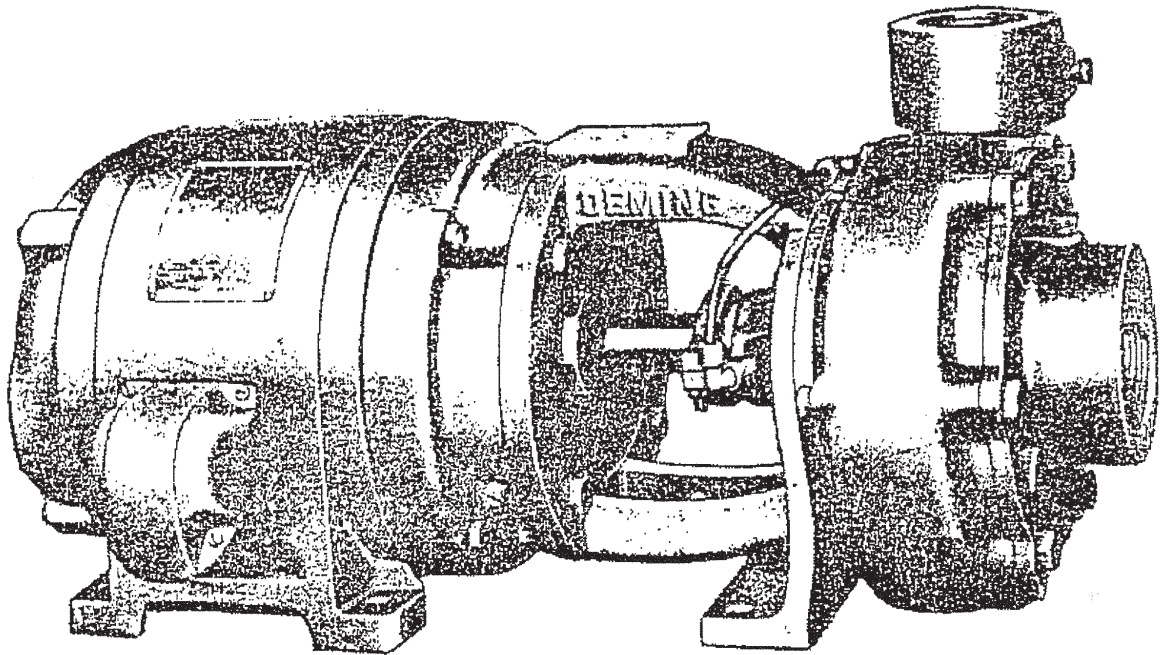


DEMING®

INSTALLATION, OPERATION & MAINTENANCE MANUAL MotorMount Centrifugal Pumps

Series: 4201, 4211, 4221



IMPORTANT!

*Read all instructions in this manual before operating pump.
As a result of Crane Pumps & Systems, Inc., constant product improvement program,
product changes may occur. As such Crane Pumps & Systems reserves the right to
change product without prior written notification.*

CRANE[®]

A Crane Co. Company

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Bramton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650

Form No. 120005-Rev. D

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SAFETY FIRST!

Please Read This Before Installing Or Operating Pump. This information is provided for **SAFETY** and to **PREVENT EQUIPMENT PROBLEMS**. To help recognize this information, observe the following symbols:



IMPORTANT! Warns about hazards that can result in personal injury or indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

CAUTION! Warns about hazards that **can or will cause minor** personal injury or property damage if ignored. Used with symbols below.

WARNING! Warns about hazards that can or will cause serious personal injury, death, or major property damage if ignored. Used with symbols below.



Hazardous fluids can cause fire or explosions, burns or death could result.



Extremely hot - Severe burns can occur on contact.



Biohazard can cause serious personal injury.



Hazardous fluids can Hazardous pressure, eruptions or explosions could cause personal injury or property damage.

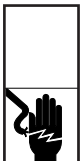


Rotating machinery Amputation or severe laceration can result.



Hazardous voltage can shock, burn or cause death.

Only qualified personnel should install, operate and repair pump. Any wiring of pumps should be performed by a qualified electrician.



WARNING! To reduce risk of electrical shock, pumps and control panels must be properly grounded in accordance with the National Electric Code (NEC) or the Canadian Electrical Code (CEC) and all applicable state, province, local codes and ordinances. Improper grounding voids warranty.



WARNING! To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.



WARNING! Operation against a closed discharge valve will cause premature bearing and seal failure on any pump, and on end suction and self priming pump the heat build may cause the generation of steam with resulting dangerous pressures. It is recommended that a high case temperature switch or pressure relief valve be installed on the pump body.



CAUTION! Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.



WARNING! Do not pump hazardous materials (flammable, caustic, etc.) unless the pump is specifically designed and designated to handle them.



WARNING! Do not wear loose clothing that may become entangled in moving parts.



WARNING! Keep clear of suction and discharge openings. **DO NOT** insert fingers in pump with power connected.

Always wear eye protection when working on pumps.

