

# **OWNER'S AND OPERATOR'S MANUAL**

**PLEASE FILL IN DATA  
FROM YOUR PUMP  
NAMEPLATE**

**Pump model** \_\_\_\_\_

**Spec. No.** \_\_\_\_\_

**Serial No.** \_\_\_\_\_

**Seal No.** \_\_\_\_\_

**SELF-PRIMING  
SOLIDS HANDLING PUMPS  
MOTOR DRIVEN: LONG COUPLED**

**TYPE: EL-EB  
TRASH HOG II ®**

**MODELS: 3DTH15EL-EB — 3DTH23EL-EB  
4DTH14EL-EB — 4DTH24EL-EB  
6ETH26EL-EB — 6ETH28EL-EB  
8GTH8EL-EB — 8GTH14EL-EB  
10GTH9EL-EB**



# Congratulations

You are now the owner of an ITT pump. This pump was carefully inspected and subjected to final performance tests before releasing for shipment.

In order to obtain maximum performance, please follow the simple instructions in this manual.

## RECOMMENDED PRECAUTIONS

1. Avoid system pressures that may exceed one and a half times the operating point selected from the pump performance curve.
2. Should the fluid temperature rise more than 50°F above ambient, expansion joints must be installed on both the suction and discharge ports to relieve any stress on the pump casing.
3. All electrical wiring of the pump installation must be done by a licensed electrician who will observe all national and local electrical codes. All motors require a magnetic starter with current over-load protection.
4. No modifications, additions or deletions should be made to the pump, without prior approval of the factory.
5. In systems where shock wave pressures may be generated, protective devices such as check valves/gate valves, etc., must be installed on discharge line to prevent shock pressures from entering the pump casing.
6. In systems containing discharge check valves, gate valves, etc., pump will not prime against a closed valve. Check the discharge valves making sure they are open before attempting to prime pump. If there is a possibility of air being entrapped in the pump casing, install an automatic venting device to bleed off the air.
7. This pump is designed primarily for water use. Before pumping other liquids, read carefully the **CAUTION** below.
8. Overheated pumps are dangerous. Burns or explosion could occur due to steam pressure. Operating pumps with suction and discharge closed is one cause of severe overheating. If over heating of pump casing occurs: 1. Stop pump immediately. 2. Allow pump to cool. 3. Slowly and cautiously vent pump.
9. Drain casing completely when servicing pump handling volatile or harmful liquids.
10. Do not use in a combustible atmosphere.
11. Make daily checks of the tightness of suction and discharge pipe, drain, filter plug and pump gaskets. Operation should not proceed until all of the above items have been checked and are tight.
12. After servicing the pump, always install the coupling guards, belt guards and other safety devices as originally found prior to disassembly.



### CAUTION: (Read Carefully)

The performance of ITT pumps is based upon clear, cold, fresh water with suction conditions as shown on the performance curve. If used to pump other liquids, pump performance may differ from rated performance based on the different specific gravity, temperature, viscosity, etc. of the liquid being pumped. A standard pump may not be safe for pumping all types of liquids, such as toxic, volatile or chemical liquids, or liquids under extreme temperatures or pressures. Please consult ITT catalogs as well as local codes and general references to determine the appropriate pumps for your particular application. Since it is impossible for us to anticipate every application of an ITT pump, if you plan to use the pump for a non-water application, *consult ITT beforehand* to determine whether such application may be proper or safe under the circumstances. *Failure to do so could result in property damage or personal injury.*

## **WARRANTY**

WARRANTY - Company warrants title to the product(s) and, except as noted with respect to items not of Company's manufacturer, also warrants the product(s) on date of shipment to Purchaser, to be of the kind and quality described herein, and free of defects in workmanship and material.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, AND CONSTITUTES THE ONLY WARRANTY OF COMPANY WITH RESPECT TO THE PRODUCT(S).

If within one year from date of initial operation, but not more than eighteen months from date of shipment by Company of any item of product(s), Purchaser discovers that such item was not as warranted above and promptly notifies Company in writing thereof, Company shall remedy such nonconformance by, at Company's option, adjustment or repair or replacement of the item and any affected part of the product(s). Purchaser shall assume all responsibility and expense for removal, reinstallation, and freight in connection with the foregoing remedies. The same obligations and conditions shall extend to replacement parts furnished by Company hereunder. Company shall have the right of disposal of parts replaced by it.

ANY SEPARATELY LISTED ITEM OF THE PRODUCT(S) WHICH IS NOT MANUFACTURED BY THE COMPANY IS NOT WARRANTED BY COMPANY and shall be covered only by the express warranty, if any, of the manufacturer thereof.

THIS STATES PURCHASER'S EXCLUSIVE REMEDY AGAINST COMPANY AND ITS SUPPLIERS RELATING TO THE PRODUCT(S), WHETHER IN CONTRACT OR IN TORT OR UNDER ANY OTHER LEGAL THEORY, AND WHETHER ARISING OUT OF WARRANTIES, REPRESENTATIONS, INSTRUCTIONS, INSTALLATIONS OR DEFECTS FROM ANY CAUSE. Company and its suppliers shall have no obligation as to any product which has been improperly stored or handled, or which has not been operated or maintained according to instructions in Company or supplier furnished manuals.

## 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 [www.gouldspumps.com/literature\\_ioms.html](http://www.gouldspumps.com/literature_ioms.html) 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 [www.gouldspumps.com](http://www.gouldspumps.com).

# SAFETY WARNINGS

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

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 **WARNING**

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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.

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 **WARNING**

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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.

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 **WARNING**

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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.

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 **WARNING**

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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 [www.gouldspumps.com/literature](http://www.gouldspumps.com/literature).

# 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 this 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**

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.









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.

## 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.

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><b>Safety Apparel:</b></p> <ul style="list-style-type: none"> <li>♦ Insulated work gloves when handling hot bearings or using bearing heater</li> <li>♦ Heavy work gloves when handling parts with sharp edges, especially impellers</li> <li>♦ Safety glasses (with side shields) for eye protection</li> <li>♦ Steel-toed shoes for foot protection when handling parts, heavy tools, etc.</li> <li>♦ Other personal protective equipment to protect against hazardous/toxic fluids</li> </ul>
WARNING		<p><b>Receiving:</b></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 <a href="http://www.gouldspumps.com/literature_ioms.html">www.gouldspumps.com/literature_ioms.html</a> 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><b>Alignment:</b></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>

<b>General Precautions</b>		
<b>WARNING</b>		Before beginning any alignment procedure, make sure driver power is locked out. Failure to lock out driver power will result in serious physical injury.
<b>CAUTION</b>		<b>Piping:</b> 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.
<b>WARNING</b>		<b>Flanged Connections:</b> Use only fasteners of the proper size and material.
<b>WARNING</b>		Replace all corroded fasteners.
<b>WARNING</b>		Ensure all fasteners are properly tightened and there are no missing fasteners.
<b>WARNING</b>		<b>Startup and Operation:</b> When installing in a potentially explosive environment, please ensure that the motor is properly certified.
<b>WARNING</b>		Operating pump in reverse rotation may result in contact of metal parts, heat generation, and breach of containment.
<b>WARNING</b>		Lock out driver power to prevent accidental start-up and physical injury.
<b>WARNING</b>		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.
<b>WARNING</b>		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.
<b>WARNING</b>		The coupling used in an ATEX classified environment must be properly certified and must be constructed from a non-sparking material.
<b>WARNING</b>		Never operate a pump without coupling guard properly installed. Personal injury will occur if pump is run without coupling guard.
<b>WARNING</b>		Make sure to properly lubricate the bearings. Failure to do so may result in excess heat generation, sparks, and / or premature failure.
<b>CAUTION</b>		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.
<b>CAUTION</b>		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.
<b>WARNING</b>		Never attempt to replace packing until the driver is properly locked out and the coupling spacer is removed.
<b>WARNING</b>		Dynamic seals are not allowed in an ATEX classified environment.
<b>WARNING</b>		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.



