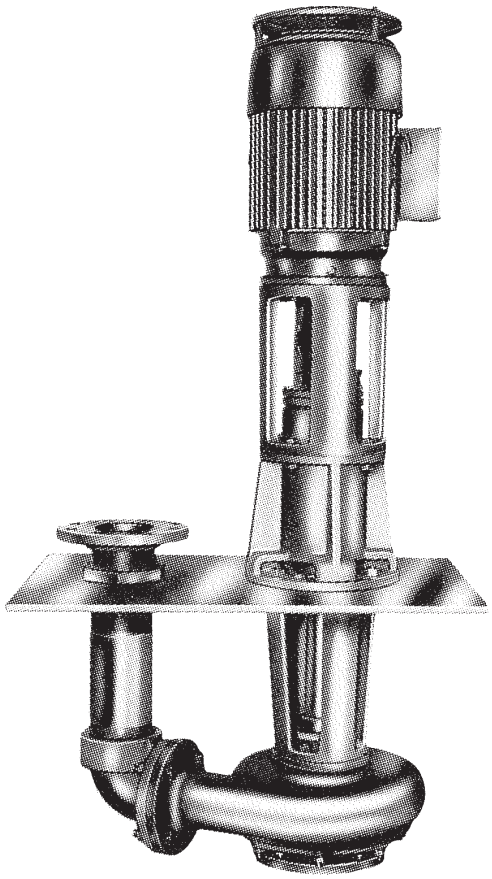
Manual Index

DEMING®

INSTALLATION, OPERATION & MAINTENANCE MANUAL
Vertical Process Pumps



Series: 5562-H
5564

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. 120025-Rev. D

CONTENTS

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 orIndicates 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, burnes or death could result.

Extremely hot - Severe burnes 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.

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.

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.

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 - BEFORE YOU BEGIN

These pumps are assembled, carefully adjusted and lubricated at the factory before shipment.

When motors are shipped unmounted or supplied by the user, the motor and flexible shaft coupling must be mounted on the pump at time of installation.

If pump is furnished with chair bracket for mounting horizontal type motor, the motor shaft must be carefully aligned with pump shaft before installing flexible shaft coupling. See “Chair Bracket Mounting”.

C - INSTALLATION

1. Carefully lower the assembled pumping unit into the tank or pit. The base plate (23) must rest evenly at all points and must be level before it is bolted to the foundation. Shim and grout to level the base plate. Install foundation bolts.

2. If motor and shaft coupling were shipped unmounted:
   a. Install coupling (42) on the motor shaft and pump shaft according to coupling manufacturer’s recommendations.

   b. Lift the motor over the driver pedestal (81) and carefully lower the motor until it rests on the pedestal. Insert and tighten cap screws (219). Complete coupling assembly and tighten coupling setscrews.

3. Rotate pump shaft by hand several times to be sure that it rotates freely. If shaft binds, refer to the section on “Pump Adjustment”.

4. A check valve and gate valve should be installed in the discharge piping near the pump discharge to prevent damage to the pump due to reverse flow upon the pump shut-down.

   Connect discharge piping to the pump discharge. The weight of the pipe and valves must be supported so that the weight does not rest on pump discharge connection, as this may cause misalignment. Do not pull pipe into position with flange bolts.

5. Rotate shaft again by hand several times to be sure that it rotates freely.

D - DIRECTION OF ROTATION

Connect power leads to motor terminals according to wiring diagram on the motor and to the motor control or starter. Remove motor cap screws (219) and disengage the shaft coupling. Jog control to test for proper pump rotation. Standard pump rotate clockwise when looking down on top of the motor, see rotation arrow on the pump. If rotation is incorrect, on 3 phase current interchange the 2 main power leads at the starter and test for rotation again. When proper rotation is established mark the power leads to the proper starter terminals and reassemble the shaft coupling and replace motor cap screws.

E - OPERATION

Start the pump and check again for proper rotation. Pump should operate smoothly and without vibration. If pump vibrates, impeller adjustment may be incorrect or there may be distortion of the pump base plate (23) or the discharge piping. Refer to section on “Pump Adjustment”.

F - PUMP ADJUSTMENT

If after making the installation as above and the pump shaft does not rotate freely or if there is vibration in the pumping unit, the following adjustments are recommended. **LOCK ENTRANCE DISCONNECT SWITCH IN THE OFF POSITION** and separate the coupling halves before proceeding.