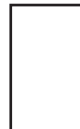


Make sure lifting handles are securely fastened each time before lifting. **DO NOT** operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair. Secure the pump in its operating position so it can not tip over, fall or slide.

DO NOT exceed manufacturers recommendation for maximum performance, as this could cause the motor to overheat.



WARNING! To reduce risk of electrical shock, all wiring and junction connections should be made per the NEC or CEC and applicable state or province and local codes. Requirements may vary depending on usage and location.



WARNING! Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment, to insure that employees will not be exposed to health hazards in handling said material. All Applicable Laws And Regulations Shall Apply.



Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for potable water systems. Lead is known to cause cancer and birth defects or other reproductive harm. Various government agencies have determined that leaded copper alloys should not be used in potable water applications. For non-leaded copper alloy materials of construction, please contact factory.



Crane Pumps & Systems, Inc. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

A - GENERAL INFORMATION

TO THE PURCHASER:

Congratulations! You are the owner of one of the finest pumps on the market today. These pumps are products engineered and manufactured of high quality components. With years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest applications.

Check local codes and requirements before installation. Servicing should be performed by knowledgeable pump service contractors or authorized service stations.

RECEIVING:

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. If the manual is removed from the crating, do not lose or misplace.

STORAGE:

Short Term - Pumps are manufactured for efficient performance following long inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

Long Term - Any length of time exceeding six (6) months, but not more than twenty four (24) months. The units should be stored in a temperature controlled area, a roofed over walled enclosure that provides protection from the elements (rain, snow, wind blown dust, etc.), and whose temperature can be maintained between +40 deg. F and +120 deg. F. Pump should be stored in its original shipping container and before initial start up, rotate impeller by hand to assure seal and impeller rotate freely.

SERVICE CENTERS:

For the location of the nearest Deming Service Center, check your Deming representative or Crane Pumps & Systems Service Department in Piqua, Ohio, telephone (937) 778-8947 or Crane Pumps & Systems Canada, Inc., Bramton, Ontario, (905) 457-6223.

B - INSTALLATION

1. FOUNDATION

The Motor-Mount pumps can be installed on any sufficiently solid foundation since pump and motor are rigidly aligned. The unit may be installed on a concrete foundation with anchor bolts set in place or securely mounted on a wall in either a horizontal or vertical position with motor above pump. The pump should be located as near the source of supply as possible with a minimum of suction pipe and elbows. Maximum suction lift, (lift plus pipe friction is 15 feet based on 65°F water at sea level.

Foundation bolts, of the proper size, should be imbedded in the concrete. A pipe sleeve, about 2½" diameters larger than the bolt, should be used to allow for final positioning of the bolts. See Figure 1.

Position unit on foundation and level using rectangular metal blocks and shims, or wedges having a small taper as shown in Figure 2.

2. PIPING

A foot valve and strainer must be installed on the lower end of the suction pipe to keep pump completely filled with liquid when the pump is used under suction lift conditions. Connect suction pipe to pump, making certain that all connections are airtight. When a foot valve and strainer are used, it is necessary to install a check valve in the discharge line near the pump to prevent possible casing damage due to line shock or surge when the pump stops. A gate valve should also be installed in the discharge line. Connect discharge pipe to pump casing.

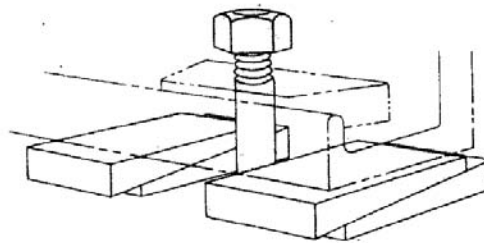


Figure 2. Adjusting Wedges for Mounting

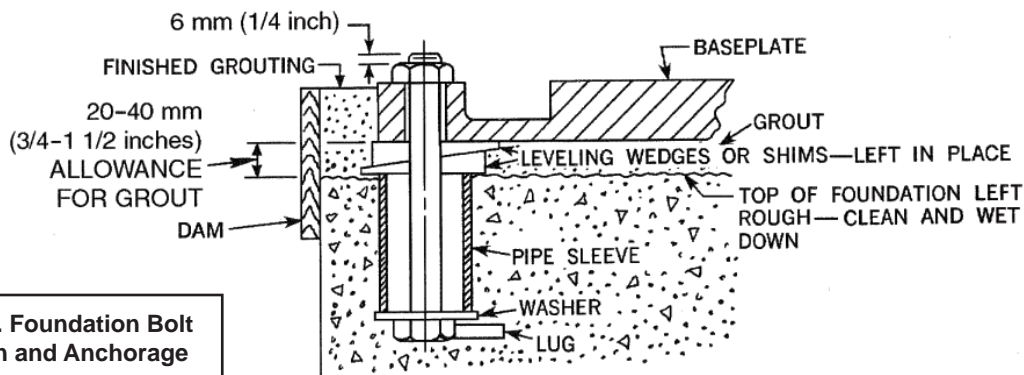


Figure 1. Foundation Bolt Location and Anchorage

It is important that the suction and discharge pipes “line up” naturally with the pump. Do Not “pull” pipes into position with flange bolts or fittings. Both suction and discharge pipes must be supported independently near the pump to eliminate any strain on the pump. Piping should be arranged with as few bends as possible, and, preferably, with long radius elbow whenever possible. Turn shaft to see that it rotates freely. If rotor binds, it indicates a strain on the casing, which must be corrected before operating pump. It may be necessary to shim motor at foundation to assist piping connection line-up.

