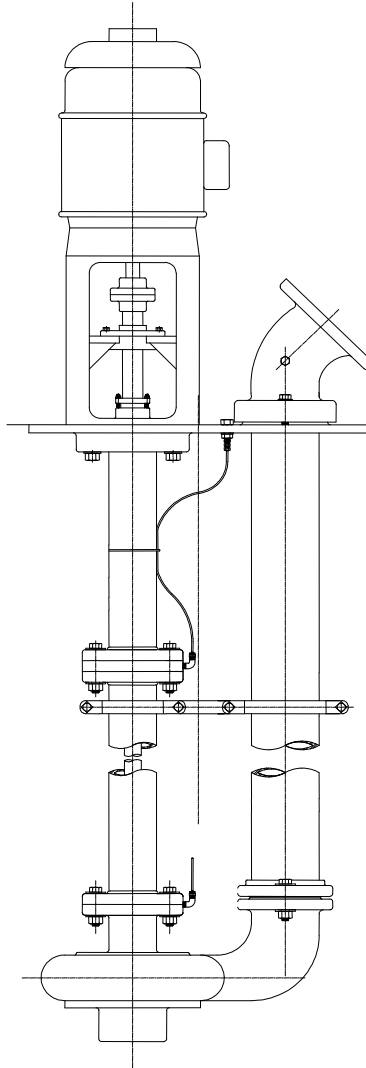


YEOMANS WET PIT PUMPS

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

SERIES 3000 SCREENED SUCTION AND
SERIES 8000 SCREENLESS SUSPENDED PUMPS



YEOMANS PUMP
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AURORA, IL 60598 USA

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**Note: This instruction 800-300 wet pit manual supersedes the following:
199,191,103-A & 104-A**

INSTRUCTIONS FOR THE INSTALLATION AND OPERATION OF YEOMANS SUBMERGED TYPE HEAVY DUTY PUMPS

INTRODUCTION

You have in your YEOMANS pump the best unit available for doing the work for which it is intended. This unit was tested at the factory and found to be in perfect condition both mechanically and electrically. It operated satisfactorily at rated capacity and head, with reasonable care it will give years of low cost efficient pumping.

These instructions cover the general points in erecting and setting YEOMANS Heavy Duty Submerged Pumps. This data furnishes the information needed to obtain the most efficient and trouble-free service from this pumping unit. Study these instructions carefully before putting the unit into service, as satisfactory service can only be realized by careful observance thereof. We have tried to cover all essential factors in the installation and operation of our Heavy Duty Submerged Pumps, but will be glad to give special instructions and advise for unusual situations.

LOCATION

In selecting a location for the pump, provide sufficient floor space for inspection and servicing and ample head room for installing and removing pump.

SETTING AND ALIGNMENT

Before setting pump, clean sump or basin and all incoming drainage lines of any material left after construction. Pump should be set so that basin cover plate fits squarely over opening in floor and is level and supported evenly at all points around its edge. Pump shaft must be plumb.

DISCHARGE PIPING

The discharge piping should be independently supported so as no strain will be transmitted to the pump. Provisions should also be made for expansion or contraction of the discharge pipe to avoid placing any strain on the pump. To decrease the loss of head due to friction it is advisable to increase the size of the discharge pipe at the pump connection and use as few bends as possible. A long radius elbow should be used wherever practical. A check valve and a gate valve should be installed near the pump outlet. The check valve will prevent back flow from the discharge line through the pump and back into the sump. The check valve should be installed between the gate valve and pump.

Most pumps are supplied with an elbow at the pump suspension plate connected to the pump discharge pipe. Do not remove this elbow from the pump when connecting the discharge pipe, removal of elbow may cause misalignment and damage the pump. Make provision so that no pipe strain can be transmitted to the pump by the discharge piping.

BELOW COVER DISCHARGE

To meet special job conditions we occasionally furnish a pump equipped with a tee in the discharge pipe below the cover. If your pump is so equipped, additional care is required in installing the pump and connecting the discharge piping. The location of the discharge connection increases the possibility of pump misalignment due pipe strain. A flexible connection must be used to eliminate pipe strain.

STUFFING BOXES AND PACKING

All YEOMANS Heavy Duty Submerged Pumps are provided with a stuffing box at the suspension plate.

The stuffing boxes are packed before shipment with packing suitable for the application. When it becomes necessary to repack the stuffing boxes, they should be carefully cleaned before new packing is placed in them. It is impossible to determine accurately how often the stuffing box will have to be repacked as this depends upon the severity of operation.

In replacing the packing, each packing ring should be cut to the proper length so that the ends just come together, but do not overlap. The rings of packing should not be compressed too tightly as this may result in burning the packing and cutting the shaft. The stuffing box is not properly adjusted if the friction in it prevents turning the shaft by hand.

All pumps for general service are shipped packed with the best grade of soft square non-asbestos packing impregnated with oil and graphite. This type of packing is successfully used on all usual pump applications including pumps for boiler feed service handling water up to 212 F and pumps used for circulating cold brine.

If the pump is not to be placed in service within two to four weeks after delivery, it is advisable to immediately remove the packing from the stuffing boxes. Continued exposure of these materials to the packing containing graphite will result in a pitted and rough shaft that will cause trouble when the pump is eventually started. This applies only to a pump not in operation, as an operating pump will not develop this condition. If the pump is shut down, as in seasonal operation, the packing should be removed as the same corrosive action will take place.