G - IMPELLER ADJUSTMENT

An outstanding feature of this pump is the abillity to adjust the impeller clearance to compensate for eventual wear or to modify the design performance of the pump.

The normal clearance between the impeller vanes and suction cover (9) or the casing (1) at the suction inlet is .012 to .015 inches which provides optimum operating performance. To adjust the impeller clearance, proceed as follows:

1. Disengage flexible shaft coupling.

2. Unscrew the 3 adjusting lock nuts (204) until they are against the heads of the jackscrews (286) then unscrew the jackscrews several turns.

3. Tighten the 3 cap screws (213) evenly by alternating the cap screws until the shaft can no longer be turned by hand at the coupling. This will lower the rotating assembly, seating the impeller (2) against the suction cover or casing.

4. Loosen the cap screws (213) ½ turn. Carefully tighten the 3 jackscrews (286) by alternating the jackscrews approximately 1 - 1½ hex to obtain the desired .015 inches clearance. Retighten the cap screws (213) until snug and then tighten the adjusting lock nuts (204) to lock adjustment. Make sure that the shaft turns freely by hand before starting the pump.

5. Reassemble coupling and place pump in operation.

H - DISCHARGE PIPE

Improper alignment of the discharge pipe (161) may cause the shaft to bind. Loosen the top pipe lock nut (294) 2 to 3 turns and test for shaft rotation. If shaft is free, gradually tighten the top pipe lock nut checking shaft rotation as the nut is tightened.

If the shaft still binds, lift the pump from the tank or pit and loosen the bottom pipe lock nut. 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 accomplished and make sure that the top pipe lock nut is tight.

An accurate check of the impeller and pump alignment can be established by the use of a watt meter to measure the minimum power requirement of the motor.

I - LUBRICATION

The pump bearings (18) and (16) and the lip seals (47) and (49) were properly lubricated at the factory before shipment. Periods of subsequent lubrication will depend on local conditions, hours of operation, speed, temperature, etc.

It is recommended that the bearings and seals be periodically inspected and lubricated. As a guide we would recommend the following frequency.

Pump Service	Ambient Temperature	Lubrication Interval
8 hours per day	high low	6 to 8 weeks 12 weeks
24 hours per day	high low	3 to 4 weeks 6 to 8 weeks

A lithium base grease of medium consistency with corrosion resistant inhibiting properties must be used for the ball bearings and the lip seals. Shell Alvania #2 or equal is recommended.

Motor bearings should be lubricated in accord with motor manufacturer's recommendations.

J - GENERAL MAINTENANCE & REPAIRS

Care should be exercised in keeping all parts of the pump clean when out of the pump. Special precautions must be taken to keep ball bearings and lip seals dirt-free at all times.

Any part which is excessively worn or deteriorated and all gaskets should be replaced with new parts before reassembling the pump.

When ordering repairs, refer to the illustration for correct item names and to the pump nameplate on which is stamped the pump model number, size and serial number which must be available when ordering repairs.

K - FOR INSPECTION OR REPAIR OF LIQUID END

1. Close the gate valve in the discharge line and **LOCK THE ENTRANCE DISCONNECT SWITCH IN THE OFF POSITION.**

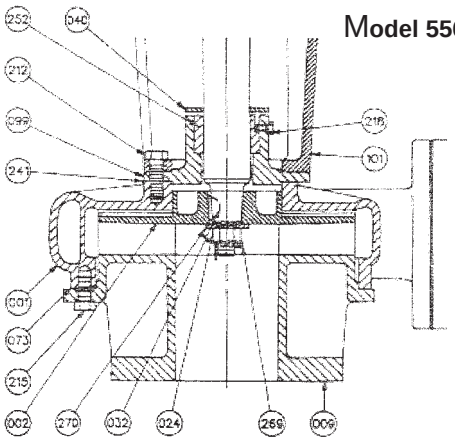
2. Remove power leads from the motor. Disconnect the discharge pipe at the pump base plate.

3. Disengage the flexible shaft coupling, per manufacturer's instructions. Remove motor cap screws (219) then remove motor from the motor pedestal (81). Remove foundation bolts in the base plate (23), and lift pump and base plate from pit to the floor or other suitable support.