3. WIRING / ROTATION

Check motor name plate for electrical characteristics. Be sure they are the same as the rating of the electric power available. Connect power lines to motor in accordance with the wiring diagram on the motor. Test rotation by jogging motor. Shaft must rotate in the direction indicated by arrow cast on pump casing.

C - OPERATION

1. STARTING THE PUMP

The following important items should be checked before starting.

- a. Pump and driver securely bolted
- b. Piping complete
- c. Motor properly lubricated. Follow the recommendations found in the Maintenance Section
- d. Open the seal flush valve, if used
- e. Shaft turns freely
- f. Rotation is correct. The pump must rotate in the direction of the arrow on the casing.
- g. Discharge valve. A high or medium head centrifugal pump operating at full speed with the discharge valve closed, requires much less power than when operating at its rated head and capacity with the discharge valve open.

For this reason, it is usually best to have the discharge valve only partially open when starting the pump.



WARNING! - Operating the pump with a closed or partially open discharge valve can result in excessive heat buildup. Such operation should be limited to the shortest practical duration.

Operating the pump at or near shut-off head places greater loads on the shaft and motor than operation at the designed flow rate and head.

- h. Suction valve, if used, must be fully open. Do not use suction valve as a throttling device.
- i. Pump fully primed

Only after these items have been checked should the pump be started.

2. PRIMING

CAUTION: Before starting the pump, the casing and suction line must be filled with liquid, and air-vented through the vent pipe plugs. The pump must not be run until it is completely filled with liquid, because of danger of injuring some of the parts of the pump which depend upon liquid for lubrication.

The discharge gate valve should be closed during priming. Be sure the mechanical seal and power frame are supplied with the proper lubrication. See LUBRICATION.

PRIMING BY SUCTION PRESSURE

When operating with suction pressure (flooded suction), remove the pipe plug at the top of the casing and when pump is filled with liquid, replace plug.

PRIMING WITH FOOT VALVE AND STRAINER

A foot valve and strainer may be installed on the lower end of the suction pipe to keep pump filled with liquid. Incorporate filler pipe in discharge pipe between pump and check valve. Remove pipe plug at top of casing, then fill suction pipe and pump with liquid. When pump is full of liquid, replace plug and close filler pipe.

CAUTION: When a foot valve and strainer are installed on the suction pipe, a spring loaded type check valve **MUST** be installed next to the pump in the discharge piping to prevent pump rupture from water hammer shock.

Priming by means of primer pump or ejector, attached to the pump, will also remove air from suction pipe and pump casing. When pump is filled with liquid, start motor and slowly open discharge gate valve.

3. STARTING

Start the pump. When the pump has reached its designed operating speed slowly open the discharge valve to obtain the desired capacity and pressure.

With the pump running, carefully check for unusual vibration, quiet operation, mechanical seal function and unusually high temperature.



WARNING! - NEVER try to adjust or work on the pump while it is running. Always stop the unit completely before attempting any adjustment.

D. MAINTENANCE

1. LUBRICATION

BEARINGS - Motor bearings should have periodic attention and lubrication in accord with motor manufacturer's recommendations. Under ordinary conditions a ball bearing will run from 10°F to 60°F above ambient temperatures. Unless bearing temperature runs extremely hot do not become alarmed.

PACKING - On standard-fitted, bronze-fitted and all-bronze construction, the stuffing box is lubricated by liquid being pumped thru a by-pass tube. On all-iron construction, the by-pass tube is eliminated and a grease fitting installed for stuffing box lubrication. A "water pump" grease is recommended for the grease cup. If the liquid being pumped is abrasive, a fresh water supply should be connected to the stuffing box instead of the grease fitting or by-pass tube.

SINGLE SEAL - Single seals normally are lubricated and cooled by the liquid returned to the seal chamber thru by-pass tube.

DOUBLE SEAL - Double seals should be cooled and lubricated by sealing liquid under pressure, such as clear water. If the pressure at the inner face of the seal is under 25 psi and the liquid temperature is under the boiling point, a spring-loaded compression type grease cup, filled with Standard Artic No. "0" grease or equal, may be used if suitable sealing liquid is not available.

2. PROPER ADJUSTMENT of STUFFING BOX

The liquid being pumped should constantly, yet slowly, drip from the stuffing box gland (16) when the pump is running. This slow drip lubricates the shaft sleeve (3) and prevents scoring. **NEVER** tighten the gland so as to entirely stop the leakage through stuffing box. See Section "Repacking Standard Stuffing Box".

E - REPAIR



WARNING - If pumping any fluid that could cause bodily injury (hot water, caustic, etc.), always use eye protection and wear protective clothing over all exposed body areas.

