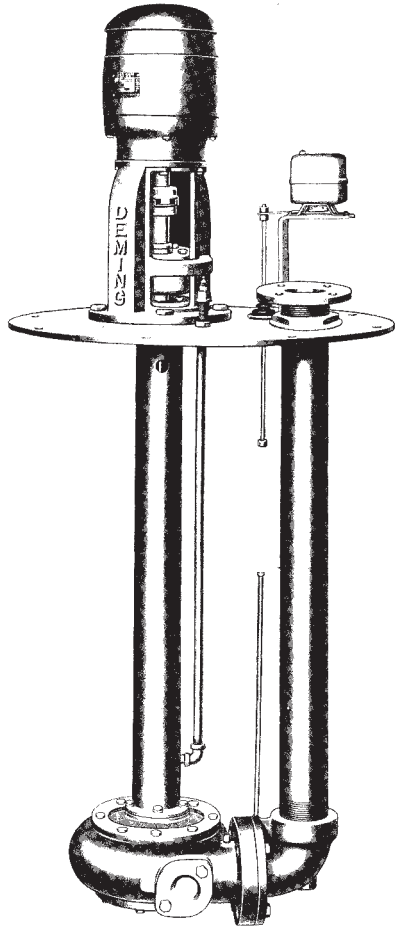


DEMING®

INSTALLATION, OPERATION & MAINTENANCE MANUAL Vertical Wet Pit Solids Handling Sump Pumps



Series: 7560

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.*

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A Crane Co. Company

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Form No. 120032-Rev. D

CONTENTS

SAFETY FIRST	3
A. GENERAL INFORMATION.....	4
Receiving	
Storage	
Service Centers	
B. INSTALLATION	4
C. DIRECTION OF ROTATION.....	5
D. LUBRICATION.....	5
E. PUMP ADJUSTMENT	5 - 6
F. GENERAL MAINTENANCE AND REPAIR.....	6
G. LIQUID END DISASSEMBLY	6
H. DISASSEMBLY OF COLUMN AND SHAFT - 6 ft or less	6
H. DISASSEMBLY OF COLUMN AND SHAFT - greater than 6ft	7
I. TO INSPECT OR REPLACE THRUST BEARING & SEALS	7
J. TO REPLACE SHAFT	7
K. SHAFT GUIDE BEARING	8
L. INSTALLING NEW BEARING BUSHING	8
M. TOP COLUMN CLOSURE	8
N. REASSEMBLY	9
O. THRUST BEARING ASSEMBLY	9
P. ALTERNATE GUIDE BEARING ASSEMBLY	9 - 10
Q. LOCATING TROUBLE	10
CROSS-SECTION & PARTS LIST	11 - 12
WARRANTY & RETURNED GOODS	15

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.

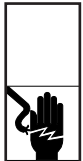


Rotating machinery Amputation or severe laceration can result.



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! Never operate a pump with a plug-in type power cord without a ground fault circuit interrupter.



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.



CAUTION! Do not block or restrict discharge hose, as discharge hose may whip under pressure.



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.



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.



DO NOT remove cord and strain relief. **DO NOT** connect conduit to pump.



WARNING! Cable should be protected at all times to avoid punctures, cut, bruises and abrasions. Inspect frequently. Never handle connected power cords with wet hands.



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! Submersible Pumps are not approved for use in swimming pools, recreational water installations decorative fountains or any installation where human contact with the pumped fluid is common.



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.

This pump is designed for pumping raw or treated sewage, light sludge, slurries, industrial wastes and similar liquids containing solids. Standard pumps are assembled, adjusted and lubricated at the factory before shipment. Motor and flexible shaft coupling are normally shipped unmounted and are to be installed on the pump at job site.

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.

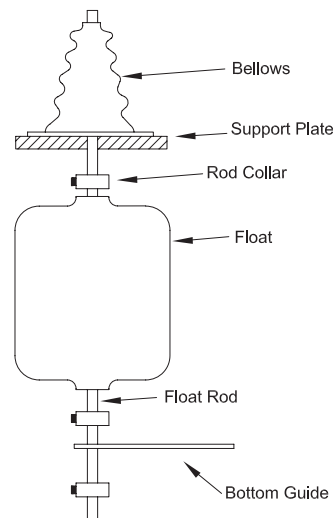
Long Term - Any length of time exceeding six (6) months, but not more than twenty four (24) months. The units should be stored in a temperature controlled area, a roofed over walled enclosure that provides protection from the elements (rain, snow, wind blown dust, etc.), and whose temperature can be 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. The float and rod, when used, must be mounted as shown and partially adjusted before the pump is lowered into the sump.
 - a. Insert float rod through the rubber bellows on the support plate or pit cover. Slide a float rod collar onto the lower end of the float rod, then the float, then an additional float rod collar.



