




AURORA[®]

MODELS 321, 323 AND 324A
**SINGLE STAGE END SUCTION
HORIZONTAL AND VERTICAL PUMPS**
INSTRUCTION AND REPAIR MANUAL

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

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CALIFORNIA PROPOSITION 65 WARNING:

 **Warning:** This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

NOTE

This repair manual is applicable to pump Models 321, 323 and 324A. All photos illustrate Model 324A.

ATTENTION: SAFETY WARNINGS:

Read and understand all warnings before installation or servicing pump.

OPERATIONAL LIMITS: *

Maximum Operating Pressure: 175 psi at Temperatures to 150°F (65.6°C)

Maximum Operating Temperature: 225°F (107°C)

* See ANSI B16.4 for pressure-temperature ratings of class 125 threaded fittings.


ELECTRICAL SAFETY:

 **Warning:** Electrical Shock Hazard

All electrical connections are to be made by a qualified electrician in accordance with all codes and ordinances. Failure to follow these instructions could result in serious personal injury, death or property damage.

 **Warning:** Electrical Overload Hazard

Insure all motors have properly sized overload protection. Failure to follow these instructions could result in serious personal injury, death or property damage.

 **Warning:** Sudden Start-Up Hazard

Disconnect and lockout power source before servicing. Failure to follow these instructions could result in serious personal injury, death or property damage.

HIGH TEMPERATURE SAFETY:


 **Warning:** Hot Surface Hazard

If pumping hot water, insure guards or proper insulation is installed to protect against skin contact to hot piping or pump components. Failure to follow these instructions could result in serious personal injury, death or property damage.

 **Warning:** Spraying Water Hazard

When servicing pump replace all gaskets and seals. Do not re-use old gaskets or seals. Failure to follow these instructions could result in serious personal injury, death or property damage.

HIGH PRESSURE SAFETY:

 **Warning:** High Pressure Hazard

The pump is rated at a maximum of 175 psi at 150°F. Do not exceed this pressure. Install properly sized pressure relief valves in system. Failure to follow these instructions could result in serious personal injury, death or property damage.

 **Warning:** Expansion Hazard

Water expands when heated. Install properly sized thermal expansion tanks and relief valves. Failure to follow these instructions could result in serious personal injury, death or property damage.

SERVICE

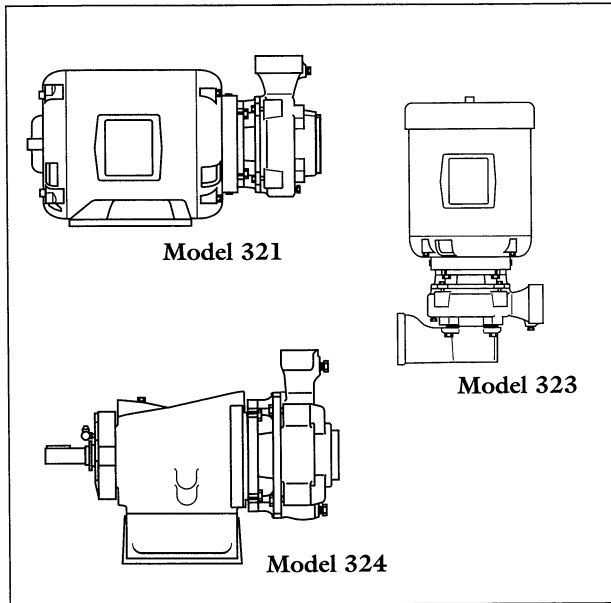
Your Aurora pump requires no maintenance other than periodic inspection, occasional cleaning and lubrication of bearings (Model 324A only). The intent of inspection is to prevent breakdown, thus obtaining optimum service life. The liquid end of the pump is lubricated by the fluid being pumped and therefore does not require periodic lubrication. The motor, however may require lubrication, in which case the motor manufacturer's recommendation should be followed.