REMOVE AND LOCK-OUT POWER TO THE DRIVER WHILE PERFORMING THESE TASKS

Be sure that no one can accidentally restore power while the pump is being serviced.

1. DISASSEMBLY OF LIQUID END - The following procedure is for the complete disassembly of the pump. If complete disassembly is not necessary, use only those steps which apply.

a. Slowly remove drain plug (37). Disconnect suction and discharge pipes.

b. Remove suction head capscrews (9), then set a block of wood against the finished flange or back of the suction head (32) and tap block lightly with a hammer to loosen suction head. Remove suction head from pump and place suction head gasket (31) in a bucket of water to keep it soft and pliable.

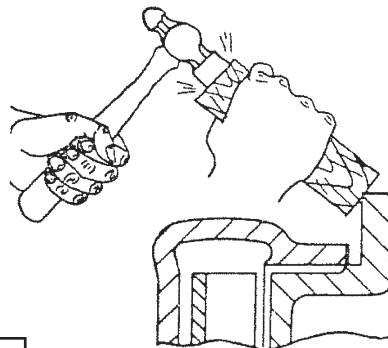


Figure 3

c. Unscrew the impeller nut (6) by turning counter-clockwise while holding shaft with a wrench at slinger (7). Then slide the impeller nut gasket (13) off the shaft. Place gasket in water.

d. To remove the impeller (40) from the shaft, make 3 special capscrews 1/2" x 13 N.C. with thread cut 3" long. Screw these capscrews into the three tapped holes in the impeller shroud. The capscrews will tighten against the stuffing box head (15) thus forcing the impeller from the shaft. Lift the key (4) from its seat in the shaft and remove shaft sleeve gasket (12).

e. To remove the pump casing (35), first disconnect by-pass tube (21) from the casing then remove casing capscrews (2), casing and stuffing box gasket (14) will lift off the motor support (1). Place gasket in water.

f. The stuffing box head (15) can be removed after removing gland (17) bolts and nuts (18) and tubing (21). Stuffing box packing (20), lantern ring (19) and gland can now be removed.

g. Shaft sleeve (3) and slinger (7) may be removed from the shaft. If necessary to remove the motor support (1) remove the motor capscrews (8) and lift motor support from motor.

h. When necessary to replace wearing rings (36) & (33), the casing wearing ring (36) can be pressed from the casing, however it will be necessary to either machine or cut the suction head wearing ring (33) from its seat in the suction head.

i. Clean and carefully inspect all parts for wear or damage. Replace any part which is excessively worn or damaged.

2. REASSEMBLY OF LIQUID END

- a. Press suction head wearing ring (33) into recess of suction head making certain that it is properly seated. Also press the casing wearing ring (36) into casing until it is flush with inside edge of casing.
- d. Reposition motor support (1) on motor and replace capscrews (8). Slide slinger (7) onto shaft, followed by shaft sleeve until sleeve is tight against shaft shoulder. Align shaft and sleeve keyways. Place key (4) in keyway and position shaft sleeve gasket (12) against end of sleeve.
- c. Place stuffing box gland (16) and lantern ring (19) over the shaft sleeve (3). Place stuffing box head (15) over shaft in manner shown with slots for gland bolts and nuts (8) on horizontal centerline when holes in the flange of the stuffing box head are in line with those of the motor support (1).
- d. Insert casing capscrews (2) through holes in motor support and stuffing box head and position stuffing box head gasket (14) on stuffing box head. Position casing (35) with discharge in desired position, and tighten capscrews securely. Reconnect by-pass tube (21).
- e. Place impeller (40) over the end of the shaft with keyway over the key (4). Tap impeller into position on the shaft with either a babbitt or rawhide hammer. Replace impeller nut gasket (13) and impeller nut (6) on shaft stud (5). Tighten nut securely.
- f. Position suction head gasket (31) on suction head (32). Mount suction head on casing and tighten capscrews (9) securely. Replace drain plug (37).
- g. See section "Repacking Standard Stuffing Box" beginning with item b.

3. REPACKING STANDARD STUFFING BOX

- a. Remove stuffing box bolts (17) and nuts (18) also gland bolts and nuts and remove gland from shaft. With a packing puller, remove the old packing (20) and lantern ring (19) from the stuffing box.
- b. Cut five rings of packing (20) so that when wrapped around the shaft, the ends do not quite touch, a bevelled cut is recommended.
- c. Tamp first ring into stuffing box (15) then turn shaft over by hand.
- d. Stagger the next packing ring joint so that the joints will be 180° apart. Seat ring evenly and tamp into place. Turn shaft again by hand.
- e. Place lantern ring (19) in next.

- f. Position and seat the next three rings of packing separately, staggering the joints 180° apart. Tamp into place.
- g. Replace split gland (16) fastening the two halves together with gland bolts and nuts. Replace and tighten stuffing box bolts and nuts (18), then loosen nuts until shaft can be turned freely by hand. See section "Proper Adjustment Of Stuffing Box" for proper adjustment.

