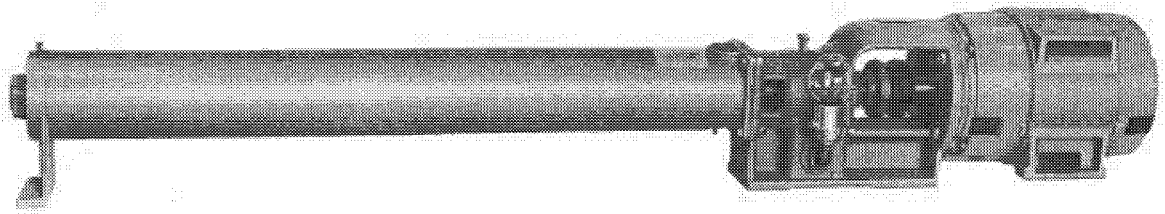


# GOULDS PUMPS

## Installation, Operation and Maintenance Instructions

MODEL 3333



ITT

## 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.

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"> <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		Receiving:

4 General precautions

		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.
WARNING		Alignment: 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.
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		Piping: 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.
WARNING		Flanged Connections: Use only fasteners of the proper size and material.
WARNING		Replace all corroded fasteners.
WARNING		Ensure all fasteners are properly tightened and there are no missing fasteners.
WARNING		Startup and Operation: When installing in a potentially explosive environment, please ensure that the motor is properly certified.
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.
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.

4 General precautions

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WARNING		<p>Noise:</p> <p>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.</p>
WARNING		<p>Temperature:</p> <p>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.</p>
WARNING		<p>This product contains Carbon Black a chemical known to the State of California to cause cancer. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a></p>



## 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:



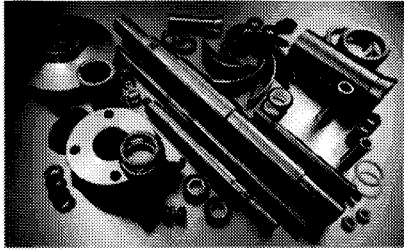
The CE and the Ex designate the ATEX compliance. The code directly below these symbols reads as follows:

- 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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# INTRODUCTION

This instruction manual is intended to assist those involved with the installation, operation, and maintenance of Goulds Model 3333 Multi-stage pumps.

It is recommended that this manual be thoroughly reviewed prior to installing or performing any work on the pump or motor.

## SECTION I—GENERAL

### A. Importance of Instructions

The design, material, and workmanship incorporated into the construction of Goulds Pumps make them capable of giving long, trouble-free service. The life and satisfactory service of any mechanical unit, however, is enhanced and extended by correct application, proper installation, periodic inspection, and careful maintenance. This instruction manual was prepared to assist the operator in understanding the construction and correct methods of installing, operating, and maintaining these pumps.

Study thoroughly the Section I, II, III, and carefully follow the instructions for installation and operation. Sections IV, V, VII, and VIII are answers to trouble and maintenance questions. Keep this instruction manual handy for reference. Further information can be obtained by contacting your local branch office of the Engineered Products Division; Goulds Pumps, Inc.; Seneca Falls, New York.

### B. Special Warnings

Goulds Pumps, Inc. will not be liable for any damages or delays caused by failure to comply with the provisions of this instruction manual. This pump is not to be operated at speeds, working pressures, discharge pressures or temperatures

higher than, or used with liquids other than, stated in the original order acknowledgement without written permission of Goulds Pumps, Inc.

### C. Receiving Inspection—Shortages

Care should be taken when unloading pumps. If shipment is not delivered in good order and in accordance with the Bill-of-Lading, note the damage or shortage on both receipt and freight bill. **MAKE ANY CLAIMS TO THE TRANSPORTATION COMPANY PROMPTLY!** Instruction sheets on various components, as well as the Instruction Book for the pump, are included in the shipment. **DO NOT DISCARD!**

### D. Preservation and Storage

Goulds' normal domestic storage preparation is suitable for protecting the pump during shipment in covered trucks. It also provides protection during covered storage at the job site and for a short period between installation and startup.

### E. Handling Techniques

Care should be used in moving pumps. Where required by size of units, slings should be put under both pump and motor.

## SECTION II—INSTALLATION

### A. Location

Pumping unit should be placed as close as practical to the source of supply. Floor space and head room allotted to the unit must be sufficient for inspection and maintenance. Be sure to allow for crane or hoist service.

### B. Installation

Model 3333 pumps are multi-stage pumps, close coupled to the driving motor. The pump should be supported only at the bearing frame and pump foot. The unit should be bolted to a substantial, rigid base to prevent distortion of the pump.

Pumps should not be hoisted in the air for mounting purposes with the motor bolted to the frame. Motors should be mounted after the pump is securely installed on its permanent base.

On high temperature service, a gap should be left between the pump foot and end of the casing or shoulder of the discharge head to allow for ther-

mal expansion. The pump foot bolt (371U) should not be tightened down until pump has reached operating temperature. **THE DISCHARGE HEAD SHOULD NEVER BE LOOSENED OR TIGHTENED TO MAKE UP PIPING.**

On pumps with flanged suction and discharge connections, the pump foot fits over the casing.

Oil lubricated pumps must be installed in the horizontal position. Grease lubricated pumps may be installed in the vertical position, but should have the motor above the pump. The Model 3333 should never run dry. If there is any possibility that the pump's source of liquid might fail, a protective device should be incorporated into the system to shut the pump down.

### C. Piping

The pump should not run with a closed discharge for more than a few minutes such as during start-

up or shut-down. Sufficient heat may be generated to vaporize the liquid and allow the pump to run dry and fail. The suction pipe should never be of smaller diameter than the pump suction. Use of suction pipe one or two sizes larger than the pump suction, with a reducer at the pump suction, is desirable. **THE PUMP SHOULD NEVER BE THROTTLED ON THE SUCTION SIDE.** Quick closing valves should be avoided in the discharge line to protect the pump from damage due to surging and water hammer.

For operation at low flow, or to insure liquid will always be flowing through the pump, a bypass line should be installed. The bypass line should be returned to the liquid source and injected below minimum liquid level to prevent air entrainment.

If a bypass line is not used, it is recommended that precautions be taken to insure that the pump will not run dry, run at closed discharge, or handle pumpage of excessive temperature at pump suction. Devices which can protect the pump from the above problems are flow switches or high temperature switches. When handling liquids at elevated

temperature, it is suggested that expansion loops or joints be installed in the suction and discharge so that expansion of the piping will not impose excessive strain on the pump.

Additional information on piping can be found in "Hydraulic Institute Standards".

#### D. Alignment Procedures

Pumps which have NEMA C flange motors directly mounted to the bearing frame do not require pump and motor shaft alignment. Jog the motor to be sure rotation is correct before connecting coupling. Rotation is counter-clockwise when viewed from the coupling end.

#### E. Mechanical Seals

The pump is equipped with a mechanical seal. Damage can result if mechanical seals are run dry or in abrasives. For special seals, follow the instructions on the seal drawing supplied with the order for recirculation, flush and/or cooling flows required.

## SECTION III—OPERATION

### START UP CHECKLIST

#### A. Lubrication

**C Frame**—C frame pumps have no bearings in frame.

**J Frame**—J frame pumps have greased-for-life ball bearings. No additional lubrication is required.

**S Frame**—S frame pumps have ball bearings which are greased at the factory. Bearings should be regreased every 2000-3000 hours (3-4 months).

To regrease bearings:

1. Remove plug on top of bearing frame. Screw in Alemite grease fitting included in the box of fittings shipped with the pump.
2. Add grease while turning shaft by hand until old grease is forced out of grease relief fitting at bottom of bearing cap and fresh grease appears.
3. Remove grease fitting and reinstall plug.

