

 **GOULDS PUMPS**

Installation, Operation, and Maintenance Manual

HSUL



ITT

Table of Contents

1 Introduction.....	2
1.1 Important Safety Notice.....	2
1.2 Safety warnings.....	2
1.3 Safety.....	3
1.4 General precautions.....	4
1.5 ATEX Considerations and Intended Use.....	7
1.6 Parts.....	9
2 Transportation and Storage.....	10
2.1 Receive the unit.....	10
2.2 Unpack the unit.....	10
2.3 Pump handling.....	10
2.3.1 Lifting methods.....	10
2.4 Pump storage requirements.....	11
2.5 Preservation and Storage.....	12
3 Installation.....	13
3.1 Inspect the Pump.....	13
3.2 Install the sump.....	13
3.3 Install the motor.....	13
3.4 Install the pump.....	13
3.5 Slide rail system (optional).....	13
3.5.1 Install the base component assembly.....	13
3.5.2 Install the guide bracket / pivot bracket assembly.....	14
3.5.3 Install the lifting bracket assembly.....	14
3.5.4 Install the slide rail.....	15
4 Commissioning, Startup, Operation, and Shutdown.....	18
4.1 Start the pump.....	18
5 Maintenance.....	19
5.1 Disassembly.....	19
5.1.1 Disassemble the pump.....	19
5.2 Pre-assembly.....	20
5.2.1 Pre-assembly inspections.....	20
5.2.2 Replacement guidelines.....	20
5.3 Reassembly.....	21
5.3.1 Reassemble the pump.....	21
6 Troubleshooting.....	23
6.1 Troubleshooting.....	23

1 Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance



CAUTION:

Failure to observe the instructions contained in this manual could result in personal injury and/or property damage, and may void the warranty. Read this manual carefully before installing and using the product.

NOTICE:

Save this manual for future reference and keep it readily available.

1.1 Important Safety Notice

To: Our Valued Customers:

User safety is a major focus in the design of our products. Following the precautions outlined in this manual will minimize your risk of injury.

ITT Goulds pumps will provide safe, trouble-free service when properly installed, maintained, and operated.

Safe installation, operation, and maintenance of ITT Goulds Pumps equipment are an essential end user responsibility. This Pump Safety Manual identifies specific safety risks that must be considered at all times during product life. Understanding and adhering to these safety warnings is mandatory to ensure personnel, property, and/or the environment will not be harmed. Adherence to these warnings alone, however, is not sufficient — it is anticipated that the end user will also comply with industry and corporate safety standards. Identifying and eliminating unsafe installation, operating and maintenance practices is the responsibility of all individuals involved in the installation, operation, and maintenance of industrial equipment.

Please take the time to review and understand the safe installation, operation, and maintenance guidelines outlined in this Pump Safety Manual and the Instruction, Operation, and Maintenance (IOM) manual. Current manuals are available at <https://www.gouldspumps.com/en-US/Tools-and-Resources/Literature/> or by contacting your nearest Goulds Pumps sales representative.

These manuals must be read and understood before installation and start-up.

For additional information, contact your nearest Goulds Pumps sales representative or visit our Web site at <https://www.gouldspumps.com>

1.2 Safety warnings

Specific to pumping equipment, significant risks bear reinforcement above and beyond normal safety precautions.

**WARNING:**

A pump is a pressure vessel with rotating parts that can be hazardous. Any pressure vessel can explode, rupture, or discharge its contents if sufficiently over pressurized causing death, personal injury, property damage, and/or damage to the environment. All necessary measures must be taken to ensure over pressurization does not occur.

**WARNING:**

Operation of any pumping system with a blocked suction and discharge must be avoided in all cases. Operation, even for a brief period under these conditions, can cause superheating of enclosed pumpage and result in a violent explosion. All necessary measures must be taken by the end user to ensure this condition is avoided.

**WARNING:**

The pump may handle hazardous and/or toxic fluids. Care must be taken to identify the contents of the pump and eliminate the possibility of exposure, particularly if hazardous and/or toxic. Potential hazards include, but are not limited to, high temperature, flammable, acidic, caustic, explosive, and other risks.

**WARNING:**

Pumping equipment Instruction, Operation, and Maintenance manuals clearly identify accepted methods for disassembling pumping units. These methods must be adhered to. Specifically, applying heat to impellers and/or impeller retaining devices to aid in their removal is strictly forbidden. Trapped liquid can rapidly expand and result in a violent explosion and injury.

ITT Goulds Pumps will not accept responsibility for physical injury, damage, or delays caused by a failure to observe the instructions for installation, operation, and maintenance contained in this Pump Safety Manual or the current IOM available at <http://www.gouldspumps.com/literature>.

1.3 Safety

Definitions

Throughout this manual the words Warning, Caution, Electrical, and ATEX are used to indicate where special operator attention is required.

Observe all Cautions and Warnings highlighted in the Pump Safety Manual and the IOM provided with your equipment.

**WARNING:**

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. Example: Pump shall never be operated without coupling guard installed correctly.

**CAUTION:**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. Example: Throttling flow from the suction side may cause cavitation and pump damage.

Electrical Hazard:



WARNING:

Indicates the possibility of electrical risks if directions are not followed.
 Example: Lock out driver power to prevent electric shock, accidental start-up, and physical injury.

ATEX:



WARNING:

When installed in potentially explosive atmospheres, the instructions that follow the Ex symbol must be followed. Personal injury and/or equipment damage may occur if these instructions are not followed. If there is any question regarding these requirements or if the equipment is to be modified, please contact an ITT Goulds Pumps representative before proceeding.
 Example: Improper impeller adjustment could cause contact between the rotating and stationary parts, resulting in a spark and heat generation.

