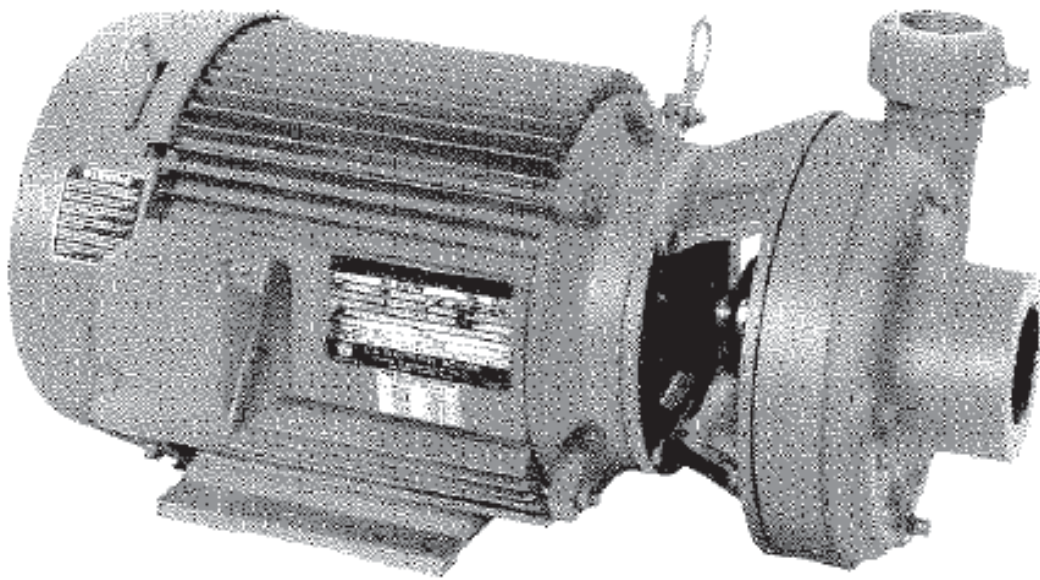


DEMING®

INSTALLATION, OPERATION & MAINTENANCE MANUAL MotorMount Centrifugal Pumps

Series: 4359



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

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Form No. 120010-Rev. C

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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 cause hazardous pressure, eruptions or explosions could cause personal injury or property damage.

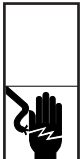


Rotating machinery Amputation or severe laceration can result.



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.



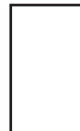
Always wear eye protection when working on pumps.



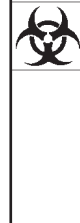
Make sure lifting handles are securely fastened each time before lifting. **DO NOT** operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair. Secure the pump in its operating position so it can not tip over, fall or slide.



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. Minimum 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.

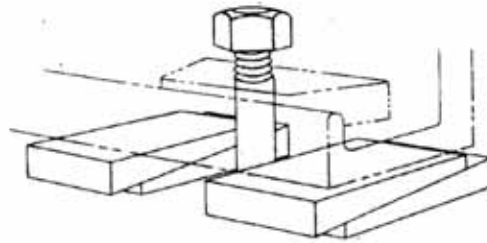


Figure 2. Adjusting Wedges for Mounting

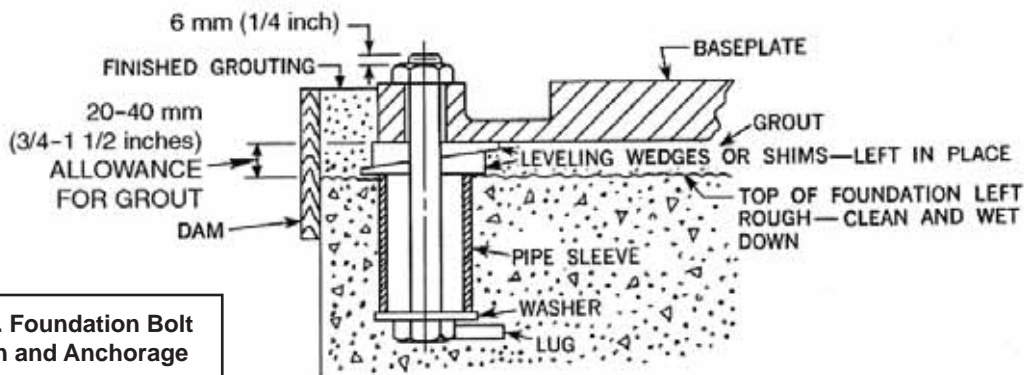


Figure 1. Foundation Bolt Location and Anchorage

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.