#### M, L, AND X Frames

M, L, and X frames have flood oil lubricated bearings. **THE BEARINGS ARE NOT LUBRICATED AT THE FACTORY.** A constant level oiler, #5 TRICO, is packed with the pump.

1. Before installing the oiler on the bearing frame, check the oiler adjustment. The setting dimension  $\frac{3}{16}$ " (14.3 mm) is illustrated in Figure 1.
2. Remove the small plastic plug from the large pipe plug on the left side of the frame as viewed from the motor end of the pump.
3. The nipple-elbow assembly is assembled finger tight at the factory. Before installing it on the pump, the threaded connections should be made up with pipe sealant.

**NOTE:** The oiler may be installed on the right side of the pump (viewed from motor end) by moving the 2"-11½ NPT plug with ½"-18 NPT tapped hole to right side and assembling as above.

4. Install the nipple-elbow assembly so the long nipple (¼ NPT x 1.75 (44 mm) long) extends horizontally from the frame to the 90 degree elbow and the short nipple vertically from the elbow to the BOTTOM connection of the oiler. Refer to Figure 1.

5. Fill bearing reservoir using oiler bottle. Several fillings will be required. Never fill the frame through the frame breather located at the top of the frame or through the oiler without use of the bottle. This can result in overfilling and high oil temperature.

6. After starting pump, remove the breather. Oil viewed through the breather hole should be a mist. If oil is thrown out of the breather hole, or an oil mist is not visible, recheck all dimensions shown on Figure 1.

#### B. Alignment

As described in Section II—D, alignment is normally built in and need not be checked.

#### C. Mechanical Seal

Refer to Section II—E. If auxiliary piping for cooling and/or flushing from an outside source is being used, establish these flows.

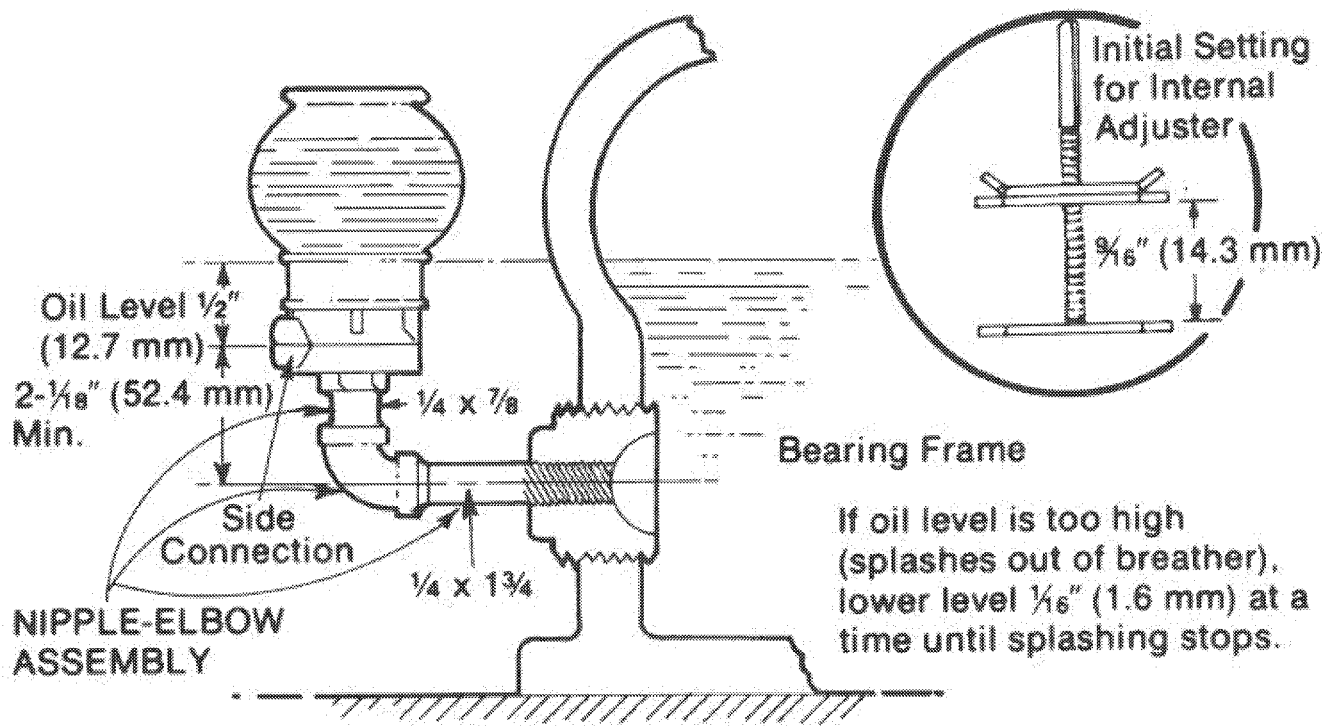


FIGURE 1

#### D. Priming

Pump and suction pipe must be full of liquid before pump is started. Usually, suction supply will be primed when shutoff valves to pump are opened. If suction supply is below pump, priming by other means such as foot valve or ejector will be required.

#### E. Check for Free Turning

Before pump is started, rotate shaft by hand to be sure it is free. If pump cannot be turned by hand, or binding and rubbing are noticed, correct before starting.

#### F. Start-Up Procedures

##### 1. Valves

Be sure suction valve is fully open. Normally, discharge valve should be at least partially closed so that flow will be controlled.

##### 2. Rotation Check

With motor uncoupled from frame, jog motor to check for proper rotation. Rotation should be counter-clockwise when viewed from coupling end. Recouple when satisfied.

#### OPERATIONAL CHECKS

Inspect pump carefully and frequently during the

first few hours of operation. Mechanical seal may weep slightly but should "run in" in a few hours. Be sure all auxiliary lines (cooling, flushing, sealing, etc.) are functioning properly. Check pump bearings for excessive heating. Check motor for excessive heating. Check complete unit for excessive vibration or unusual noise. Do not run pump at greatly reduced flow, because all the motor horsepower will go into heating the liquid in the pump, and damage may result. *Do not run pump beyond maximum recommended flow since up-thrust may cause damage to the bearings.*

#### Maximum Recommended Flow

Size	60 HZ Speed	50 HZ Speed
CB5	11 GPM (2.5 M <sup>3</sup> /hr)	9 GPM (2.1 M <sup>3</sup> /hr)
CB10	14 GPM (3.2 M <sup>3</sup> /hr)	11 GPM (2.5 M <sup>3</sup> /hr)
CB25	40 GPM (9.1 M <sup>3</sup> /hr)	33 GPM (7.5 M <sup>3</sup> /hr)
CB45	60 GPM (13.6 M <sup>3</sup> /hr)	50 GPM (11.3 M <sup>3</sup> /hr)

#### SHUTDOWN PROCEDURES

If pump is installed with a check valve, it can be shut down without closing any valves. When no check valve is used, the discharge valve must be closed after the pump is stopped to prevent back-flow through the pump. If the pump is to be serviced, be sure suction valves are closed, auxiliary cooling and flushing flows are shut off and motor is locked out before working on pump.

## SECTION IV—PREVENTATIVE AND CORRECTIVE MAINTENANCE

#### A. Lubrication

Refer to Section III-A for lubrication procedures for pump. Follow motor and coupling manufac-

turer's lubrication instructions.

## B. Mechanical Seal

The seal requires no attention other than to make sure that circulating lines, where installed, do not become clogged.

## C. Vibration

It is good practice to periodically monitor vibration of the pump. Normally, vibration level will be well

below accepted standards. Of equal importance is that the vibration level does not increase. If a problem with vibration is encountered, refer to Trouble Shooting, Section VII.

## D. Performance

If performance deteriorates, refer to Trouble Shooting, Section VII.