1.4 General precautions










WARNING:









A pump is a pressure vessel with rotating parts that can be hazardous. Hazardous fluids may be contained by the pump including high temperature, flammable, acidic, caustic, explosive, and other risks. Operators and maintenance personnel must realize this and follow safety measures. Personal injuries will result if procedures outlined in this manual are not followed. ITT Goulds Pumps will not accept responsibility for physical injury, damage or delays caused by a failure to observe the instructions in this manual and the IOM provided with your equipment.



Table 1: General Precautions

WARNING		NEVER APPLY HEAT TO REMOVE IMPELLER. It may explode due to trapped liquid.
WARNING		NEVER use heat to disassemble pump due to risk of explosion from tapped liquid.
WARNING		NEVER operate pump without coupling guard correctly installed.
WARNING		NEVER run pump below recommended minimum flow when dry, or without prime.
WARNING		ALWAYS lock out power to the driver before performing pump maintenance.
WARNING		NEVER operate pump without safety devices installed.
WARNING		NEVER operate pump with discharge valve closed.
WARNING		NEVER operate pump with suction valve closed.

WARNING		DO NOT change service application without approval of an authorized ITT Goulds Pumps representative.
WARNING		<p>Safety Apparel:</p> <ul style="list-style-type: none"> • Insulated work gloves when handling hot bearings or using bearing heater • Heavy work gloves when handling parts with sharp edges, especially impellers • Safety glasses (with side shields) for eye protection • Steel-toed shoes for foot protection when handling parts, heavy tools, etc. • Other personal protective equipment to protect against hazardous/toxic fluids
WARNING		<p>Receiving:</p> <p>Assembled pumping units and their components are heavy. Failure to properly lift and support equipment can result in serious physical injury and/or equipment damage. Lift equipment only at specifically identified lifting points or as instructed in the current IOM. Current manuals are available at www.gouldspumps.com/literature_ioms.html or from your local ITT Goulds Pumps sales representative. Note: Lifting devices (eyebolts, slings, spreaders, etc.) must be rated, selected, and used for the entire load being lifted.</p>
WARNING		<p>Alignment:</p> <p>Shaft alignment procedures must be followed to prevent catastrophic failure of drive components or unintended contact of rotating parts. Follow coupling manufacturer's coupling installation and operation procedures.</p>
WARNING		Before beginning any alignment procedure, make sure driver power is locked out. Failure to lock out driver power will result in serious physical injury.
CAUTION		<p>Piping:</p> <p>Never draw piping into place by forcing at the flanged connections of the pump. This may impose dangerous strains on the unit and cause misalignment between pump and driver. Pipe strain will adversely effect the operation of the pump resulting in physical injury and damage to the equipment.</p>
WARNING		<p>Flanged Connections:</p> <p>Use only fasteners of the proper size and material.</p>
WARNING		Replace all corroded fasteners.
WARNING		Ensure all fasteners are properly tightened and there are no missing fasteners.
WARNING		<p>Startup and Operation:</p> <p>When installing in a potentially explosive environment, please ensure that the motor is properly certified.</p>
WARNING		Operating pump in reverse rotation may result in contact of metal parts, heat generation, and breach of containment.
WARNING		Lock out driver power to prevent accidental start-up and physical injury.

1.4 General precautions

WARNING		The impeller clearance setting procedure must be followed. Improperly setting the clearance or not following any of the proper procedures can result in sparks, unexpected heat generation and equipment damage.
WARNING		If using a cartridge mechanical seal, the centering clips must be installed and set screws loosened prior to setting impeller clearance. Failure to do so could result in sparks, heat generation, and mechanical seal damage.
WARNING		The coupling used in an ATEX classified environment must be properly certified and must be constructed from a non-sparking material.
WARNING		Never operate a pump without coupling guard properly installed. Personal injury will occur if pump is run without coupling guard.
WARNING		Make sure to properly lubricate the bearings. Failure to do so may result in excess heat generation, sparks, and / or premature failure.
CAUTION		The mechanical seal used in an ATEX classified environment must be properly certified. Prior to start up, ensure all points of potential leakage of process fluid to the work environment are closed.
CAUTION		Never operate the pump without liquid supplied to mechanical seal. Running a mechanical seal dry, even for a few seconds, can cause seal damage and must be avoided. Physical injury can occur if mechanical seal fails.
WARNING		Never attempt to replace packing until the driver is properly locked out and the coupling spacer is removed.
WARNING		Dynamic seals are not allowed in an ATEX classified environment.
WARNING		DO NOT operate pump below minimum rated flows or with suction and/or discharge valve closed. These conditions may create an explosive hazard due to vaporization of pumpage and can quickly lead to pump failure and physical injury
WARNING		Ensure pump is isolated from system and pressure is relieved before disassembling pump, removing plugs, opening vent or drain valves, or disconnecting piping.
WARNING		Shutdown, Disassembly, and Reassembly: Pump components can be heavy. Proper methods of lifting must be employed to avoid physical injury and/or equipment damage. Steel toed shoes must be worn at all times.
WARNING		The pump may handle hazardous and/or toxic fluids. Observe proper decontamination procedures. Proper personal protective equipment should be worn. Precautions must be taken to prevent physical injury. Pumpage must be handled and disposed of in conformance with applicable environmental regulations.
WARNING		Operator must be aware of pumpage and safety precautions to prevent physical injury.