<b>General Precautions</b>		
<b>WARNING</b>		Ensure pump is isolated from system and pressure is relieved before disassembling pump, removing plugs, opening vent or drain valves, or disconnecting piping.
<b>WARNING</b>		<b>Shutdown, Disassembly, and Reassembly:</b> 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.
<b>WARNING</b>		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.
<b>WARNING</b>		Operator must be aware of pumpage and safety precautions to prevent physical injury.
<b>WARNING</b>		Lock out driver power to prevent accidental startup and physical injury.
<b>CAUTION</b>		Allow all system and pump components to cool before handling them to prevent physical injury.
<b>CAUTION</b>		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.
<b>WARNING</b>		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.
<b>CAUTION</b>		Wear heavy work gloves when handling impellers as sharp edges may cause physical injury.
<b>CAUTION</b>		Wear insulated gloves when using a bearing heater. Bearings will get hot and can cause physical injury.

## 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:

1. Monitoring the pump frame 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 [www.gouldspumps.com/literature\\_ioms.html](http://www.gouldspumps.com/literature_ioms.html) 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 baseplate on which it is mounted. A typical tag would look like this:



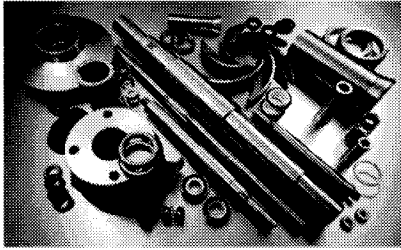
The CE and the Ex designate the ATEX compliance. The code directly below these symbols reads as follows:

- II = Group 2
- 2 = Category 2
- G/D = Gas and Dust present
- T4 = Temperature class, can be T1 to T6 (see Table 1)

<b>Code</b>	<b>Max permissible surface temperature °F (°C)</b>	<b>Max permissible liquid temperature °F (°C)</b>
T1	842 (450)	700 (372)
T2	572 (300)	530 (277)
T3	392 (200)	350 (177)
T4	275 (135)	235 (113)
T5	212 (100)	Option not available
T6	185 (85)	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.

## 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.

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## ITT SELF-PRIMING SOLIDS HANDLING PUMPS MOTOR DRIVEN: LONG COUPLED TYPE: EL/EB "TRASH HOG II"

### GENERAL

Our shipping container has been specifically designed to prevent transit damage. However, any indications of damage should be carefully noted on the delivery ticket and a claim filed promptly with the carrier.

### LOCATION

By placing your ITT pump on a firm, level foundation, you reduce harmful vibrations and unnecessary noise. Your ITT pump is self-priming and may be located above the source of liquid supply. Best pump operation is obtained by locating the pump as close as possible to the liquid being handled. Keep in mind a pump can push liquid more effectively than it can pull or draw liquid. The actual priming ability of a pump depends upon many factors such as the size and layout of the piping, the type of liquid and its temperature, the specific pump selected and its speed of operation. Additional priming information is given in the ITT Sales Catalog. Provide the necessary space around the pump for future inspection and servicing of the unit.

### CONNECTIONS

Connections at the easily accessible suction and discharge ports can be made either with hose or pipe. The use of strongly reinforced suction hose will prevent collapsing of the hose during operation. New hose washers should be used at the couplings to prevent trouble-causing leaks. All hose or pipe should be independently supported to eliminate excessive strain on the pump.

### ROTATION

Your pump is specifically designed to rotate in a counterclockwise direction when viewing the motor from the pump end. Three phase motors can rotate in either direction. Interchanging any two leads of a three phase motor will reverse the rotation. Check your rotation.

### SUCTION PIPING

1. Suction piping should be as short as possible using the fewest number of elbows and fittings possible to reduce friction loss and avoid priming problems.
2. The designer of the piping system must be sure that the available NPSH of the system exceeds the required NPSH of the pump. (Refer to pump performance curve for the value of the NPSH required by the pump at the operating point).
3. Suction piping should be the same size as the pump inlet.
4. Any reducer should be of the eccentric type. If a reducer is used in the horizontal run of suction piping, it must be used with *flat* part of reducer on the *top* to avoid air pockets.

5. A horizontal portion of the suction line must have a gradual *rise* to the pump from the source of the liquid being pumped. Any high point in the suction line will create an air pocket, and will prevent proper pump operation and inhibit priming capability.
6. An installation requiring long pipe lines handling hot or chilled liquids, requires provisions for relieving the expansion and contraction of the pipe to eliminate any pipe stress from acting on the pump casing.
7. It is recommended to use long radius elbows and eccentric reducers whenever possible. These types of fittings reduce friction loss. Tapered reducers should only be used in vertical suction piping.
8. If a suction strainer is used, it should have mesh size equal to or less than the solid handling capability of the pump, and open mesh area equivalent to a minimum of eight times the area of the suction pipe size.
9. The size and length of the suction pipe, the number and type of pipe fittings, and the height of the static suction lift will determine the *total dynamic suction lift of each piping system*. This system characteristic should be calculated so that it does not exceed the design capacity of the pump causing reduced flow and/or cavitation.
10. Before tightening the suction pipe connection flange, align it exactly with the pump suction flange. Do not pull a pipe into place by tightening the flange bolts and/or couplings. All pipe lines near the pump must be rigidly supported to avoid strain on the pump, which may cause excessive vibration, decreased bearing life and/or increased shaft deflection and seal wear.
11. Leaks in the suction line can adversely affect both the pump's priming, and performance; especially when the pump is operating at high suction lift. To prevent leaks, make sure all piping connections are tightly sealed. The piping gasket sealant used should be compatible with the liquid being pumped.
12. If a single suction line is installed into a sump, it should be installed away from the sump wall at a minimum distance equal to 1½ times the diameter of the suction line. If more than one suction line is installed in the same sump, separate the suction lines from each other by a minimum distance equal to three times the diameter of the largest suction line.
13. If there is a discharge from an open pipe into the sump, the flow should be kept away from the pump's suction pipe. This inflow usually carries air down into the sump with the liquid. Liquid with entrained air will increase

# PIPING RECOMMENDATIONS

priming time and reduce pump efficiency. If the discharge into the sump is close to the suction pipe, install a baffle between the inflow and suction pipe at a distance of at least six times the diameter of suction pipe away from the suction pipe. The baffle will allow the air to escape from liquid before it is drawn into the suction pipe.