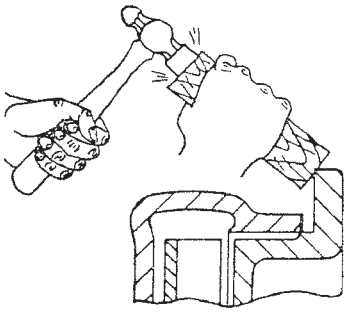
4. a. If the pump is furnished with threaded discharge fittings, unscrew the pipe coupling or flange (295) from the top end of the discharge pipe then remove the top pipe nut (294) and unscrew the lower pipe nut to the end of the threads. Unscrew the discharge pipe (161) from the discharge elbow (105).

   b. If the pump is furnished with combination elbow (105), remove the cap screws and nuts (267) and (268) at the pump discharge flange.

5. Liquid end disassembly - Model: 5562-H



   a. Remove cap screws (215), then place a block of wood against the finished flange or back of the suction cover (9) and tap the block lightly with a hammer to loosen the suction cover. Remove the suction cover and the gasket (73).



   b. Bend and remove the cotter pin (269) and the castellated impeller nut (24). Hold shaft with a wrench at the coupling (42) and unscrew the impeller nut (24) by turning counter clockwise, also remove the impeller washer (270).

   c. To remove impeller (2) from the shaft (6) it will be necessary to make 3 special jackscrews depending upon the size of the liquid end as follows:
      1.) If the discharge outlet of the casing (1) is threaded 1", 1½" or 2½" and the impeller diameter is 6" or less, the required jackscrews are 3/8" x 16NC, 1¾" long.
      2.) For all other sizes of liquid ends the required jackscrews are 1/2" x 13NC, 3" long.

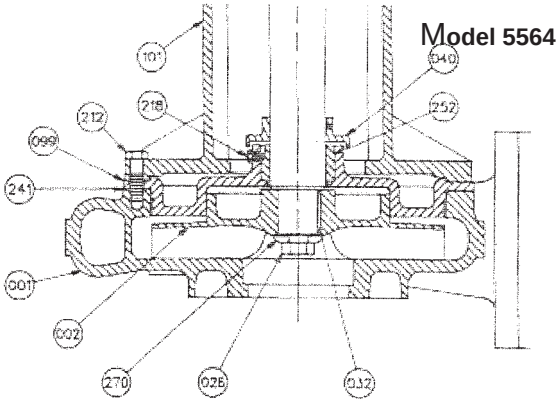
   Thread the jackscrews into the 3 tapped holes in the impeller shroud and tighten alternating jackscrews, until the impeller is forced from the shaft. Lift impeller key (32) from its seat.

   d. The casing (1) and throttle housing (99) may be removed from the column pipe (101) after removing cap screws (249).

   e. Inspect the throttle bushing (252) for excessive wear and replace by unscrewing the cap screw (218) and pressing the bushing from the housing. Press new bushing into the throttle housing (99), aligning the slot with the cap screw (218) then tighten cap screw until firm. Slide deflector (40) from the shaft.

   Slide deflector (40) from the shaft.

5. Liquid end disassembly - Model: 5564



   a. Remove the cap screws (212) the remove casing (1) and gasket (241) from the column pipe (101).

   b. Remove the impeller screw (26) while blocking the impeller to prevent it from turning and also remove washer (270). Pull impeller (2) from shaft with a bearing or wheel puller. Remove impeller key (32) from shaft.

   c. Throttle housing (99) may be removed from the column pipe for inspection or replacement of the throttle bushing (252) and press bushing from housing. Press new bushing into the bearing housing (99) aligning the slot in the bushing with the cap screw (218) then tighten cap screw until firm.

   d. Loosen set screw and slide deflector (40) off impeller end of shaft.

6. Unscrew cap screws (260) holding column pipe (101) to frame (19) and slide column off the impeller end of the shaft. Grease retainer (51) and seal (89) may be pressed from the column pipe for inspection and replacement of seal if required. Pack grease retainer with fresh grease when replacing seal.