WARNING		Lock out driver power to prevent accidental startup and physical injury.
CAUTION		Allow all system and pump components to cool before handling them to prevent physical injury.
CAUTION		If pump is a Model NM3171, NM3196, 3198, 3298, V3298, SP3298, 4150, 4550, or 3107, there may be a risk of static electric discharge from plastic parts that are not properly grounded. If pumped fluid is non-conductive, pump should be drained and flushed with a conductive fluid under conditions that will not allow for a spark to be released to the atmosphere.
WARNING		Never apply heat to remove an impeller. The use of heat may cause an explosion due to trapped fluid, resulting in severe physical injury and property damage.
CAUTION		Wear heavy work gloves when handling impellers as sharp edges may cause physical injury.
CAUTION		Wear insulated gloves when using a bearing heater. Bearings will get hot and can cause physical injury.
WARNING		Noise: Sound pressure levels may exceed 80 dbA in operating process plants. Clear visual warnings or other indicators should be available to those entering an area with unsafe noise levels. Personnel should wear appropriate hearing protection when working on or around any equipment, including pumps. Consider limiting personnel's exposure time to noise or, where possible, enclosing equipment to reduce noise. Local law may provide specific guidance regarding exposure of personnel to noise and when noise exposure reduction is required.
WARNING		Temperature: Equipment and piping surfaces may exceed 130°F (54°C) in operating process plants. Clear visual warnings or other indicators should alert personnel to surfaces that may reach a potentially unsafe temperature. Do not touch hot surfaces. Allow pumps operating at a high temperature to cool sufficiently before performing maintenance. If touching a hot surface cannot be avoided, personnel should wear appropriate gloves, clothing, and other protective gear as necessary. Local law may provide specific guidance regarding exposure of personnel to unsafe temperatures.

1.5 ATEX Considerations and Intended Use

Special care must be taken in potentially explosive environments to ensure that the equipment is properly maintained. This includes but is not limited to:

Description of ATEX

The ATEX directives are a specification enforced in Europe for electrical and non-electrical equipment installed in Europe. ATEX deals with the control of potentially explosive atmospheres and the standards of equipment and protective systems used within these atmospheres. The relevance of the ATEX requirements is not limited to Europe. You can apply these guidelines to equipment installed in any potentially explosive atmosphere.

Guidelines for compliance

Compliance is fulfilled only when you operate the unit within its intended use. Do not change the conditions of the service without the approval of an ITT representative. When you install or maintain explosion proof products, always comply with the directive and applicable standards (for example, IEC/EN 60079-14).

1. Monitoring the and liquid end temperature.
2. Maintaining proper bearing lubrication.
3. Ensuring that the pump is operated in the intended hydraulic range.

The ATEX conformance is only applicable when the pump unit is operated within its intended use. Operating, installing or maintaining the pump unit in any way that is not covered in the Instruction, Operation, and Maintenance manual (IOM) can cause serious personal injury or damage to the equipment. This includes any modification to the equipment or use of parts not provided by ITT Goulds Pumps. If there is any question regarding the intended use of the equipment, please contact an ITT Goulds representative before proceeding.

Current IOMs are available at <https://www.gouldspumps.com/en-US/Tools-and-Resources/Literature/IOMs/> or from your local ITT Goulds Pumps Sales representative.

All pumping unit (pump, seal, coupling, motor and pump accessories) certified for use in an ATEX classified environment, are identified by an ATEX tag secured to the pump or the on which it is mounted. A typical tag would look like this:



Figure 1: Typical ATEX pump nameplate

Table 2: Temperature class definitions

Code	Maximum permissible pumpage temperature in °C °F	Minimum permissible pumpage temperature in °C °F
T1	450 842	372 700
T2	300 572	277 530
T3	200 392	177 350
T4	135 275	113 235
T5	100 212	Option not available
T6	85 185	Option not available

The code classification marked on the equipment must be in accordance with the specified area where the equipment will be installed. If it is not, do not operate the equipment and contact your ITT Goulds Pumps sales representative before proceeding.

The CE and the Ex designate the ATEX compliance. The code below reads as follows:

II = Group 2

2 = Category 2

G/D = Gas and Dust present

T4 = Temperature class, can be T1 to T6 (see Table)

The code classification marked on the equipment must be in accordance with the specified area where the equipment will be installed. If it is not, do not operate the equipment and contact your ITT Goulds Pumps sales representative before proceeding.

1.6 Parts



The use of genuine Goulds parts will provide the safest and most reliable operation of your pump. ITT Goulds Pumps ISO certification and quality control procedures ensure the parts are manufactured to the highest quality and safety levels.

Please contact your local Goulds representative for details on genuine Goulds parts.

2 Transportation and Storage

2.1 Receive the unit

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order.
4. Pump should be placed in upright position only.

2.2 Unpack the unit

1. Remove packing materials from the unit.
Dispose of all packing materials in accordance with local regulations.
2. Inspect the unit to determine if any parts have been damaged or are missing.
3. Contact your ITT representative if anything is out of order.
4. Pump should be placed in upright position only.

2.3 Pump handling



WARNING:

Dropping, rolling or tipping units, or applying other shock loads, can cause property damage and/or personal injury. Ensure that the unit is properly supported and secure during lifting and handling.



CAUTION:

Risk of injury or equipment damage from use of inadequate lifting devices. Ensure lifting devices (such as chains, straps, forklifts, cranes, etc.) are rated to sufficient capacity.