14. Recommended is the use of bell type increasers at the bottom of the suction pipe to reduce inlet velocity. If this can't be done, cut the bottom of the suction pipe at a 45° angle to avoid swirling of liquid.
15. Refer to Hydraulic Institute Standards general guideline for sump design.

## VALVES

ITT does not recommend the use of a valve on the suction line EXCEPT:

- a) In case where positive suction heads are present in the system or
- b) Where it is possible for a positive head to develop due to flooding conditions.
- c) Sometimes it is advisable to have valves on suction and discharge so that the pump may be isolated during repair.

In any case, if suction valve is used, install with stems in horizontal position to avoid air pockets.

1. If throttling valves are necessary in the discharge line, use a valve size equivalent to the largest pipe size in the line to minimize friction loss. Never install a throttling valve in the suction line.
2. Gate and check valves may be used on the discharge side, but it is not necessary in low discharge head applications.
3. It is recommended to use a throttling valve and check valve in the discharge line to protect the pump from excessive shock or water hammer and reversed rotation when pump is stopped.

## DISCHARGE PIPING

1. To minimize piping friction losses:
  - a) Keep discharge line as straight as possible.
  - b) Use the minimum number possible of elbows and other pipe fittings.
  - c) Use *long radius* elbows and/or eccentric reducers.
2. Do not terminate the discharge line at a level lower than that of the liquid being pumped, unless a siphon breaker is used in the discharge line. Siphoning action may cause damage to the pump.
3. If there is a high discharge head, slow re-priming may be encountered requiring the use of an air venting device. If a discharge check valve is used an air release line must be incorporated between the discharge check valve and pump to insure priming.
4. If the system has a long discharge line it is recom-

mended to install a siphon breaker to avoid siphoning out the liquid from pump casing.

## AIR RELEASE LINE

It is essential to allow the air to escape from the discharge line to atmosphere during the initial priming and re-priming cycle. In systems with high discharge heads, it may be advisable to install an air release line between the pump casing and discharge check valve to aid their venting. The size of the air release line is selected such that it does not significantly affect the discharge capacity. You may install an air release line through the filler plug hole if necessary. However, the preferred location is in the discharge line—between the pump and the discharge check valve—as close to the discharge check valve as possible. We recommend the following line sizes for the following ITT pumps.

3DTH & 4DTH	-3/4" Line
6ETH	-1" Line
8GTH & 10GTH	-1 1/4" Line

### NOTE:

1. This line size may be increased or decreased depending on application.
2. Direct the air release line back into the sump (not into the pump suction line). Leave the end of the line open to atmosphere. *Do not submerge* into the liquid being pumped.
3. The air release line may clog, particularly if a shut off valve is installed in the line and is closed during operation. If this condition occurs, either use a larger line or leave the shut off valve open during pumping operation. To aid in maintaining air release lines, fit them with crosses instead of elbows.

## STARTING

Follow the motor manufacturer's instructions carefully. Before starting fill the pump casing with liquid through the priming plug provided. Your pump has been designed to prime itself in a few minutes. High suction lifts require additional time and reduce the performance of the pump. Should you have difficulty, refer to the "Trouble Guide" paragraph.

ITT self priming pumps prime and reprime themselves providing the casing is filled with liquid. Should you lose this liquid from the casing accidentally or by draining purposely, it will be necessary to fill casing with liquid before starting.

Check oil level in bearing housing cavity. Units are shipped without oil. Fill bearing housing oil cavity with proper grade of oil. (Refer to "Lubrication" for proper oil level).

Check drive coupling and "V" belt alignment. (Refer "coupling alignment" for instructions).

Check motor wiring.

# OPERATING INSTRUCTIONS

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## WARNINGS:

1. All electrical work *must* be done by a licensed electrician.
2. Before working on pump and/or motor be certain that the electrical power is off at the main junction box.
3. Disconnect the fuse or circuit breaker and have the main switch tagged "DO NOT ENERGIZE THIS SWITCH PERSONNEL WORKING ON EQUIPMENT."
4. Some motors are equipped with built-in thermal overloads to shut off the motors in the event the temperature becomes excessive (as a result of low voltage, poor ventilation, overloaded lines, etc.) These motors will restart automatically as the motor cools down. For safety sake, DO NOT work on any motor without shutting off the electricity.
5. Never operate an electric motor driven pump without properly grounding the motor frame. Serious injury or death by electrocution could result.
6. Drain pump casing completely before taking pump apart. It is advisable to flush the inside of the casing with water before taking pump apart.
7. Never start pump before putting back all necessary guards such as coupling guard and/or belt guard.

## LUBRICATION

**A. BEARING LUBRICATION:** (Refer to drawing) Use good grade SAE #30 non-detergent motor oil. Units are shipped without oil and must be filled before starting. Fill bearing housing oil cavity with oil through "filter" provided on top of bearing housing nearest motor until oil starts to drip out of "oil level" hole. ("Oil Level" cast on housing). Install breather to vent any oil vapor.

Also, provision is made on the housing to install "constant level oiler" ("Oiler" cast on housing.) This oiler can be supplied as an optional item.

Under normal service, drain and refill housing cavity oil yearly. However, oil level should be checked regularly.

### BEARING CAVITY OIL CAPACITY:

3DTH & 4DTH	:56 fl. oz.
6ETH	:68 fl. oz.
8GTH	:68 fl. oz.
10GTH	:68 fl. oz.

### B. SEAL CAVITY LUBRICATION:

Use good grade SAE #30 non-detergent motor oil. Units are shipped without oil but should be checked before starting.

Fill seal cavity with oil through hole provided on top of bearing housing nearest pump casing, until you see oil through hole opening. Install breather to vent any oil vapor.

**NOTE:** It is recommended that the seal cavity oil be drained (through the drain hole) and replaced with clean grade SAE #30 non-detergent motor oil every 6 months.

The mechanical shaft seal is a wearing part that will eventually need to be replaced. A leaky seal must be replaced quickly to prevent damage to the pump. Any overflow of liquid through the breather (vented plug) is an indication of a possible seal failure.

**CAUTION:** At the first sign of overflow from the cavity vent, the oil drain plug should be removed from the seal cavity chamber to drain the pumpage and remaining oil. The cavity can remain opened until the pump can be shut down and the mechanical seal checked or replaced. Failure to do so may contaminate the bearing housing and void warranty

### OIL CAPACITY OF SEAL CAVITY:

3DTH	:20 fl. oz. minimum
4DTH	:20 fl. oz. minimum
6ETH	:20 fl. oz. minimum
8GTH	:20 fl. oz. minimum
10GTH	:20 fl. oz. minimum

### C. MOTOR BEARING LUBRICATION:

Follow motor manufacturer's specification.

## FLEXIBLE COUPLINGS:

A flexible coupling should not be used to compensate for misalignment of the pump and driver shafts. The purpose of the flexible coupling is to compensate for temperature changes and to permit end movement of the shafts without interference with each other while transmitting power from the driver to the pump.

## TYPES OF MISALIGNMENT:

There are two forms of misalignment between the pump shaft and the driver shaft, as follows:

Angular misalignment—shafts with axes concentric but not parallel.

Parallel misalignment—shafts with axes parallel but not concentric.