LUBRICATION

See lubrication instructions for proper lubrication.

DIRECTION OF ROTATION

Most pumps are right hand pumps and operate in a clockwise direction when observed from the motor end or top. In special cases, left hand pumps are furnished for operation in a counter-clockwise rotation. Although centrifugal pumps will handle some water when operated in reverse, it is important that they be operated correctly. Arrows on the motor support bracket or suspension plate indicate proper direction of rotation.

STARTING

Turn pump shaft by hand before turning on power to see that the pump shaft turns freely.

It is important to check the voltage of your incoming power lines with the motor characteristics on the motor nameplate to ascertain that both voltages are the same. Check your motor connections with the motor wiring diagram. Before making your final connections permanent, check the rotation of the motor.

ADJUSTMENT OF AUTOMATIC CONTROL

The float rod stops are secured to the float rod by means of set screws. The float travel may be varied simply by loosening the float rod stop set screws and moving the stops to the desired positions. It is recommended that the lower float rod stop be set to cut in the float switch before the water level reaches the height of the incoming drainage lines and also before the top of the float strikes the lower end of the float rod guide pipe. The upper float rod stop should be set to cut out the float switch before the water level in the sump recedes to a depth of not less than six (6) inches above the top of the pump casing.

It is important that a sufficient depth of liquid be maintained above the top of the casing as a low setting may cause a vortex, causing the pump to lose prime.

SLIDING FLOATS

Pumps equipped with sliding floats are for all practical purposes adjusted in the same manner as pumps with stationary floats. The float rod stops in these installations are located below the cover. The differential between the high and low water level will be the same as for the stationary float.

LOCATING TROUBLE

While investigating cause of trouble with centrifugal pumps bear in mind that every YEOMANS Centrifugal Pump has been inspected at the factory and was found to meet the guarantee and to be mechanically correct. Discounting the possibility of damage during shipment, most of the trouble in the field is due to faulty installation. If the following points are checked, it is likely the difficulty will be discovered and can be remedied.

1. NO LIQUID DELIVERED

- (a) Speed too low.
- (b) Discharge head too high.
- (c) Impeller or discharge pipe plugged.
- (d) Wrong direction of rotation.
- (e) Pump is air bound – avoid influent cascading down onto pump casing, which can carry entrance air into volute inlet / pump suction.

2. NOT ENOUGH PRESSURE OR LIQUID DELIVERED

- (a) Speed too low.
- (b) Discharge head higher than anticipated.
- (c) Impeller partially plugged.
- (d) Discharge pipe partially plugged.
- (e) Mechanical defects.

3. PUMP TAKES TOO MUCH POWER

- (a) Head lower than anticipated, pump pumps too much liquid.
- (b) Liquid heavier than water, check specific gravity.
- (c) Viscosity greater than anticipated.
- (d) Mechanical defects.
 - 1. Volute or suspension pipe distorted to excessive strains from discharge piping.
 - 2. Shaft bent.
 - 3. Rotation elements bind.
- (e) Wrong direction of rotation.

Check motor speed with a tachometer. If speed is slow, check the line voltage.

In cases where checking over the points outlined do not disclose the trouble and this trouble had developed before the pump has outlived the contract guarantee, YEOMANS CHICAGO CORPORATION will send out one of its engineers to make an investigation on the basis of a written agreement that if the trouble proves to be a defect in the pump, no charge will be made for the company's engineer, but if the trouble is due to faulty installation or conditions not in accordance with those for which the pump is guaranteed then the customer must pay for the engineer's service.

INSTRUCTIONS FOR ORDERING SPARE PARTS

When ordering repair parts, give the sales order number stamped on the nameplate located on the pump. Information on the motor nameplate is desirable but not necessary.

DISASSEMBLY INSTRUCTIONS
FOR YEOMANS
HEAVY DUTY BILGE PUMP & SCREEN LESS EJECTOR

IMPORTANT

Read instructions through carefully at least once before starting to dismantle pump.

Whenever attempting to repair or dismantle a pump, proper tools should be used. These should include a hammer, allen wrenches, screwdriver, set of standard wrenches, retaining ring pliers, several good blocks of hardwood and a piece of steel rod to drive out sleeve bearings.

As with any piece of machinery, cleanliness is of prime importance. It is imperative that no dirt or grit be allowed to get into the bearings or on the shaft.

Follow operations in order given below and refer to cross-section drawings for part number.

1. Remove motor, part #1, from motor support bracket, part #15.
2. Take off cap screws or nuts holding suspension plate, part #7, and lift pump out of sump.
3. PUMP WITH DISCHARGE ELBOW:
 - A. Remove cap screws, part #18, holding the discharge elbow, part #16, to the suspension plate, and lift elbow and rubber jam washer, part # 19, from discharge pipe.

PUMP WITH LOCKNUT CONSTRUCTION

- A. Remove locknut, part #70, from discharge pipe.

PUMP WITH TEE IN DISCHARGE

- A. Remove pipe cap, part #101, and locknut, part #70, from discharge pipe.

PUMP WITH STUDS OR CAP SCREWS ONLY

- A. Remove cap screws or studs, part #18. Remove bolts and nuts, part #21, holding discharge pipe, part #20, and flange, part #22, from pump.