2.3.1 Lifting methods



WARNING:

- Risk of serious personal injury or equipment damage. Proper lifting practices are critical to safe transport of heavy equipment. Ensure that practices used are in compliance with all applicable regulations and standards.
 - Safe lifting points are specifically identified in this manual. It is critical to lift the equipment only at these points. Integral lifting eyes or eye bolts on pump and motor components are intended for use in lifting the individual components only.
 - Lifting and handling heavy equipment poses a crush hazard. Use caution during lifting and handling and wear appropriate Personal Protective Equipment (PPE, such as steel-toed shoes, gloves, etc.) at all times. Seek assistance if necessary.
-

Use the supplied lifting lugs and suitable slings in order to lift the entire pump to a vertical position and lower the unit into the sump. Then use the lifting lugs on the motor and a suitable sling, or optional slide rail system to hoist the motor into position. Use a tag line attached to the casing end in order to prevent the pump from swinging.

Examples

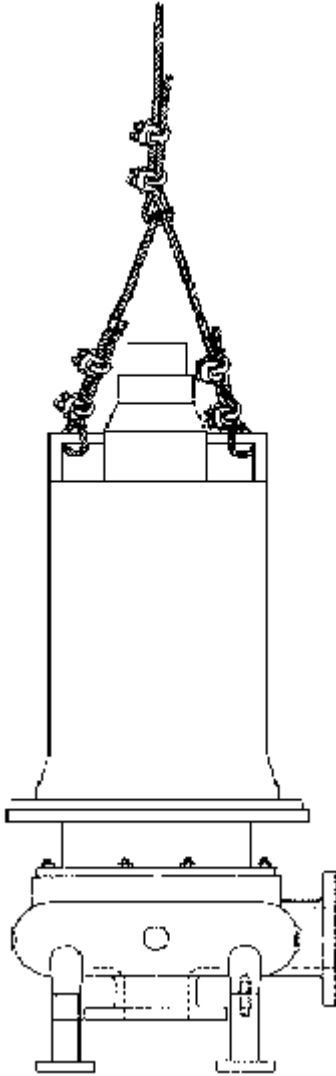


Figure 2: Example of proper lifting method using lifting lugs

2.4 Pump storage requirements

Requirements

Submersible units require proper preparation for storage and regular maintenance during storage. The unit is considered in storage when it has been delivered to the job site and is awaiting installation.

For specific requirements for storing motors, gearboxes, engines, panels, sealing plans and other auxiliaries, contact the equipment manufacturer.

Storage preparation

Condition	Proper preparation
Indoor storage area (preferred)	<ul style="list-style-type: none"> • Pave the area. • Clean the area.

Condition	Proper preparation
	<ul style="list-style-type: none"> • Drain the area and keep it free from flooding.
Outdoor storage area (when indoor storage is not available)	<ul style="list-style-type: none"> • Observe all indoor storage requirements. • Use weather-proof coverings such as flame-resistant sheeting or tarpaulins. • Place coverings in a manner that maximizes drainage and air circulation. • Tie coverings down in order to protect the pump from wind damage.
Placement of pumps and component parts	<ul style="list-style-type: none"> • Place the unit on skids, pallets, or shoring higher than 15 cm 6 in. from the ground for good air circulation. • Sort the parts in order to permit easy access for inspection and/or maintenance without excessive handling.
Stacking of units or component parts	<ul style="list-style-type: none"> • Make sure that racks, containers, or crates bear the full weight of units or parts in order to prevent distortion. • Keep identification markings readily visible. • Immediately replace any cover you remove for internal access.
Rotation of the pump and bowl assembly shaft	<ul style="list-style-type: none"> • Make sure that the shaft rotates freely.
Controlled storage facilities	<ul style="list-style-type: none"> • Maintain an even temperature of 6°C 10°F or higher above the dew point. • Keep the relative humidity to less than 50%. • Make sure that there is little or no dust.
Uncontrolled storage facilities that have uneven temperatures, higher humidity, and/or dusty conditions)	<ul style="list-style-type: none"> • Inspect the unit periodically to make sure that all preservatives are intact. • Seal all pipe threads and flanged pipe covers with tape.

When pump is not in regular operation

If a pump has been installed, but is not in regular operation for an extended period of time, such as during a seasonal shutdown, then operate it for at least 15 minutes every two weeks.

2.5 Preservation and Storage

ITT Goulds Pump Division's normal domestic shipping and storage preparation is suitable for protecting the pump during shipment in covered trucks. Although this is a submersible pump, storage in a clean, dry area will help preserve the paint and prevent corrosion. Hand rotation of the shaft every thirty days is recommended to keep the seals free and the bearings lubricated. For additional storage requirements, reference ABB/Baldor/Reliance Submersible motor Instruction Manual.

3 Installation

3.1 Inspect the Pump

3.2 Install the sump

1. The sump floor should be level and firm where the pump will be placed.
2. Make sure the sump and sump inlet line are free from large pieces of debris which could eventually obstruct the pump inlet.

3.3 Install the motor

The motor is furnished with thermal protection and a moisture probe.

1. Wire the motor according to the motor manufacturer's wiring diagram in the motor IOM.
2. Recheck the protective circuits after the wiring is completed to avoid a possible motor failure because of an oversight.
3. The motor must be completely submerged for continuous operation. It can be operated for a maximum of 15 minutes without being submerged, The sump controls should be set to allow a maximum possible run of 15 minutes after the motor is no longer completely submerged if the sump is large enough to not have completed the pump-down in that time. Motor is rated for a maximum 10 starts per hour.

NOTICE:

The motor is rated for full horsepower with liquid temperatures of 104°F (40°C) or lower, unless noted otherwise on nameplate or ITT documentation.

3.4 Install the pump

1. Make sure the lifting device is securely fastened to the motor lugs or hooks so the unit will not be dropped when it is lowered into the sump.
2. Check the 1/8" vent hole in the adapter plate, between the motor and the casing, to make certain it is not plugged and then carefully lower the unit into position in the sump.
3. Check the pump for being approximately level.
4. Support the discharge pipe to prevent excessive loads from being transmitted to the pump flange and casing.