LUBRICATION OF IMPELLER SHAFT BEARINGS

The Model 324A pumps are available with three options for lubricating the shaft bearings. They are:

1. Regreasable (standard)
2. Oil Lubrication
3. Sealed Bearings, Permanent Lubrication.

MODELS 321-323-324A



A. Assembled Units.

Regreasable bearings will require periodic lubrication which can be accomplished by using the zerk or lubrication fittings in the cartridge cap and power frame. Lubricate the bearings at regular intervals using a grease of high quality. Polyurea base grease is recommended as bearing lubricant for pumps operating in both wet and dry locations. Mixing of different brands of grease should be avoided due to possible chemical reactions between the brands which could damage the bearings. Accordingly, avoid grease of a vegetable or animal base which can develop acids, as well as grease containing rosin, graphite, talc and other impurities. Under no circumstance should grease be reused.

Over lubrication should be avoided as it may result in overheating and possible bearing failure. Under normal application, adequate lubrication is assured if the amount of grease is maintained at 1/3 to 1/2 the capacity of the bearing and adjacent space surrounding it. Approximately 1/2 ounce of grease is required to maintain this level.

In dry locations, each bearing will need lubrication at least after every 4,000 hours of running time or every 6 to 12 months, whichever is more frequent. In wet locations, the bearings should be lubricated at least after every 2,000 hours of running time or every 4 to 6 months, whichever is more frequent. A unit is considered to be installed in a wet location if the pump and motor are exposed to dripping water, to the weather, or to heavy condensation such as is found in unheated and poorly ventilated underground locations.

Oil lubricated bearings are optional on all Model 324A pumps. A fixed oil level is maintained within the power frame by an oiler which allows visual indications of reserve oil.

At initial installation and before starting a unit that has been shut down for repairs or for any extended length of time, run enough 10W-30 weight motor oil through the oiler to maintain a constant oil level to insure that the bearing will never be without an oil supply. Oil will have to be added at intervals to maintain a constant level in the oiler. This interval can only be determined by experience.

Under working conditions, oil will breakdown and need to be replaced at regular intervals. The length of these intervals will depend on many factors. Under normal operation, in clean and dry locations, the oil should be changed about once a year. However, when the pump is exposed to dirt contamination, high temperatures (200°F. or above) or a wet location, the oil may have to be changed every 2 or 3 months.

REPAIRS

Before starting any work, insure the electrical power is locked out, the system pressure has been lowered to 0 psi and temperature of the unit is at a safe level.

The pump may be disassembled using the illustrations and text provided. Although complete disassembly is covered, it will seldom be necessary to completely disassemble your Aurora pump.

The illustrations accompanying the disassembly instructions show the pump at various stages of disassembly. The illustrations are intended to aid in the correct identification of the parts mentioned in the text.

Inspect removed parts at disassembly to determine if they can be reused. Ball bearings that turn roughly or show wear should be replaced. Cracked castings should never be reused. Scored or worn pump shafts should be replaced. Gaskets should be replaced at reassembly simply as a matter of economy. They are much less expensive to replace routinely than to replace singly as the need arises.



Warning: Sudden Start-Up Hazard

Disconnect and lockout power source before servicing. Failure to follow these instructions could result in serious personal injury, death or property damage.



Warning: Hot Surface Hazard

If pumping hot water, insure guards or proper insulation is installed to protect against skin contact to hot piping or pump components. Failure to follow these instructions could result in serious personal injury, death or property damage.



Warning: High Pressure Hazard

The pump is rated at a maximum of 175 psi at 150°F. Do not exceed this pressure. Install properly sized pressure relief valves in system. Failure to follow these instructions could result in serious personal injury, death or property damage.



Warning: Spraying Water Hazard

When servicing pump replace all gaskets and seals. Do not re-use old gaskets or seals. Failure to follow these instructions could result in serious personal injury, death or property damage.

DISASSEMBLY

Refer to Figure 2 for Model 321, Figure 3 for Model 323 and Figure 4 for Model 324A at the back of this manual and the following text and disassemble only what is needed to make repairs or accomplish inspection.