4. Disconnect all lubrication lines or cross-connection pipes.
5. Remove pump half coupling, part #13, by loosening set screw and sliding it off shaft.
6. Unfasten and remove the suction screen, part #46, (if furnished) suction plate, part #23, or the volute part # 10.
7. To remove pump shaft, part #14, and impeller, part #40:
 - A. Bend prong of lockwasher, part #28, out of slot in locknut, part #27, and remove both parts.
 - B. Hold shaft securely and unscrew bearing collar, part #3.
 - C. Shaft and impeller may now be removed by pulling out through the bottom of the pump.
- 7a. Pumps for pits of 15'-0" or over or in special cases are built in two or more sections. These pumps are equipped with rigid couplings. To remove the lower section of shaft, part #14B, and the impeller, part #40:
 - A. Support the shaft, part # 14, by screwing an eyebolt or J-rod into the top of the shaft.
 - B. Bend prong of lockwasher, part #28, out of slot in locknut, part #27, and slide up on the shaft.
 - C. Support the lower section of the pump so it will not fall to the bottom of the pit.
 - D. Remove nuts, and bolts, part #24, from the guide bearing housing, part #9, then either lift the upper section of the pump or lower the bottom section of the pump about eight inches.
 - E. Hold the shaft t securely and unscrew the bearing collar, part #3.
 - F. Lower the shaft sufficiently to expose the rigid coupling, part #66 and #67.
 - G. Remove the cap screws, part #73, and the locknut, part #84; the rigid coupling halves can then be slipped off the shaft; and the shaft and the impeller can be removed from the pump.

Proceed with the disassembly as with any other pump.

8. To remove the impeller from the shaft, loosen the setscrew in the impeller, or if the pump is equipped with a shaft locknut remove it and slide the impeller off the shaft.
9. To dismantle the remainder of the pump, remove nuts, bolts or cap screws from mating pieces and all the parts are easily dismantled.
10. Sleeve bearings in guide bearing, part #9, and pump bearing, part #37, are pressed into place. To replace, drive out old bearing and press in new bearing.

NOTE: When driving out old bearings, use a piece of rod or pipe with an outside diameter approximately the same as that of the bearing being replaced.

REPLACING BALL THRUST BEARING

To replace ball thrust bearing, part #30 proceed as follows:

1. Remove motor.
2. Remove pump half coupling, part # 13.
3. Bend prong of lockwasher, part #28, out of slot in locknut, part #27 and remove both parts.
4. Hold shafts securely and unscrew bearing collar, part #3.
5. Remove cap screws, nuts and washers, part #31, and remove complete bearing housing, part A.
6. Remove retaining ring, part #29.
7. Bearing collar, part #3, and ball thrust bearing, part #30, may now be removed from the bearing housing.
NOTE: A slight tapping may be required to remove bearing from the housing.
8. Remove retaining ring, part #32. Clean the bore of the housing where the bearing will slide out. Lubricate with light oil. Bearing collar, part #3, and ball thrust bearing, part #30, may now be separated.
9. Before reassembling, clean all parts thoroughly. Before removing bearing. Note the location of the shield if any. Hand pack ball bearing approximately ½ full of grease
10. To reassemble, place new ball thrust bearing on bearing collar with the metal seat side of the bearing against the shoulder of the bearing collar and reverse the above disassembly operations.

NOTE: The bearing collar is pressed into the bearing first, and then both items are placed into the bearing housing. A slight tapping may be required to seal the bearing into the housing.

REPLACING SHAFT SLEEVE

To remove the Hastelloy or stainless steel shaft sleeve, part #47, it should be heated to a cherry red with a torch and slipped off the shaft.

The new sleeve should be placed in oil, which has a flash point of 600° F and heated to about 425° F. The sleeve may then be slipped onto the shaft. If absolutely necessary, the sleeve may be driven onto the shaft.

CAUTION

When driving a sleeve onto a shaft extreme care should be exercised in order that the sleeve is not broken.

REPLACING PUMP SHAFT

1. Fasten impeller on proper end to the shaft. Press impeller on shaft with key placed in the keyway. On shaft with locknut construction, screw on locknut and tighten. On shafts using a setscrew it is necessary to press on the impeller with the key in place and spot a hole for the setscrew using a drill.
2. Place the shaft into the pump through the bottom being careful not to distort the threads on the upper portion of the shaft. It may be advisable to place a strip of friction or electrical tape on them for protection.

NOTE: A light film of oil applied to the shaft will help ease replacement.

REASSEMBLY

Before reassembling any pump, all parts should be thoroughly cleaned.

When replacing lower bearing, file down any sharp edges or corners. Be careful that the bearing is properly seated in the pump casing or else the shaft will not align correctly.

To reassemble pump, reverse the previous mentioned disassembly instructions. If there is more than one section, always start at the bottom most section and work upward to the top section.

All parts with the exception of the discharge pipe have tongue and groove joints and are indexed for accurate assembly.

The final reassembling operation is to connect the discharge pipe, locknuts or discharge elbow, rubber jam washers and flange to the pump making sure that the pump has not been distorted by uneven tightening of the discharge pipe parts. This can be checked by turning the shaft by hand while tightening the bolts and cap screw. Shaft should turn freely. Place the pump into the pit.