3.5 Slide rail system (optional)

3.5.1 Install the base component assembly

1. Apply gasket adhesive to item #360W and place on side shown in Section Y-Y to base upright.

NOTICE:

Quantity two 1/2" holes may need to be punched or cut in gasket to allow clearance for items #372K.

2. Position item #787G, sump flange adapter, as shown in section Y-Y and secure to base upright using items #372K.
3. Apply gasket adhesive to item #360W and place in section Y-Y and secure to base upright.
4. Insert short-threaded end of studs, items #787U, through base uprights and into the top two holes of the sump flange adapter, item #787G.
5. Position top two holes of the discharge elbow, item #315, over the two studs, items #787U, and thread nuts, items #787V, onto studs finger tight. Insert items #370S, hex head cap screws, through remaining elbow and base upright holes, and thread into sump flange adapter finger tight.
6. Level discharge flange then tighten nuts and hex head cap screws, items #370S and #787V.
7. Secure item #787H, adjusting bracket, to sump flange adapter using items 370T, hex head cap screws.
8. Thread quantity one nut, item #357, onto the entire length of item #787J, adjusting bolts, and insert into the hole centered in item #787H, adjusting bracket.

NOTICE:

The adjusting bolt's head should face towards the sump flange adapter.

3.5.2 Install the guide bracket / pivot bracket assembly

Apply Loctite 242 on all hardware unless otherwise specified.

1. Apply gasket adhesive to item #360W and place on side shown in Section "Y"- "Y" to base upright. Note, quantity two 1/2" holes may need to be punched or cut in gasket to allow clearance for items
2. Position item #787G, sump flange adapter, as shown in section "Y"- "Y" and secure to base upright using items #372K.
3. Apply gasket adhesive to item #360W and place on opposite side shown in Section "Y"- "Y" to base upright..
4. Insert short-threaded end of studs, items #787U, through base upright and into the top two holes of the sump flange adapter, item #787G.
5. Position top two holes of the discharge elbow, item #315, over the two studs, items #787U, and thread nuts, items #787V, onto studs finger tight. Insert items #370S, hex head cap screws, through remaining elbow and base upright holes, and thread into sump flange adapter finger tight.
6. Level discharge flange then tighten nuts and hex head cap screws, items #370S and #787V.
7. Secure item #787H, adjusting bracket, to sump flange adapter using items 370T, hex head cap screws.
8. Thread quantity one nut, item #357, onto the entire length of item #787J, adjusting bolt, and insert into the hole centered in item #787H, adjusting bracket. Note, the adjusting bolt's head should face towards the sump flange adapter.

3.5.3 Install the lifting bracket assembly

Apply Loctite 271 to all lifting bracket hardware.

1. Position left and right lifting brackets as shown on the top and elevation views of the drawing. Insert item #370R, hex head cap screw, through the right lifting bracket, the motor's lifting lug, and out left lifting bracket. Thread item #357C onto item #370R finger tight.
2. Place washers, items #788B, over items #788A, hex head cap screws, and insert them into the holes located in the motor adapter, item #240, finger tight. Note, drill and tap holes in motor adapter at the location shown on page 4 of the slide rail installation instructions. Pump does not need to be disassembled for drill and tap operation.
3. Insert item #371G, hex head cap screw, through both lifting brackets and thread heavy hex nut, item #357A, finger tight. Do not apply Loctite 271 to items #371G and #357A at this time. Text of third step.
4. Tighten items #788A and #357C.

5. Remove items #371G and #357A and position lift cable loop between lifting brackets. Apply Loctite 271 and reinsert item #371G, hex head cap screw, through cable and lifting brackets and thread heavy hex nut, item #357A, and item #415A, jam nut, onto item #371G. Check cable clamps..

3.5.4 Install the slide rail

Refer to drawing B1-445153SLR and B2-445153SLR

1. With anchor bolts in position, lower the base, item #787A, onto a flat, clean foundation and tighten anchor bolt nuts.
2. Insert the slide rails, items #787C over the cylinders on the base and insert intermediate bracket, item #787P, cylinders into the tops of the slide rails. Allow .25" gap between the top of the slide rails and the intermediate bracket for thermal expansion. Secure the intermediate bracket to the sump wall. Repeat as necessary with the remainder of the rails and brackets.
3. Install the discharge pipe.
4. Lift the pump using the lift cable and lower it to have the guide bracket fit between the rail pipes. The pump should be reasonably level to keep the guide bracket from exerting too much force on the rail pipes when the pump is lowered or raised
5. Carefully lower the pump into position. Turn the adjusting bolts, items #787J, to provide the proper o-ring compression. The pump may need to be raised and lowered back into position a few times until the proper adjustment is found. The pump should properly lock into place with no visible gap between the o-ring and sump flange adapter. Tighten items #357, hex nuts, against items #787H, adjusting brackets, to prevent movement of adjusting bolts.