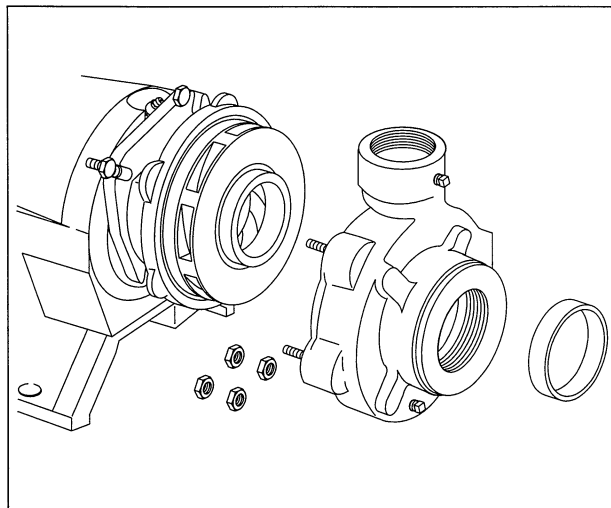
NOTE
Model 324A

If repair operations are required only on the pump and not the power frame, the flexible couplings need not be disconnected.

1. Unscrew pipe plugs (3) from casing (4). On Model 323 pumps disconnect relief line from suction base. Remove capscrews (46) and remove pump from suction base (45). Discard gasket (47).
2. Remove four nuts (1) or capscrews (2) and separate pump casing (4) from pump bracket (18).
3. To replace wear ring (5), chuck entire casing (4) onto engine lathe. Turn down ring thickness until approximately 1/32" remains. This remaining ring section can be removed by cutting with a sharp tool. Do not remove wear ring unless necessary.
4. Remove screw (7), washer (8), and remove impeller (9) from shaft with key (10).

NOTE

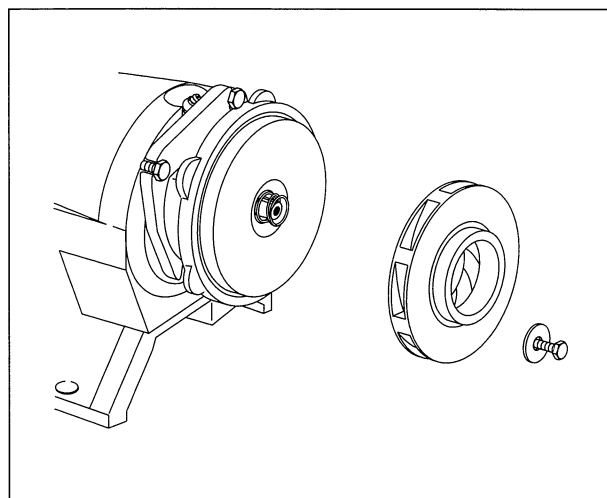
A puller may be used to remove the impeller, or it may be pried loose. Care should be taken that the impeller is not damaged during removal.



B. Casing and Wear Ring Removed.

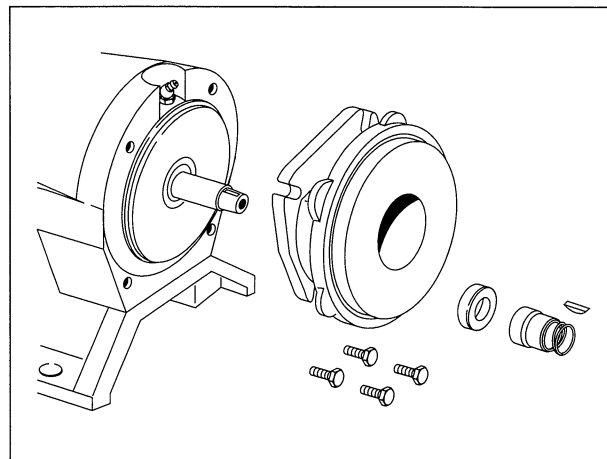
CAUTION

The mechanical seal (see Figure 1) is a precision product and must be treated as such. During removal, great care must be taken to avoid dropping any part of the seal. Take particular care not to scratch the lapped faces on the washer or the sealing seat. If any wear of the seal faces is noted, it is recommended to replace with a new seal during reassembly.