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. Check the seal.
- e. Open the seal flush valve, if used
- f. Shaft turns freely
- g. Rotation is correct. The pump must rotate in the direction of the arrow on the casing.
- h. 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.

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

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

2. PRIMING

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, packing or 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

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.

2. MECHANICAL SEAL

By their nature, a properly lubricated mechanical seal requires no maintenance.

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.

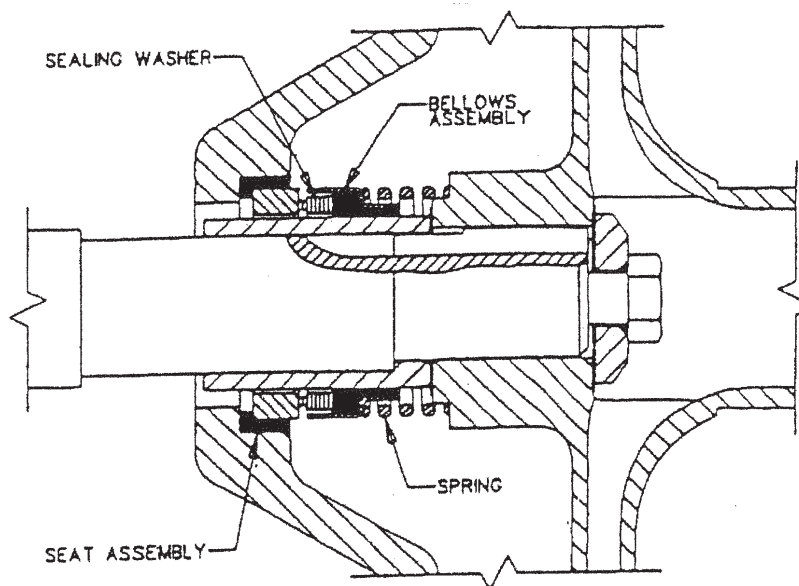
- Slowly remove drain plugs (15) in top and bottom of casing (14). Disconnect suction and discharge pipes.
- Remove motor foundation bolts.
- Remove casing capscrews (12). Pull casing (14) from support head (11). Place casing gasket (13) in a bucket of water to keep it soft and pliable
- Hold impeller and remove impeller capscrew (09), impeller washer (07), gasket (06), and O-ring (08).
- Insert pry bar behind the impeller (10) and carefully exert pressure at several points, forcing the impeller from the shaft.
- Remove sleeve gasket (05) from shaft.
- Remove key (04) from shaft.

2. REPLACEMENT OF THE MECHANICAL SEAL

- Special precautions must be taken when handling a mechanical seal. Do Not drop the carbon seal faces, floating seats or scratch the lapped faces of these pieces.
- To remove the seal assembly, dismantle the pump liquid end. After removing the casing (14) and impeller (10), the support head assembly (11) may be removed from the motor (01) by removing capscrews (02). Press the seat assembly (18) from the support head (11).
- To install new seal assembly oil the outer surfaces of the seat ring (use oil, not grease) and push the assembly into the support head cavity, seating it firmly and squarely. If it is not possible to insert seat with fingers, place cardboard protecting ring furnished with the 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.
- Mount support head (11) to motor and replace capscrews (2). Slide shaft sleeve (03) onto shaft until it is tight against shaft shoulder. Apply a thin coating of clean light oil to the shaft sleeve (03) then slide the sealing washer, bellows assembly and spring onto shaft sleeve.

3. REASSEMBLY OF LIQUID END

- Align keyways on shaft and sleeve (03) and place key (04) in keyway.
- Position sleeve gasket (05) against end of sleeve (03) next to hub of impeller (10).
- Mount impeller (10) on the end of motor shaft. Be sure impeller is fully seated against the end of shaft sleeve (03).



CAUTION: - DO NOT drive impeller onto motor shaft as this may damage motor bearings and mechanical seal.

- d. Assemble the impeller screw O-ring (08), impeller washer (07) and impeller washer gasket (06) on the impeller screw (09). Clean threads and apply a drop of Loctite® #601 to the impeller screw. Mount this assembly on the end of the motor shaft. Tighten securely.
- e. Place casing gasket (13) against support head (11). Mount casing (14) in proper position and replace cap screws (12).