4. REPLACE SINGLE MECHANICAL SEAL - Seals are available as a complete assembly only.

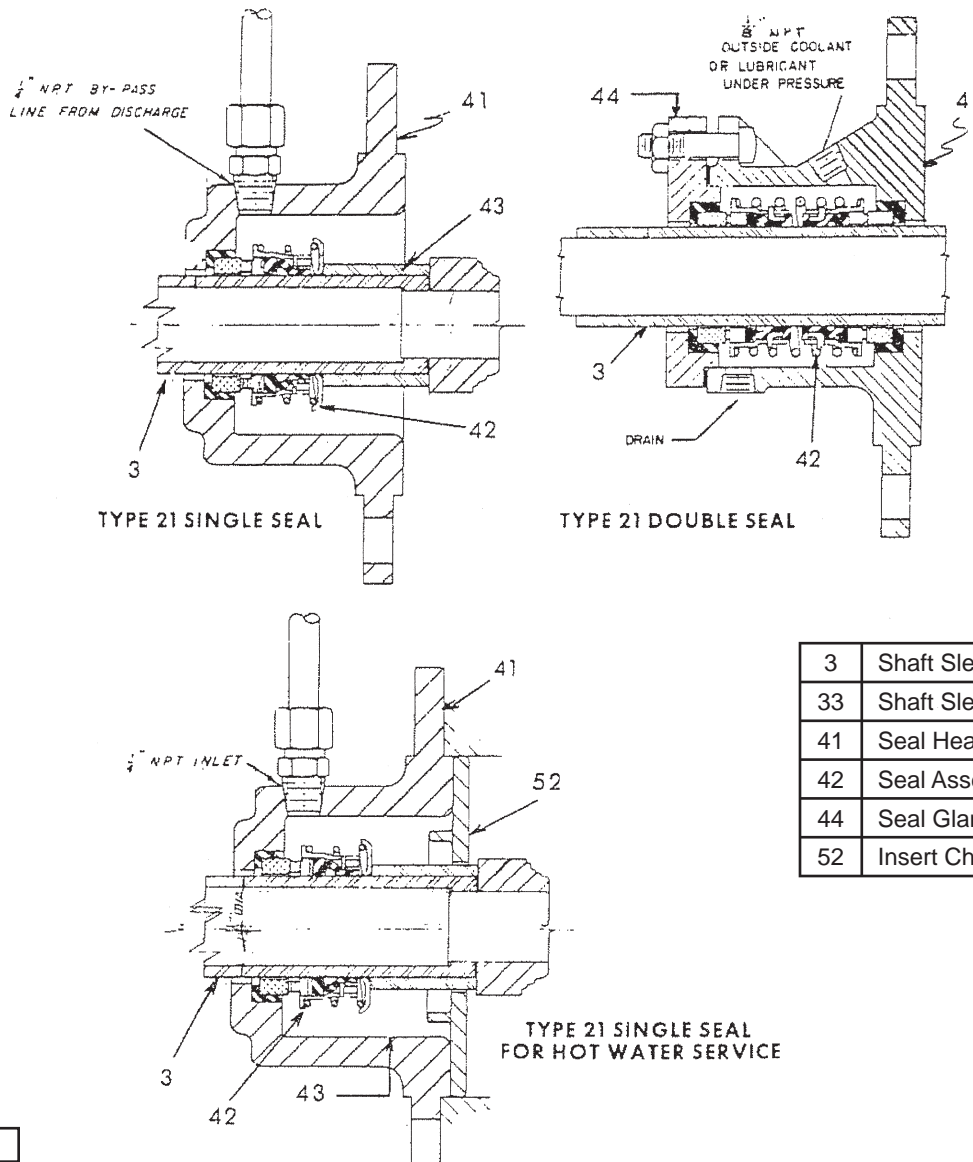
- a. The single seal as shown is used for handling clear liquids at temperatures below their boiling point. A portion of this liquid is by-passed into the seal chambers through the by-pass tube to serve as a lubricant and as a coolant. The by-pass from the pump discharge must be a minimum of 20 pounds pressure above the suction pressure of the pump to insure proper operation of the seal.
- b. Special precautions must be observed when handling a mechanical seal. DO NOT drop the seal face carbons, or floating seats, nor scratch the lapped faces of these pieces.
- c. To remove the seal assembly, dismantle the liquid end of the pump as described in Section E. After removing the casing, the seal head assembly may be removed from the motor support. Press the seal assembly (42) from the seal head (41).
- d. To install new seal assembly, oil the outer surfaces of the seal seat and press assembly into the seal head cavity. DO NOT SCRATCH FACE OF FLOATING SEAT. If it is not possible to insert seat with the fingers, place cardboard protecting ring furnished with seal over face of seat and press into bore with piece of tubing having end cut square. Tubing should be only slightly larger than diameter of shaft. Remove cardboard ring after seat is firmly seated.
- e. Apply a thin coating of clean light oil to the shaft sleeve (3) and reposition seal head (41) on the motor support. Also apply a thin coating of light oil to the inside of the seal bellows and the seal face carbon then slide the sealing washer and bellows assembly onto the shaft sleeve (3).
- f. Insert casing capscrews (2) through holes in motor support (1) and seal head (41) and complete assembly of liquid end as described in section "Reassembly of Liquid End".