## COUPLING ALIGNMENT:

The faces of the coupling halves should be spaced far enough apart so that they cannot strike each other when the driver rotor is moved hard over toward the pump. Due

allowance should be made for wear of the thrust bearings. A minimum dimension for the separation of the coupling halves is specified by the manufacturer, usually 1/8". The necessary tools for approximately checking the alignment of a flexible coupling are a straight edge and a taper gauge or a set of feeler gauges.

## ANGULAR MISALIGNMENT:

A check for angular alignment is made by inserting the taper gauge or feelers at four points between the coupling faces and comparing the distance between the faces of four points spaced at 90-degree intervals around the coupling. The unit will be in angular alignment when the measurements show that the coupling faces are the same distance apart at all points.

## OPERATING INSTRUCTIONS

### PARALLEL MISALIGNMENT:

A check for parallel alignment is made by placing a straight edge across both coupling rims at the top, bottom and at both sides. The unit will be in parallel alignment when the straight edge rests evenly on the coupling rim at all positions. Allowance may be necessary for temperature changes and for coupling halves that are not of the same outside diameter. Care must be taken to have the straight edge parallel to the axis of the shafts. Angular and parallel misalignment are corrected by means of shims under the motor mounting feet. After each change, it is necessary to recheck the alignment of the coupling halves. Adjustment in one direction may disturb adjustments already made in another direction. It should not be necessary to adjust the shims under the pump.

### GROUTING:

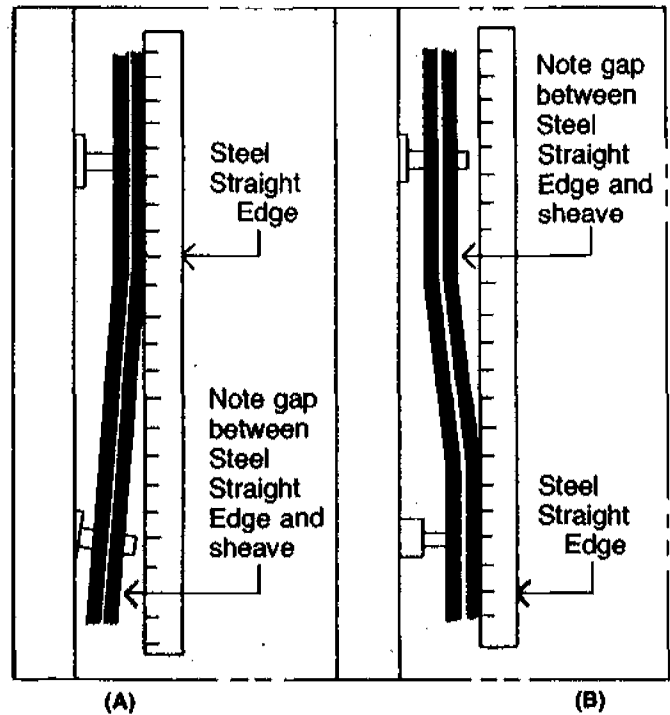
When the alignment is correct, the foundation bolts should be tightened evenly but not too firmly. The unit can then be grouted to the foundation. The base plate should be completely filled with grout and it is desirable to grout the leveling pieces, shims or wedges in place. Foundation bolts should not be fully tightened until the grout is hardened, usually about 48 hours after pouring.

### FINAL CHECK OF ALIGNMENT:

After the grout has set and the foundation bolts have been properly tightened, the unit should be checked for parallel and angular alignment and, if necessary, corrective measures taken. After the piping of the unit has been connected, the alignment should be again checked.

### "V" BELT ALIGNMENT:

Although alignment is not as critical in V-belt drives as in others, proper alignment is essential for long belt and sheave life. First, make sure that drive shafts are parallel. The most common causes of misalignment are non-parallel shafts and improperly located sheaves. Where shafts are not parallel, belts on one side are drawn tighter and pull more than their share of the load. As a result, these belts wear out faster, requiring the entire set to be replaced before it has given maximum service. If misalignment is in the sheave, belts will enter and leave the grooves at an angle, causing excessive belt cover and sheave wear.



### CHECK SHEAVE MOUNTING AND ALIGNMENT

"V"-Belt drives do not require alignment to as close tolerances as most other types of drives—but unless the belts enter and leave the sheaves in a relatively straight line, wear is accelerated.

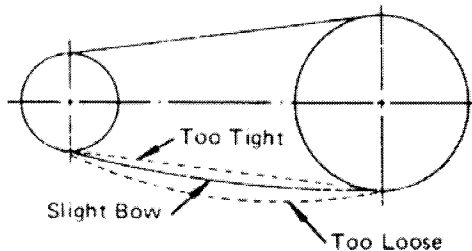
The two most common causes of misalignment are shown: (a) the shafts of the driver and driven machines are not parallel, and (b) the sheaves are not located properly on the shafts. To check alignment, all you need is a straight-edge or, for drives with longer centers, a steel tape. If these aren't available, you can, as a last resort, even use heavy string. Just line the straight edge or tape along the outside face of both sheaves as shown in the illustration. Misalignment will show up as a gap in between the sheave face and straight-edge, or perhaps as a "break" in the tape or string. Make sure that the width of the outside land is equal on both sheaves, when using this method.

## "V" BELT DRIVE TENSIONING METHOD:

Before attempting to tension any drive it is important that the sheaves be properly installed and aligned. The V-belts should be placed over the sheaves and in the grooves without forcing them over the sides of the grooves.

**Step 1:** With all belts in their proper groove adjust the centers to take up all slack and until the belts are fairly tight.

**Step 2:** Start the drive and continue to adjust until the belts have only a slight bow on the slack side of the drive while operating under load. See sketch.



The drive is now properly tensioned and should operate satisfactorily with only an occasional readjustment to compensate for belt and groove wear.

## IMPELLER RUNNING CLEARANCE:

The impeller running clearance, the distance between the impeller vanes and wear plate, is adjusted at the factory prior to shipment to .020"-.030". To adjust this clearance in the field, shut down the pump, disconnect power supply to the pump and use the following instructions.

1. Drain pump casing (1) completely by removing drain plugs (2) from both suction and discharge chamber.
2. Remove clean-out cover (83) by unscrewing the two hand knobs (81).
3. Reach inside the pump casing through the clean-out hole with a feeler gage and measure the gap between the impeller vanes and wear plate (89). Measure this gap at each impeller vane. If this gap is not within the allowable limits of .020"-.030", adjust this clearance as follows:
  - (a) Unscrew the three jack-screws (112) and jam nuts (111). Partially loosen the bearing carrier capscrews (45).
  - (b) Adjust the jack-screws (112) and capscrews (45) until the front clearance between the impeller vanes and wear plate falls within the allowable range of .020"-.030". Tightening the jack-screws (112) will increase the front clearance and tightening the capscrews (45) will decrease the front clearance.

**Step 3:** After a few days operation the belts will seat themselves in the sheave grooves and it may become necessary to readjust so that the drive again shows a slight "bow" in the slack side.

## OPERATING INSTRUCTIONS

Tighten one set of screws and loosen the other to go in the direction required. Tighten locknut (111).

