peak efficiency flow of the pump. Listed below are applicable bypass orifice sizes, which will meet the bypass flow requirement of the GTO selected:

Pump Type:	Orifice Size:
T060 / T090	3/32” (2.387mm)
T120 / T150	1/8 “(3.175mm)
T302 / T242	5/32” (3.962mm)

Thomas Pump recommends that a 1/2” (13 mm) bypass line be installed in the discharge line of the pump, between the pump and the discharge valve. For longer runs this pipe size may need to be increased. The bypass line should be piped back to the suction reservoir, or to a drain.

⚠ CAUTION

Never pipe the bypass line directly into the intake or suction line of the pump.

Thomas Pump optionally furnishes a pump safety package that includes an outlet throttle valve, a pressure gauge, a tee, and a bypass orifice; ready to connect to the pump discharge line and a bypass line.

⚠ CAUTION

A vortex breaker, screen or baffle may be required if the pump tank is too small or the bypass return line is too close to the pump suction line.

When suction and/ or discharge piping is not installed 100% stress free, pump may be damaged due to heavy forces on pump. Vibrations may be transferred through the pipes, if this is the case, it is recommended to install pulsation dampers.

Non-return and/or block valves are required in the bypass line if the line enters the reservoir below the fluid surface.

6.6 Filtration

As a minimum recommendation, install a 100 Mesh (150 Micron) strainer or equivalent filtration device in the suction piping adjacent to the pump to prevent mill scale, rust and
other foreign material from damaging the pump. The GTO pump is not designed to pump abrasives and is not warranted against abrasive damage or wear. Pumps will normally operate satisfactorily with up to 100PPM suspended solids, but this will depend on the particle size
and hardness. Consult Thomas Pump for filtration and special parts recommendations if this level is exceeded.

6.7 Seal Drain

In the event of seal failure, the leakage will exit from the seal drain. Piping may be connected to the seal drain and piped away from the unit **IT SHOULD NEVER BE PLUGGED.** If pumping other than water please consult the factory. Leakage should be monitored for identification of seal failure.

6.8 Seal Flush

Unless the pump was equipped for seal flush, the seal flush inlet should remain plugged. If seal flush is necessary, the tubing or piping should be connected to the seal flush inlet. It is recommended that the flush fluid be supplied at 2-3 USGPM (.5-. 7 m3/hr) flow rate and 15-20 PSIg (1-1.4 bar) pressure above the inlet pressure. Flush fluid temperature is dependent on pump duty and temperature of pumped fluid. Please consult factory.

6.9 Alignment

The pump and driver, if supplied, were aligned at the factory but loose with pump since the unit can shift during shipment. Couplings are disconnected and spacer shipped, belts not tensioned. The pump and driver shafts must be checked for angular and parallel alignment. (Realignment is also necessary after the grout has hardened and anchor bolts have been tightened.)
The alignment must also be finally checked after the piping has been completed, and rechecked periodically. Inaccurate alignment results in vibration and excessive wear on bearings, shaft sleeves or mechanical seals.

Electrical service must be locked out with an approved lockout and key when checking alignment, or performing any work on the units. Failure to lockout equipment may result in injury.

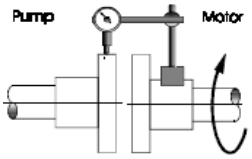
The bearing system in each model is designed to optimize bearing life with their respective type drive. Warranty will not be extended to any problems or damage due to misapplication.

6.10 Direct Drive Coupling Alignment

Flexible couplings are not intended to run with permanent misalignment. Even slight misalignment will reduce bearing life and possibly cause other problems. Flexible couplings do allow for some temporary slight change in alignment or endplay to cover unusual momentary loads or thermal expansion during start-up. Refer to the coupling manufacturer's instruction manuals for details of coupling installation. Below is one method for alignment procedure; refer to Annex A (Table 1) for alignment tolerances for the GTO Gator®, GTO Rhino® Pump and GTO Rhino Gear®

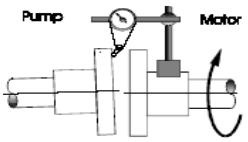
Lateral Alignment

Mount a dial gauge on the motor shaft or coupling with the gauge running on the outer machined diameter of the pump coupling. Turn the motor shaft and note the total indicator reading.



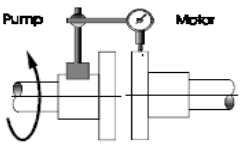
Angular Alignment

Mount a dial gauge on the motor shaft or coupling to run on a face of the pump coupling as near the outside diameter as possible. Turn the motor shaft and note the total indicator reading.



Confirm Lateral Alignment

Mount the dial gauge on the pump shaft or coupling with the gauge running on the outer machined diameter of the motor coupling. Turn the pump shaft and note the total indicator reading.