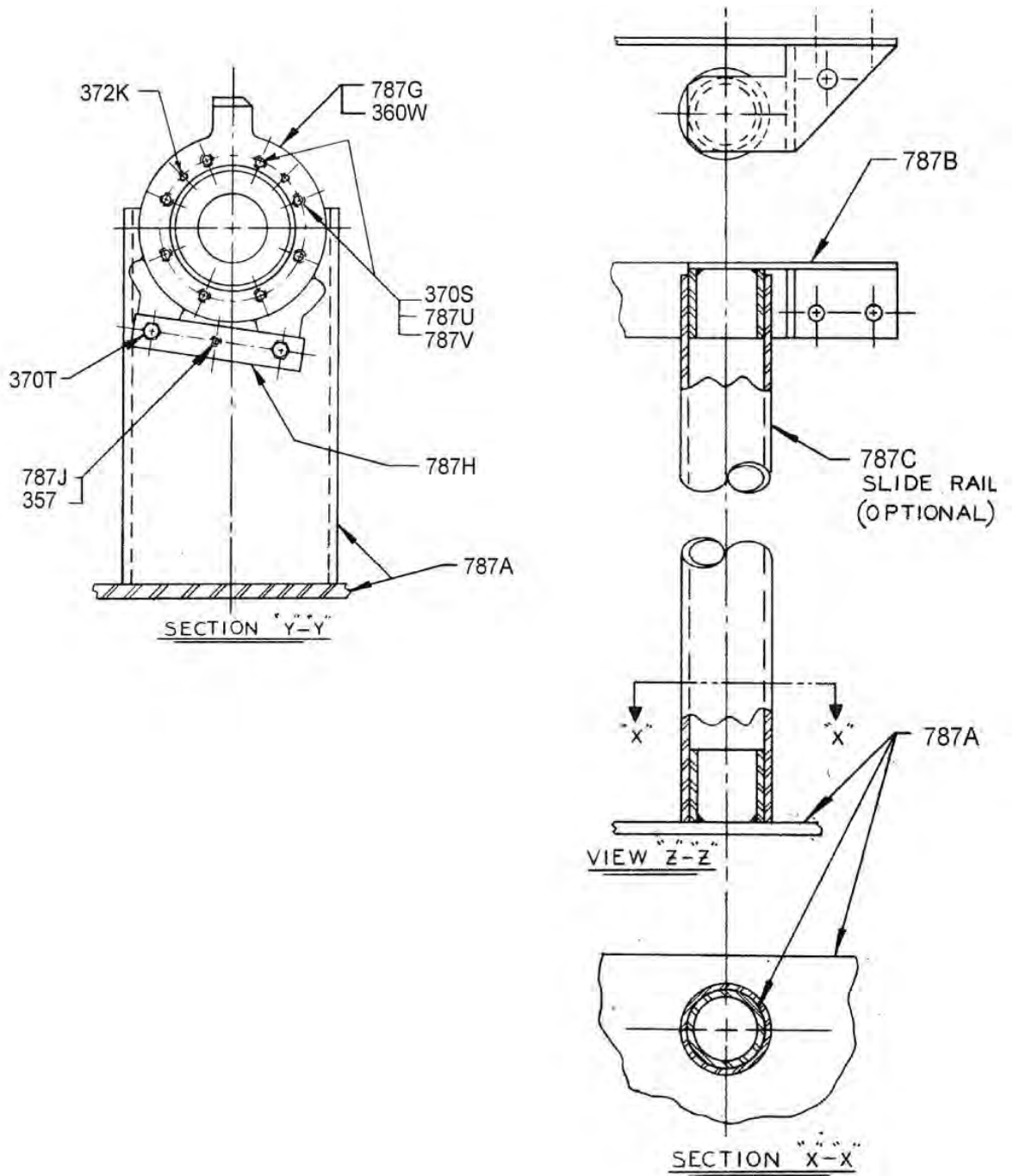


Figure 3: Slide rail system (optional)