**Note:** Maximum allowable bearing carrier (110) pull back movement is 1/8", (i.e. from the condition when impeller is "just" touching the wearplate you can push back the bearing carrier assembly by 1/8").

## SHAFT AND BEARING REPLACEMENT

If shaft or bearing replacement is necessary, follow these instructions. (Shut down the pump and disconnect power supply to the pump before working on pump.)

1. Install the front (impeller end) bearing (36) on the shaft (38).
2. Slide the carrier retaining ring (106) onto the shaft (38).
3. Install the rear (coupling end) bearing (117) on the shaft (38).
4. Install the retaining ring (108) onto the shaft (38). Add shims (107) between the retaining ring (108) and the bearing (117) if required to lock the bearing (117) on to the shaft axially.
5. Install "O" ring (109) into the bearing carrier groove.
6. Slide the bearing carrier (110) with "O" ring over the rear bearing such that rear bearing slides into the bearing carrier (110). Install the retaining ring (106) in place.
7. Insert shaft assembly with bearings and carrier into the housing (31).

## CLEANING OR REPLACING CHECK VALVE:

(Shut down the pump and disconnect power supply to the pump before working on the pump.)



Drain pump casing (1) completely by removing drain plugs (2). Access to suction check valve can be made by removing the check valve cover plate (76) from the top of the suction chamber of pump casing.

Reaching through the check valve cover plate hole, remove the two shoulder screws (118) and check valve keeper plate (53). Now slide off check valve (51). Pull the check valve assembly out of the pump casing through the cover plate hole. Inspect the sealing surface of the check valve and make sure it is in good condition and free of debris.

## CLEANING IMPELLER:

Drain pump casing completely by removing drain plugs (2). Remove handknobs (81), remove clean-out cover (83) and using coat hanger remove debris from the impeller eye area and if necessary wash it off with garden hose. Check "O" ring (84) on the clean-out cover—replace it if necessary.

## OPERATING INSTRUCTIONS

### HYDROTEST:

**NOTE:** If hydrostatic test is required in the field, it must be performed with suction check valve removed or with partially open suction check valve.

1. The maximum allowable hydrotest pressure for these pumps is:

3DTH	EL & EB	}	130 psi
4DTH	EL & EB		
6ETH	EL & EB		
8GTH	EL & EB		
10GTH	EL & EB	}	85 psi

2. Before hydrotesting the pump all air *must* be removed from the suction priming chamber. This is done by:
  - (a) Removing ¼" pipe plug from check valve cover plate (76).
  - (b) Installing a ¼" pet cock valve (not supplied by ITT) in place of pipe plug.
  - (c) With pet cock open fill casing (1) with fluid being pumped through filler plug (98) provided on top of casing. Do not close pet cock until all air is out of casing (as shown by a solid stream of liquid coming out of pet cock).
  - (d) Close pet cock, reinstall filler plug. Unit is now ready for hydrotest.

### DISASSEMBLY

If you need to replace impeller, wear plate, shaft seal, front oil lip seal, bearing or check valve, follow these steps:

1. Drain pump casing completely by removing drain plug (2) from both suction and discharge chamber.
2. Drain seal cavity oil by removing drain plug (27) from bearing housing.
 

**Note:** A mixture of oil and water does not necessarily indicate a seal failure. Inspect seal for damage and replace if needed.
3. Drain bearing cavity oil by removing drain plug (28).
 

**Note:** If oil is mixed with water, shaft seal and front oil lip seal must be inspected for failure.
4. Remove bearing housing support (35) capscrews from base.
5. Disconnect coupling or "V" Belt.
6. Remove capscrews (102) which holds seal plate (10) to casing (1).

7. Pull complete assembly including bearing housing assembly, seal plate and impeller (91) from pump casing.
8. Remove impeller nut (4) & impeller washer (5) from the shaft (38). Pry out the impeller (91) using wedges behind the impeller.

**Note:** Check impeller for any broken vanes or wear. If it is necessary, replace it.

Refer to impeller-nut torque value before reinstalling impeller nut.

9. Remove wear plate (89) by removing locknut (116) through the clean-out cover (83) hole. Check wear plate for wear. Replace if required.
10. Remove seal assy. (17) from seal well as follows:
  - (a) Remove spring and rotating element of the seal.
  - (b) Pry out the stationary element gently from the seal cavity by using screw driver. *OR* if seal plate is removed from the shaft, the stationary seal will slide out off the shaft along with seal plate. Be careful not to damage stationary element by letting it hit the shaft.

**Note:** Please refer to seal re-assembly section before reinstalling the seal. If the seal appears damaged in any way, replace with new seal assembly.

11. Remove capscrews (33) to disassemble bearing housing from seal plate.
 

**Note:** Check gasket (105)—if worn, replace it.
12. Remove the shaft assembly with bearings and bearing carrier out of the bearing housing (31).
13. Check both lip seals (42), replace if necessary.
14. Remove the snap ring (106) from the bearing carrier (110) which will allow the bearing carrier (110) to slide off the shaft (38), along with "O" ring (109).
15. Remove snap ring (108) from the shaft (38).
16. Check the bearings. If they feel rough when turning by hand, replace the bearings. Remove bearings (36 & 117) from the shaft (38) using a hydraulic press.
17. If your pump is supplied with a shaft sleeve (24), the sleeve is locked in place with a roll pin (101) and an "O" ring (104) to prevent leakage under the shaft. To remove shaft sleeve, push the roll pin into the shaft (shaft has a drilled through hole) and pull the sleeve

from the shaft along with the "O" ring. Push the roll pin out of the shaft. Pump with slotted shaft sleeve, pull the sleeve along with "O" Ring from the shaft. If roll pin is damaged, pull Roll pin out of shaft. Replace shaft sleeve, "O" Ring and Roll pin if necessary.

Check "O" ring and shaft sleeve. If damaged, replace as necessary.

When reinstalling the sleeve onto the shaft, make sure that the roll pin is installed flush or max. .005" under the sleeve O.D.

Follow the above procedure in reverse to reassemble

the pump.

**Note:** (1) Make sure all gaskets, "O" rings, and sealing surfaces of the check valve are in good condition before reassembly. Replace as is necessary.

(2) Make a heavy bead of "**GASKET ELIMINATOR**" **loctite #518** or equivalent all around the outer edge, inner edge and around the mounting holes on the wear plate (89) before reinstalling wear plate onto the pump casing (1) for sealing.