Before placing the motor on the motor bracket, position the motor half of the coupling with the key in place so that the face of the body of the coupling to which the prongs are attached is even with the end of the motor shaft. After this has been done, tighten the setscrews to hold the coupling in place.

Fit the pump half of the coupling to the pump shaft in the same manner as the motor half coupling. Put the coupling insert in its proper position. Place the motor on the motor support bracket fitting the coupling halves together. There should be about 1/16" clearance between the coupling halves.

ADJUSTMENT OF IMPELLER CLEARANCE

Impeller clearance should be checked periodically. When pumping clean liquid, the impeller may not have to be adjusted but once every three months, when pumping liquid containing sand, grit, fly ash, or other abrasive material, the pump may have to be adjusted every week.

On all 8000 models (except B4206 and B4209), the following impeller clearance adjustment procedure applies. These models are axial clearance requiring .025"-.035" gap at the impeller eye between the impeller and suction plate:

The impeller clearance adjustment is made by rotating the threaded bearing collar up and down in the bearing frame. The adjustment is made after the pump is assembled and installed, the cap screws and the nuts are all secured, and the discharge pipe is installed. Lower the shaft and impeller assembly down by rotating the bearing collar using a spanner wrench or suitable tool until the impeller touches the suction and the shaft can no longer be rotated by hand. The clearance between the impeller wear ring and the suction wear ring is .025"-.035". This is accomplished by turning the collar 1/2 turn in the clockwise direction to raise the shaft and impeller assembly up. Be sure the shaft turns freely after the clearance adjustment is made. After the clearance is set and the shaft is checked for free rotation, the adjusting collar is locked in place using the locknut.

All the 3000 series (and only the 8000 series models B4206 and B4209) are radial clearance. On radial clearance type pumps the space between the repelling vanes on top of the impeller and the top plate/volute is critical. The following procedure applies to all Series 3000 (and only the 8000 series models B4206 and B4209):

1. Bend prong on lockwasher, part #28, out of slot in locknut, part #27.
2. Loosen the locknut, part #27, and coupling set screws, rotate the bearing collar, part #3, about the shaft, part #14, so as to raise the shaft as far as possible. Then carefully back off the bearing collar to lower the shaft. **DO NOT BACK OFF THE BEARING COLLAR MORE THAN 1/8 TURN.** Lock the adjustment by tightening the locknut. Check the clearance established between the repelling vanes on the impeller, part #40, and the volute, part #10, by turning the pump shaft by hand. The shaft should rotate freely, or have a very slight drag. If the shaft is hard to turn, loosen the locknut and lower the shaft one more 1/8 turn of the bearing collar. Retighten and recheck. Finally retighten coupling setscrews with correct clearance between coupling halves.
3. If at any time you suspect the lubricant is not reaching the pump bearing, check the adjustment of the lubri-vac system by resetting impeller clearance.

PROPER CARE AND MAINTENANCE OF BALL BEARINGS

GENERAL

The principles of ball bearing lubrication differ radically from the fundamentals governing the care of plain or sleeve bearings. The life of ball bearings can be greatly increased through proper care and maintenance.

FREQUENCY OF LUBRICATION

The lubrication frequency for ball bearings is dependent upon a number of factors, including temperature, load conditions and speed. Ball bearings in pump operation under normal operations should be lubricated approximately every 1500 operating hours. In some special cases the bearings may have to be lubricated more frequently. The maintenance man must determine this. It is well to remember, however, that over-greasing is harmful to a ball bearing.

QUANTITY OF LUBRICANT

CAUTION! DO NOT OVER-GREASE! A ball bearing requires but a FEW OUNCES OF GREASE A YEAR. For most effective operation, the ball bearing should be only about HALF FULL OF GREASE. Under no circumstances should a bearing be greased until the grease oozes out! Grease oozing out of a ball bearing does NOT lubricate the bearing-it simply catches dirt. In addition, the grease that stays IN an over-greased bearing has a churning action, which tends to over-heat the bearing. In some cases, this overheating may reach the point where the temper is drawn out of the balls, rendering them soft and causing bearing failure in a short period of time.

CAUTION! DO NOT OVER-GREASE! This cannot be repeated too often--more ball bearings are ruined by over-greasing than by any other single cause! A bearing running under normal conditions will require about an ounce of grease each lubricating period. As we mentioned above, the maintenance man depending on service must determine lubricating periods.

RECOMMENDED LUBRICANTS

For normal service the following lithium base greases (or equal) are recommended:

<u>COMPANY</u>	<u>TRADE NAMES</u>
Arco	Litholine E.P. #2
Mobil	Mobilux #2
Phillips	Phillips IB & EB #2
Shell	Alvania EP #2
Standard	Super Permalube
Texaco	Regal AFB #2
Union	UNOBA EP #2
Citgo	Lithium EP-2

OIL Lubricated: Citgo Citgard 500 10W

NOTE: The above listings represent several of the companies and brands with wide distribution. If your supplier is not listed, he should be able to give you a product of equal quality, if you show him this listing for a cross-reference.

In cases where abnormal conditions exist (such as very high temperature); it is advisable to consult your local lubricating engineer to determine the proper lubricant to be use. If this is not practical, write to Yeomans Chicago Corp., stating your conditions, and we will procure the information for you.