Adjustment

The motor must be shimmed and repositioned to align the shafts within the coupling alignment tolerance (Table 1)

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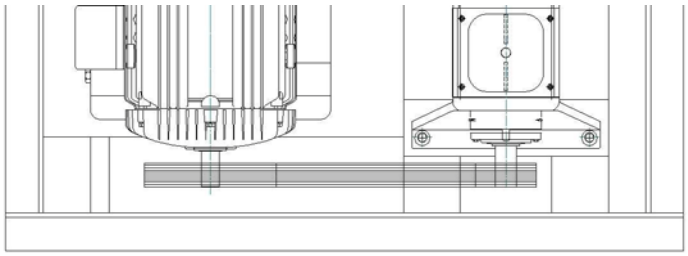
6.11 V Belt Drive Alignment and Belt Tension

Measuring the distance between the shafts at two positions can check shaft alignment. If the distances are equal, then the shafts are parallel. To correct alignment, slacken the pump or motor mounting bolts align shafts and retighten the bolts. To check the pulley alignment, refer to the belt drive manufacturer's instructions, or proceed generally thus: Use a straight edge to the faces of the V Belt Pulleys. The pulley faces should touch the straight edge in four places. Adjust the position of the motor to ensure this condition is achieved.

Turn each pulley through a quarter turn and recheck as above with the straight edge. If the pulleys do not remain true remove the pulleys from the shaft, clean all mating surfaces and reassemble. The pulleys should be mounted as close as possible to the pump and motor bearings. With pulleys aligned, tighten cap screws evenly and progressively. Check again to ensure the pulleys run true. Adjust the belt tension by releasing the motor bolts and use the adjustment screws to move the motor to tension the belts in line with the belt manufacturers instructions. Always turn the adjustment screws by the same number of turns or flats to maintain the motor shaft alignment setting. Before reinstalling the guards, check the sheaves to be sure there is no grease, oil, dirt, or rust in the grooves. Any that is present must be removed before starting, or the belts could be damaged. When replacing belts, a matched set should be purchased, and all belts replaced at the same time. Refer to the drive manufacturer's instructions for belt tension and installation data.



6.12 Electric Motor Drive Should be installed according to suppliers' installation instructions.

If the pump driver us an electric motor, a motor starter with overload protection must be provided. The overload resets should be set according to local code. Refer to motor nameplate. Direction of rotation of pump shaft must be counterclockwise when facing pump shaft extension. Make motor electric connections accordingly. Changing any two leads on a three phase motor will change direction of motor rotation.

Be sure the power source is correct for the driver.
Determine the power to be used, and provide the appropriate wire size.

⚠WARNING

All electrical connections and wiring are to be in compliance with local building and safety codes.

Do not operate equipment with open electrical boxes or fittings. Contact with incorrectly wired equipment could result in injury.

Do not operate pump with both suction and discharge valves closed or with suction or discharge closed by clogging. This could cause damage and is dangerous. The* GTO GATOR™ / GTO RHINO® *pump is to be used for liquid service only. Excess pressure can cause malfunction leading to injury.

6.13 Guards

Rotating sheaves and drive belts must be guarded, as required by applicable local safety codes and OSHA regulations to protect personnel from injury. The pump should never be allowed to operate until this protection has been provided. A guard is part of the belt drive package, which is optionally furnished by Thomas Pump.

7.0 Material of Construction Code

Description	Materials of Construction Code		
	Code 1 DI	**Code 2 SS**	**Code 3 CD**
*Rotor *Rotor Cover	Ductile Iron 65-45-12	Stainless Steel A351-CF8M	CD4 MCU ASTM A890 Grade 1A/1B
*Pitot Tube	Alloy Stainless Steel 17-4 PH 17Cr4Ni		
*2" X 2" NPT Manifold	Ductile Iron 65-45-12	Stainless Steel A351- CF8M	Stainless Steel A351- CF8M
3" X 2" NPT and flanged Manifold	Carbon Steel A216 WCB GS		
Seal Hub Seal Plate	Stainless Steel AISI 316 (not applicable on 2" X 2" Screwed manifold)		Duplex steel
Pedestal Rotor Casing	Ductile Iron 65-45-12		
*End Bell	Steel A-105 St		
Shaft	High Tensile, Low Alloy Carbon Steel A576- 4140 HT 42 CrMo4V		
*O Rings	Viton® is standard O-ring material but Teflon® and Kalrez® are available as options		