L - TO INSPECT BALL BEARINGS & SEALS OR SHAFT

1. Remove Liquid end assembly.

2. Remove coupling (42) and key (46) from shaft (6).

3. Remove cap screws (333) and nuts (261) and lift driver pedestal (81) from frame (19).

4. Remove cap screw. Unscrew the 3 lock nuts (204) until against the head of the jackscrew (286) then remove jackscrews. Slide bearing cover (37) with seal (49) off the top end of the shaft (6). Inspect the seal and replace if worn.

5. Bend tape on bearing lock washer (69) then unscrew and remove the bearing lock nut (22) and bearing lock washer (69).

6. Replace the jackscrews (286) in the bearing housing flange and tighten the jackscrews to raise the bearing housing (33) and ball bearing (18) from the top of the frame (19). A pry bar may be required to assist in removing the bearing housing. Carefully press the ball bearing from the bearing housing.

7. Carefully withdraw the pump shaft and ball bearing (16) upward through the frame (19). Remove the bearing (16) from the shaft.

8. Inspect the bearing cover seal (47) and if worn replace with new seal. Bearing cover (35) and seal may be removed from the frame using a piece of pipe or tubing inserted through the top of the frame to force the bearing cover from the frame.

M -TO REASSEMBLE BALL BEARINGS AND SEALS

1. Press bearing (16) onto the shaft. Position the bearing so that the inner bearing race is against the shaft shoulder. **CAUTION:** Apply force only to the inner bearing race.

2. If the bearing cover (35) and the seal (47) were removed from the frame, apply sufficient grease to fill the space below the ball bearing (16). Press bearing cover with seal into the frame from the impeller end until the bearing cover is flushed with the frame. Be sure that seal (47) is installed with the spring side of the seal toward the impeller.

3. Insert shaft with bearing, impeller end first, into the top of the frame (19) being careful not to damage the seal (47).

4. Place bearing housing (33) in a vice with the flange resting on vice jaws. Apply light oil to interior of housing then press bearing (18) into the bearing housing making sure that the bearing is fully seated in the bearing housing. ***CAUTION: Apply force to the outer ring of the bearing only.*** Place the assembly over the end of the pump shaft and press into position so that the inner race of the bearing is against the shaft shoulder. ***CAUTION: Apply force to the inner ring of the bearing only.***

5. Place lock washer (69) over the bearing and thread the bearing lock nut (22) onto the shaft and tighten securely. Bend tabs of lock washer into slots in the bearing lock nut.

6. If frame (19) was removed from the support plate (23), mount the frame on the base plate replacing cap screw and nuts (221) and (258)

7. If grease retainer (51) with seal (89) were removed from the column pipe (101) press the assembly into the top of the column and slide the column over the shaft. When properly seated against the frame, replace and tighten cap screws (260).

8. Slide deflector (40) onto the shaft.

N - ASSEMBLY OF LIQUID END Model: 5562-H

1. Place throttle housing (99) with throttle bushing over impeller end of shaft. Align bolt holes and position against column pipe (101).

2. Position gasket (241) on throttle housing (99) then place casing (1) against the flange of the bearing housing aligning the studs with the holes and with the discharge outlet in the proper position. Replace cap screws (212). Tighten securely

3. Insert impeller key (32) into shaft keyway and place impeller (2) on shaft with keyway over impeller key. Place wooden block over impeller vanes and tap lightly on the wood block to seat the impeller on the shaft. Back up coupling end of shaft to prevent bearing damage.

4. Replace impeller washer (270) onto the shaft then the castellated nut (24). Tighten the nut and place new cotter pin (269) through nut and shaft. ***CAUTION: Do Not use impeller nut to draw the impeller onto the shaft. The nut is a locking device only.***

Recommended torque for tightening the impeller nut is as follows:

1/2" - 45 Ft. lbs.
5/8" - 90 Ft. lbs.
3/4" - 170 Ft. lbs.

5. Place gasket (73) on suction cover (9). Position cover against the casing (1) and replace and tighten cap screws (215).

N - ASSEMBLY OF LIQUID END Model: 5564

1. Place throttle housing (99) with throttle bushing over the end of the shaft. Align bolt holes and position against column pipe (101)

2. Insert impeller key (32) into the shaft keyway and place impeller (2) on the shaft with keyway over the key. Place a wooden block over the impeller vanes and tap block lightly to seat the impeller on the shaft. Back up coupling end of shaft to prevent bearing damage.