CLEANING

It is recommended that ball bearings be cleaned at least once a year. It may be necessary to clean the bearings more often if the equipment is in a location that is exceptionally dusty or gritty.

CLEANING UN-MOUNTED BEARINGS

Place bearings in a basket and suspend the basket in a container of clean, cold petroleum solvent or kerosene and allow the bearings to soak, preferably overnight. In cases of bearings with badly oxidized grease, it may be necessary to soak the bearings in hot oil (200 to 240 degrees). In extreme cases, boiling in emulsifying cleaners diluted with water may be necessary. If a hot emulsion solution is used, the bearings should be drained and spun individually until the water has completely evaporated.

OILS USED FOR CLEANING

Light transformer oils; spindle oils, or automotive flushing oil is suitable for cleaning bearings. Any oil heavier than light motor oil (SAE 10) is not recommended.

CAUTION: Petroleum solvents must be used with the usual precautions associated with fire hazards. The use of chlorinated solvents is not recommended for bearing cleaning because of the rust hazard involved.

TEST BEARINGS

If it is practical, it is advisable to test a ball bearing periodically. To determine the quietness of operation, place your ear against a screwdriver or length of metal rod, one end of which is firmly pressed against the bearing housing. If a rumbling or unevenness is noticed, it may be due to dirt. A whistling sound usually means improper lubrication. Unusual noises should be investigated immediately and the condition corrected. After the bearing has been in operation a short time, it should be checked for quiet operation.

LUBRICATION INSTRUCTION
FOR
PUMP AND / OR GUIDE BEARING

LUBRICANT - GREASE

PUMP AND/OR GUIDE BEARINGS

On most 3000 and 8000 Series Models, The pump and / or guide bearings are sleeve-type bearings, equipped with alemite fittings, and are grease lubricated. The same grade and type of grease as used to lubricate the ball thrust bearing is used to lubricate these bearings. The frequency of lubrication of these bearings depends upon severity of operation, but unlike ball bearings, these bearings are intended to be run with the grease cavity full. It is recommended that these bearings be lubricated every twenty-four (24) hours of actual operating time. An ounce of grease pumped into each bearing each lubricating period is sufficient.

MEEHANITE BEARINGS

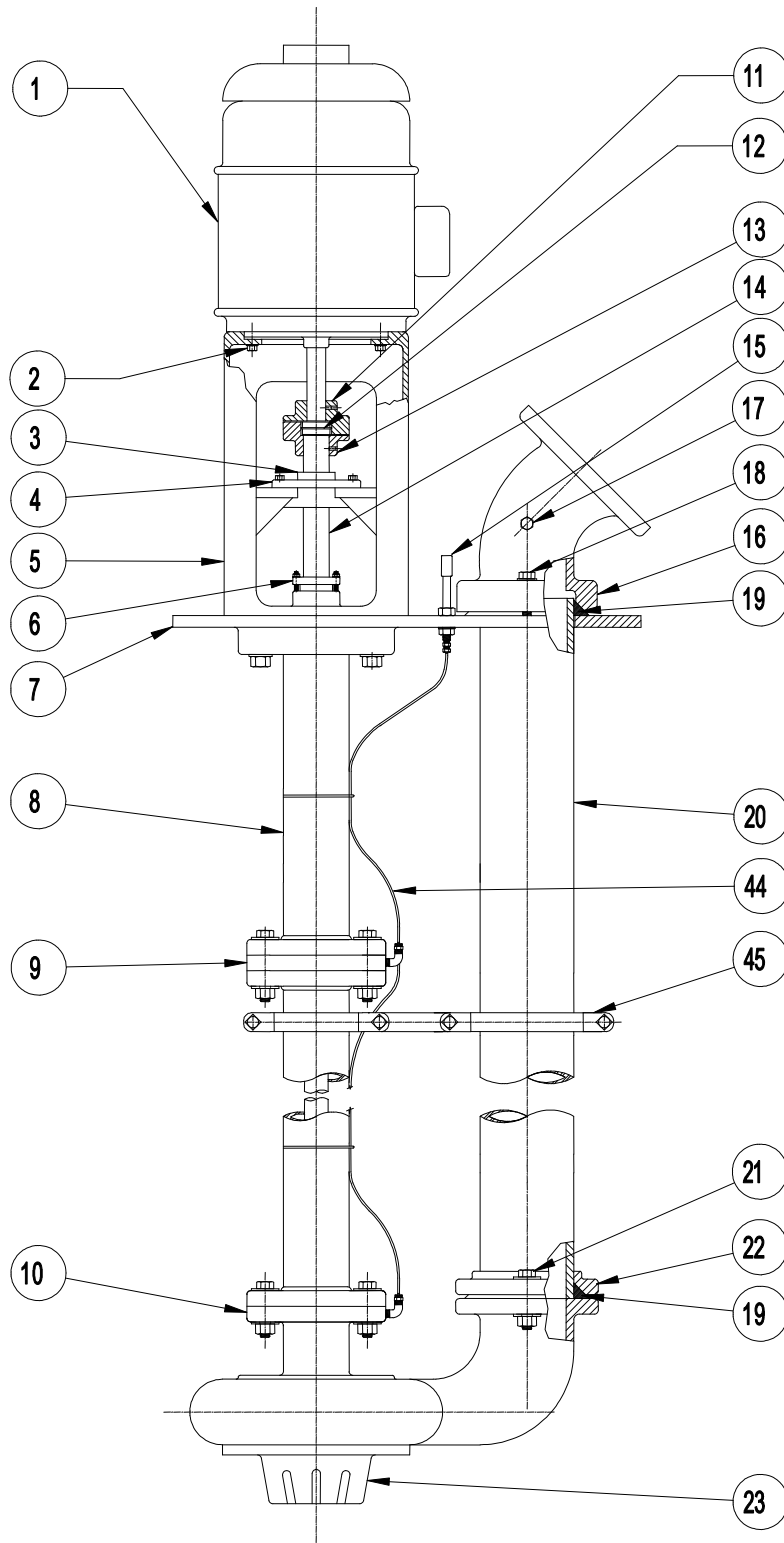
When Meehanite bearings are supplied, ONLY lithium-base greases may be used.
SOAP BASE GREASES WILL DESTROY MEEHANITE BEARINGS.
Lithium-based greases are recommended for ball-bearings.