# SECTION V—DISASSEMBLY AND REASSEMBLY

## A. Disassembly of Pump

1. Lock out power source.
  2. Shut off valves controlling flow to and from pump. Disconnect piping.
  3. Drain pump through plug (408A) in bottom of casing adapter, (108).
- NOTE: If pump has handled corrosive liquids, the motor end should be elevated to assure complete draining. Flushing is recommended.
4. If pump is oil lubricated, drain oil through oil drain plug on bottom of bearing frame (228A).
  5. C frame requires loosening of coupling set screws on motor shaft. Unbolt and remove motor from frame (228 or 228A).

NOTE: For pumps with other than insert-type couplings, see coupling manufacturer's instructions for removal.

6. Loosen set screw in coupling hub (233) and remove hub and key (400) from stub shaft (380). C frame coupling is removed directly from pump shaft.
7. Loosen bolt (317U) so that discharge head (152) can turn in pump foot (131). Do not remove pump foot at this time.
8. Slide a heavy bar or pipe through the frame being careful not to let the bar contact the stub shaft (380). Place a wrench on the discharge head. Unscrew the discharge head until casing (100) is loose. Threads are right hand. Do not completely unscrew casing. A strap wrench may be utilized to prevent the casing from turning.
9. Set pump in a vertical position, resting on the frame (228 or 228A). Remove discharge head (152) and pump foot (131). Unscrew and remove casing (100) from casing adapter (108). The casing must be removed vertically so that the pump shaft is not bent. The total overhead clearance required will be the total pump length, less motor, plus the length of the casing (100).
10. Remove the double shaft nuts from shaft (122). Remove sleeves (157). Mark all parts for reassembly.
11. Complete stages, consisting of bowl (258), impeller (101), and diffuser (150) (Figure 2) may now be slid off the shaft and disassembled for inspection and/or replacement. All intermediate bearings

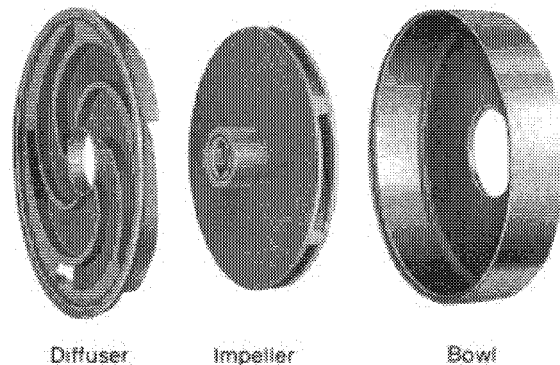


FIGURE 2

and shim washers should be inspected at this time. Mark each impeller, bowl, diffuser, intermediate bearing and shim washer to identify its position within the pump to aid in reassembly.

12. Loosen set screws on pump end of stub shaft. Remove pump shaft (122) from insert of stub shaft. Disregard this step for C frame.
13. Remove seal from shaft only if it is to be replaced. Use care to avoid damaging rubber bellows.
14. Unbolt and remove casing adapter (108).
15. Remove seal mount (158) from the casing adapter.
16. Remove stationary seat from seal mount only if replacement is necessary.
17. Unbolt and remove thrust bearing end cover (109) or (109A). On J frame thrust bearing cover is not used. Remove retaining ring (361E). The C frame makes use of the motor bearings and contains no additional bearings. (Disregard steps 18 through 21 only for C frame.)
18. Remove stub shaft assembly from bearing frame.
19. Remove thrust bearing locknut (136). (J frame does not have locknut).
20. Remove ball bearing (112 or 112A and 168A) using a suitable hammer to drive shaft through bearings. Protect bearings from contamination.
21. Remove wave washer (529) from bearing frame. (J frame does not have wave washer.)

## B. Inspection and Overhaul

1. **O-rings**—Inspect and replace if damaged.
2. **Shafts**—Check shaft for runout (.005" maximum at seal, .010" over entire length) to be sure it is not bent. Runout must be checked on rollers or V blocks using spacer sleeves (157) for bearings and dial indicator contact. Bearing seats, surfaces under oil seals, and surface under mechanical seal should be in good condition. Replace if faces are worn, scarred or cracked, or if elastomeric bellows are damaged.
3. **Intermediate and discharge head bearings**—Check for excessive wear in rubber bearings. Replace as necessary.
4. **Oil seal**—Replace as necessary.
5. **General**—All parts should be clean and free of burrs before assembly. This is especially important at O-ring grooves, threads, and bearing areas.

## C. Reassembly of Pump

Begin reassembly with the bearing frame.

1. Refer to instructions for the proper reassembly of individual bearing frames. See Section VI-A for identification of bearing frame.

### C frame—

No action required.

### J frame—

- a. Install ball bearing (112) on stub shaft (380) using a driving sleeve or bearing press. (Figure 3)
- b. Lightly oil the bearing housing bore and outer

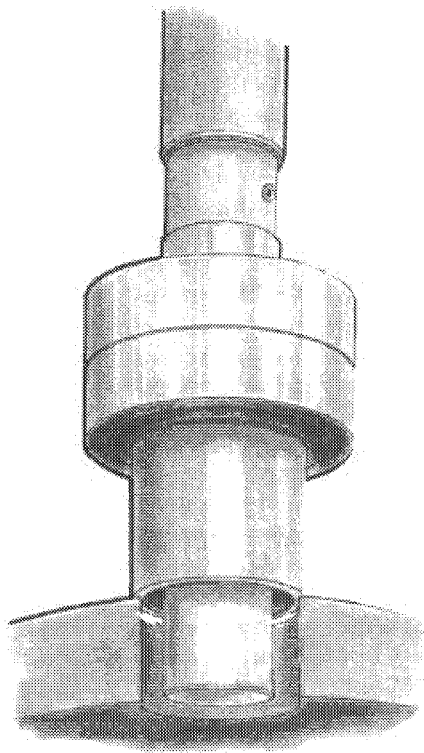


Fig. 3 Stub Shaft Assembly in Bearing Press.

race of the bearing. Install stub shaft assembly. This is a sliding fit when started properly; do not tap into place.

- c. Replace retaining ring (361E) in bearing frame with tapered side of ring away from bearing.
- d. Replace coupling hub (233) and key (400).

### S frame—

- a. Clean the frame (228) and bearing end cover (109) and install the grease seal (333) with the lip out.
- b. The S frame uses angular contact (duplex) bearings mounted in the face-to-face configuration (thin edges of bearing outer race together). Install the bearings (112) on the stub shaft (380) so the thick outer race of the first bearing goes on first and thick outer race of the second bearing goes on last. Install the bearings using a driving sleeve or a bearing press. Drive inner race of bearing only. (Figure 4)
- c. Thread the bearing locknut (136) on stub shaft (380) and tighten firmly.
- d. Place wave washer (529) in the bottom of the bearing frame (228).
- e. After lightly oiling the bearing housing bore and bearing outer races, install the stub shaft assembly. This is a sliding fit; do not tap in place.
- f. Install the bearing end cover (109) and gasket (360) and tighten bearing cap bolts (370N) evenly. The bearing cap should be installed with the grease relief fitting (113) at the bottom.

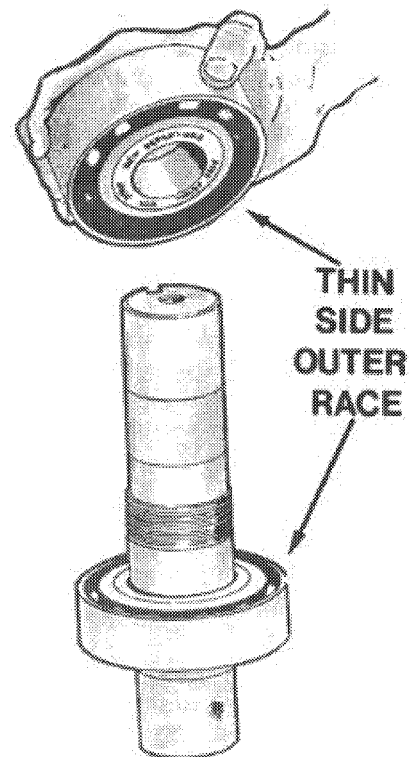


Fig. 4 S Frame Stub Shaft showing sequence of mounting bearings.