- b. Insert the bottom end of the float rod through the bottom guide, then attach the lower float rod collar near the end of the float rod and tighten set screw.
 - c. Slide a float rod collar on the top end of the float rod and insert the rod through the float switch arm. Place another float rod collar on the top end of the float rod and partially tighten set screw.
 - d. Position the float rod collar below the float so that it is locating approximately 4" above the bottom guide and tighten the set screw. At this level the pump will stop operating.
 - e. Place the rod collar above the float at the desired start level, measured from the support plate, and tighten the set screw.
2. Place the support plate sealing gasket around the rim of the sump, aligning the holes in the gasket with the foundation bolt holes. Carefully lower the pumping unit into the sump, placing the discharge pipe in the desired position and aligning the holes in the support plate with the foundation bolts.
 3. The support plate (23) must rest evenly at all points and must be level before it is bolted to the sump rim. Shim and grout to level the support plate, then partially tighten foundation bolts. Turn pump shaft by hand to be sure that it rotates freely. Continue to tighten foundation bolts, checking shaft rotation until bolts are snug.
 4. Install coupling halves (42 & 44) on the motor shaft and pump shaft according to coupling manufacturer's recommendations.
 5. Lift the motor over the frame (19) and carefully lower the motor until it rests on the frame. Insert and tighten cap screws (219).
 6. Connect the power leads to motor terminals according to motor wiring diagram and to motor control or starter and test for proper motor rotation, refer to section "Direction of Rotation".

7. When proper rotation established, complete the coupling assembly and tighten coupling set screws. Rotate pump shaft several times by hand to be sure that shaft rotates freely. If shaft binds, refer to section on "Pump Adjustments".
8. Make permanent power lead connections to the float switch and/or starter and motor. **Note:** Float switch must provide overload protection for the motor or an across-the-line magnetic starter, providing overload and low voltage protection for the motor, plus a float switch, is required for use with the pump.
9. Push the float switch arm down to its lowest position. Lift the float rod about 1/2" and slide the top float rod collar against the switch arm and tighten the set screw. Position the lower float rod collar about 1/2" below the float switch arm and tighten the set screw.
10. Connect discharge pipe to pump discharge. **Note:** The discharge pipe must be properly supported so that the weight of the pipe and fittings do not rest on the pump discharge connection as this may cause pump misalignment. A check valve and gate valve should be installed near the pump discharge to prevent possible pump damage due to reverse flow upon pump shut-down.
11. Start the pump and check for proper rotation. The pump should operate smoothly and without vibration. If the pump vibrates, there may be distortion of the pump support plate or discharge pipe. Relieve this strain until the pump operates without vibration. Refer to section on "Pump Adjustments".

C - DIRECTION OF ROTATION

Before placing pump in service, the proper direction of rotation must be established. If pump rotates in reverse rotation the shaft coupling might unscrew and cause a bent shaft or broken impeller or casing.

These pumps normally operate in right hand or clockwise direction when looking down on top of the motor, however, pumps specified for left hand rotation will rotate counter-clockwise. See rotation arrow on the pump.

Jog control to test rotation. If rotation is incorrect, on three phase current, interchange the two main power leads at the starter and test rotation again. On single phase current, if motor rotation is reversed, consult motor manufacturer or his representative. When proper direction of rotation is established, mark power leads to starter terminals.

D - LUBRICATION

All pump and component parts have been lubricated at the factory before shipment. Periods of subsequent lubrication depend upon operating conditions. Periodic inspection of the bearings and packing box lubrication is necessary and additional grease should be added as required.

CAUTION: Do Not overgrease ball bearings.

The following lubricants are recommended for this pump. Ball thrust Bearings: Shell Alvania #71012 or equal.

Stuffing Box Packing: Shell Alvania #71012 or equal.

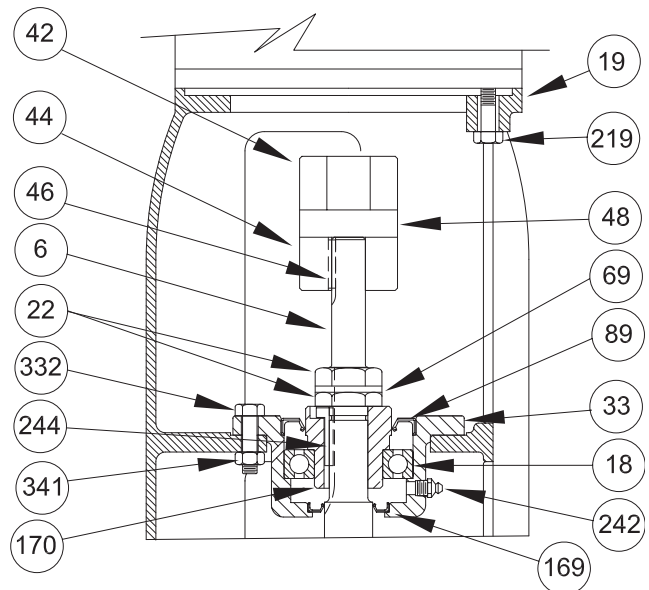
Shaft Bearings: For standard bronze or iron bearings use a water resistant grease such as Shell Alvania EPRO #71030 or equal.