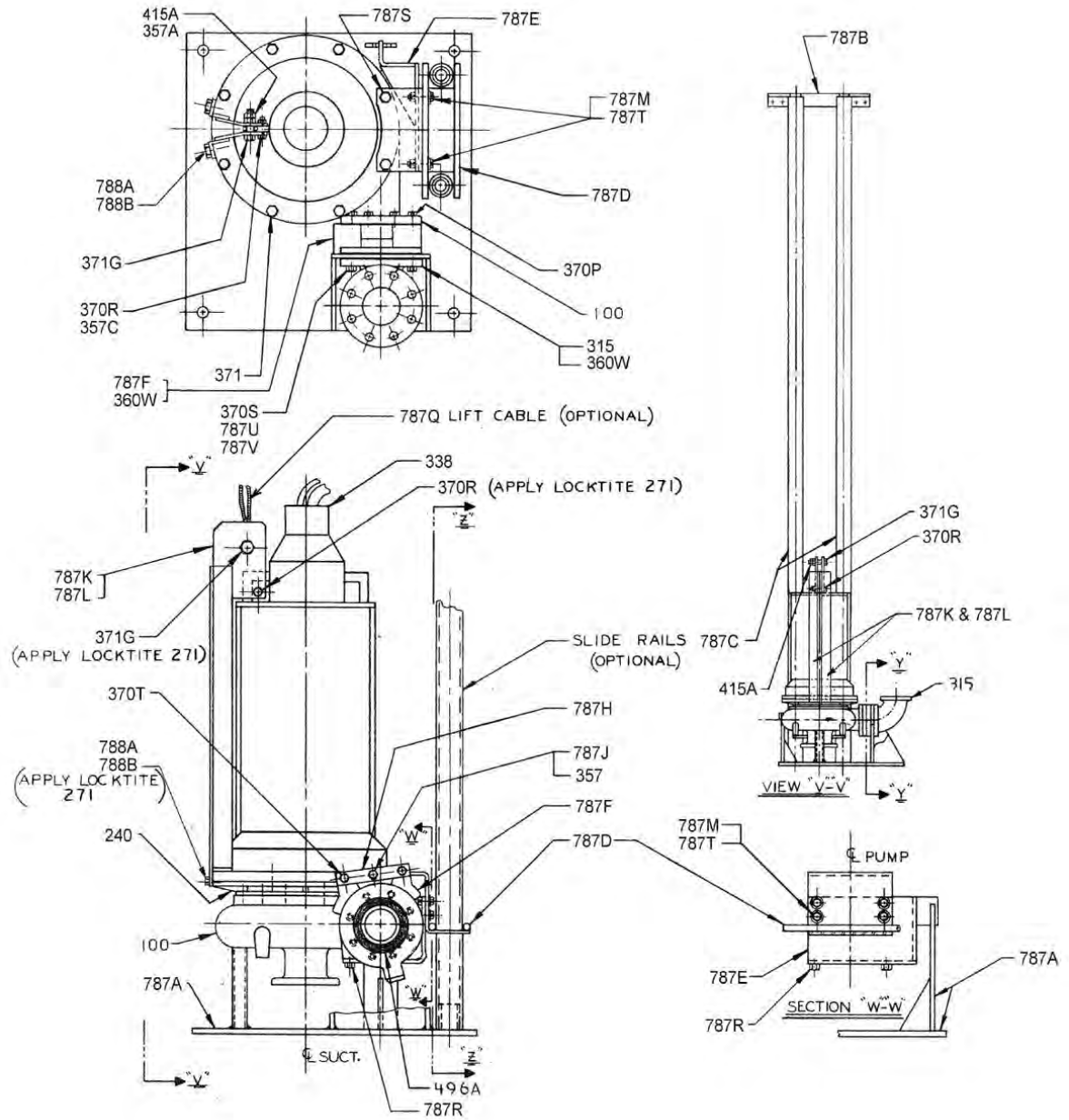


Figure 4: Slide rail system (optional)

NOTICE:

Pump shown is a JCU, not an HSUL. For illustrative purposes only.

4 Commissioning, Startup, Operation, and Shutdown

4.1 Start the pump

The most important concern is the prevention of motor overloading.

1. Refer to the motor nameplate for full load ampere rating of the motor.
2. Install an ammeter on the motor leads and check the motor draw immediately after the unit is started.

NOTICE:

A lower than expected current draw with a 3-phase motor may be an indication of incorrect rotation. If the amps are lower than expected, check rotation.

- a) Observe the discharge for flow rate. If it is lower than expected change two of the three motor leads to reverse the direction of rotation.

NOTICE:

Single-phase motors are internally wired for correct rotation.

- b) Check the motor overload at some other condition from that encountered at start-up
The ammeter on the motor leads should be checked for overload at all sump level heights with the liquid that will be normally pumped. The horsepower will tend to increase as the level in the sump rises, due to increased flow.

5 Maintenance

5.1 Disassembly

5.1.1 Disassemble the pump

1. Disconnect all electrical service. Mark leads for reassembly.
2. Remove fasteners which secure casing (100) to motor adapter (340) and separate the parts.
3. Remove impeller cap screw (370C) and impeller washer (528J). Impeller is keyed to shaft. Carefully slide impeller off shaft.
4. Remove fasteners attaching motor adapter (340) to motor (9700) and separate parts.

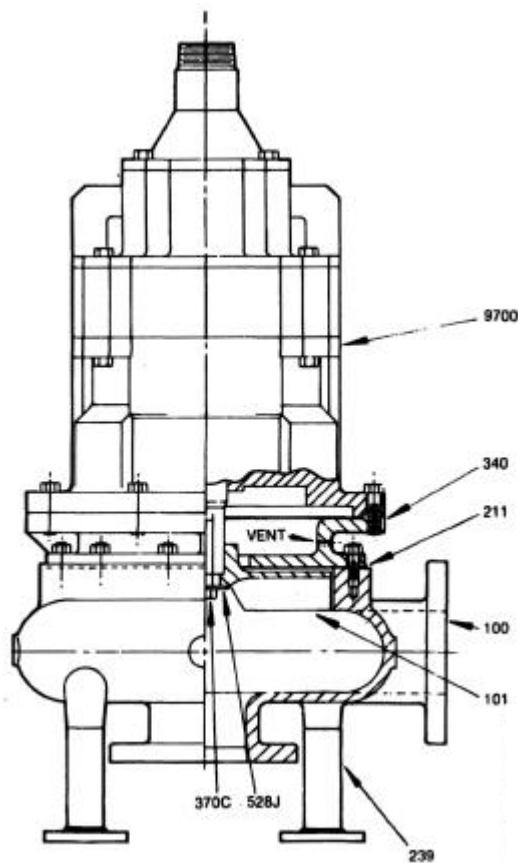


Figure 5: HSUL pump

NOTICE:

The motor shall be disassembled only by an authorized repair center. Failure to comply will result in voiding warranty.

For motor instructions see ABB/Baldor/Reliance Electrical Manual B-3629.

Table 3: Standard parts

Item	Qty / Pump	Part
100	1	Casing

Item	Qty / Pump	Part
101*1	1	Impeller
211*1	1	Gasket
239	4	Casing Supports
340	1	Motor Adapter
356	4	Stud
513*1	1	Casing Gasket
370C*1,*2	1	HH Cap Screw, Impeller
528J*1,*2	1	Washer, Impeller
9700	1	Motor

5.2 Pre-assembly

5.2.1 Pre-assembly inspections

Guidelines

Before you assemble the pump parts, make sure you follow these guidelines:

- Inspect the pump parts according to the information in these pre-assembly topics before you reassemble your pump. Replace any part that does not meet the required criteria.
- Make sure that the parts are clean. Clean the pump parts in solvent in order to remove oil, grease, and dirt.

NOTICE:

Protect machined surfaces while cleaning the parts. Failure to do so may result in equipment damage.