***Note:** Other materials are available on request

Viton®, Teflon® and Kalrez® are registered Trademarks of E.I. DuPont

7.1 Operation Limits and Data

OPERATION PARAMETER	GTO GATOR® MAXIMUM	MINIMUM	GTO RHINO® MAXIMUM	MINIMUM
Pump speed	**5443 rpm**	**-**	**6800**	**-**
Suction pressure (1)	**250 psi (17 bar)**	**NPSHR from curve**	**250 psi (17 bar)**	**NPSHR from curve**
Flow	**480 GPM (110 m^3/h)**	**4 GPM (1 m^3/h)**	**480 GPM (110 m^3/h)**	**8 GPM (2 m^3/h)**
Spec.grav. (2)	**1.2 (1200 kg/m^3)**	**.6 (600 kg/m^3)**	**1.2 (1200 kg/m^3)**	**.6 (600 kg/m^3)**
Power	**400 HP (300kW)**	**25 HP (18kW)**	**400 HP (300kW)**	**25 HP (18kW)**
Fluid Temp. (3) **Water single seal** **Single seal with cooled flush** **Double seal with cooled flush** **Other fluids**	 **230°F (110 °C)** **250°F (135 °C)** **300°F (150 °C)** **550°F (288 °C)**	**Higher of 20 °F (-7°C) or fluid freezing temperature.**	 **230°F (110 °C)** **250°F (135 °C)** **300°F (150 °C)** **550°F (288 °C)**	**Higher of 20 °F (-7°C) or fluid freezing temperature.**
First critical speed	**8530 rpm**	**-**	**8530 rpm**	**-**
Fluid abrasives (4)	**100 ppm suspended solids**	**-**	**100 ppm suspended solids**	**-**

Consult Factory

Notes:

1) **Material and mechanical seals over 200-psi (14bar)**
2) **Specific gravities over 1.2 and less than .6**
3) **Material, seals, o-rings and auxiliary equipment required over 250°F (135°C)**
4) **Materials and pump components required for increased abrasion resistance**

8.0 Before Starting

The following procedures should be used when starting a new unit for the first time or after major maintenance has been performed.

⚠WARNING

When checking alignment or performing any work on the units, electrical service must be locked out with an approved lockout and key. Failure to lockout equipment may result in injury.

- Be sure that all installation requirements have been met and that the system has been designed to keep the pump within its operating limits.
- Rotate unit by hand to be sure that it turns freely.
- Be sure pump and drivers are aligned.
- Check bearing lubrication. The bearings in oil-lubricated pumps should be sprayed with a small amount of oil before the initial pump start-up. Refer to lubrication instructions. Prime pump. The **GTO GATOR® / GTO RHINO®** is not a self-priming pump and may be damaged if run dry. It must always be filled completely with liquid before starting. Be sure all valves in the suction line are fully open. If the pump is installed with a positive head on the suction, prime by opening the inlet valve while venting air out of discharge line. If equipped with charge pump, prime by starting charge pump while venting the discharge line until all air is out of the rotor.
- Close discharge valve. (This should be done to reduce the load on the driver during start-up and to provide a restriction.)
- If equipped with seal flush be sure all flush inlet valves are open so that liquid can get to the seal.
- Jog driver: check rotation (counter-clockwise when facing pump drive shaft).
- Be sure all guards are installed on rotating parts.

8.1 Start-up

⚠WARNING

All guards and protective devices must be installed before the pump started. Contact with unguarded belts, sheaves, or couplings could result in injury.

Start driver and bring unit up to speed.

- Slowly open discharge valve until operating point is reached.

- Check bearings during first hour of operation to be sure that they are operating correctly. (Bearing temperatures should not exceed 180°F (82°C) for ambient pumping temperatures.)

8.2 Operating Checks

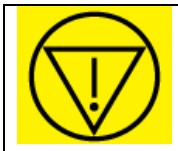
- Check the pump and piping to assure that there are no leaks.
- Check and record inlet and discharge pressure gauge readings for future reference.
- Check and record voltage, amperage per phase and kW if an indicating wattmeter is available.
- Note any unusual noise or vibration.

8.3 General Comments

- Belt and coupling guards must always be in place during operation.
- In cold weather, the fluid in the pump and piping must be kept from freezing.
- The pump must always be primed before starting or the mechanical seal may be damaged.
- Repeated trial starts may overheat the driver; allow sufficient time between starts for heat to dissipate from motor windings.
- All pressure and flow adjustments must be made with the discharge valve; **never use a valve on the suction side of the pump for this purpose.**
- Do not operate near shutoff (low flow) without a bypass.

8.4 Shutdown Sequence

- Close discharge valve. (Prevents reversal or continuation of flow after shutoff.)
- Stop pump.
- Close valves to prevent flow through by-pass, if applicable.
- If pump is to remain out of service more than 2 weeks, follow the storage instructions.



Emergency Switching Off

It is the responsibility of the installer to provide a local disconnect upstream of the pump assembly. It must be within site of the pump assembly, easily accessible, and clearly marked to indicate which pump assembly it controls.

In the event that the pump assembly suffers catastrophic failure resulting in damage to the pump and places persons in the vicinity of the pump assembly in danger, utilize the disconnect switch as an emergency switching off device.