Motor Bearings: Follow motor manufacturer's Instructions as to the type of grease and frequency of lubrication.

E - PUMP ADJUSTMENTS

If after making the installation, the pump shaft does not rotate freely or if there is vibration in the pumping unit, the following adjustments are recommended.

1. Place entrance switch in the off position and separate the coupling halves so that the shaft turns free.



2. Bend the tang of the lockwasher (69) clear of the top lock nut (22) and unscrew the lock nut. Hold the pump shaft (6) with a strap wrench and turn the bottom adjusting nut (22) counter clockwise to lower the shaft until the impeller just rubs the suction cover (7) when the shaft is rotated. Tighten the lower adjusting nut (22) by turning clockwise 1/6 turn or approximately 60° to obtain an impeller clearance of .008" to .010". This setting will give maximum performance under normal operating conditions.
3. Tighten the top lock nut (22) and bend the tang of the lockwasher into the slot of the lock nut. Check again to see that shaft turns freely, then engage coupling halves and reconnect power.

4. Improper alignment of the discharge pipe (161) may cause the shaft to bind. Loosen the top pipe lock nut (254) two or three turns and test for shaft rotation. If shaft is free, gradually tighten the pipe lock nut again, checking for shaft rotation as the nut is tightened.
5. If shaft still binds, lift pump from the sump and loosen the bottom pipe lock nut below the support plate (23). Continue to tighten the top pipe lock nut and the binding should be relieved. Tighten the bottom pipe lock nut. when maximum shaft freedom has been obtained and make sure the top pipe lock nut tight.
6. Lubrication or flush lines (335) have been furnished to the bottom and intermediate bearing assembly (99). Check adjustment of the pipe lock nuts above and below the support plate for proper adjustment as in number 5 above.
7. An accurate adjustment of the pump impeller and alignment can be established by the use of a watt-meter to measure minimum current requirement of the motor as the adjustments are being made.
8. Top Column Closure - The stuffing box packing (13) is properly adjusted when the gland (17) is tight enough to prevent gases from escaping along the shaft but does not prevent the shaft from turning freely. Excessive gland pressure will cause the packing to wear on the shaft and increase power consumption.

F- GENERAL MAINTENANCE AND REPAIR

Care should be exercised in keeping all parts of the pump clean when the pump is disassembled. Special precautions should be taken to keep ball bearings dirt-free at all times. Any part which is excessively worn or deteriorated should be replaced with new parts before reassembling the pump.

When ordering repairs, refer to the illustrations included in this manual for correct part names and to the pump nameplate on which is stamped the pump figure number, size and serial number which must be available when ordering repairs.

When dismantling the pump for inspection or repair and complete disassembly is not required, use only the steps contained herein which apply to the particular requirements.

1. Close the discharge line gate valve and place the entrance switch in the off position. Remove and tag the power leads to the motor and disconnect the discharge pipe at the pipe flange or coupling (295).

2. Disengage the flexible shaft coupling, following manufacturer's recommendations. Remove motor cap screws (219) then remove the motor from the frame (19), also remove foundation bolts from support plate.
3. Lift the pumping unit with support plate from the sump to a horizontal position on the floor or other suitable support.

G - LIQUID END DISASSEMBLY

1. Remove cap screws (215), suction cover (9) and gasket (73). Place gasket in water.
2. Remove impeller screw (26) by turning counter clockwise, also remove impeller washer (270). Pull impeller (2) from the shaft and lift key (32) from the keyway in the shaft.
3. Remove cap screw (265), cap screws (267) and hex nuts (268) at the casing discharge flange and place gasket (336) in water also dismantle lube pipe assembly (335) to the bottom bearing assembly.
4. Unscrew cap screws (212) and remove casing (1) from casing adapter (71). Place gasket (73A) in water. Unscrew cap screws (226) and remove casing adapter (71), gasket (241) and bottom guide bearing assembly (99) from shaft. Place gasket in water.

If it is necessary to remove discharge pipe (161) from the pump, remove discharge flange (295) or coupling, top pipe nut (294) and gasket (254) then remove pipe and elbow (105).

H - DISASSEMBLY OF COLUMN AND SHAFT - 6 feet or less

Pumps furnished for sump depths 6 feet or less will normally include one column pipe (101) and one shaft (6).

1. Dismantle liquid end assembly as in Section G.
2. Unscrew nuts (256) and remove column pipe (101).
3. Packing box assembly (11) can now be removed from the shaft. Loosen nuts (210) to relieve pressure on the packing (13).
4. To remove pump shaft (6) see procedure to remove thrust bearing assembly, Section I, then the shaft may be removed from frame (19).