5. REPLACE DOUBLE MECHANICAL SEAL - Seals are available as a complete assembly only.

a. The double mechanical seal as shown is used when pumping abrasives or nonlubricating liquids or with liquids at excessive temperatures. A sealing liquid at 15 to 20 pounds above suction must be circulated through the seal chamber. Clear water under pressure can be used in most applications as a sealing liquid for lubrication and cooling. If the pressure at the inner seal face is under 25 pounds and the temperature is under boiling point of the liquid being pumped, the seal chamber can be filled with grease. See "Lubrication", a spring loaded compression type grease cup should be installed to maintain pressure in the seal chamber.

b. Special precautions must be observed when handling a mechanical seal. DO NOT drop the seal face carbons or floating seats nor scratch the lapped faces for these pieces.

c. To remove the seal assembly, dismantle the liquid end of the pump as described in "Disassembly of Liquid End", then unscrew gland bolts and nuts. Remove seal head casting (41) from the motor support, exposing the seal assembly. Grasp the seal firmly by hand and twist it on the shaft to break the seal between the bellows and the shaft. The seal can now be pulled from the sleeve. Also remove the seal gland (44) from the shaft. Place gland gasket in water. Press seal seats from the seal gland (44) and seal head (41).



3	Shaft Sleeve
33	Shaft Sleeve
41	Seal Head
42	Seal Assembly
44	Seal Gland
52	Insert Choker Ring

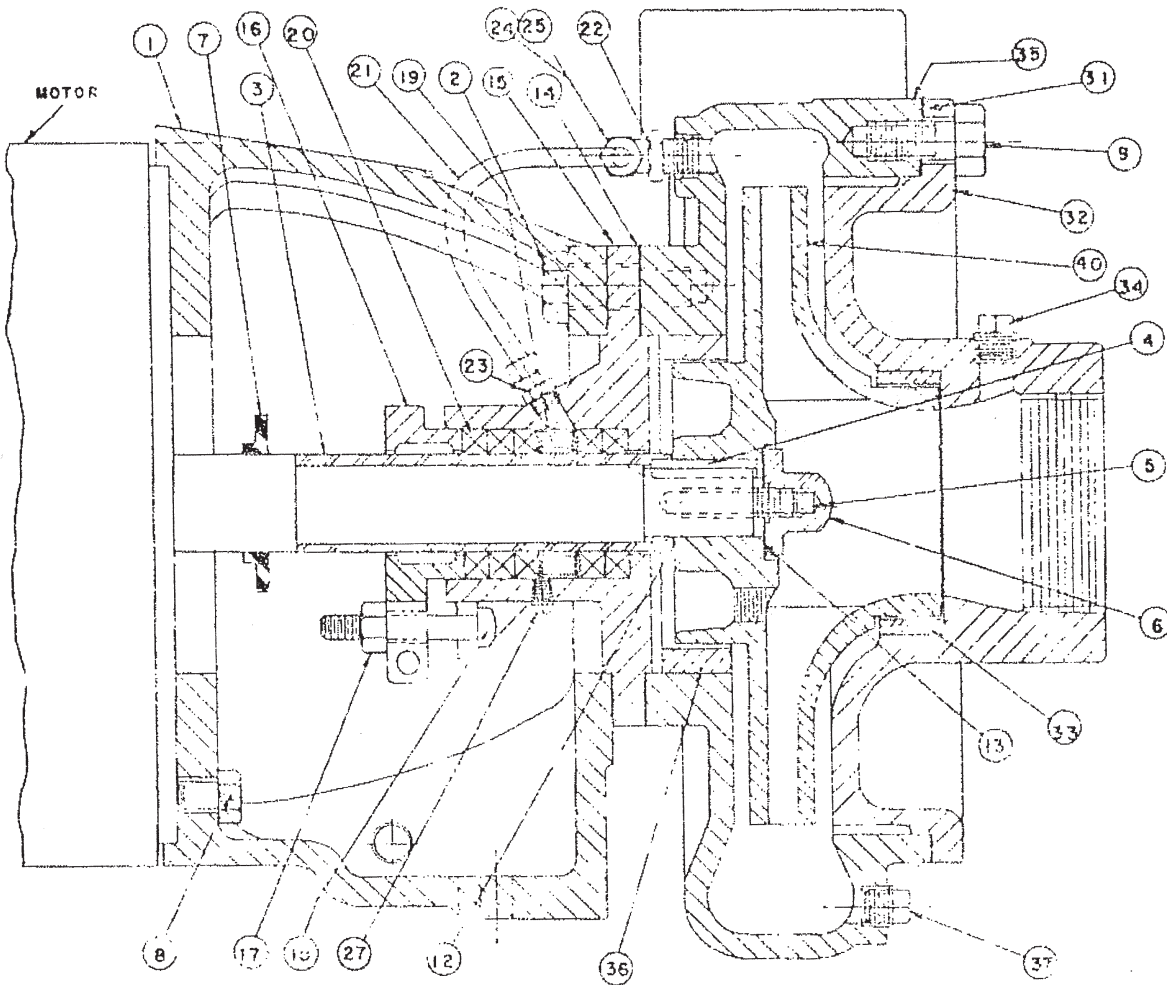
Figure 4

- d. To install new seal assembly, oil the face and outer surfaces of the seal seat. Press seats into the seal gland and seal head (41) cavity. **DO NOT SCRATCH FACE OF FLOATING SEATS.**
 - e. Apply a thin coating of light oil (not grease) to the shaft sleeve and inside of bellows. Slide the seal gland assembly onto the shaft sleeve (3) followed by the gland gasket. Carefully wipe the face of the seal face carbon with light oil and slide it onto shaft sleeve, followed by the retainer and bellows assembly. Assemble as shown in Figure 4. Next place the spring over the first section of seal then slide the second bellows retainer and seal face carbon onto the shaft sleeve. Carefully wipe the face of seal face carbon with light oil.
 - f. Place the seal head (41) over the shaft with slots for bolts and nuts on the horizontal centerline when the holes in the flange of the seal head are in line with those of the support head. Insert casing capscrews through holes in support head, and position gasket on seal head. Replace seal gland and bolts. Complete assembly of liquid end as described in "Reassembly of Liquid End".
- 3. Not Enough Pressure
 - a. Speed too low - Check motor speed
 - b. Air or gas in liquid
 - c. Mechanical defects. Bent shaft or impeller binding
 - d. Impeller diameter too small
 - 4. Pump Works For A While Then Quits
 - a. Leak in suction line
 - b. Suction plugged
 - c. Suction lift over 15 feet. Check with vacuum gauge
 - d. Air or gas in liquid
 - 5. Pump Takes Too Much Power
 - a. Speed too high
 - b. Head lower than rating - pumps too much liquid. Check system requirements