3. Place impeller washer (270) against impeller hub and insert and tighten the impeller screw (26) to torque of 170 ft. lbs.

4. Place casing gasket (241) on throttle housing (99) and place casing (1) against throttle housing with discharge outlet in the proper position. Replace cap screws (212).

5. If suction bell (55) was furnished with the pump and was removed from the casing, remount using cap screws (215). Note, suction bell is furnished only on special applications.

6. Position deflector (40) on the shaft to allow 1/8" clearance between the top of the bearing housing and the inside of the deflector and tighten deflector set screw.

7. Fill the cavity of the bearing cover (37) with grease and slide over top end of shaft, being careful not to damage the seal (49). Align holes of the bearing housing (33) and the bearing cover (37) and insert cap screws (332) and jack screws (286) but do not tighten.

8. Reassemble discharge pipe and fittings through the support place (23). Tighten lower pipe nut (294) until snug against the plate then tighten the upper pipe nut being careful not to distort the piping or the base plate.

9. Mount the driver pedestal (81) on the frame (19) and replace cap screws and nuts (333) and (261).

10. Adjust impeller clearance as recommended in section "Impeller Adjustment", also make any pump adjustment required as recommended in section "Pump Adjustments".

11. Complete installation of the pump and motor as described in section "Installation".

O - LOCATING TROUBLE

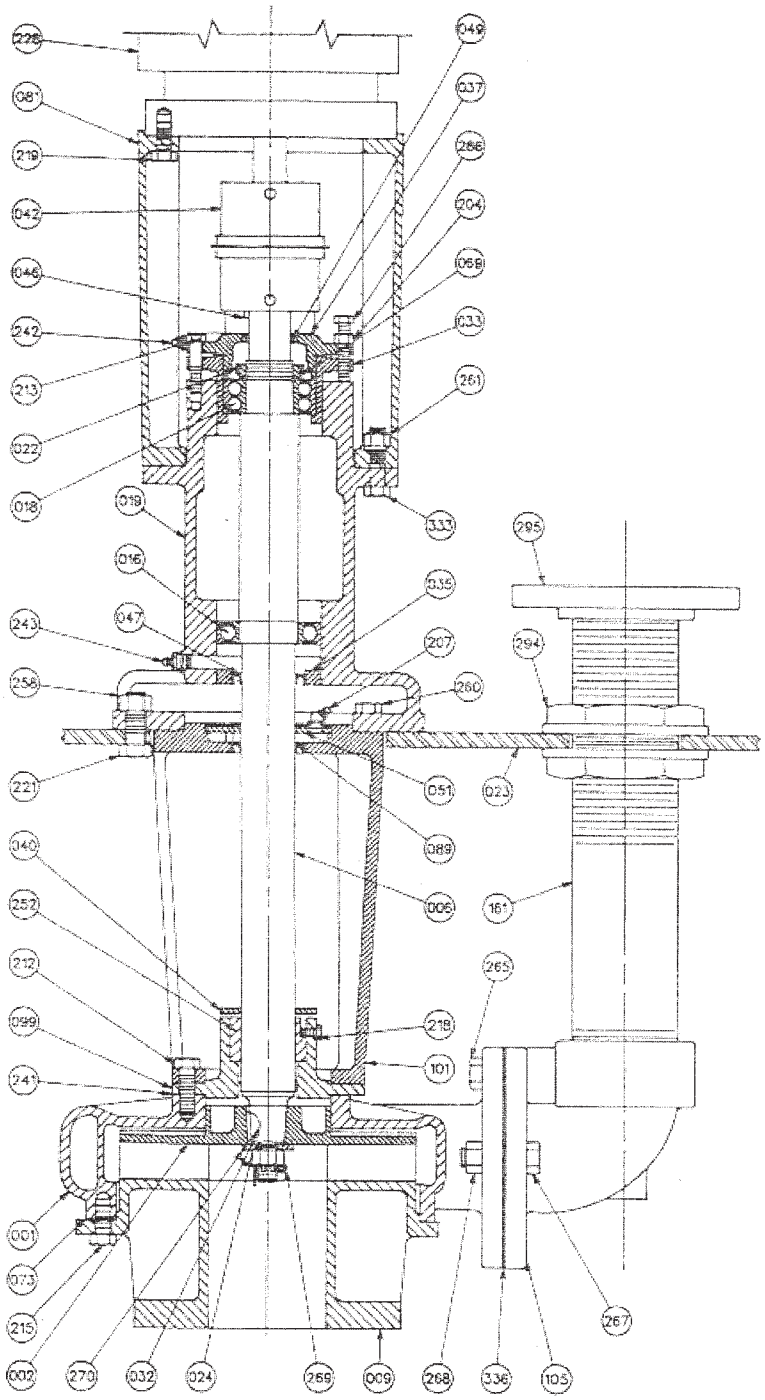
1. No water delivered
   a. Wrong direction of rotation
   b. Impeller or pipes plugged
   c. Discharge head too high
   d. No water in pit
   e. Pump suction to close to bottom of pit