LUBRICANT – OIL

When oil lubricated sleeve-type bearings are specified, normally a reservoir is supplied and a solenoid valve to control the flow of oil. The solenoid valve should be connected so oil only flows when the pump is operating. The starting point for oil consumption rate is to adjust the sight feed for the drip oilers for 15 drops per minute.

LUBRICANT – CLEAN WATER FLUSH

Rubber lined bearings and some graphite bearings use water flush. Make sure the water starts flowing to the bearings before the pump starts operating.
Graphite based bearings should not be oil or grease lubricated.

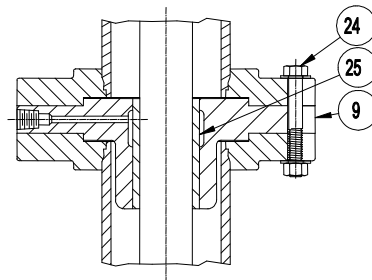


3000 Series

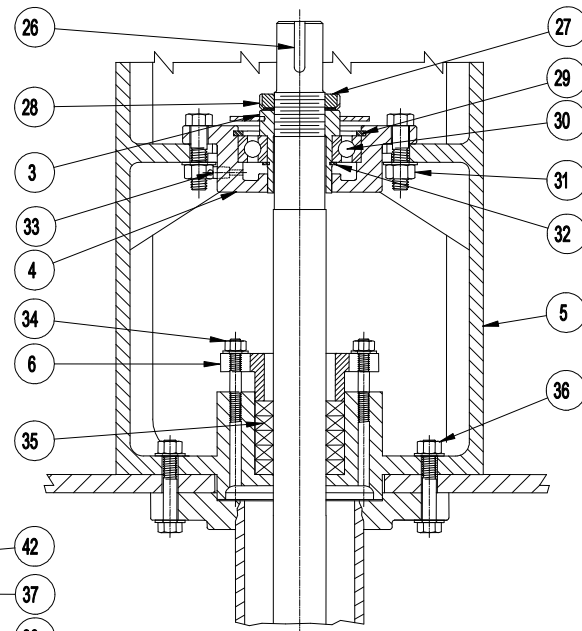
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LIST OF PARTS

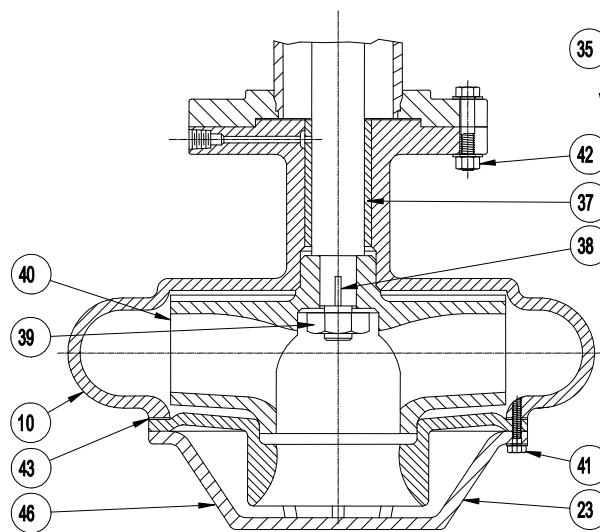
NO.	DESCRIPTION
1	MOTOR
2	CAP SCREW & WASHER
3	BEARING COLLAR
4	BEARING HOUSING
5	MOTOR SUPPORT
6	STUFFING BOX GLAND
7	SUSPENSION PLATE
8	SUSPENSION PIPE ASSEMBLY
9	GUIDE BEARING HOUSING
10	VOLUTE
11	COUPLING (MOTOR HALF)
12	COUPLING INSERT
13	COUPLING (PUMP HALF)
14	PUMP SHAFT
15	ALEMITE GREASE FITTING
16	45° ELBOW
17	PIPE PLUG
18	CAP SCREW AND WASHER
19	JAM WASHER
20	DISCHARGE PIPE
21	CAP SCREW, NUT & WASHER
22	OVAL FLANGE
23	SUCTION PLATE
24	CAP SCREW, NUT, WASHER & LOCKWASHER
25	GUIDE BEARING
26	WOODRUFF KEY (COUPLING)
27	LOCKNUT
28	LOCKWASHER
29	RETAINER RING
30	BALL BEARING
31	CAP SCREW, NUT & WASHER
32	RETAINER RING
33	ALEMITE GREASE FITTING
34	GLAND STUD, LOCKNUT & WASHER
35	PACKING RING
36	CAP SCREW, NUT, WASHER & LOCKWASHER
37	LOWER PUMP BEARING
38	WOODRUFF KEY (IMPELLER)
39	IMPELLER LOCKNUT
40	IMPELLER
41	CAP SCREW & WASHER
42	CAP SCREW, NUT, WASHER & LOCKWASHER
43	GASKET
44	LUBRICATION PIPE AND FITTINGS
45	PIPE STRAP
46	SCREEN