C. Impeller Removed.

5. Carefully remove mechanical seal (11).
6. Remove gasket (12) from bracket (18). Unscrew pipe plug (13) from bracket (18). On Model 323 pumps remove connector (48), tubing (49), connector (50), coupling (51) and nipple (52) from bracket (18).
7. Remove nameplate (15) and screws (14) only if replacement is necessary.
8. Remove screws (16) with washers (17) and separate seal bracket (18) from power frame (37) or motor depending on pump model. Remove slinger (19) from shaft. Carefully push the seal seat and cup out of the seal bracket.



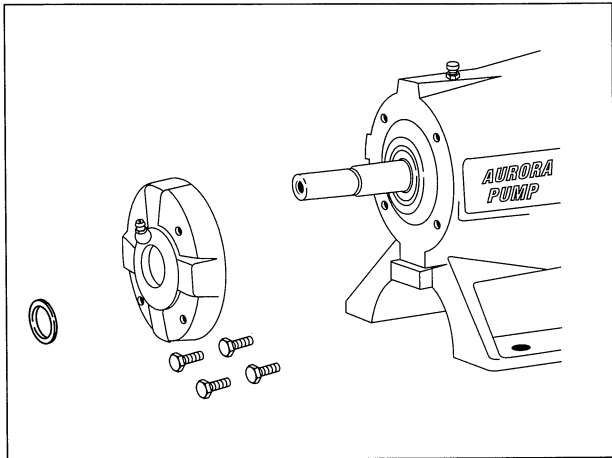
D. Mechanical Seal and Bracket Removed.

NOTE

Complete disassembly of the power frame for Model 324A pumps is covered, however disassemble only what is needed to make repairs. It is advisable not to disassemble the support (21) as correct alignment may be lost.

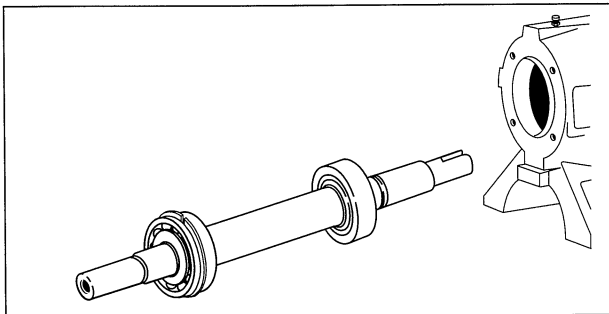
MODELS 321-323-324A

9. Remove coupling half, key (22) and slinger (27) from shaft to avoid losing them.
10. Unscrew lubrication fitting (23, 25, 26, 36, 38, 39, 41) as required by the particular power frame and drain.



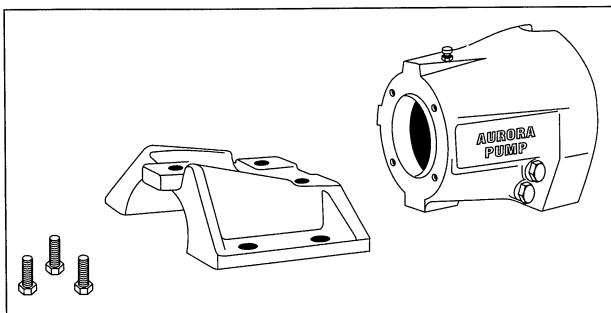
E. Slinger and Bearing Cap Removed

11. Remove capscrew (28) and disassemble bearing cap (29) with seal (31) and "O" ring (30) (oil lube only) from power frame.
12. Remove shaft (35) with bearings (33 and 34) from power frame assembly. Remove snap ring (32) and bearing (33) if replacement is necessary.
13. Clean and inspect bearing (34) and check its operation. Remove bearing (34) from shaft (35) only if repair demands it.