2. Not enough water delivered
   a. Discharge head higher than expected
   b. Impeller or pipes partly plugged
   c. Improper impeller adjustment
   d. Low water level in pit
   e. Mechanical defects
      1. Impeller worn or damaged
      2. Casing worn
   f. 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 to much water
   c. Liquid either viscous or heaver 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

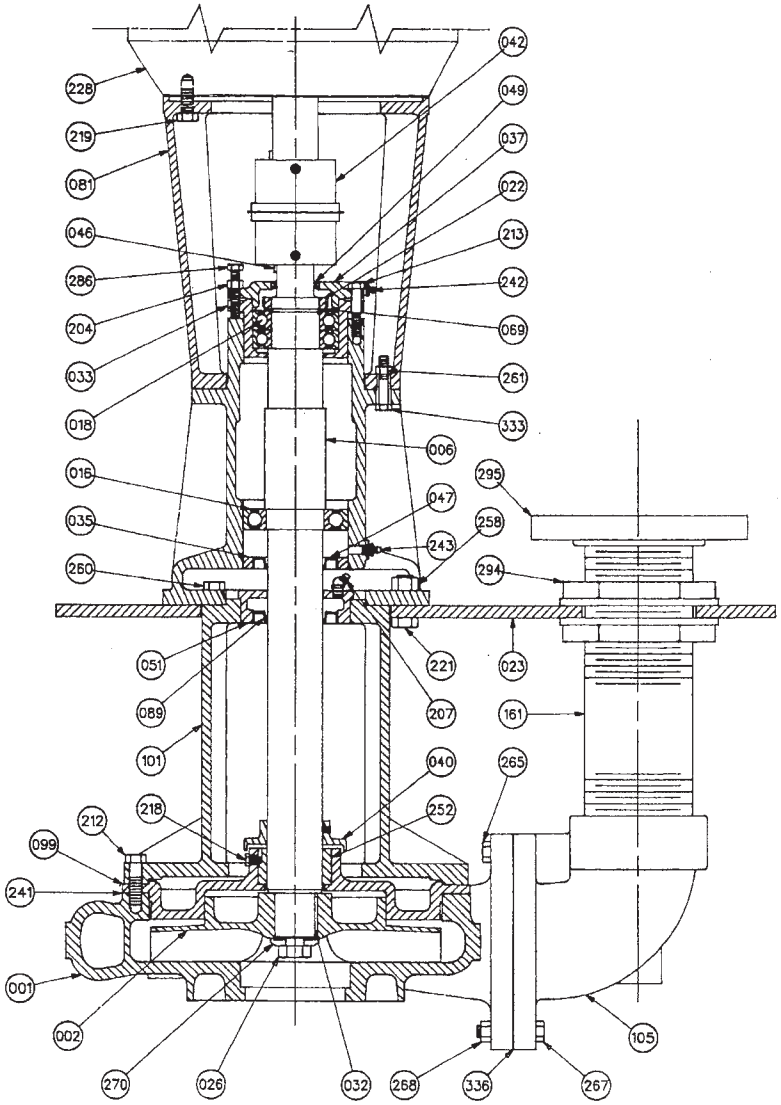
MODEL 5562-H



(*) Recommended Spare Parts

ITEM No.	DESCRIPTION
001	Casing
002	Impeller
006	Shaft
009	Suction Cover
*016	Ball Bearing (Inboard)
*018	Ball Bearing (Outboard)
019	Frame
022	Lock Nut (Bearing)
023	Base Plate
*024	Impeller Nut
032	Impeller Key
033	Bearing Housing (Outboard)
035	Bearing Cover (Inboard)
037	Bearing Cover (Outboard)
040	Deflector
042	Coupling
046	Coupling Key
*047	Bearing Cover Seal
*049	Bearing Cover Seal
051	Grease Retainer
069	Bearing Lock Washer
*073	Gasket
081	Drive Pedestal
089	Lip Seal
099	Throttle Housing
101	Column
105	Discharge Elbow
161	Discharge Pipe
204	Adjusting Lock Nut
207	Grease Fitting
212	Cap Screw
213	Cap Screw
215	Cap Screw
218	Cap Screw
219	Cap Screw
221	Cap Screw
228	Motor
*241	Gasket
242	Grease Fitting
243	Grease Fitting
*252	Throttle Bushing