GUIDE BEARING
SECTIONAL VIEW



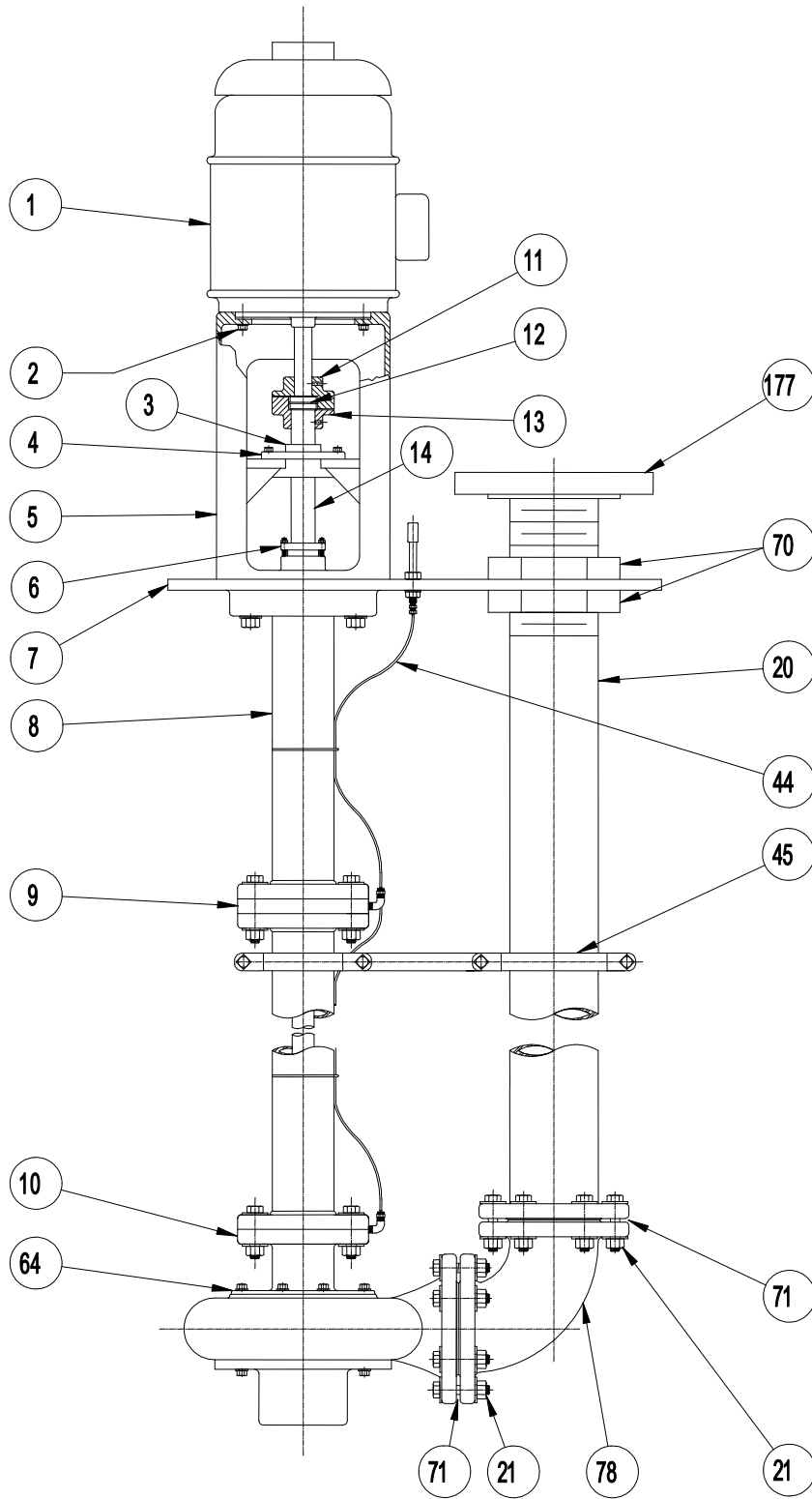
BEARING HOUSING & PACKING
GLAND SECTIONAL VIEW



VOLUTE, IMPELLER, SUCTION
PLATE & SCREEN SECTIONAL
VIEW

3000 Series

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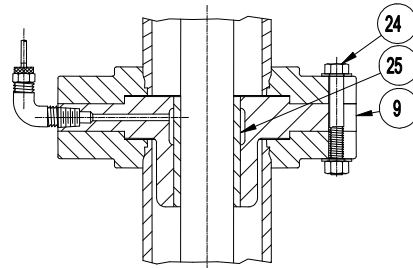