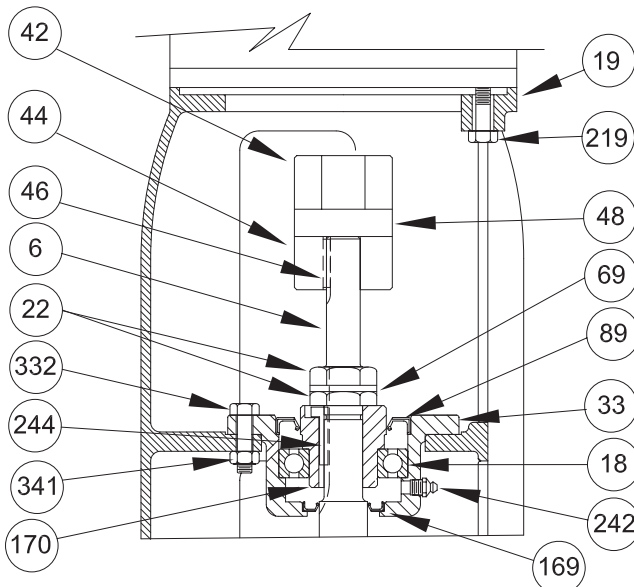
H - DISASSEMBLY OF COLUMN AND SHAFT - greater than 6 feet

Pumps furnish for sump depths greater than 6 feet will include two or more lengths of column pipe (101I) and shaft with coupling (6 & 70) with intermediate guide bearing assembly (99I) located in each connecting flange. Note: Shaft threads are normally right hand.

1. Dismantle liquid end assembly as in Section G.
2. Remove lube pipe assembly (335) to each intermediate bearing assembly (99I).
3. Unscrew nuts (288) and remove intermediate column pipe and intermediate bearing assembly.
4. Remove top column pipe, packing box cover assembly (11) and shaft as noted above.

I - TO INSPECT OR REPLACE THRUST BEARING & SEALS

1. Place entrance switch in off position and remove and tag power leads to the motor.



2. Disengage flexible shaft coupling then remove cap screws (219) and lift motor from frame (19).
3. Remove lower half of flexible coupling (44) and key (46) from shaft (6). Bend tang of lockwasher (69) and remove top lock nut (22), lockwasher (69) and lower lock nut (22) by turning counter-clockwise.
4. Unscrew grease fitting (242) and remove cap screws and nuts (332) & (341) also bearing adapter key (244). Lift the bearing housing assembly (33) from the frame (19).

5. To remove bearing adapter (170), thrust bearing (18) and shaft seal (89) from the bearing housing (33), place a rod through the hole at the bearing housing seal (169) and gently bump on the bottom of bearing adapter, moving around its diameter, until it is released from the bearing housing. Note: This must be done carefully.
6. Remove the thrust bearing (18) from the bearing adapter. The bearing housing seal (169) may be pushed out of the bearing housing with a rod or piece of wood.
7. Press the new thrust bearing (18) onto the bearing adapter (170), with the wide space between the bearing races toward the top of the bearing adapter, until the bearing is firm against the shoulder of the bearing adapter. Apply fresh grease to the bearing.
8. Press new bearing housing seal (169) into the bottom of the bearing housing with the "lip" visible looking down into the bearing housing. Loosely pack the bearing housing with fresh grease.
9. Place bearing housing (33) in a vise with flange resting on vise jaws. Place bearing adapter with bearing over bearing housing and press down on top of the bearing adapter to seat the thrust bearing (18) in its seat. Lay a piece of wood across the top of the bearing adapter and tap lightly on wood to completely seat the bearing and seal (169).
10. Place this assembly over the shaft, line up keyway in the shaft and bearing adapter and press into position. Insert bearing adapter key (244) into keyway. Align holes in the flange of the bearing housing with those in the frame (19) and replace cap screws (332) and nuts (341). Tighten securely. Press new seal (89) into flange of the bearing housing.
11. Thread lower bearing lock nut (22) onto the shaft and tighten until snug. Hold the shaft in a down position by applying pressure to the top of the shaft and tighten the lower lock nut until the shaft just turns free by hand. If shaft binds refer to "Pump Adjustments". Replace lockwasher (69) and top bearing lock nut (22).
12. Proceed with impeller adjustment, See "Pump Adjustment". Note: When installing new thrust bearing, we also recommend replacing the two seal (89) & (169).

J - TO REPLACE SHAFT

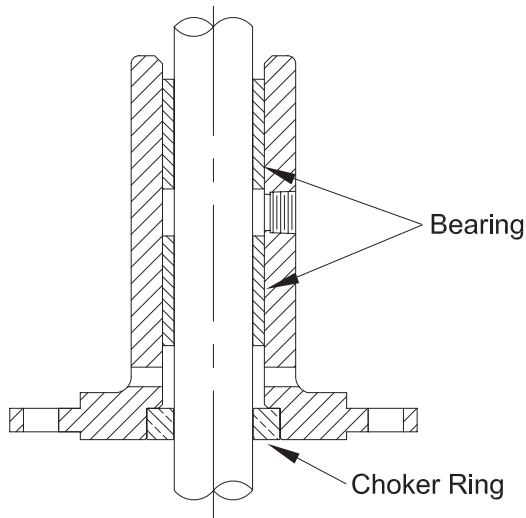
Proceed as in Sections G, H & I. Before replacing bearing housing assembly in the frame (19) as described, insert new shaft through the frame then proceed with reassembly as described.