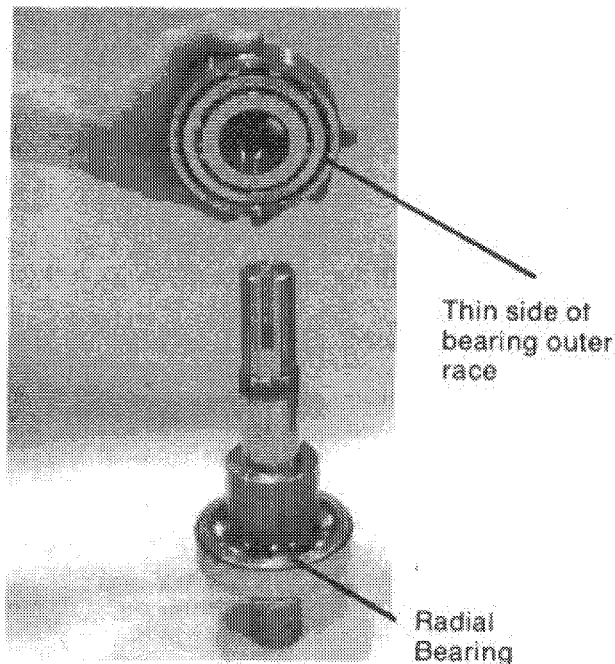


Fig. 5a

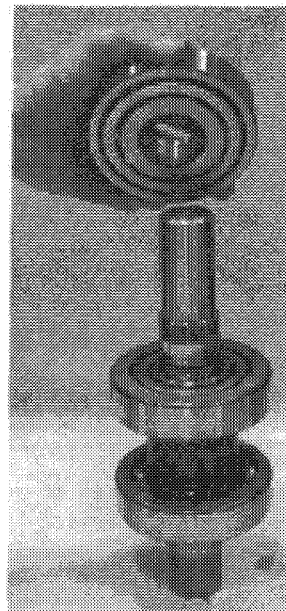


Fig. 5b

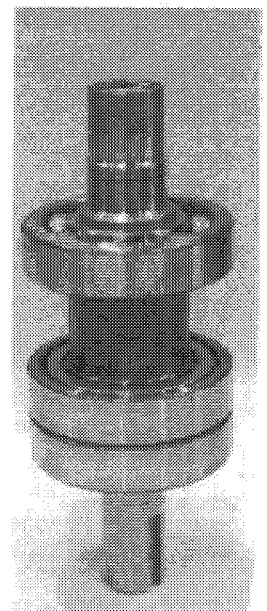


Fig. 6  
Frame Stub  
Shaft with Tandem  
Thrust Bearings.

Fig. 5 L Frame Stub Shaft showing sequence of mounting Tandem thrust bearings.

g. Refer to lubrication instructions in Section III-A to lubricate the bearings.

h. Replace coupling hub (233) and key (400).

**M, L, and X frames—**

a. Clean the frame (228A) and bearing end cover (109) and install the oil seals (332A, 333D) with the lips in.

b. The M, L, and X frames use a single deep groove radial bearing and either one (M frame) or two (L, X frames) angular contact thrust bearings. The radial bearing (168A) has both outer race edges the same thickness. It is installed first on the stub shaft (380) (farthest from the motor). A bearing spacer (443) is then installed on the stub shaft (380). The single thrust bearing (112A) (M frame), or first of two thrust bearings (112A) (L or X frames), should then be mounted. These should be installed so the thin edges of the outer race points toward the radial bearing (168A) (toward the liquid end on the pump). For the L and X frames the second thrust bearing (112A) is installed in the same direction. Drive inner race of bearing only. (Figures 5 and 6).

c. Thread the bearing locknut (136) on the stub shaft (380) and tighten firmly.

d. Place wave washer (529) in bottom of bearing frame (228A).

e. After lightly oiling the bearing frame bore and bearing outer races, install the stub shaft assembly. This is a sliding fit; do not tap in place.

f. Install the bearing end cover (109A) and gasket (360) and tighten the bearing cap bolts (370N) evenly. Insure that the mark "TOP" in the bearing cap is UP.

g. Replace pump coupling hub (233) and key (400).

2. Install O-ring on stationary seat of mechanical seal (383B). Lubricate O-ring and press stationary seat into seal mount.

3. Install O-ring (412L) in its fit in seal mount (158), reinstall the seal mount (158) into its fit in the frame (228) (228A).

4. Slide rotary unit of mechanical seal (383A) over end of pump shaft (122) and against the shoulder on seal shaft sleeve. Use care to avoid damaging rubber bellows. O-ring lubricant may facilitate sliding of the rotary unit.

5. **M, L, and X frames—**With bearing frame (228) (228A) in vertical position, bolt casing adaptor (108) to bearing frame. Do not damage seal mount O-ring (412L). Install O-ring (412K).

**C frame—**C frames require mounting the motor in the vertical position, attaching the spacer coupling (334), tightening the two pump shaft set screws and then affixing the frame (228) to the motor. If it is not practical to utilize the motor, the following steps must be taken:

a. Support frame (228) in vertical position with seal mount (158) and stationary seal ring installed. Hold spacer coupling (334) in place and lower shaft (122) through seal mount and into fit in spacer coupling. With shaft (122) bottomed against spacer coupling (334), tighten the set screws in pump end of spacer coupling.

b. Locate machined groove in spacer coupling (334) 2" below the bottom of the seal mount (158). This position must be held during the pump assembly. Blocks can be placed under spacer coupling (334) for support.

- c. Bolt casing adaptor (108) to frame (228). Do not damage seal mount O-ring (412L). Install O-ring (412K).
6. Lower pump shaft (122) into fit in stub shaft (380). Be sure shaft is bottomed on stub shaft (380). Dimple the set screw seating surface with a hand drill if shaft is not already dimpled. Tighten the two set screws in pump end of stub shaft (380).
7. Install suction sleeve (157D) and one spacer sleeve (157) on shaft.
8. **CB5 and CB10 Stack Procedure:**
  - a. Install the first stage bowl (258), impeller (101) and diffuser (150) assembly. Lay a straight edge across the top of the diffuser and flush with a flat of the shaft. Using the hex shims provided, shim the 1st stage impeller up until its hub is even with the top of the bowl  $\pm .005"$ . Install  $.040"$  shim over shaft and then the second stage bowl, impeller and diffuser assembly. Continue adding bowls, impellers and diffusers with  $.040"$  shim in front of each impeller except as noted in Step 8b. Intermediate bearings are required on CB5-23 through CB5-62 and CB10-27 through CB10-62 (see Table 2).
  - b. Add intermediate bearings (260) and intermediate bearing shaft sleeves (157B) per schedule in Table 2. After each intermediate bearing shaft sleeve (157B) impeller shimming is to be  $.020"$  rather than  $.040"$ .
  - c. Continue assembly with Step 10, Page 8.  
SEE CAUTION AT END OF ASSEMBLY PROCEDURE.