## OPERATING INSTRUCTIONS

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### IMPELLER NUT INSTALLATION TORQUE:

Use following impeller nut (4) torque value during installation:

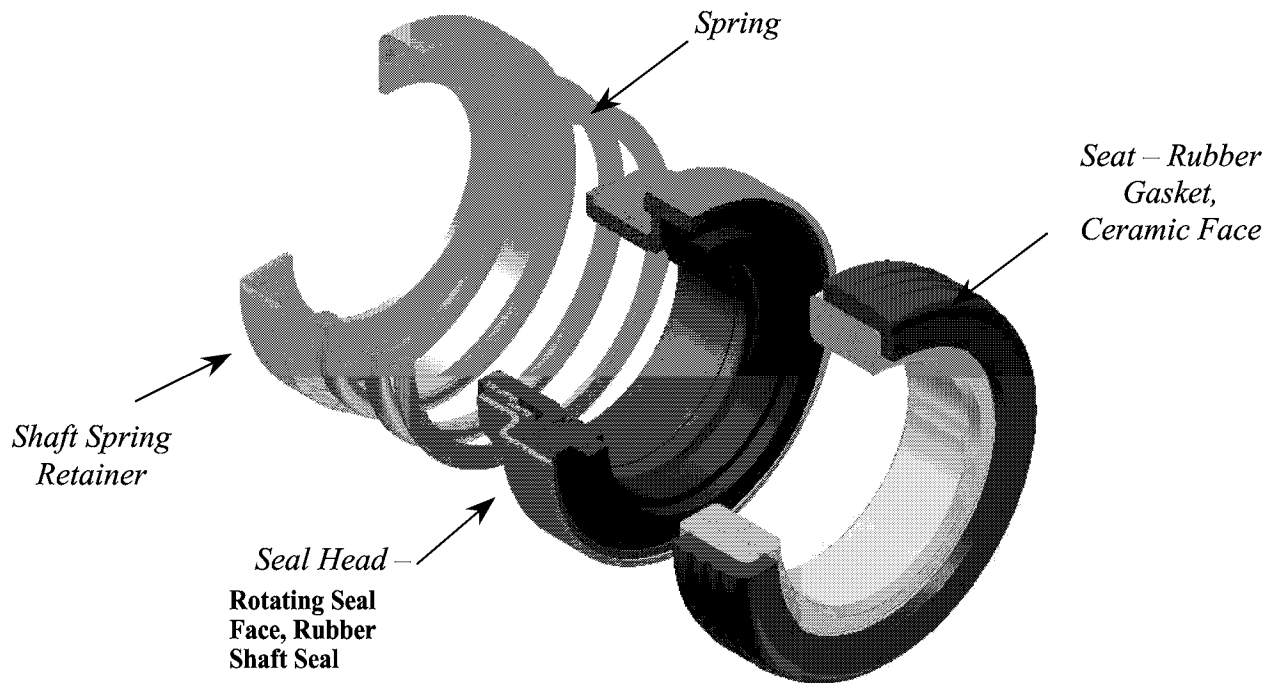
Pump Model	Nut Size	Torque Value
3DTH	1"-14 Esna Nut (Short)	125-150 ft. lbs
4DTH	1"-14 Esna Nut (Short)	125-150 ft. lbs
6ETH26	1"-14 Esna Nut (Short)	125-150 ft. lbs
8GTH8	1"-14 Esna Nut (Short)	125-150 ft. lbs
10GTH9	1"-14 Esna Nut (Short)	125-150 ft. lbs
6ETH28	1 1/4"-12 Esna Nut	150-175 ft. lbs
8GTH14	1 1/4"-12 Esna Nut	150-175 ft. lbs

**NOTE:** Before installing impeller (91) onto the shaft (38), apply coat of loctite grade 242 into the impeller bore to help prevent corrosion.

### WINTER STORAGE

1. Wash off exterior of pump.
2. Flush suction line, discharge line, pump casing, and impeller of all solids by pumping clear liquid for a short time.
3. Drain pump casing, suction line & discharge line.
4. If complete draining is impossible, add small amount of antifreeze into the pump casing. Rotate shaft for mixing.
5. Drain the old oil from bearing housing cavity and seal cavity and refill both cavities with proper grade of oil. (Refer to lubrication section).
6. Seal off suction and discharge ports.
7. Store the units in clean & dry area if possible.
8. Motor windings should be protected from excessive moisture. Follow motor manufacturer's instructions.
9. Spray interior of pump casing with commercially available anti-rust and anti-corrosion petroleum aerosol.
10. Once a month rotate the pump shaft during the storage period to avoid freeze up and to lubricate the bearings.

# Mechanical Shaft Seal Replacement Instructions



**NOTE: Protect precision lapped faces of the seal seat and seal ring from DAMAGE, DIRT, and FINGER MARKS.**

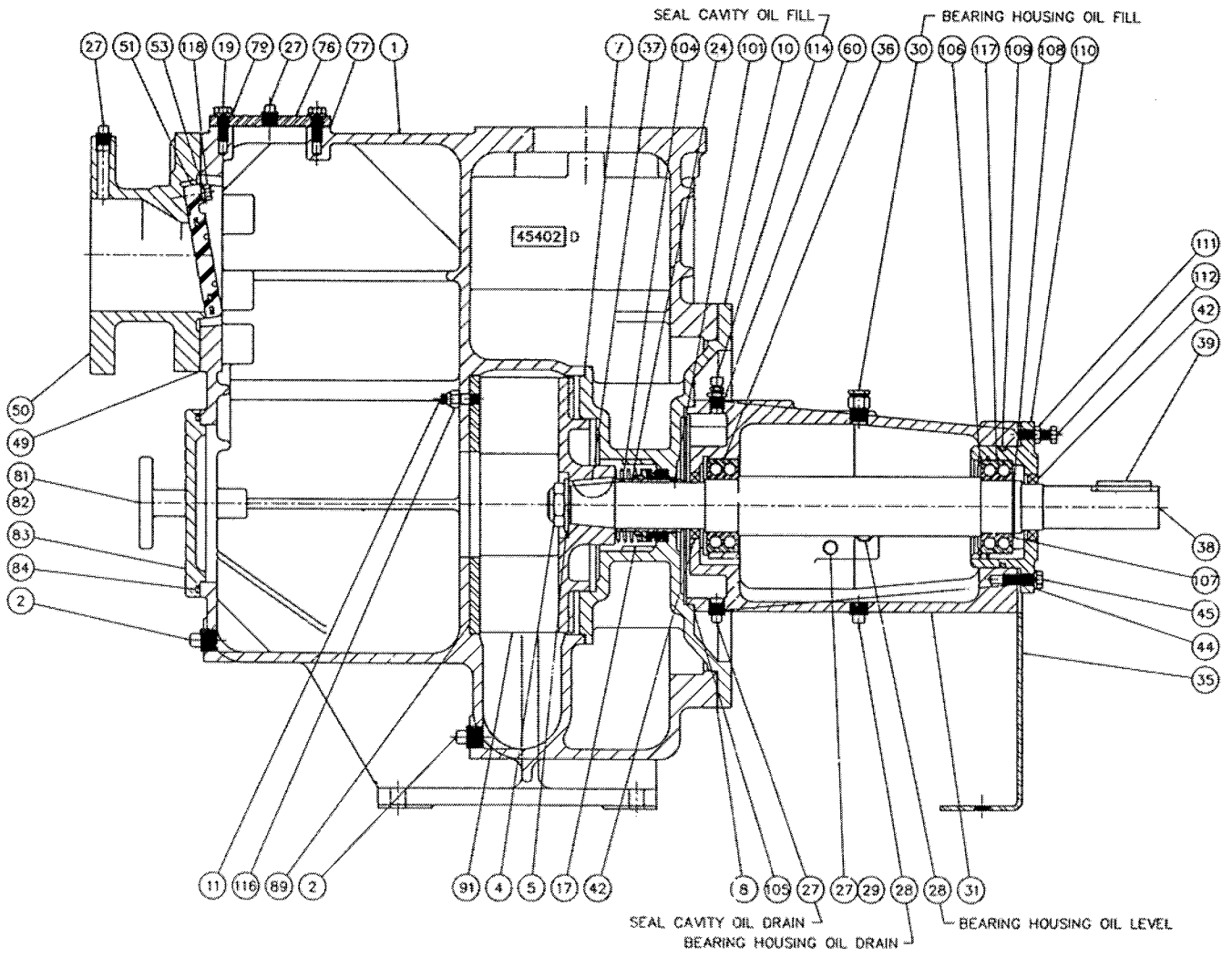
1. Disassemble pump housing to expose seal: NOTE HOW THE OLD SEAL IS ASSEMBLED, THIS ASSISTS TO CONFIRM REPLACEMENT SEAL IS INSTALLED IN IDENTICAL MANNER.
2. Carefully remove old seal head and seat, taking care not to scratch shaft or seal counter bore.
3. Clean shaft and counter bore surfaces using fine emery cloth or equivalent. Remove rust, burrs, and wipe clean. Avoid making flat spots or reducing shaft diameter.
4. Assemble the pump back pullout including the impeller, but less the mechanical seal rotating seal face, shaft spring and retainer
5. Install the pump back pullout into the pump casing and adjust the impeller to the correct clearance on the wear plate, typically .020"-.030".
6. Remove the pump back pullout from the casing
7. Measure and record the gap between the bearing housing (31) and the bearing carrier (110).
8. Remove the impeller from the shaft
9. If bearing housing adjustment was required to remove the impeller from the shaft taper, readjust the gap between the bearing housing (31) and the bearing carrier (110) to the dimension measured in step #7.
10. Lubricate the shaft, rubber inner diameter (ID) of the rotating seal head and rubber seat outer diameter (OD) of the stationary seal seat with a water-based lubricant. Seal faces should not be lubricated. **NOTE: NEVER use grease or heavy oil as an installation lubricant. Any oil or grease on the seal faces may cause the seal to leak.**
11. Press seal stationary seat firmly into the pump counter bore ensuring it is bottomed out and square to the shaft. This can be hand pressed or driven into place taking care to protect the sealing face from direct blow with any metal object. Use a piece of plastic between the face and any driving force.
12. Check both seal surfaces to assure they are free of any foreign matter. Slide the rotating seal head by hand pressure along shaft to a completely parallel contact with the stationary seat. Avoid extreme installation pressure or hammering of seal. Insure rubber boot that grips the shaft has been pressed down as far as it will go. This will insure full wear allowance will be available. Make sure spring correctly engages shoulder of seal head and impeller shoulder or shaft spring retainer.
13. Re-assemble impeller and pump housing, confirming measurement taken in step #7.
14. **DO NOT RUN PUMP DRY. ALWAYS PRIME PUMP BEFORE STARTING. IN CASE OF SELF-PRIMING MODELS THE PUMP CASING MUST BE FILLED.**