When performing equipment maintenance or if the pump is to remain out of service for a period of time, the equipment electrical service must be locked out with an approved lockout and key. Failure to lockout equipment may result in injury.

9.0 Maintenance

9.1 General

Operating conditions vary so widely that to recommend one schedule of preventive maintenance for all GTO's is not possible. Yet some sort of regular inspection must be planned and followed. We suggest a permanent record be kept of the periodic inspections and maintenance performed on the pump. This recognition of maintenance procedure will keep your pump in good working condition, and prevent breakdowns.

One of the best rules to follow in the proper maintenance of your GTO is to keep a record of actual operating hours. Then, after a predetermined period of operation has elapsed, the pump should be given a thorough inspection. The length of this operating period will vary with different applications, and can only be determined from experience. New equipment, however, should be examined after a relatively short period of operation. The next inspection can be lengthened somewhat. This system can be followed until a maximum period of operation is reached, which should then be considered the operating schedule between inspections.

9.2 Maintenance Timetable

SCHEDULE TIME	MAINTENANCE
Daily	Operating conditions pressure, flow, seal leakage, vibration - oil level.
4000 Hours/ 6 months; whichever occurs first.	Change bearing oil. * Check belt-tension and check belt sheaves for wear or driver alignment.
Annually	Disassemble, clean and inspect pump.
As Required	Replace seals; maximum allowable leakage is: 1/8 gallon / hour

- **Oil incompatibility may cause bearing failure.**

- **Schedule time based on using Mobil Delvac 1 with other type oil; intervals to change every 3 months or 2000 hours**

9.3 Mechanical Seal

The mechanical seal provided in the pump requires no maintenance or operational adjustment. When the seal becomes worn or damaged and leaks excessively, it must be replaced. The mechanical seal is a precision product; therefore, treat it with care. In handling, do not scratch the face of the seal or mating ring or let it drop, and take particular care not to scratch the lapped face that comes in contact with the seal mating ring. Cleanliness is of great importance, particularly at the seal faces. The seal faces "wear in" with respect to each other and if disturbed, it may not be possible to reseal them. It is good practice to maintain a spare seal kit and replace the seal and the seal-mating ring as a set. The seal faces should be inspected for abnormal wear pattern. Seals should never be immersed in solvent of any kind as this could damage the internal O-ring.

9.4 Bearing Lubrication - OIL

The ***GTO GATOR***® bearing housing is filled with 1 gallon (3.785 liters) of **Mobil Delvac No. 1 Synthetic Oil** during manufacture. The ***GTO RHINO***® bearing housing is filled with 1.5 gallon (5.67 liters) of **Mobil Delvac No. 1 Synthetic Oil** during manufacture**. Before starting**, remove the pedestal cover and ensure that the bearings are liberally coated with oil and run smoothly. These intervals should be reduced for hot, dirty, dusty and moist conditions. **Approved Oils** Do not use any oil that is not listed unless Thomas Pump approves. Failure to comply may invalidate the pump warranty.

Approved Oils

APPROVED OILS	FOR PUMPS BELOW 3550 RPM	FOR PUMPS 3550 RPM or ABOVE
Mobil	DTE Heavy Medium	THERE ARE NO APPROVED SUBTSITUTE OILS
Exxon	Terrestic 68	
Shell	Turbo 68	
Chevron	GTS Oil 68	

⚠ CAUTION

Oil incompatibility may cause bearing failure. When changing oil be sure to flush the oil sump. The sump should be filled and drained several times using appropriate agents, such as cleaning solvent like Naphtha; diesel oil could also be used. Fill to one or two inches above oil sight glass and drain. Use a clean cloth to wipe out after draining. A spray on degreaser that removes oil could also be used. Check with a local supplier of such products.

Note: Disposal of the flush liquid per plant, local, state or country regulations.

10.0 Troubleshooting

10.1 No Liquid Delivered

No liquid delivered at end delivery point or through flow meter	
Possible Causes	**Corrective Action**
1. Inlet or Discharge Valves Closed.	Be sure all valves are fully opened.
2. Lack of Prime.	Fill pump and suction completely with liquid. Check for vapor bind.
3. Obstruction in Liquid Passages.	Dismantle pump and inspect passages of pick-up tube, rotor cover and manifold. Remove obstruction.
4. System Head Too High.	Total system head greater than head for which pumps designed. Check pipe friction losses. Larger piping may correct condition. Are valves wide open? Increase pumps speed to develop greater differential pressure. CAUTION - Brake HP of pump varies as the cube of the speed; therefore, any increase in speed means considerable increase in the power demand.
5. Suction Lift Too High.	If no obstruction at inlet, check for pipe friction losses. However, static lift may be too great. Measure with mercury column or vacuum gauge while pump operates. If static lift is too high, liquid to be pumped must be raised or pump lowered or a booster pump added.
6. Air Leak in Suction Line.	Shutting off or plugging inlet and putting line under pressure can test suction line. A gauge will indicate leak with a drop of pressure.
7. Speed Too Low.	Slipping drive belts - check belt tension. Check driver sheave and verify correct size for required speed. Check whether motor is directly across-the-line and receiving full voltage. Frequency may be incorrect; motor may have an open phase.
8. Wrong Rotation.	Check motor rotation with required pump rotation. Pump rotation is clockwise viewed from the manifold end of pump.
9. Suction or Discharge Line Plugged.	Unplug line.
10. Gas or Vapor Pocket in Suction Line.	Provide gas separation chamber on suction line.