K - SHAFT GUIDE BEARING

Standard shaft guide bearings include Design 6 Bottom Assembly and Design 8 Intermediate Assembly. Other design assemblies are available as shown in "Alternate Guide Bearing Assembly". Identify design construction before attempting to replace bearing bushings. Note carefully the position of each piece in the bearing housing (99).

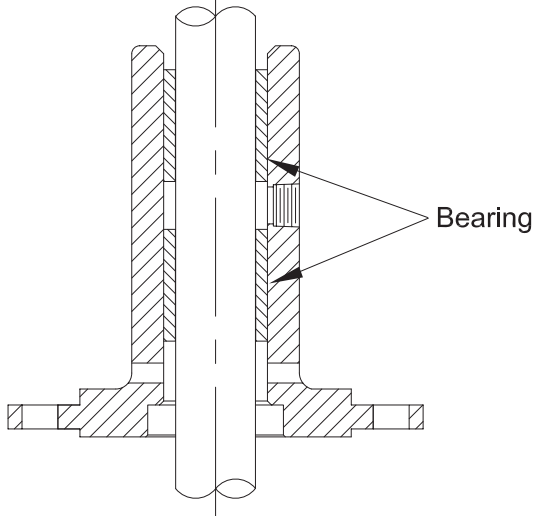
1. DESIGN 6 BOTTOM ASSEMBLY, Fig.1

Dismantle liquid end as described previously. Place bearing assembly in a vise, flanged end down, then with a piece of tubing or round bar of the proper size push the two bearing bushings (39) and choker ring (257) out of the flanged end of the bearing housing (99).



2. DESIGN 8 INTERMEDIATE ASSEMBLY Fig. 2

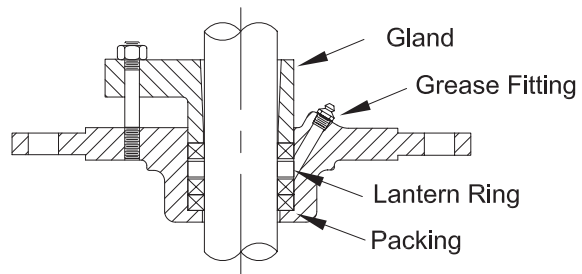
Dismantle liquid end and column pipe as shown in Fig. 2. Design 8 is similar in construction to Design 6 except that it does not include choker ring (257). For dismantling of other designs refer to "Alternate Guide Bearing Assembly".



L - INSTALLING NEW BEARING BUSHING

1. Bearing bushings (39) are furnished in sections, two sections required per housing. Place the bearing housing (99) in a vise, flanged end up. Select a bearing bushing and note that one end shows a grease groove while the other end is plain (except for certain special application bearings).
2. Position bearing bushing in the bearing housing with the grease groove down and carefully press bearing into position as shown. Also press choker ring (257) into position, Design 6 only. Turn the bearing housing over and carefully press the other half of the bearing bushing into position in the same manner as above. CAUTION: Do not cover grease port in side of bearing housing.
3. See "Alternate Guide BEaring Assemblies".

M - TOP COLUMN CLOSURE



1. To replace packing (13) remove hex nuts (210) also gland bolts and nuts and remove split gland (17) from the shaft. With a packing puller, remove the old packing and lantern ring (29) from the packing box cover (11).
2. Tamp first ring of new packing into packing box. Stagger the next packing ring so that the joint will be approximately 180° apart. Tamp the rings evenly then turn the shaft by hand.
3. Replace the lantern ring in the packing box, then position the final packing ring in the box and tamp into place.
4. Reassemble split gland on the shaft, replace hex nuts (210) and tighten to seat packing. Loosen the nuts until shaft rotates freely by hand. Refer to section on "Pump Adjustment", for proper adjustment. Note: If packing is other than pre-formed rings, cut packing length so that when wrapped around the shaft, the ends do not quite touch.

N - REASSEMBLY

Select those steps below which apply to the repairs involved.

1. **Frame** - If frame (19) and gasket (250) were removed from the support plate (23), reposition these on the support plate and replace cap screws (221) and nuts (247). Tighten securely. Insert cap screws (260) through the frame.
2. **Column and Shaft** - Insert shaft through frame as shown. Place packing box cover (11) over lower end of shaft and slide into position against bottom of frame (19), aligning holes in flange with cap screws (260). If pump includes more than one piece of shaft, assemble top and intermediate or top and bottom pieces at the shaft coupling.