5.2.2 Replacement guidelines

Casing check and replacement



WARNING:

Risk of death or serious injury. Leaking fluid can cause fire and/or burns. Inspect and ensure gasket sealing surfaces are not damaged and repair or replace as necessary.

Inspect the casing for cracks and excessive wear or pitting. Thoroughly clean gasket surfaces and alignment fits in order to remove rust and debris.

Repair or replace the casing if you notice any of these conditions:

- Localized wear or grooving that is greater than 3.2 mm | 1/8 in. deep
- Pitting that is greater than 3.2 mm | 1/8 in. deep
- Irregularities in the casing-gasket seat surface

Casing areas to inspect

The arrows point to the areas to inspect for wear on the casing:

Impeller replacement

Inspect impeller vane edges for excessive cracks, pitting or corrosion damage. Replace impeller if excessively worn or defective.

Gaskets, O-rings, and seats replacement



WARNING:

Risk of death or serious injury. Leaking fluid can cause fire and/or burns. Replace all gaskets and O-rings at each overhaul or disassembly.



WARNING:

Risk of serious personal injury or property damage. Fasteners such as bolts and nuts are critical to the safe and reliable operation of the product. Ensure appropriate use of fasteners during installation or reassembly of the unit.

- Use fasteners of the proper size and material only.
- Replace all corroded fasteners.
- Ensure that all fasteners are properly tightened and that there are no missing fasteners.

Motor support

Inspect the motor support for any cracks or excessive corrosion damage. Replace if necessary.

Motor shaft check

Check the shaft for straightness or excessive wear, including thread wear or galling. If damage is evident, contact Baldor authorized motor repair center for motor repairs.

5.3 Reassembly

5.3.1 Reassemble the pump

How to reassemble HSUL pump

1. Check vent hole in motor adapter (340) to be sure it is clear.

Figure 6: Pump reassembly

2. Clean and remove any burrs from all mating metal surfaces, including shaft and impeller bore.
3. Align Motor Adapter on motor flange and fasten.

NOTICE:

On certain sizes, the same set of screws secures the casing, motor adapter and motor. On these sizes clamp the motor adapter to the motor while installing impeller.

4. Place motor key on shaft, and slide impeller onto shaft until seated. Be sure impeller shaft is bottomed out on impeller bore and secure with impeller screw (370C) and impeller washer (528J).
5. Align casing gasket (513) on motor adapter (340). Align casing (100) to motor adapter and fasten.
6. Connect Low Voltage wires to moisture detector (required to maintain motor warranty) and high temperature alarm. Connect power wires to power supply. Verify proper rotation, (counter-clockwise rotation when viewing suction side of pump).

NOTICE:

Refer to 5.1.1 Disassemble the pump on page 19 for parts description.

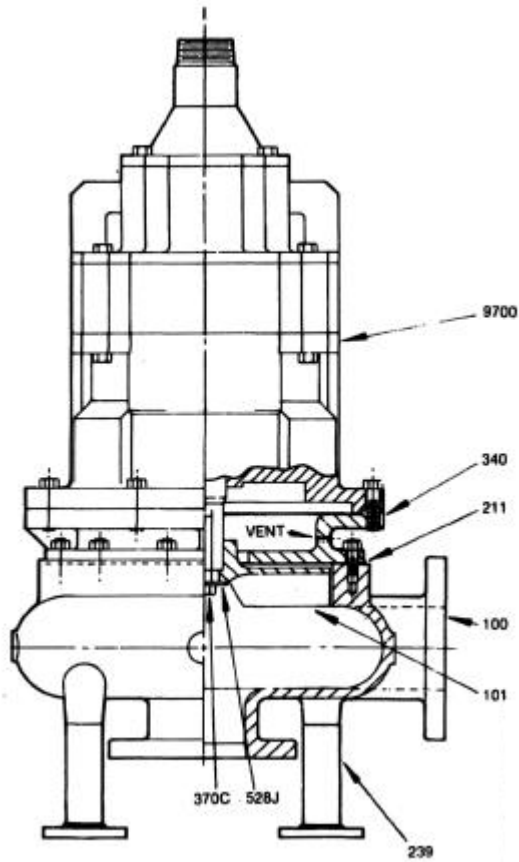


Figure 7: HSUL pump

6 Troubleshooting

6.1 Troubleshooting

Symptom	Cause	Remedy
Insufficient or no discharge	Speed too low due to low voltage	Verify voltage is within rated range
	System head too high	Verify discharge pressure
	Insufficient NPSH or submergence	Verify liquid level is above minimum required
	Worn pump parts	Check parts for wear
	Incorrect motor rotation	Verify rotation and swapped 2 of 3 motor leads if necessary
	Incomplete pump priming due to plugged vent hole	Check vent hole
	Clogged suction or discharge pipe	Clean suction area and check discharge piping for clogs
	High fluid viscosity	Check for solids settling that has increased viscosity.
Excessive current draw	Low system head allowing pump to operate at higher flow than expected	Check discharge pressure. If lower than expected, increase with discharge valve if available
	Impeller rubbing or solid stuck in pump	Check that impeller turns freely. Disconnect and lockout power. Heed all safety precautions and warnings in this manual
	Mechanical defect in motor	Repair motor at ABB/Baldor/Reliance Authorized repair center
	Specific gravity or viscosity too high	Check for solids settling that has increased viscosity.
	Low voltage	Verify voltage is within rated range

**Visit our website for the latest version of
this document and more information:**
<http://www.gouldspumps.com>



Goulds Pumps Inc.
240 Fall Street
Seneca Falls, NY 13148
USA

Form IOM.HSUL.en-US.2021-09

©2021 ITT Corporation
The original instruction is in English. All non-English instructions are translations of the original instruction.