10.2 Not Enough Liquid Delivered

Not enough liquid delivered at end delivery point or through flow meter	
Possible Causes	**Corrective Action**
1. Air Leak in Suction Line.	Shutting off or plugging inlet and putting line under pressure can test suction line. A gauge will indicate a leak with a drop of pressure.
2. Speed Too Low.	Slipping drive belts - check belt tension. Check driver sheave and verify correct size for required speed. Check whether motor is directly across the line and receiving full voltage. Frequency may be incorrect; motor may have an open phase.
3. Wrong Rotation.	Check motor rotation with required pump rotation. Pump rotation is clockwise viewed from manifold end of pump.
4. Obstruction in Liquid Passages.	Dismantle pump and inspect passages of pick-up tube, rotor cover and manifold. Remove obstruction.
5. Discharge Head Too High.	Total system head greater than head for which pump designed. Check pipe friction losses. Larger piping may correct condition. Are valves wide open? Increase pump speed to develop greater differential pressure. CAUTION - Brake HP of pump varies as the cube of the speed; therefore, any increase in speed means considerable increase in power demand.
6. Suction Lift Too High.	If no obstruction at inlet, check pipe friction losses. However, static lift may be too great. Measure with mercury column or vacuum gauge while pump operates. If static lift is too high, liquid to be pumped must be raised or pump lowered.
7. Suction or Discharge Line Partially Plugged.	Unplug line.
8. Inlet Cavitation.	Insufficient NPSH (Net Positive Suction Head) available. Available NPSH must always equal or exceed the required NPSH of the pump. Depending on installation: A. Increase inlet pressure to pump. B. Reduce inlet pipe friction losses. C. Increase height of suction vessel. D. Pressurize suction vessel. E. Lower the pump.

10.3 Not Enough Pressure

Not enough pressure on pressure gauge	
Possible Causes	**Corrective Action**
1. No Restriction on Pump Discharge.	Close valve on discharge side at start up.
2. Speed Too Low.	Slipping drive belts - check belt tension. Check driver sheave and verify correct size for required speed. Check whether motor is directly across the line and receiving full voltage. Frequency may be incorrect; motor may have an open phase.
3. Wrong Rotation.	Check motor rotation with required pump rotation. Pump rotation is clockwise viewed from manifold end of pump.
4. Obstruction in Liquid Passages.	Dismantle pump and inspect passages of pick-up tube, rotor cover and manifold. Remove obstruction.
5. Air leak in Suction Line.	Shutting off or plugging inlet and putting line under pressure can test suction line. A gauge will indicate a leak with a drop of pressure.
6. Air or Gasses in Liquid.	May be possible to over rate pump to point where it will provide adequate pressure despite condition. Better to provide gas separation chamber on suction line near pump.
7. Head Lower Than Rating, Pumps Too Much Liquid.	Pump may be operating at a higher flow rate than suspected. Throttle pump at discharge to reduce flow.
8. Pick-up Tube Damaged.	Dismantle pump and inspect pick-up tube for erosion or damage.
9. Inlet Cavitation.	Insufficient NPSH (Net Positive Suction Head) available. Available NPSH must always equal or exceed the required NPSH of the pump. Depending on installation: A. Increase inlet pressure to pump. B. Reduce inlet pipe friction losses. C. Increase height of suction vessel. D. Pressurize suction vessel. E. Lower the pump.

10.4 Pump Overloads Driver

Pump overloads driver	
Possible Causes	**Corrective Action**
1. Speed too fast.	Check driver and verify correct size for required speed.
2. Specific Gravity too high.	Check. This can cause overloading.
3. Head Lower Than Rating, Pumps Too Much Liquid.	Pump may be operating at a higher flow rate than suspected. Throttle pump at discharge to reduce flow.
4. High Viscosity.	Check. This can cause high drag on the rotor, rotor cover and pick-up tube.
5. Electrical Defects.	The voltage and frequency of the electric motor may be lower than that for which the motor was built. The motor may not be ventilated properly due to a poor location. The pump motor overload (if installed) may be set too low. It should be set to 125% of the FLA rating of the motor. The pump motor thermal protector (if provided) may be malfunctioning and causing the motor to drop out at a temperature lower than it should. Consult with a qualified electrician to determine if it requires replacement.