Slide the top column pipe (1011), if furnished, or the bottom column pipe (101) over the shaft, and align holes in flange with the cap screws, replace nuts and tighten securely. Be sure hole for grease pipe is in the proper position in relation to the support plate.

Insert intermediate guide bearing assembly (991), if furnished, into the lower end of the top column pipe, aligning grease pipe hole with the hole in the column pipe. Slide bottom column pipe over shaft, align grease pipe holes then replace cap screws and nuts (285) and (288) in the connecting flange.

If only the bottom column pipe (101) is to be installed, omit the above paragraph and insert the lower guide bearing assembly (99) into the lower end of the bottom column pipe, align grease pipe hole with hole in column pipe and replace gasket (241) and casing adaptor (71) on the end of the column pipe and attach with cap screws (226). Reassemble grease pipes to the guide bearing assemblies.

3. **Liquid End Assembly** - Place casing gasket (73A) and casing (1) against the casing adaptor with the discharge flange in the proper position and replace cap screws (212). Tighten securely. Clean pump shaft and bore of impeller hub with emery cloth. Apply a drop of Loctite No. 601 to the pump shaft and spread around the shaft. Place impeller key (32) in the shaft keyway.

Place the impeller (2) onto the shaft. Hold a block of wood over the impeller and tap lightly on the block until the impeller is seated on the shaft. Apply a drop of Loctite No. 601 on the impeller screw (26) then replace the impeller washer (270) and impeller screw on end of the pump shaft and tighten securely.

CAUTION: Do not use impeller screw to draw the impeller onto the shaft.

Place the suction cover gasket (73) on the suction cover (9) and attach to casing (1) using cap screws (215). Reassemble discharge pipe (161), if previously dismantled, and align with casing discharge flange. Replace gasket (336), cap screw (265) and cap screws and nuts (267) and (268).

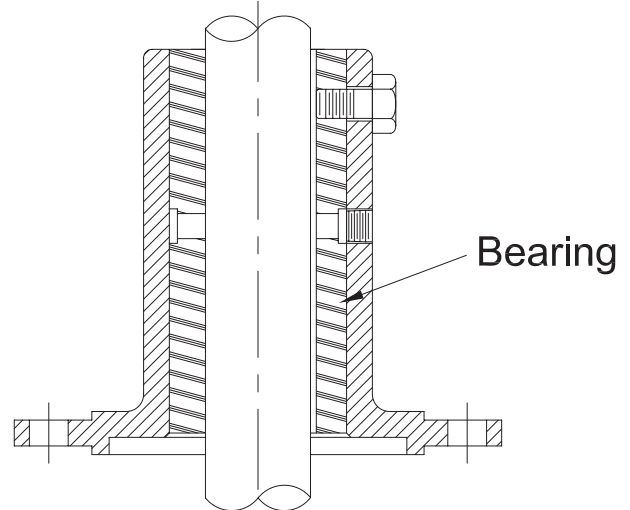
O - THRUST BEARING ASSEMBLY

Refer to "General Maintenance & Repairs" section I, items 10 thru 12 for installation of Thrust Bearing Assembly.

P - ALTERNATE GUIDE BEARING ASSEMBLY

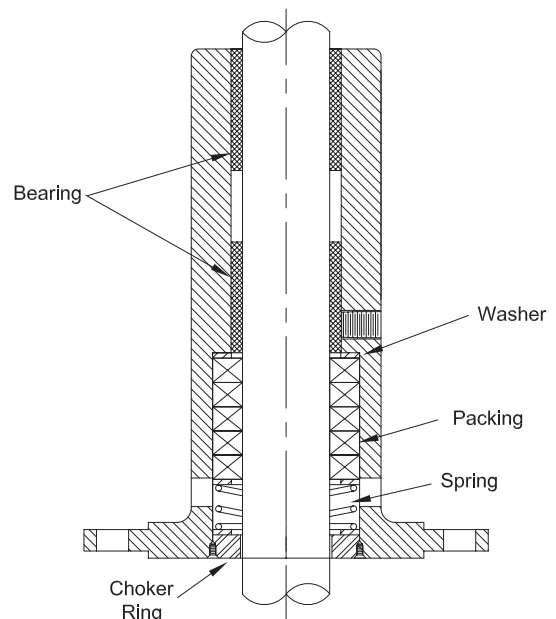
In certain application, alternate guide bearing assemblies will be furnished as shown below.

To replace bearings in those shown, follow general instructions on pages 6 thru 9 applying to Design 6 or Design 8 and proceed as follows.



Design 10 - Remove lock screw and push bearing bushing (39) from flanged end of bearing housing (99). Place housing in vise, flanged end up, and carefully press the Teflon bearing bushing into the housing. Make sure that the lubrication groove is opposite the tapped pipe opening in the center of the bearing housing.