258	Hex Nut
260	Cap Screw
261	Hex Nut
265	Cap Screw
267	Cap Screw
268	Cap Screw
*269	Cotter Pin
270	Impeller Washer
286	Jackscrew
294	Pipe Nut
295	Discharge Flange
332	Cap Screw (Not Shown)
333	Cap Screw
*336	Gasket

MODEL 5564



ITEM No.	DESCRIPTION
001	Casing
002	Impeller
006	Shaft
*016	Ball Bearing (Inboard)
*018	Ball Bearing (Outboard)
019	Frame
022	Lock Nut (Bearing)
023	Base Plate
*026	Impeller Screw
032	Impeller Key
033	Bearing Housing (Outboard)
035	Bearing Cover (Inboard)
037	Bearing Cover (Outboard)
040	Deflector
042	Coupling
046	Coupling Key
*047	Bearing Cover Seal
*049	Bearing Cover Seal
051	Grease Retainer
069	Bearing Lock Washer
081	Drive Pedestal
089	Lip Seal
099	Throttle Housing
101	Column
105	Discharge Elbow
161	Discharge Pipe
204	Adjusting Lock Nut
207	Grease Fitting
212	Cap Screw
213	Cap Screw
218	Cap Screw
219	Cap Screw
221	Cap Screw
228	Motor
239	Stud (Not Shown)
*241	Gasket
242	Grease Fitting
243	Grease Fitting
246	Stud (Not Shown)
247	Hex Nut (Not Shown)
249	Hex Nut (Not Shown)
*252	Throttle Bushing
258	Hex Nut
260	Cap Screw
261	Hex Nut
265	Cap Screw
267	Cap Screw
268	Cap Screw
270	Impeller Washer
286	Jackscrew
294	Pipe Nut
295	Discharge Flange
332	Cap Screw (Not Shown)
333	Lube Pipe Assembly
*336	Gasket