10.5 Pump Works for a While, then Quits

Pump works for a while, then quits	
Possible Causes	**Corrective Action**
1. Incomplete Priming.	Free pump, piping and valves of all air. If high points in suction line prevent this, they need correcting.
2. Suction Lift Too High.	If no obstruction at inlet, check for pipe friction losses. However, static lift may be too great. Measure with mercury column or vacuum gauge while pump operates. If static lift is too high, liquid to be pumped must be raised or pump lowered.
3. Air Leak in Suction Line.	Shutting off or plugging inlet and putting line under pressure can test suction line. A gauge will indicate a leak with a drop of pressure.
4. Air or Gasses in Liquid.	May be possible to over rate pump to point where it will provide adequate pressure despite condition. Better to provide gas separation chamber on suction line near pump.
5. Mechanical Failure of Critical Pump Parts.	Check bearings and pick-up tube for damage.

10.6 Pump Vibration

Pump vibration	
Possible Causes	**Corrective Action**
1. Inlet Cavitation	Insufficient NPSH (Net Positive Suction Head) available. Available NPSH must always equal or exceed the required NPSH of the pump. Depending on installation: A. Increase inlet pressure to pump. B. Reduce inlet pipe friction losses. C. Increase height of suction vessel. D. Pressurize suction vessel. E. Lower the pump.
2. Air or Gasses in Liquid	May be possible to over rate pump to point where it will provide adequate pressure despite condition. Better to provide gas separation chamber on suction line near pump.
3. Misalignment.	Check coupling alignment soft foot, V-belts tension and Alignment.
4. Mechanical Failure of Critical Pump Parts.	Check bearings and pick-up tube for damage.
5. Obstruction in liquid Passages.	Dismantle pump and inspect passages of pick-up tube, rotor cover and manifold. Remove obstruction.
6. Foundation not Rigid.	The foundation must be rigid enough to support the pump, auxiliary equipment, driver and base plate, and prevent vibration and misalignment during operation.
7. Foreign Particles in Rotor.	The accumulation of foreign particles in the rotor may create an unbalanced condition. Clean pump rotor.
8. Erosion of Rotor.	Check pump rotor for evidence of erosion. Displacement of metal within rotor could create an unbalanced condition. Rebalance or replace rotor assembly.
9. Piping not secure causing resonation	Properly secure piping with supports.

10.7 Bearings Overheat or Wear Rapidly

Bearings overheat or wear rapidly	
Possible Causes	**Corrective Action**
1. Improper lubrication or bearing preload.	Make sure bearings are installed properly.
2. Vibration.	See Vibration Trouble Shooting Section.
3. Bearings Too Tight.	Check V-belt tension. Follow procedure outlined in manufacturer's manual.
4. High Suction Pressure	Inlet pressure appreciably different than specified.
5. Dirt or Water in Bearings.	Dismantle pump and clean bearing housing. Replace bearings and lubricate.

10.8 Liquid Runs from Drain hole

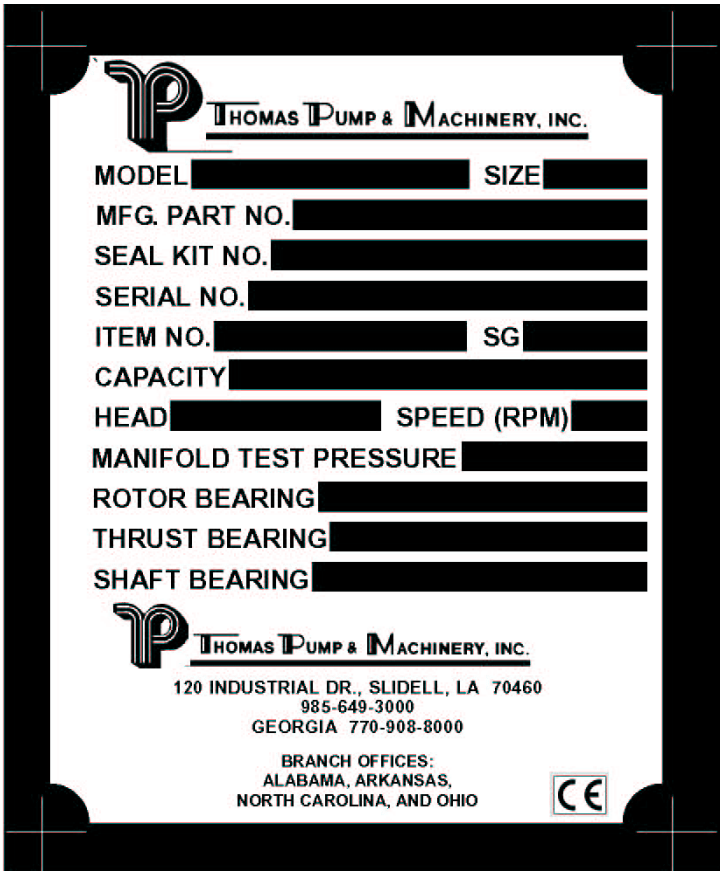
Liquid runs from drain hole	
Possible Causes	**Corrective Action**
1. Seal Leaking.	Dismantle pump and inspect seal faces. Replace as necessary.
2. Leakage Past O-rings.	Dismantle pump, clean and inspect O-ring grooves. Inspect O-rings. Replace parts as necessary.