Drill a hole, 1/4 inches in diameter, in the bearing bushing through the tapped hole in the bearing housing, and



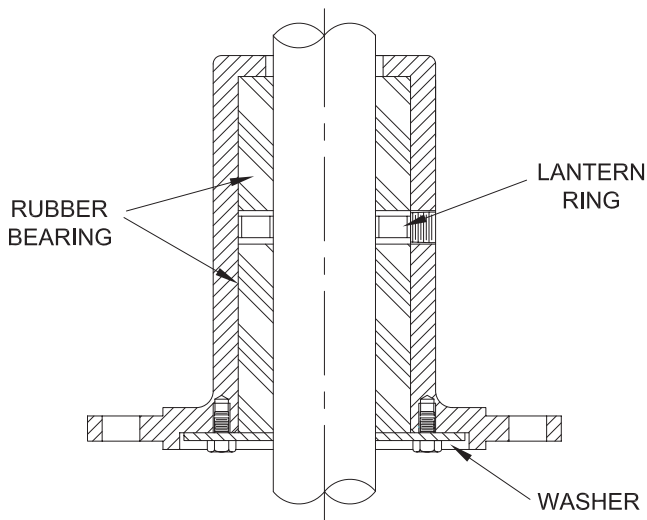
replace the lock screw.

Design 11 - Remove the lock screws. Place bearing housing (99) in vise, flanged end down. Press chocker ring, washer, spring and bearing bushing from the housing. Invert bearing housing. Select on bearing bushing and press into bearing housing, with grooved end up, until flush with end of housing bore; See above.

Press second bearing bushing into the bearing housing with grooved end down until bearing bushing is flushed with the top of the housing. **CAUTION: Grease grooves in the bearing bushings must line up with the tapped pipe opening in the side of the housing.**

From the flanged end of the bearing housing, insert the washer. Place a piece of shaft, same size as the pump shaft through the bearing housing then insert a ring of packing into the bearing housing and tamp into place. Insert and tamp the remaining four rings so that the ends are 180° apart, then insert another washer, the spring and the final washer.

Press the chocker ring into the end of the housing and replace lock screws. Withdraw the shaft. Through the tapped lubrication hole above the center of the bearing housing, drill a hole 1/4 inches in diameter through the lower bearing bushing to allow lubrication to



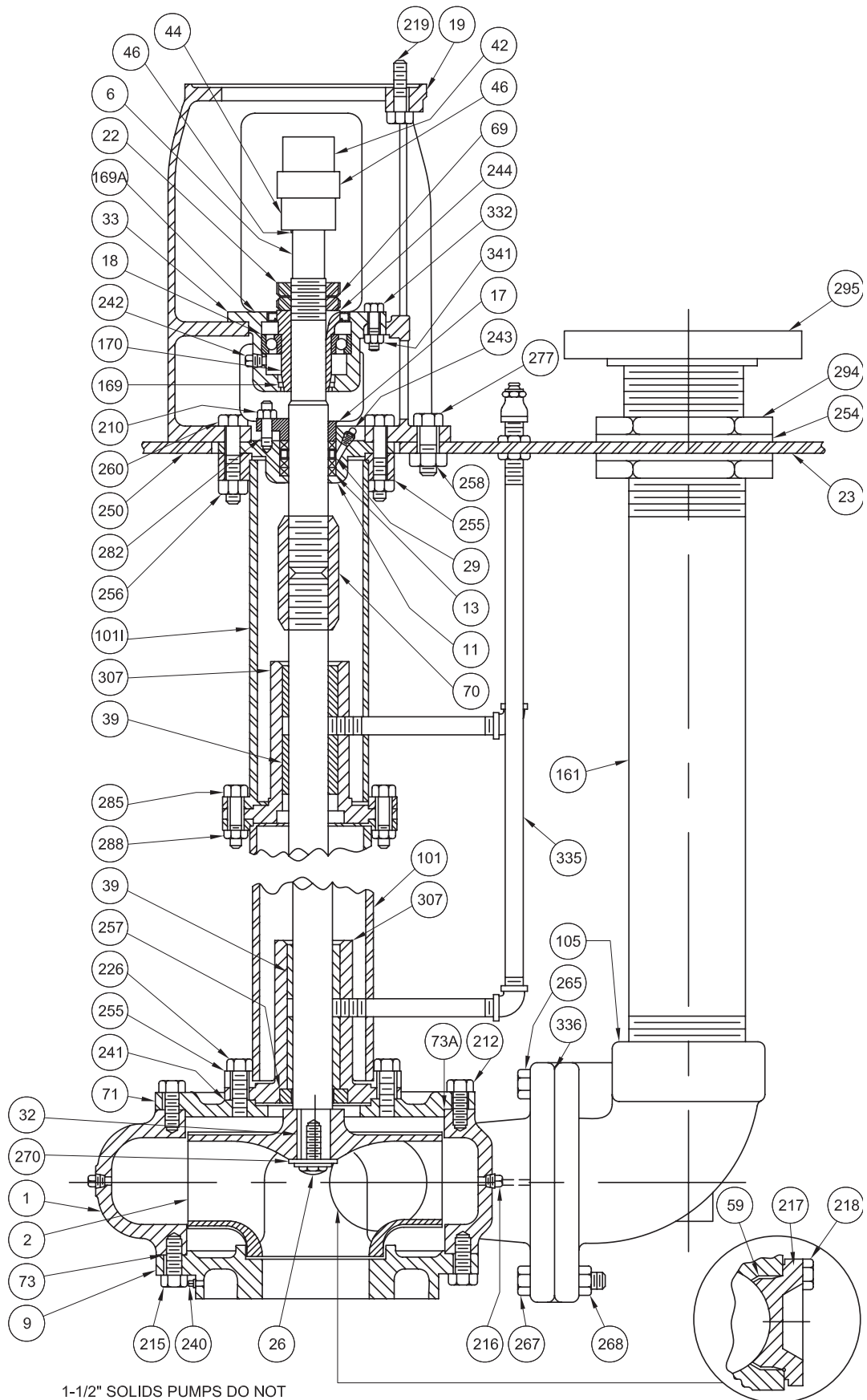
enter the bearing.