 - c. Liquid either viscous or heavier than water, or both.
 - d. Mechanical defects.

NOTE: Model number, pump serial number and part item number are always required to secure correct replacement parts. Refer to the pump serial plate and illustrations in this booklet.

F - LOCATING TROUBLE

- 1. No Liquid Delivered
 - a. Pump not primed - See Priming
 - b. Speed too low - Check motor speed and nameplate
 - c. Discharge head too high
 - d. Suction lift over 15 feet. Check with vacuum gauge.
 - e. Impeller completely plugged
 - f. Wrong direction of rotation - Check wiring
- 2. Not Enough Liquid Delivered
 - a. Air leaks in suction piping
 - b. Speed too low - Check motor speed
 - c. Discharge head higher than anticipated.
 - d. Suction lift over 15 feet. Check with vacuum gauge.
 - e. Impeller partially plugged
 - f. Not enough suction head for hot water.
 - g. Mechanical defects. Impeller or casing worn or damaged
 - h. Foot valve too small
 - i. Foot valve not immersed deep enough.



ITEM No.	DESCRIPTION
1	Motor Support
2	Casing Capscrew
3	Shaft Sleeve
4	Shaft Key
5	Motor Shaft Stud
6	Impeller Nut
7	Shaft Slinger
8	Motor Capscrews
9	Capscrews (Suction Head)
12	Shaft Sleeve Gasket
13	Impeller Nut Gasket
14	Stuffing Box Head Gasket
15	Stuffing Box Head
16	Stuffing Box Gland
17	Bolts (Gland)
18	Nuts (Gland)
19	Lantern Ring
20	Stuffing Box Packing

ITEM No.	DESCRIPTION
21	Tubing and Connectors
22	Connector 90°
23	Connector Straight
24	Compression Nut
25	Compression sleeve
27	Pipe Plug
31	Suction Head Gasket
32	Suction Head
33	Suction Head Wearing Ring
34	Pipe Plug
35	Casing
36	Casing Wearing Ring
37	Pipe Plug
40	Impeller

BARNES®

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PRESSURE **PS** SYSTEMS

CROWN

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Limited 24 Month Warranty

Crane Pumps & Systems warrants that products of our manufacture will be free of defects in material and workmanship under normal use and service for twenty-four (24) months after manufacture date, when installed and maintained in accordance with our instructions. This warranty gives you specific legal rights, and there may also be other rights which vary from state to state. In the event the product is covered by the Federal Consumer Product Warranties Law (1) the duration of any implied warranties associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. **THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, F.O.B. POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE.** Unless expressly stated otherwise, guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by us, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory tests corrected for field performance, the latter shall control. **RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN.**

This warranty shall not apply when damage is caused by (a) improper installation, (b) improper voltage (c) lightning (d) excessive sand or other abrasive material (e) scale or corrosion build-up due to excessive chemical content. Any modification of the original equipment will also void the warranty. We will not be responsible for loss, damage or labor cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval.