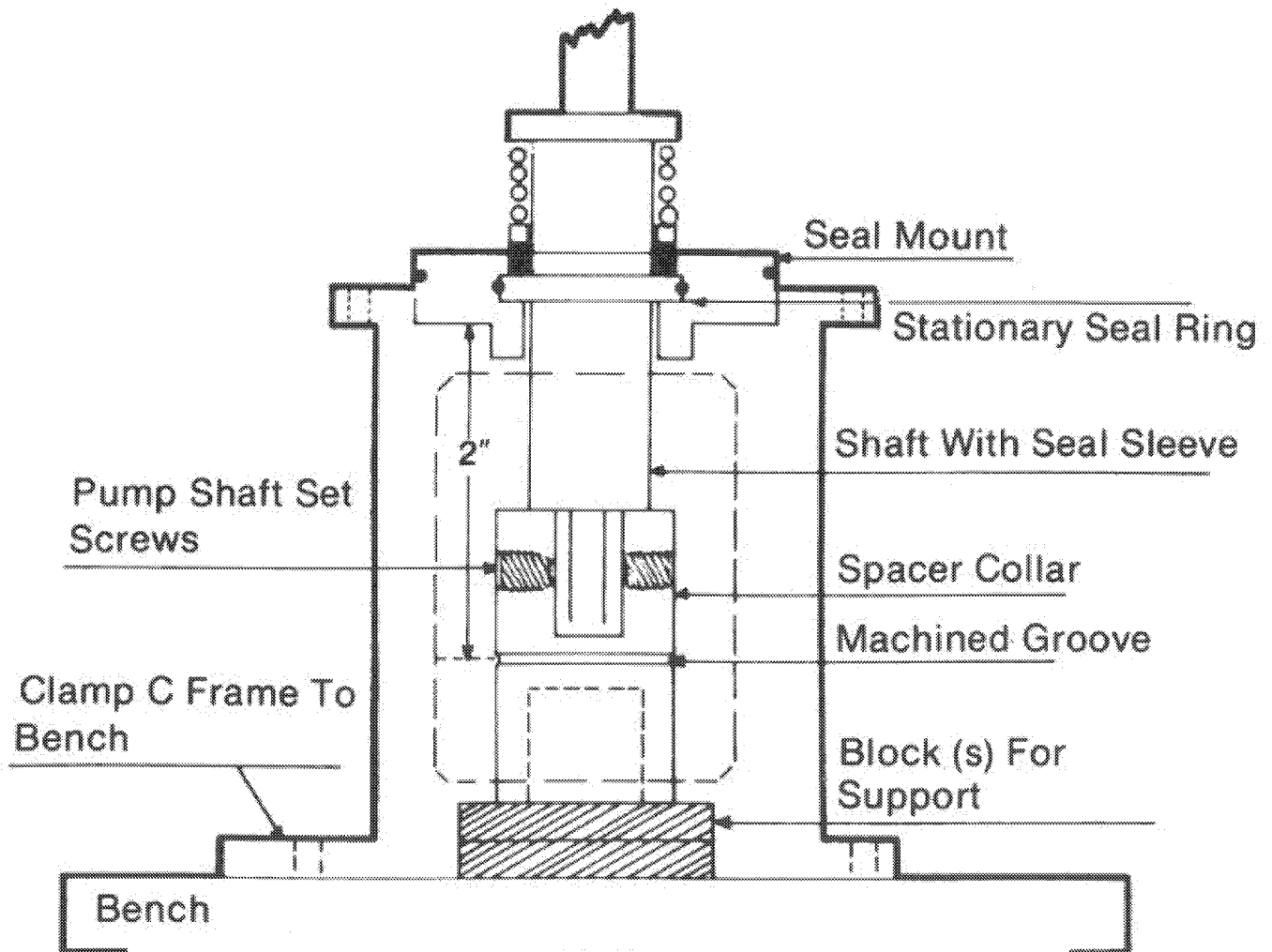


FIGURE 7

**TABLE 1**

Pump Size	*Section	"X" Dimension
CB5 & CB10	1st Section	.000" ± .005"
	2nd Section	.020" ± .005"
	3rd Section	.030" ± .005"
	4th Section	.030" ± .005"
CB25 & CB45	1st Section	.055" ± .005"
	2nd Section	.065" ± .005"

\*One section is between intermediate bearings.  
See Table 2.

**TABLE 2**

Size	Stage	Bearing	Stage	Bearing	Stage	Bearing	Stage	Size	Stage	Bearing	Stage		
CB5-8	8							CB25-4	4			(1 Bearing every 8 Stages)	
CB5-11	11							CB25-6	6				
CB5-14	14							CB25-8	8				
CB5-18	18							CB25-12	8	1	4		
CB5-23	18	1	5					CB25-16	8	1	8		
CB5-27	18	1	9					CB45-4	4			(1 Bearing every 10 Stages)	
CB5-32	18	1	14					CB45-6	6				
CB5-35	18	1	17					CB45-10	10				
CB5-41	18	1	18	1	5			CB45-13	10	1	3		
CB5-45	18	1	18	1	9			CB45-16	10	1	6		
CB5-50	18	1	18	1	14			CB45-19	10	1	9		
CB5-54	18	1	18	1	18		1						
CB5-62	18	1	18	1	18		8						
CB10-8	8												
CB10-11	11												
CB10-14	14												
CB10-18	18												
CB10-27	18	1	9										
CB10-35	18	1	17										
CB10-36	18	1	18										
CB10-45	18	1	18	1	9								
CB10-54	18	1	18	1	18								
CB10-62	18	1	18	1	18		8						

**9. CB 25 and CB45 Stacking Procedure:**

- a. Install bowl (258) and first impeller (101). The impeller hub must seat against shaft sleeve (157). Lay a straight edge across the top of bowl (258) and flush with a flat of the shaft. Use slight pressure to seat bowl (258) while measuring "X" dimension shown in Figure 8. Use .010" shims, if required, under the impeller to acquire the proper "X" dimension stated in Table 1. **DO NOT INSTALL DIFFUSER (150).**
- b. Install next bowl (258) and impeller (101). Acquire proper "X" dimension, as done in (a). Continue adding bowls (258) and impellers (101) in this manner.
- c. Install intermediate bearing (260) with sleeves (157) as indicated in Table 2. Smaller pumps do not have any intermediate bearings.
- d. Remove all bowl (258) and impeller (101) assemblies, *in sequence*. Keep track of the location of each shim. Install diffuser (150) into each bowl (258) and impeller (101) assembly. Restack bowl, impeller and diffuser assembly in previously established sequence and placing shims in proper positions.

10. Install spacer sleeves (157) after last impeller (101).

11. Thread on first of two shaft nuts, tighten sufficiently to compress impeller stack so that the pump shaft will turn with bowls (258), when the bowls (258) are turned by hand. Install 2nd shaft nut. Tighten securely against the first nut.

12. Install O-ring on the discharge head.

13. Slide casing (100) over assembly and screw onto casing adapter (108). O-rings should be lubricated to aid in assembly.

14. Screw discharge head into casing and tighten hand tight.

15. Replace pump foot (131). Tighten cap screw (371U) finger-tight. Tighten after start-up when pump has reached operating temperature.

16. Lay pump in horizontal position. Place a heavy bar or pipe through the bearing frame to hold frame. Do not allow bar to contact stub shaft. **THE DISCHARGE HEAD MUST BE TIGHTENED TO THE FOLLOWING MINIMUM TORQUE VALUES:**

175 FT. LBS. This should compress the bowls (258) and eliminate all impeller contact. **OPERATION OF THE PUMP WITHOUT PROPER TORQUE ON DISCHARGE HEAD (152) CAN RESULT IN DAMAGE TO THE PUMP.**

17. Hand turn pump at motor coupling. If any rubbing is felt, disassemble and locate affected stage(s).

a. For CB5 and CB10:

1) Remove diffusers (150), impellers (101) and bowls (258) until rub is located. Measure "X" dimension shown in Figure 8. Add or remove shims as necessary to obtain "X" dimension shown in Table 1. Apply pressure to diffuser (150) and impeller hub to assure proper seating. Continue reassembly checking and re-shimming as necessary to obtain "X" dimension as shown in Table 1 for each impeller (101).