Design 12 - Remove the lock screw and washer. Place the bearing housing (99) in a vise, flanged end down, and press the two pieces of rubber bearing and lantern ring from the bearing housing. Invert the bearing housing in the vise.

Press the short piece of rubber bearing into the bearing housing until seated against the end of the housing. Insert the lantern ring then the longer piece of bearing into the housing. Replace the cover washer and the locking screw.

Q - LOCATING TROUBLE

1. No water delivered
 - a. Wrong direction of rotation
 - b. Impeller or pipes plugged
 - c. Discharge head too high
 - d. No water in pit
 - e. Pump suction too close to bottom of pit
2. Not enough water delivered
 - a. Impeller or pipes partly plugged
 - b. Improper impeller adjustment
 - c. Impeller diameter too small
 - d. Mechanical defects
 1. Impeller worn or damaged
 2. Casing worn
 - e. Wrong direction of rotation
3. Not enough pressure
 - a. Air in water
 - b. Mechanical defects
 - c. Impeller diameter too small
 - d. Wrong direction of rotation
 - e. Impeller not properly adjusted
 - f. Discharge head (line friction) lower than expected
4. Pump takes too much power
 - a. Speed too high for required head and capacity
 - b. Head lower than rating; pumps too much water
 - c. Liquid either viscous or heavier than water or both
 - d. Mechanical defects
 1. Shaft bent
 2. Impeller binds in casing
 - e. Strain on pump caused by piping misalignment
 - f. Impeller not adjusted properly



1-1/2" SOLIDS PUMPS DO NOT
HAVE HAND HOLE AS STANDARD

ITEM No.	DESCRIPTION
1	Casing
2	Impeller
6	Shaft (Pump)
9	Suction Cover
11	Packing Box Cover
*13	Packing
17	Gland
*18	Bearing (outboard)
19	Frame
22	Bearing Lock nut
23	Support Plate
*26	Impeller Screw
29	Lantern Ring
*32	Impeller Key
33	Bearing Housing
*39	Bearing Bushing
*39I	Bearing Bushing
42	Coupling (Drive Half)
44	Coupling (Pump Half)
46	Coupling Key
48	Coupling Bushing
59	Hand Hole Cover
69	Lock Washer
70	Coupling
71	Casing Adapter
*73	Suction Cover Gasket
*73A	Casing Gasket
99	Bearing Housing
101	Column Pipe
101I	Column Pipe
105	Discharge Elbow
161	Discharge Pipe
*169	Bearing Housing Seal
170	Bearing Adapter
210	Hex Nut
212	Cap Screw
215	Cap Screw
216	Pipe Plug
*217	O-ring
218	Cap Screw
219	Cap Screw
226	Cap Screw
240	Pipe Plug
*241	Gasket
242	Grease Fitting

ITEM No.	DESCRIPTION
243	Grease Fitting
*244	Bearing Adapter Key
*250	Frame Gasket
*254	Pipe Nut Gasket
255	Column Pipe Washer
256	Hex Nut
*257	Choker Ring
258	Hex Nut
260	Cap Screw
265	Cap Screw
267	Cap Screw
268	Hex Nut
*270	Impeller Washer
277	Cap Screw
282	Stud
285	Cap Screw
288	Hex Nut
294	Pipe Nut
Ø295	Discharge Flange
307	Bearing Retainer
332	Cap Screw
335	Lube Pipe Assembly
336	Gasket
341	Hex Nut

(*) Recommended Spare Parts

(Ø) Flang 3" & up Coupling 2½" & smaller

BARNES®

BARNES®
PRESSURE **PS** SYSTEMS



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.



A Crane Co. Company

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**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.**