# OPERATING INSTRUCTIONS

<b>TROUBLE GUIDE</b>		<b>Note:</b> Should pump be handling a harmful liquid, make sure necessary safety precautions are undertaken before implementing any recommended action in the accompanying Trouble Guide. The following are some common causes of problems that may arise:	
<b>SYMPTOMS</b>	<b>PROBABLE CAUSE</b>	<b>RECOMMENDED ACTION</b>	
1. Will not prime.	<ol style="list-style-type: none"> <li>1. No liquid in pump casing.</li> <li>2. Loose suction inlet (50) and/or suction check valve cover plate (76).</li> <li>3. Worn suction inlet gasket (49) and/or cover plate gasket (77).</li> <li>4. Loose suction chamber drain plug (2).</li> <li>5. Worn pump shaft seal assy. (17).</li> <li>6. Loose clean-out cover (83) and/or worn clean-out gasket (84).</li> <li>7. Air release line clogged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill pump casing with liquid being pumped.</li> <li>2. Tighten bolts (57).</li> <li>3. Replace with new gaskets.</li> <li>4. Tighten plug, use pipe dope or Teflon Tape.</li> <li>5. Install new seal.</li> <li>6. Replace with new gasket and tighten hand-knobs (81).</li> <li>7. Clean air release line.</li> </ol>	
2. Suddenly stops pumping.	Clogged suction line or suction strainer (if used).	Clean suction line & strainer.	
3. Stops pumping until motor is stopped and re-started.	Collapsing suction hose lining.	Replace suction line & strainer.	
4. Slowly stops pumping.	<ol style="list-style-type: none"> <li>1. Clogged impeller, volute, suction line or check valve.</li> <li>2. Loose clean-out cover (83).</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean-out debris from impeller eye area, suction check valve. (Follow instructions on other pages)</li> <li>2. Clean sealing surface &amp; "O" ring gasket and tighten hand knobs.</li> </ol>	
5. Excessive leakage (oil + liquid being pumped) thru seal cavity vented hole.	Worn pump shaft seal (17).	Replace seal (follow instructions on other page).	
6. Will not hold prime.	<ol style="list-style-type: none"> <li>1. Dislodged or worn check valve (51).</li> <li>2. Loose cleanout cover (83).</li> <li>3. Loose check valve cover plate (76).</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean or replace check valve - clean sealing surface.</li> <li>2. Check gasket (84), replace if necessary. Tighten cover plate.</li> <li>3. Check gasket (77). Replace if necessary. Tighten cover plate screws.</li> </ol>	
7. Poor Performance.	<ol style="list-style-type: none"> <li>1. Worn impeller, seal or wear plate (89).</li> <li>2. Motor not up to speed:               <ol style="list-style-type: none"> <li>a) low voltage</li> <li>b) worn bearings</li> </ol> </li> <li>3. Excessive clearance between impeller and wear plate.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install new impeller, seal or wear plate.</li> <li>2. a) Larger lead wires req'd. b) Replace or rebuild</li> <li>3. Adjust to .020" to .030" clearance. (Follow instructions on other pages.)</li> </ol>	

<p>8. Noisy Operation.</p>	<ol style="list-style-type: none"><li>1. Worn motor bearings.</li><li>2. Low discharge head.</li><li>3. Impeller clogged.</li> <li>4. Worn coupling or misalignment.</li><li>5. Units operating at extreme left or right end of performance curve (capacity too high or too low).</li></ol>	<ol style="list-style-type: none"><li>1. Replace.</li><li>2. Throttle discharge.</li><li>3. Remove clean-out cover and clean impeller.</li><li>4. Replace or realign coupling.</li><li>5. Adjust for best performance point of operation.</li></ol>
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# TRASH HOG II TYPE EL LONG COUPLED