2) Continue with Step 10 on Page 8.

b. For CB25 and CB45:

Remove diffuser (150), impeller (101) and bowl (258) and recheck each "X" dimension, as done in Step 9.

18. Bolt motor to frame (118 and 228A).

**CAUTION:** When placing motor shaft in spacer coupling fit of "C" frame size pumps, the 2" dimension between the machined groove in the spacer collar and the seal mount must be maintained.

19. Pump is now ready for reinstallation. Follow applicable installation, and lubrication procedures.

20. Follow start-up procedures.

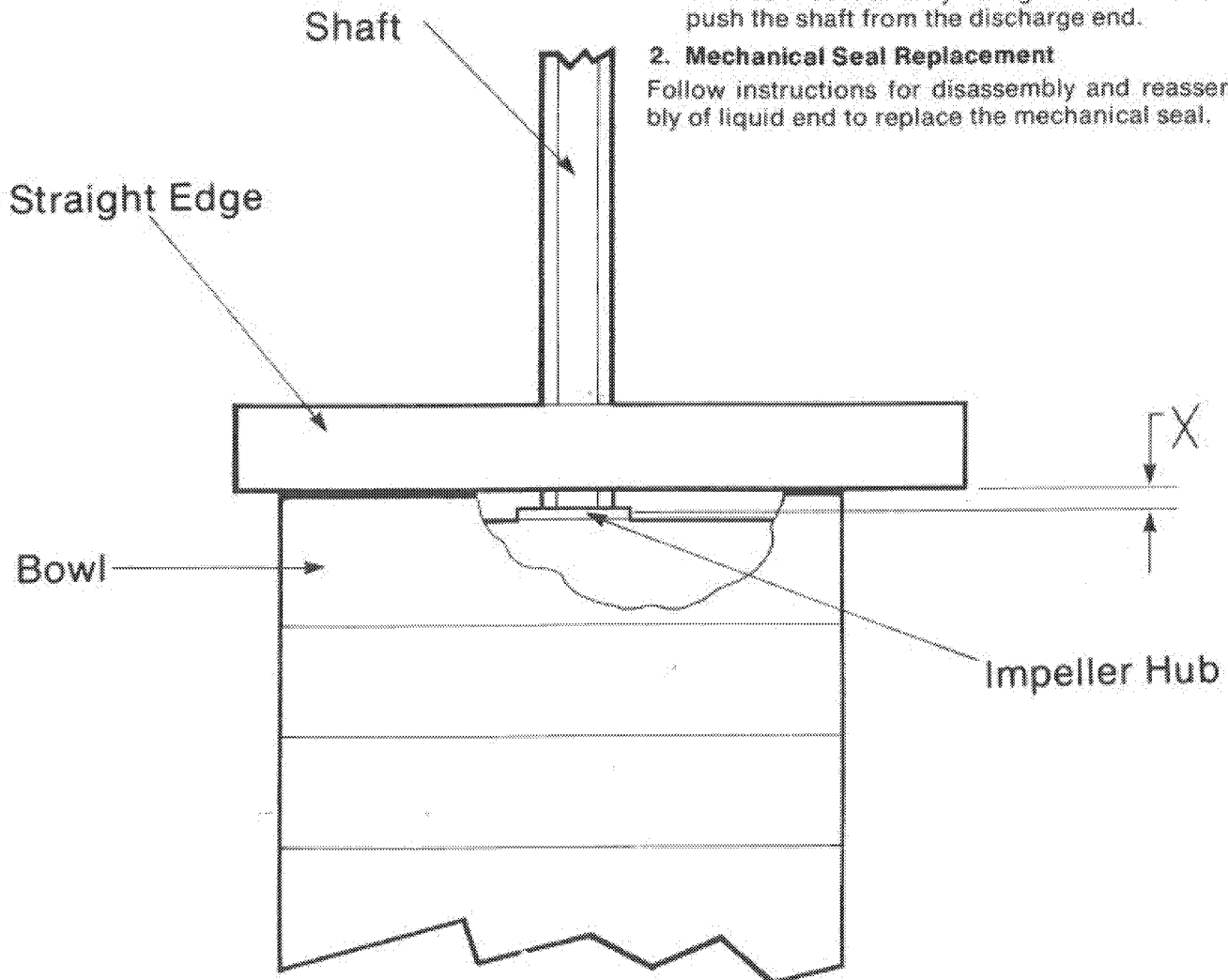
## D. Bearing and Seal Replacement

### 1. Bearing Replacement

- Follow appropriate instructions for removal of motor.
- The bearings can be changed by removing the bearing frame from the liquid end. This can be done by removing the stub shaft set screws and then removing the casing adapter—frame bolts.
- Follow instructions for the appropriate bearing frame for removal and replacement of bearing.
- When reassembling liquid end and frame, be certain that the pump shaft is seated securely in the stub shaft and the set screws are tight. This can be done by using a screwdriver to push the shaft from the discharge end.

### 2. Mechanical Seal Replacement

Follow instructions for disassembly and reassembly of liquid end to replace the mechanical seal.



**FIGURE 8**  
(for "x" dimensions)

## SECTION VI — DISCRPTION

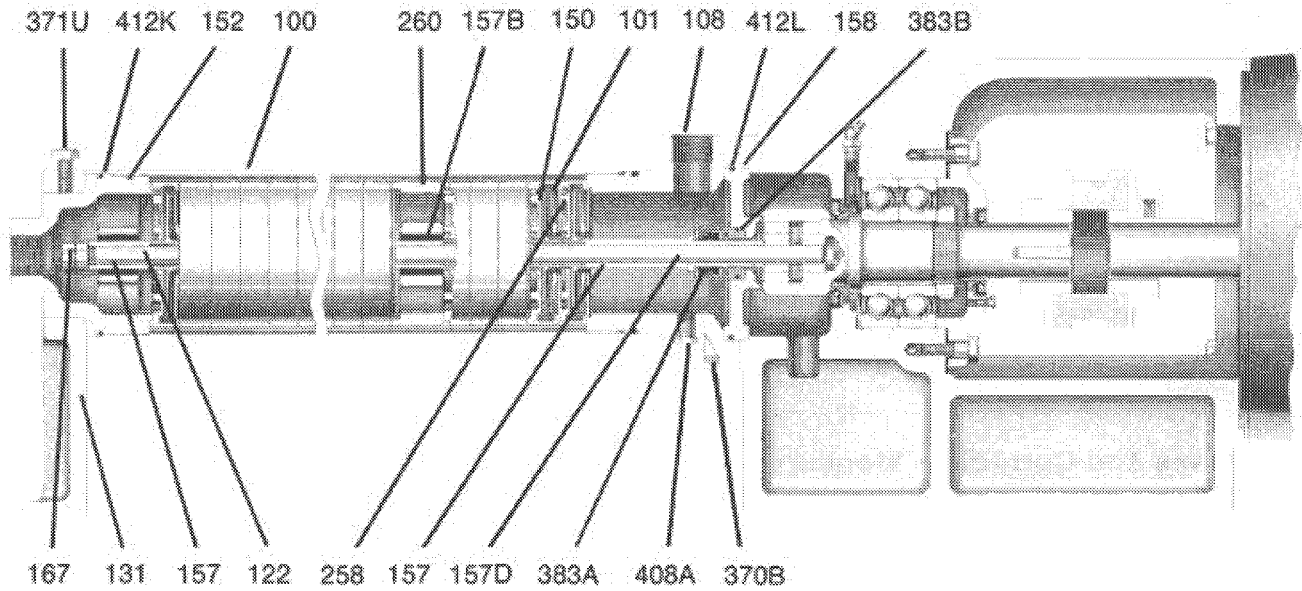
### A. Parts List and Materials of Construction