This warranty is void if our inspection reveals the product was used in a manner inconsistent with normal industry practice and/or our specific recommendations. The purchaser is responsible for communication of all necessary information regarding the application and use of the product. **UNDER NO CIRCUMSTANCES WILL WE BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR FEES, UNAUTHORIZED REPAIR SHOP EXPENSES, LOST PROFITS, LOST INCOME, LABOR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval.

CRANE®

A Crane Co. Company

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Brampton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650

**IMPORTANT!
WARRANTY REGISTRATION**

Your product is covered by the enclosed Warranty.
To complete the Warranty Registration Form go to:

<http://www.cranepumps.com/ProductRegistration/>

If you have a claim under the provision of the warranty, contact your local
Crane Pumps & Systems, Inc. Distributor.

RETURNED GOODS

**RETURN OF MERCHANDISE REQUIRES A "RETURNED GOODS AUTHORIZATION".
CONTACT YOUR LOCAL CRANE PUMPS & SYSTEMS, INC. DISTRIBUTOR.**



**Products Returned Must Be Cleaned, Sanitized,
Or Decontaminated As Necessary Prior To Shipment,
To Insure That Employees Will Not Be Exposed To Health
Hazards In Handling Said Material. All Applicable Laws
And Regulations Shall Apply.**



A Crane Co. Company

PUMPS & SYSTEMS

START-UP REPORT

General Information

Pump Owner's Name: _____
 Address: _____
 Location of Installation: _____
 Contact Person: _____ Phone: _____
 Purchased From: _____

Nameplate Data

Pump Model #: _____ Serial #: _____
 Part #: _____ Impeller Diameter: _____
 Voltage: _____ Phase: _____ Ø Hertz: _____ Horsepower: _____
 Full Load Amps: _____ Service Factor Amps: _____
 Motor Manufacturer: _____

Controls

Control panel manufacturer: _____
 Model/Part number: _____
 Number of pumps operated by control panel: _____
 Short circuit protection? YES___ NO___ Type: _____
 Number and size of short circuit device(s): _____ Amp rating: _____
 Overload Type: _____ Size: _____ Amp rating: _____
 Do protection devices comply with pump and motor Amp rating? YES___ NO___
 Are all electrical and panel entry connections tight? YES___ NO___
 Is the interior of the panel dry? YES___ NO___
 Liquid level Control Brand and Model: _____

Pre-Startup

All Pumps

Type of equipment: NEW___ REBUILT___ USED___
 Condition of equipment at Start-Up: DRY___ WET___ MUDDY___
 Was Equipment Stored? YES___ NO___ Length of Storage: _____
 Liquid being pumped: _____ Liquid Temperature: _____
 Supply Voltage/Phase/Frequency matches nameplate? YES___ NO___
 Shaft turns freely? YES___ NO___
 Direction of rotation verified for 3Ø motors? YES___ NO___
 Debris in piping or wet well? YES___ NO___
 Debris removed in your presence? YES___ NO___
 Pump case/wet well filled with liquid before startup? YES___ NO___
 Is piping properly supported? YES___ NO___

Non-Submersible Pumps

Is base plate properly installed / grouted? YES___ NO___ N/A___
 Coupling Alignment Verified per I&O Manual? YES___ NO___ N/A___
 Grease Cup/Oil Reservoir Level checked? YES___ NO___ N/A___

Submersible Pumps

Resistance of cable and pump motor (measured at pump control):

Red-Black: _____ Ohms(Ω) Red-White: _____ Ohms(Ω) White-Black: _____ Ohms(Ω)

Resistance of Ground Circuit between Control Panel and outside of pump: _____ Ohms(Ω)

MEG Ohms check of insulation:

Red to Ground: _____ White to Ground: _____ Black to Ground: _____

Operational Checks

Is there noise or vibration present? YES___ NO___ Source of noise/vibration: _____

Does check valve operate properly? YES___ NO___ N/A___

Is system free of leaks? YES___ NO___ Leaks at: _____

Does system appear to operate at design flow rate? YES___ NO___

Nominal Voltage: _____ Phase: 1Ø 3Ø (select one)

Voltage Reading at panel connection, Pump OFF: L1, L2 _____ L2, L3 _____ L1, L3 _____

Voltage Reading at panel connection, Pump ON: L1, L2 _____ L2, L3 _____ L1, L3 _____

Amperage Draw, Pump ON: L1 _____ L2 _____ L3 _____

Submersible Pumps

Are BAF and guide rails level / plumb? YES___ NO___

Is pump seated on discharge properly? YES___ NO___

Are level controls installed away from turbulence? YES___ NO___

Is level control operating properly? YES___ NO___

Is pump fully submerged during operation? YES___ NO___

Follow up/Corrective Action Required

YES___ NO___

Additional Comments:

Startup performed by: _____ Date: _____

Present at Start-Up

() Engineer: _____ () Operator: _____

() Contactor: _____ () Other: _____

All parties should retain a copy of this report for future trouble shooting/reference



PUMPS & SYSTEMS

A Crane Co. Company

420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Brampton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650