(*) Recommended Spare Parts

9” to 12” or 15” Extentions

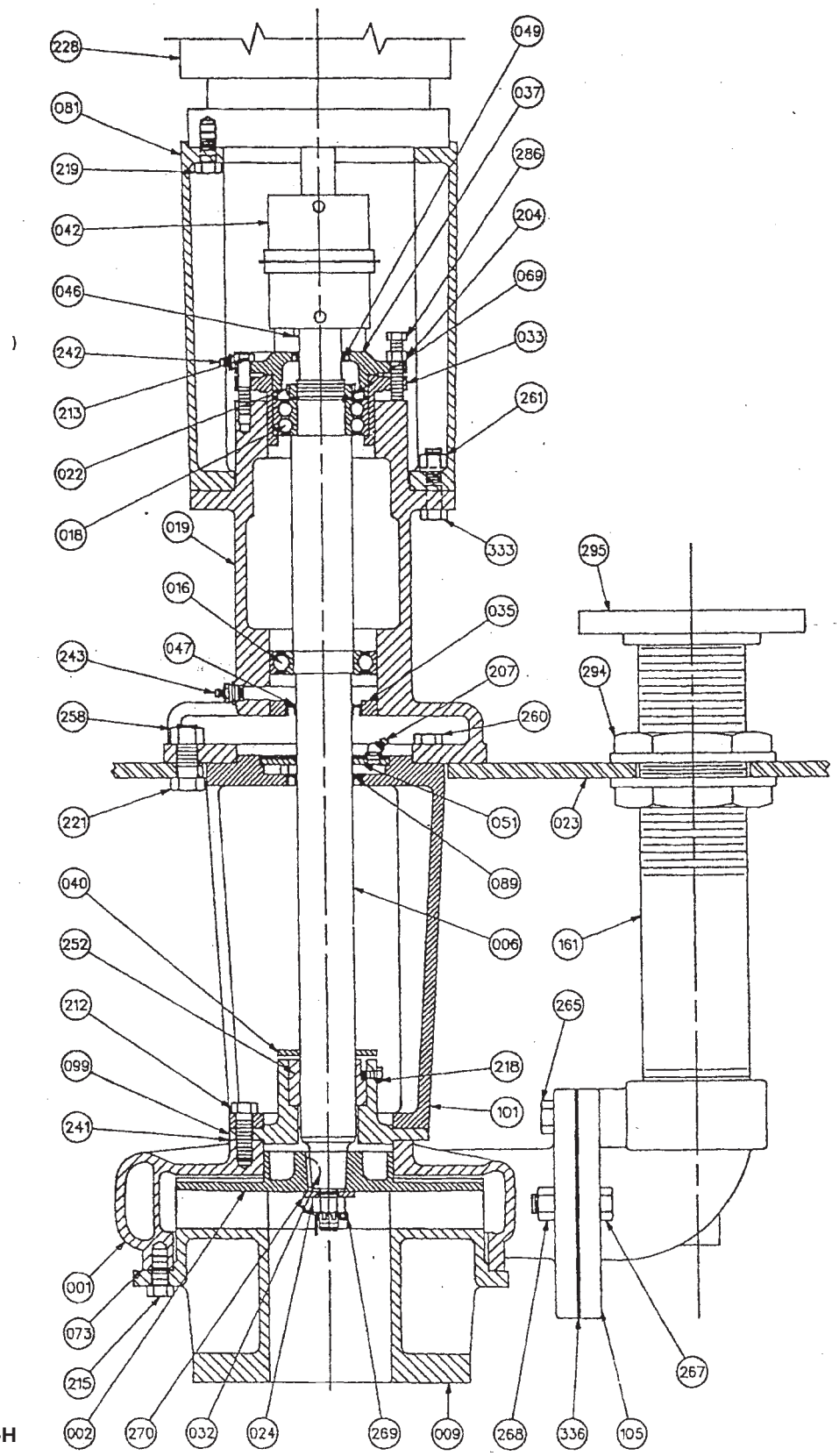


Fig. 5562-H

9” to 12” or 15” Extentions

ITEM No.	DESCRIPTION
1	Casing
2	Impeller
6	Shaft
9	Suction Cover
*16	Ball Bearing (Inboard)
*18	Ball Bearing (Outboard)
19	Frame
22	Lock Nut (Bearing)
23	Base Plate
*24	Impeller Nut
26	Impeller Screw
32	Impeller Key
33	Bearing Housing (Outboard)
35	Bearing Cover (Inboard)
37	Bearing Cover (Outboard)
40	Deflector
42	Coupling (Drive Half)
44	Coupling (Pump Half)
46	Coupling Key
*47	Bearing Cover Seal
*49	Bearing Cover Seal
51	Grease Retainer
55	Suction Bell
69	Bearing Lock Washer
*73	Gasket
81	Drive Pedestal
89	Lip Seal
99	Throttle Housing
101	Column
105	Discharge Elbow
161	Discharge Pipe
204	Adjusting Lock Nut
207	Grease Fitting

ITEM No.	DESCRIPTION
212	Cap Screw
215	Cap Screw
216	Pipe Plug
218	Cap Screw
219	Cap Screw
221	Cap Screw
228	Motor
239	Stud
240	Pipe Plug
*241	Gasket
242	Grease Fitting
243	Grease Fitting
246	Stud
247	Hex Nut
249	Hex Nut
*252	Throttle Bushing
258	Hex Nut
260	Cap Screw
261	Hex Nut
264	Pipe Plug
265	Cap Screw
267	Cap Screw
268	Cap Screw
*269	Cotter Pin
*270	Impeller Washer
286	Jackscrew
294	Pipe Nut
295	Discharge Flange
332	Cap Screw (Not Shown)
333	Cap Screw
*336	Gasket

(*) Recommended Spare Parts

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.

CRANE®

PUMPS & SYSTEMS

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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 <u>Must</u> 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.