Power End									
Item No.	Part Name	Material	Grease Lubrication				Oil Lubrication		
			C*	J	S	M	L	X	
109	Bearing End Cover	Cast Iron		---	S	---	L	X	
109A	Bearing End Cover	Cast Iron		---	---	M	L	X	
109C	Bearing End Cover Radial	Cast Iron		---	---	---	---	---	
112	Ball Bearing, Thrust	Steel		308S2Z	7308PDF	---	---	---	
112A	Ball Bearing, Thrust	Steel		---	---	7408DT	7408DT	7408DT	
113	Grease Relief Fitting	Steel/Cad Plate		---	S	---	---	---	
113A	Breather	Steel/Zinc Plate		---	---	M	L	X	
123	Deflector (Not Shown)	Lam. Plastic		---	---	---	---	---	
131	Pump Foot	Cast Iron	C	J	S	M	L	X	
136	Bearing Lock Nut	Steel		---	S	M	L	X	
188A	Ball Bearing Coupling End	Steel		---	---	408S	408S	408S	
193	Grease Fitting	Steel/Zinc Plate		---	S	---	---	---	
228	Frame—Grease Lube	Cast Iron	C*	J	S	---	---	---	
228A	Frame—Oil Lube	Cast Iron		---	---	M	L	X	
232	Coupling Hub—Motor	Die Metal		J	S	M	L	X	
233	Coupling Hub—Pump	Die Metal		J	S	M	L	X	
236	Coupling Sleeve	Rubber**		J	S	M	L	X	
251	Sight Oiler	White Metal/Glass		---	---	M	L	X	
332	Grease Seal—Bearing Cover	Buna-N		---	S	---	---	---	
332A	Oil Seal—Bearing Cover	Buna-N		---	---	M	L	X	
333	Grease Seal—Frame	Buna-N		---	S	---	---	---	
333D	Oil Seal—Frame	Buna-N		---	---	M	L	X	
334	Spacer Coupling	Steel	C	---	---	---	---	---	
360	Gasket End Cover	Vellumoid		---	S	M	L	X	
361E	Retaining Ring—Bearing	Steel		J	---	---	---	---	
370N	H Cap Screw—End Cover	Steel		---	S	M	L	X	
371	H Cap Screw—Frame to Motor	Steel	C	J	S	M	L	X	
371U	H Cap Screw—Pump Foot Retaining	Steel		J	S	M	L	X	
380	Stub Shaft	Steel		J	S	M	L	X	
382	Bearing Lock Washer	Steel		---	---	---	---	---	
400	Coupling Key	Steel		J	S	M	L	X	
443	Bearing Spacer	Steel		---	---	M	L	X	
529	Wave Washer	Steel		---	S	M	L	X	

\* C Frame uses motor bearings.

Liquid End			
Item No.	Part Name	Standard Construction	Stainless Construction
100	Casing	Carbon Steel	316 SS
101	Impeller with 316 SS Insert	Noryl	Noryl
106	Casing Adapter	Ductile Iron	316 SS
122	Shaft	316 SS	316 SS
150	G-Fluser	Noryl	Noryl
152	Discharge Head	Ductile Iron/Buna Insert	316 SS
157	Spacer Sleeve	316 SS	316 SS
157B	Intermediate Bearing Shaft Sleeve	316 SS	316 SS
157D	Spacer Sleeve (Suction)	316 SS	316 SS
158	Stationary Seal Mount	316 SS	316 SS
187	Shaft Nut	316 SS	316 SS
258	Bowl	316 SS	316 SS
260	Intermediate Bearing	316 SS/Buna Insert	316 SS/Buna Insert
331	Shim (Not Shown)	316 SS	316 SS
370B	H Cap Screw—Casing to Adapter	Steel	Steel
381A	Rotary Element	316 SS- Buna	316 SS- Buna
383B	Stationary Seal	Ceramic & Buna	Ceramic & Buna
408A	Pipe Plug—Drain	316 SS	316 SS
412K	O-ring Casing	Buna	Buna
412L	G-ring Stationary Seal Mount	Buna	Buna

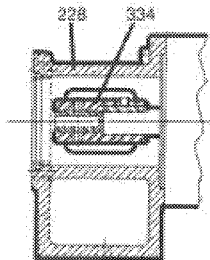
## B. Sectional View



## C. Bearing Frames

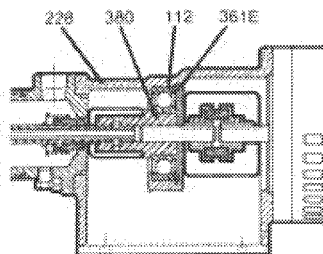
### C Frame

An adapter rather than a frame. For smaller CB5 series pumps, the thrust load is carried by the motor bearings. NEMA motors through 2 HP TEFC can be mounted on this frame.



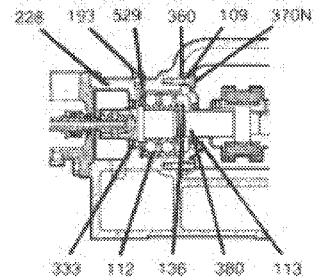
### J Frame

A greased-for-life medium duty Contract bearing carries thrust loads developed by the low pressure BP20 series pumps. The maximum HP motor able to be mounted on the J frame is the NEMA 3 HP ODP.



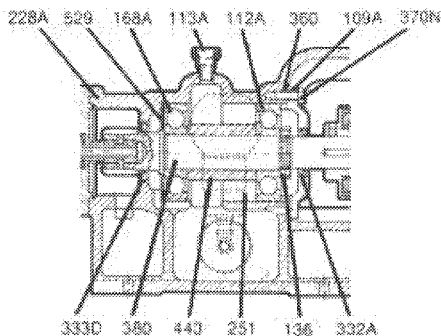
### S Frame

Two angular contact bearings mounted face-to-face carry low to medium duty thrust loads in this regreaseable bearing frame. NEMA motors from 3 HP TEFC to 25 HP ODP can be mounted on this bearing frame.



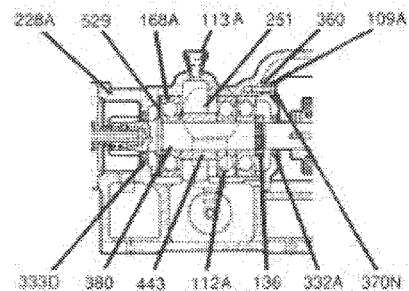
### M Frame

A single angular contact bearing carries medium to heavy thrust loads and provides oil lubrication for pumps requiring NEMA motors from 3 HP TEFC to 25 HP ODP.



### L & X Frames

The oil lubricated L frame provides high thrust capability as encountered in high discharge pressure applications with tandem mounting of angular contact bearings. The L frame takes the same motor sizes as the S and M frames. On the X frame, an angular contact, tandem bearing arrangement identical to the L frame carries high thrust loads and extends NEMA motor capability from 25 HP TEFC to 40 HP ODP.



## SECTION VII—TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSES & CORRECTION
A. No liquid delivered, not enough liquid delivered, or not enough pressure.	1,2,3,4,5,6,7,8,9,10,11,12,13,14,17,22,23.
B. Pump works a while, then quits.	4,5,7,8,9,11,12,22,23.
C. Pump takes too much power.	15,18,19.
D. Pump is noisy or vibrates.	15,16,20,21,23,24.
E. Pump leaks excessively at seal HSG.	8
F. High bearing temperatures.	23,24,25.

### A. Causes and Corrective Measures

1. Pump not primed or properly vented—check that casing and suction pipe are completely filled with liquid.
2. Speed to low—check whether motor wiring is correct and receives full voltage or turbine receives full steam pressure.
3. System discharge head too high—check system head (particularly friction losses).
4. Suction lift too high—check NPSH available (suction piping too small or long may cause excessive friction losses). Check with vacuum or compound gauge.
5. Pump or piping obstructed—check rotation.
6. Wrong direction of rotation.
7. Air pocket or leak in suction line—Check suction piping for air pockets and/or air leaks.
8. Incorrect or damaged seal allowing leakage of air into pump casing or liquid leakage out—inspect seal or replace as required.