8000 Series

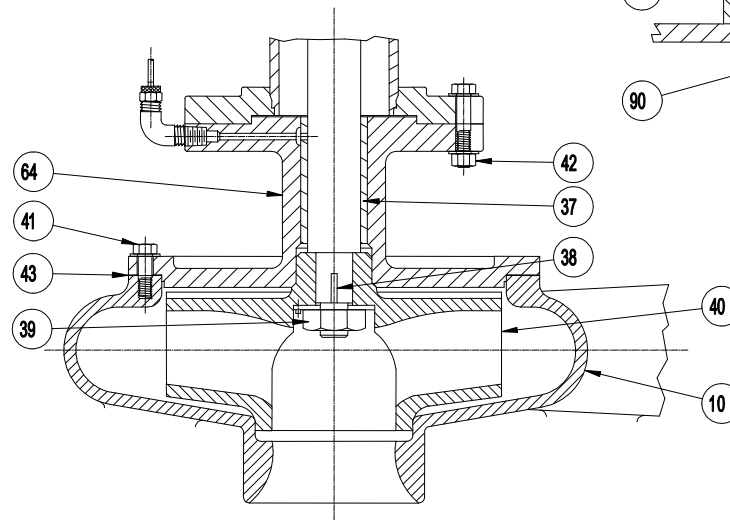
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LIST OF PARTS

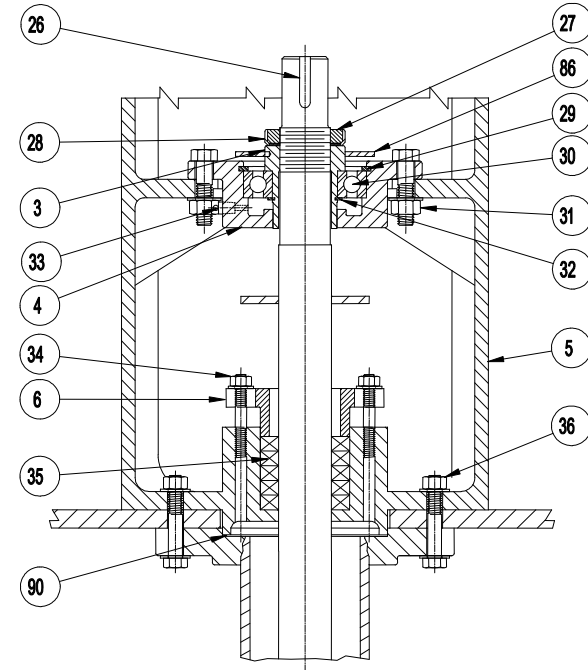
NO.	DESCRIPTION
1	MOTOR
2	CAP SCREW & WASHER
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4	BEARING HOUSING
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6	STUFFING BOX GLAND
7	SUSPENSION PLATE
8	SUSPENSION PIPE ASSEMBLY
9	GUIDE BEARING HOUSING
10	VOLUTE
11	COUPLING (MOTOR HALF)
12	COUPLING INSERT
13	COUPLING (PUMP HALF)
14	PUMP SHAFT
70	LOCKNUT
16	45° ELBOW
17	PIPE PLUG
18	CAP SCREW, WASHER & NUT
19	JAM WASHER
20	DISCHARGE PIPE
21	CAP SCREW, NUT & WASHER
177	FLANGE
24	CAP SCREW, NUT, WASHER & LOCKWASHER
25	GUIDE BEARING
26	KEY
27	LOCKNUT
28	LOCKWASHER
29	RETAINER RING
30	BALL BEARING
31	CAP SCREW, NUT & WASHERS
32	RETAINER RING
33	ALEMITE GREASE FITTING
34	GLAND STUD, LOCKNUT & WASHER
35	PACKING RING
36	CAP SCREW, NUT, WASHER & LOCKWASHER
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38	WOODRUFF KEY (IMPELLER)
39	IMPELLER LOCKNUT
40	IMPELLER
41	CAP SCREW & WASHER
42	CAP SCREW, NUT, WASHER & LOCKWASHER
43	GASKET
44	LUBRICATION PIPE AND FITTINGS
45	PIPE STRAP
64	TOP PLATE
86	SLINGER
71	GASKET
78	90° ELBOW
80	SOCKET HEAD CUP POINT SET SCREW
90	GASKET
155	SET SCREW



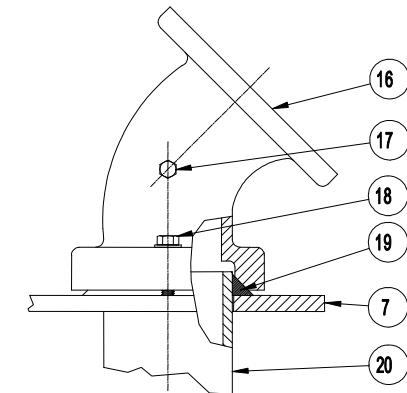
GUIDE BEARING SECTIONAL VIEW



VOLUTE, IMPELLER, SUCTION PLATE SECTIONAL VIEW



BEARING HOUSING & PACKING GLAND SECTIONAL VIEW



ALTERNATE 45° ELBOW CONSTRUCTION AT COVER PLATE

8000 Series

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