## PUMP PARTS LIST FOR SECTION DRAWING

KEY	DESCRIPTION	KEY	DESCRIPTION	KEY	DESCRIPTION
1	Casing	37	Key, Impeller	91	Impeller, Open
2	Pipe Plug	38	Shaft	100	Elbow
4	Locknut, Impeller	39	Key, Coupling	101	Pin, Roll
5	Washer, Curved	42	Retainer	104	Gasket Molded
7	Gasket, Diecut/Molded	44	Lock washer	105	Gasket, Diecut
8	Gasket, Diecut	45	Capscrew	106	Ring, Retaining
10	Cover, Stuffing Box	49	Gasket, Diecut	107	Shim, Bearing
11	Stud	50	Inlet, Suction	108	Ring, Retaining
17	Seal, Single Mech.	51	Valve, Check	109	Gasket, Molded
24	Sleeve, Shaft	60	Bushing	110	Carrier, Bearing
27	Pipe Plug	76	Cover, Check Valve	111	Hexnut, Jam
28	Pipe Plug	77	Gasket, Diecut	112	Capscrew
29	Oiler (Optional)	81	Handknob	114	Vent, Filler
30	Vent, Filter	82	Stud	115	Gasket, Wearplate
31	Housing, Bearing	83	Cover, Clean Out	116	Locknut
35	Foot, Mounting	84	Gasket, Molded	117	Bearing
36	Bearing	89	Plate, Wear	118	Screw, Shoulder

## PUMP SPARE PARTS LIST

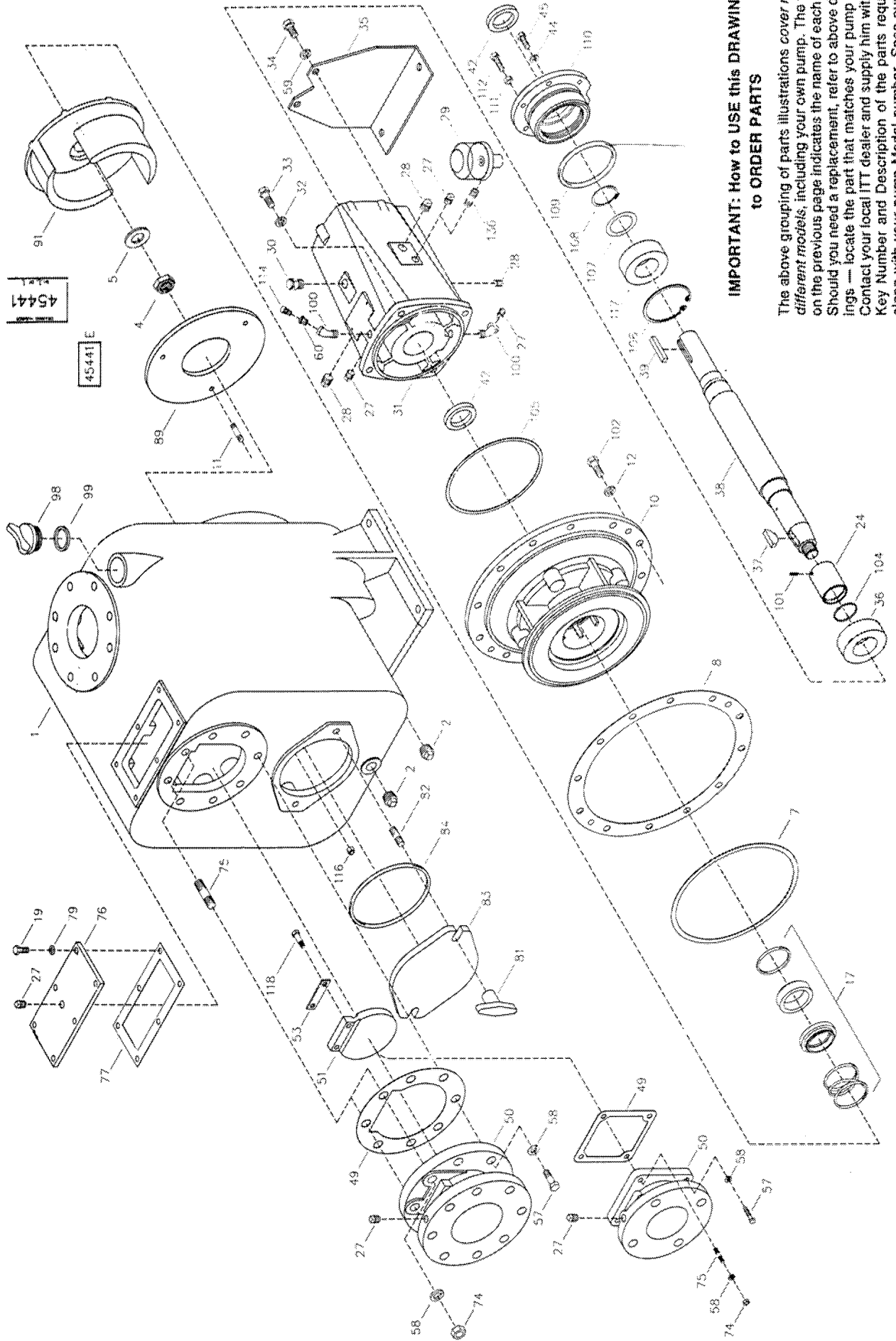
KEY	DESCRIPTION	KEY	DESCRIPTION
1	Casing	58	Lockwasher
2	Pipe Plug	59	Lockwasher
* 4	Locknut, Impeller	60	Bushing
* 5	Washer, Curved	74	Hexnut
* 7	Gasket, Diecut/Molded	75	Stud
* 8	Gasket, Diecut	76	Cover, Check Valve
10	Cover, Stuffing Box	* 77	Gasket, Diecut
11	Stud	79	Lockwasher
12	Lockwasher	81	Handknob
▪*17	Seal, Single Mech.	82	Stud
19	Capscrew	83	Cover, Clean Out
* 24	Sleeve, Shaft	* 84	Gasket, Molded
27	Pipe Plug	▪ 89	Plate, Wear
28	Pipe Plug	* 91	Impeller, Open
29	Oiler (Optional)	98	Plug, Wing
30	Vent, Filter	* 99	Gasket, Molded
31	Housing, Bearing	100	Elbow
32	Lockwasher	*101	Pin, Roll
33	Capscrew	102	Capscrew
34	Capscrew	*104	Gasket, Molded
35	Foot, Mounting	*105	Gasket, Diecut
* 36	Bearing	106	Ring, Retaining
* 37	Key, Impeller	107	Shim, Bearing
38	Shaft	108	Ring, Retaining
39	Key, Coupling	*109	Gasket, Molded
42	Retainer	110	Carrier, Bearing
44	Lockwasher	111	Hexnut, Jam
45	Capscrew	112	Capscrew
* 49	Gasket, Diecut	114	Vent, Filler
50	Inlet, Suction	116	Locknut
▪*51	Valve, Check	*117	Bearing
57	Capscrew	118	Screw, Shoulder

\* Recommended Spare Parts

▪ Recommended Distributor Stock, Export Spares, and critical service.



# TRASH HOG II TYPE EL LONG COUPLED



## IMPORTANT: How to USE this DRAWING to ORDER PARTS

The above grouping of parts illustrations cover many different models, including your own pump. The table on the previous page indicates the name of each part. Should you need a replacement, refer to above drawings — locate the part that matches your pump part. Contact your local ITT dealer and supply him with the Key Number and Description of the parts required, along with your pump Model number, Spec number and Serial number, which are located on the pump nameplate.







**ITT**

Form ITRASHHOGII 5-08

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