9. Not enough suction head for hot or volatile liquids—increase suction head, consult factory.
10. Foot valve too small—install correct size foot valve.
11. Foot valve or suction pipe not immersed deep enough—consult factory for proper depth. Use baffle to eliminate vortices.
12. Entrained air or gases in liquid—consult factory.
13. Impeller clearance too great—check for proper clearance.
14. Impeller damaged—inspect and replace as required.
15. Rotating parts bind—check internal wearing parts for clearances.
16. Coupling or pump and driver misaligned—check alignment and realign if required.
17. Improper pressure gauge location—check correct position and discharge nozzle or pipe.
18. Head lower than rating: Pumps too much liquid—consult factory. Install throttle valve.
19. Liquid heavier than anticipated—check specific gravity and viscosity.
20. Cavitation—increase NPSH available. Consult factory.
21. Improper bearing lubrication or bearings worn out—inspect and replace as required.
22. Internal recirculation due to damaged diffusers or diffuser O-rings—Replace damaged diffusers and O-rings.
23. Diffusers spinning due to insufficient torque on discharge head—Replace damaged diffusers and reassemble with proper torque on discharge head.
24. Pump not properly secured to base or piping not properly supported—provide for secure bolting to base, proper base structure and support of pipes.
25. Incorrect bearing frame oil level (high or low) or lack of grease—follow lubrication instructions.

## SECTION VIII—SPARE PARTS

### A. Ordering Spare Parts

To insure against possible long and costly "downtime" periods, especially on critical services, it is advisable to have spare parts on hand. The most desirable parts to have on hand are the following:

1. Ball bearings. Replacement angular contact thrust bearings must have races properly ground for the appropriate mounting configuration. Angular contact bearings which are universal ground may be mounted in tandem, back to back, or face to face configuration. The mounting configuration (face to face for the S frame, and tandem for the L, X, and Y) should be specified when replacement bearings are ordered from local sources to assure proper grinding of outer races.
2. Oil seals.
3. Bearing locknut.
4. Bearing lock washer (Y frame only).
5. Mechanical seal.
6. Casing O-ring.
7. O-rings for seal seat, seal mount, casing and diffusers.

Also desirable, but more dependent on plant practice, is either of the following:

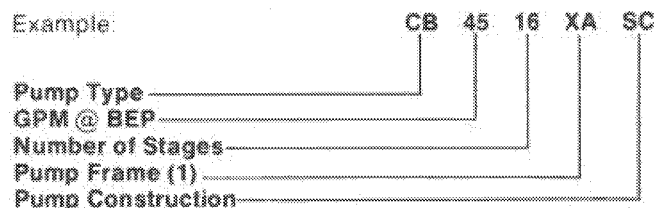
- a. Complete set of impellers and diffusers for the pump.
- b. Spare liquid end consisting of everything but the bearing frame.

### B. Instructions for Ordering Spare Parts

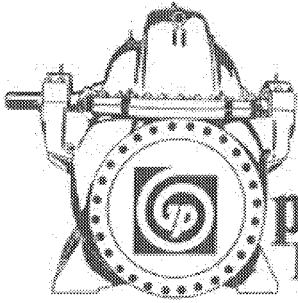
Repair orders will be handled with the minimum of problems if the following information is accurately supplied:

1. Nameplate Data
  - a. Pump serial number
  - b. Pump model number
  - c. Pump size
  - d. Pump construction
2. Order Data
  - a. Part name
  - b. Part number (item number) These names and numbers should agree with those on the Section View found in Section VI.
3. Explanation of pump nameplate designation.

Example:



- a. The first letter of this group (X) indicates the pump frame, the second letter indicates the coupling and stub shaft combination.



## product news

No. 139  
April 5, 1982

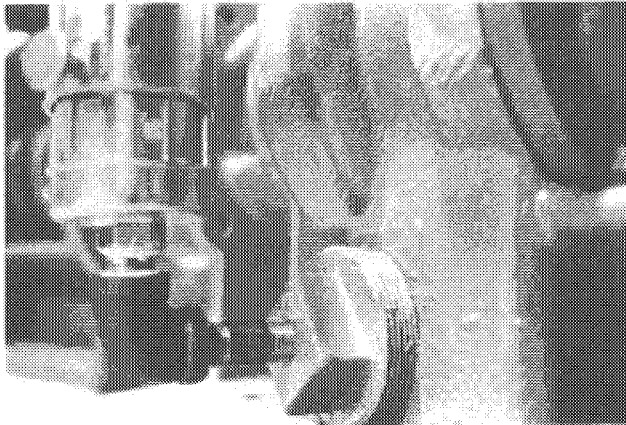
**SUBJECT:** Model 3333, 3335 & 3935

**MODIFICATION:** Relocation of Oiler on Model 3333-3335-3935 Oil Lube Frames

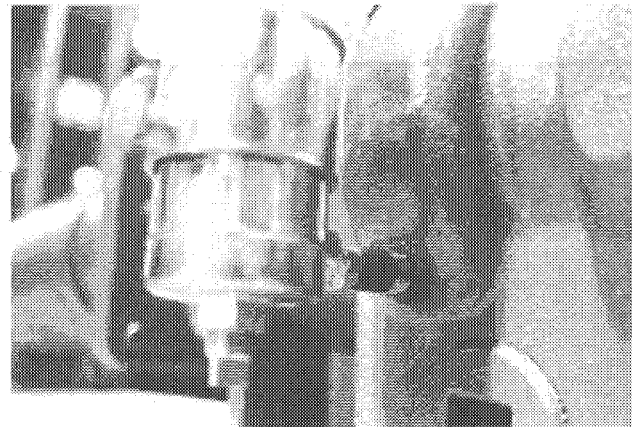
**HISTORY:** The oiler on Model 3333-3335-3935 oil lube frames was piped to the frame as shown below. Variation in the length of the vertical pipe nipple; variation in thread engagement between nipple, elbow and oiler; or use of an incorrect nipple could cause unpredictable changes in oil level.

**DESCRIPTION:** Additional tapped openings have been added to the frame. The oiler is piped to the frame using only one nipple, as shown below. Internal setting of the oiler is unchanged.

This is a running change effective immediately.



OLD DESIGN



NEW DESIGN



# A pump is only as good as its parts.

The Goulds pump featured in this instruction manual is made up of many different parts. All are engineered and precision manufactured to make the pump perform as intended. Therefore it's *most important* to make sure that you use only genuine Goulds replacement parts.

To assure that you can make no better choice than Goulds, we offer the best pump parts program in the industry. We call it "pump parts like never before" and very simply means unsurpassed *availability, service, quality and value.*



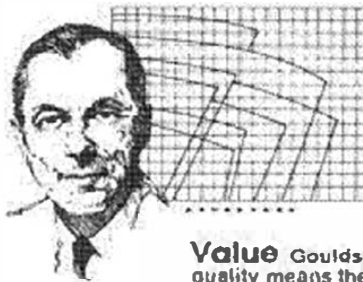
**Availability** A nationwide, computer-controlled distribution network backed by factory programs designed to get you the part you need — when you need it.



**Quality** Goulds is committed to providing the highest *original* quality and sometimes *better* if design or material improvements have been made.

**Service** Our Certified Original Parts specialists are dedicated to serving your parts needs by:

- Helping minimize parts inventories
- Delivering parts
- Providing maintenance consultation service



**Value** Goulds high standards of quality means the part will fit right and meet original standards of performance.

GOULD'S PUMPS  
**CP PARTS**  
THE REAL ONES



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