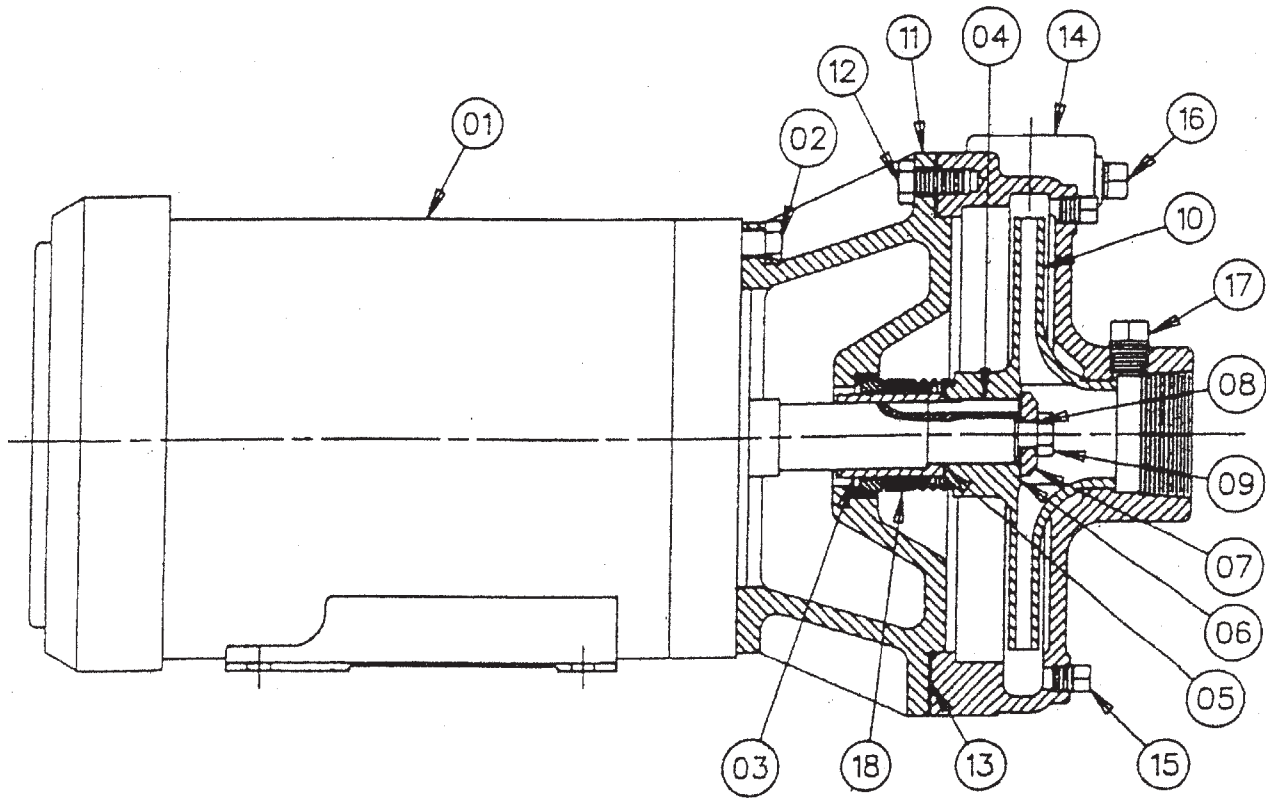
CAUTION: - Be sure that registered flange of support head (11) and casing (14) are fully seated before tightening capscrews (12).

CAUTION: - NEVER RUN PUMP DRY.

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.
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.



ITEM No.	DESCRIPTION
01	Motor
02	Capscrew
03	Sleeve, Shaft
04	Key
05	Gasket, Sleeve
06	Gasket, Impeller
07	Washer, Impeller
08	O-ring
09	Screw, Impeller
10	Impeller

ITEM No.	DESCRIPTION
11	Support Head
12	Capscrew
13	Gasket, Casing
14	Casing
15	Pipe Plug
16	Pipe Plug
17	Pipe Plug
18	Mechanical Seal

BARNES®

BARNES®
PRESSURE **PS** SYSTEMS

CROWN

burks®

WEINMAN®

DEMING®

PROSSER®

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.

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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.**