10.9 Noise

Noise	
Possible Causes	**Corrective Action**
1. Vibration.	See Vibration Trouble Shooting Section.
2. Inlet Cavitation.	Insufficient NPSH (Net Positive Suction Head) available. Available NPSH must always equal or exceed the required NPSH of the pump. Depending on installation: A. Increase inlet pressure to pump. B. Reduce inlet pipe friction losses. C. Increase height of suction vessel. D. Pressurize suction vessel. E. Lower the pump.
3. Discharge Cavitation	Decrease flow requirements; increase pump discharge pressure.
4. Belts Slipping	Adjust or replace belts.
5. Turbulence in Discharge Piping.	A. Fully open the discharge valve. B. Increase the pipe diameter. C. Eliminate sharp bends in the piping.

11.0 Tag Information

You may record details from your pump nameplate here for a quick reference



GTO GATOR PUMP CODE DESCRIPTION

EXAMPLE MODEL NUMBER: GTOT302LD1T2XX

GTO	T	302	L	D	1	T	2	1	XX
1	2	3	4	5	6	7	8	9	10

FIELD #1
CONSTANT –GTR PREFIX

FIELD #2 –TUBE STYLE
C –LT STYLE (Long Barrel)
R –ST STYLE (Short Barrel)
T –TPM STYLE

FIELD #3 PUT SIZE

*1266 –Single ST (Short Barrel) style 30 GPM
*1375 - Single ST (Short Barrel) style 60 GPM
*1484 - Single ST (Short Barrel) style 100 GPM
*1600 -Single ST (Short Barrel) style 150 GPM
*2484 – Double ST (Short Barrel) style 200 GPM
*2600-Double ST (Short Barrel) style 300 GPM
*Note: Mainly seen on House Pump Designations

T060 – Single LT (Long Barrel) style 30 GPM
T090 – Single LT (Long Barrel) style 60 GPM
T120 – Single LT (Long Barrel) style 100 GPM
T150 – Single LT (Long Barrel) style 150 GPM
T242 – Single LT (Long Barrel) style 200 GPM
T302- Single LT (Long Barrel) style 300 GPM

FIELD #4 TUBE BARREL SHORT / LONG
S –SHORT BARREL
L –LONG BARREL

FIELD #5 DRIVE INFORMATION
D –DIRECT DRIVE AND GEAR DRIVE
V –V-BELT DRIVE
X –CAN USE FOR V-BELT OR DIRECT

FIELD #6 MATERIAL OF CONSTRUCTION
1 –DUCTILE IRON
2 –STAINLESS STEEL
3 –CD4MCU
4 –CAST STEEL
5 –HASTELLOY C

FIELD #7 CONNECTION
F –FLANGED
T –THREADED

FIELD #8 CONNECTION SIZE
2 –2" NPT
3 –3"X2" 600 LB FLANGE
4 –3"X2" NPT
5 –3"X2" GRAYLOCK
6 –3"X2" 600 x 1500 LB FLANGE
7 –3"X2" 1500 x 1500 LB FLANGE
X –2"X1-1/2" 600 LB FLANGE

FIELD #9 SPECIAL TUBE
1 –INCONEL
2 –TUNGSTEN COATED
3 –HASTELLOY C

FIELD #10 ONLY USED AS A SPECIAL CODE
CONSULT FACTORY

GTO RHINO PUMP CODE DESCRIPTION

EXAMPLE MODEL NUMBER: GTRT302LD1T2XX

GTR	T	302	L	D	1	T	2	1	XX
1	2	3	4	5	6	7	8	9	10

FIELD #1
CONSTANT –GTR PREFIX

FIELD #2 –TUBE STYLE
C –LT STYLE (Long Barrel)
R –ST STYLE (Short Barrel)
T –TPM STYLE

FIELD #3 PUT SIZE
*1266 –Single ST (Short Barrel) style 30 GPM
*1375 - Single ST (Short Barrel) style 60 GPM
*1484 - Single ST (Short Barrel) style 100 GPM
*1600 -Single ST (Short Barrel) style 150 GPM
*2484 – Double ST (Short Barrel) style 200 GPM
*2600-Double ST (Short Barrel) style 300 GPM
*Note: Mainly seen on House Pump Designations

T060 – Single LT (Long Barrel) style 30 GPM
T090 – Single LT (Long Barrel) style 60 GPM
T120 – Single LT (Long Barrel) style 100 GPM
T150 – Single LT (Long Barrel) style 150 GPM
T242 – Single LT (Long Barrel) style 200 GPM
T302- Single LT (Long Barrel) style 300 GPM

FIELD #4 TUBE BARREL SHORT / LONG
S –SHORT BARREL
L –LONG BARREL

FIELD #5 DRIVE INFORMATION
D –DIRECT DRIVE AND GEAR DRIVE
V –V-BELT DRIVE
X –CAN USE FOR V-BELT OR DIRECT

FIELD #6 MATERIAL OF CONSTRUCTION
1 –DUCTILE IRON
2 –STAINLESS STEEL
3 –CD4MCU
4 –CAST STEEL
5 –HASTELLOY C

FIELD #7 CONNECTION
F –FLANGED
T –THREADED

FIELD #8 CONNECTION SIZE
2 –2" NPT
3 –3"X2" 600 LB FLANGE
4 –3"X2" NPT
5 –3"X2" GRAYLOCK
6 –3"X2" 600 x 1500 LB FLANGE
7 –3"X2" 1500 x 1500 LB FLANGE
X –2"X1-1/2" 600 LB FLANGE

FIELD #9 SPECIAL TUBE
1 –INCONEL
2 –TUNGSTEN COATED
3 –HASTELLOY C

FIELD #10 ONLY USED AS A SPECIAL CODE
CONSULT FACTORY

12.0 Maintenance Record

Date	Maintenance Record	Done By

13.0 GTO GATOR® / GTO RHINO® Warranty LIMITED WARRANTY

Thomas Pump warrants all new equipment to the original purchaser to be free from defects in material and workmanship; and will replace or repair, at its discretion, any part or parts returned to it which Thomas Pump's examination shall show to have failed under normal use and service by the original user within one year of the date of first use or eighteen months following shipment from factory, whichever comes first. (Exception: Power Frames—two years from date of first use or thirty months following shipment from factory, whichever comes first). Such repair or replacement shall be free of charge for all items except for those items that are consumable and normally replaced during repair. If the product should fail through defect in workmanship or material within the warranty period, Thomas Pump must be notified, in writing, within the warranty period of such defects. Material must be returned F.O.B. to Thomas Pump or a location designated by Thomas Pump.

The Warranty is in lieu of any other liability for defects. THOMAS PUMP MAKES NO WARRANTY OF MERCHANTABILITY AND NO WARRANTY THAT ITS PRODUCTS SHALL BE APPROPRIATE FOR ANY PARTICULAR PURPOSE, nor are there any other warranties, expressed or implied, by operation of law or otherwise. This warranty does not cover any expense (labor, lost production), incurred in repairs or alteration made outside the Thomas Pump facility without prior authorization, nor does it cover in any way the performance of equipment that has been revised or altered by others. The customer is wholly responsible for establishing the suitability of the product for his particular application and for operating conditions, which do not exceed published product limitations. Thomas Pump shall not be liable for damages or delay resulting from or related to defective products, nor for consequential, special or contingent damages for breach of warranty.
This Warranty shall not apply to equipment or parts which have been altered or repaired outside of an authorized Thomas Pump facility or factory, or damaged by improper installation or application, or subject to misuse, abuse, neglect or accident.

This Warranty applies only to equipment manufactured and sold by Thomas Pump. Any material or components manufactured by others carry the respective manufacturer's warranty.

Thomas Pump Louisiana 120 Industrial Drive	Thomas Pump Georgia 105 Enterprise Avenue	Thomas Pump Panama, S.A. RUC Urb. Bariloche, No.3
Slidell, LA 70460	Carrollton, GA 30117	Altos de Panama, Panama
Phone: 985-649-3000	Phone: 770-908-8000	Phone: 507-230-5523
Fax: 985-649-4300	Fax: 770-908-8008	Fax: 507-230-5523

Our policy is one of continuous improvement and we reserve the right to alter specifications without given notice. Document No: GTO 5-10-10 Rev 8
Original Instructions

Annex A

- Soft Foot Check
- Soft Foot Shim Recording Form
- Table 1 Coupling Alignment Tolerance

DISTRIBUTOR

For Your Application Needs Of Pumps, Parts, Service and Complete Systems, Call

Thomas Pump
& Machinery, Inc.
120 Industrial Dr.
Slidell, LA 70460 USA
Phone: 985-649-3000
Fax: 985-649-4300

Thomas Pump
& Machinery, Inc.
105 Enterprise Ave.
Carrollton, GA 30117 USA
Phone: 770-908-8000
Fax: 770-908-8008

Thomas Pump Panama, S.A.
RUC
Urb. Bariloche, No. 3
Altos de Panama, Panama
Phone: 507-230-5523
Fax: 507-230-5522

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