F. Shaft Assembly Removed.

14. Remove screws (24) with washers (20) and separate power frame assembly from support (21).



G. Support Removed.

REASSEMBLY

Clean and inspect all parts thoroughly prior to assembly. Replace "O" ring, oil seals and gaskets. Check that all mating surfaces are free of nicks and burrs. Inspect the impeller hub and wearing ring carefully for signs of excessive wear. Reassembly operations cover the entire pump and power frame. Use for reference, those steps which apply to your particular repair program. If the pump and power frame assembly were completely removed from the baseplate, consult the installation section of this manual. Refer to figures 2, 3 or 4 and proceed to reassemble the pump as follows:

1. Assemble power frame to support (21) and secure with washers (20) and screws (24).
2. Press bearings (33 and 34) on shaft (35).
3. Install retaining ring (32) on shaft (35). Install shaft assembly in power frame so that retaining ring on bearing (33) touches power frame (37).
4. Install "O" ring (30) (oil lube only) into bearing cap (29) and attach to power frame. Secure with screws (28). Press oil seals (31) into bearing cap (29) and frame (37).
5. Install slinger (27) and key (22) on shaft.
6. Reassemble lubrication fittings and accessories as applicable to the power frame.
7. Lubricate the power frame bearings as instructed on page 1.
8. On Models 321 and 323 replace slinger (19) on motor shaft. Position pump bracket (18) on power frame or motor depending on pump model and secure with washers (17) and screws (16). Tighten screws evenly.
9. If nameplate (15) was removed, install and attach screws (14).
10. Install plug (13) to the seal bracket. Position gasket (12) on seal bracket. For Model 323 pumps, install the nipple (52), coupling (51). Attach connector (50), tubing (49), and connector (48) the seal bracket.
11. Thoroughly inspect the seal cavity in seal bracket checking for burrs or nicks which could damage flexible cup of mechanical seal. Apply a film of liquid dishwashing detergent (do not use oil or grease) to the flexible cup a seal seat. Insert seat in cup and install in seal bracket (18).

NOTE

If it is not possible to insert seat with fingers, place cardboard protecting ring, furnished with seal, over lapped face of seat and press into place with a piece of tubing having end cut square. Tubing should be slightly larger than the diameter of the shaft. Remove cardboard ring after seat is firm seated.

12. Apply a film of liquid dishwashing detergent to the washer and bellows of the seal, and slide the remaining parts onto the shaft, making sure the washer is seated against the seal seat. Check the proper sequence of assembly as indicated in Figure 1.

13. Install key (10) on shaft and assemble impeller (9). Be sure spring of mechanical seal is properly positioned back side of impeller. Secure impeller with washer (8) and screw (7).
14. Assemble studs (6) if used, into pump casing.
15. Install the wearing ring (5) into the casing (4). The wearing ring must be pressed into the pump casing. Do not attempt to hammer it into position. An arbor press is ideal, place a block of wood over the ring and press it into the casing bore.
16. Install pipe plugs (3) in pump casing. Position pump casing against bracket and secure with screws (2) or nuts (1) as required. On Model 324A pumps replace lubrication fittings (23, 25, 26, 36, 38, 39, 41) as required.
17. For Model 323 pumps, position new gasket (47) and suction base (45) and secure to pump casing with screws (46). Connect the relief line to the base and tighten fittings.

Warning: Spraying Water Hazard

When servicing pump replace all gaskets and seals. Do not re-use old gaskets or seals. Failure to follow these instructions could result in serious personal injury, death or property damage.

Warning: Electrical Shock Hazard

All electrical connections are to be made by a qualified electrician in accordance with all codes and ordinances. Failure to follow these instructions could result in serious personal injury, death or property damage.

Warning: Electrical Overload Hazard

Insure all motors have properly sized overload protection. Failure to follow these instructions could result in serious personal injury, death or property damage.

STARTING PUMP AFTER REASSEMBLY

Do not start pump until all air and vapor has been bled and make sure there is liquid in the pump to provide the necessary lubrication. It is possible that the mechanical seal may drip during the first few minutes of operation.

Warning: Hot Surface Hazard

If pumping hot water insure guards or proper insulation is installed to protect against skin contact to hot piping or pump components. Failure to follow these instructions could result in serious personal injury, death or property damage.

Warning: Sudden Start-Up Hazard

Disconnect and lockout power source before servicing. Failure to follow these instructions could result in serious personal injury, death or property damage.

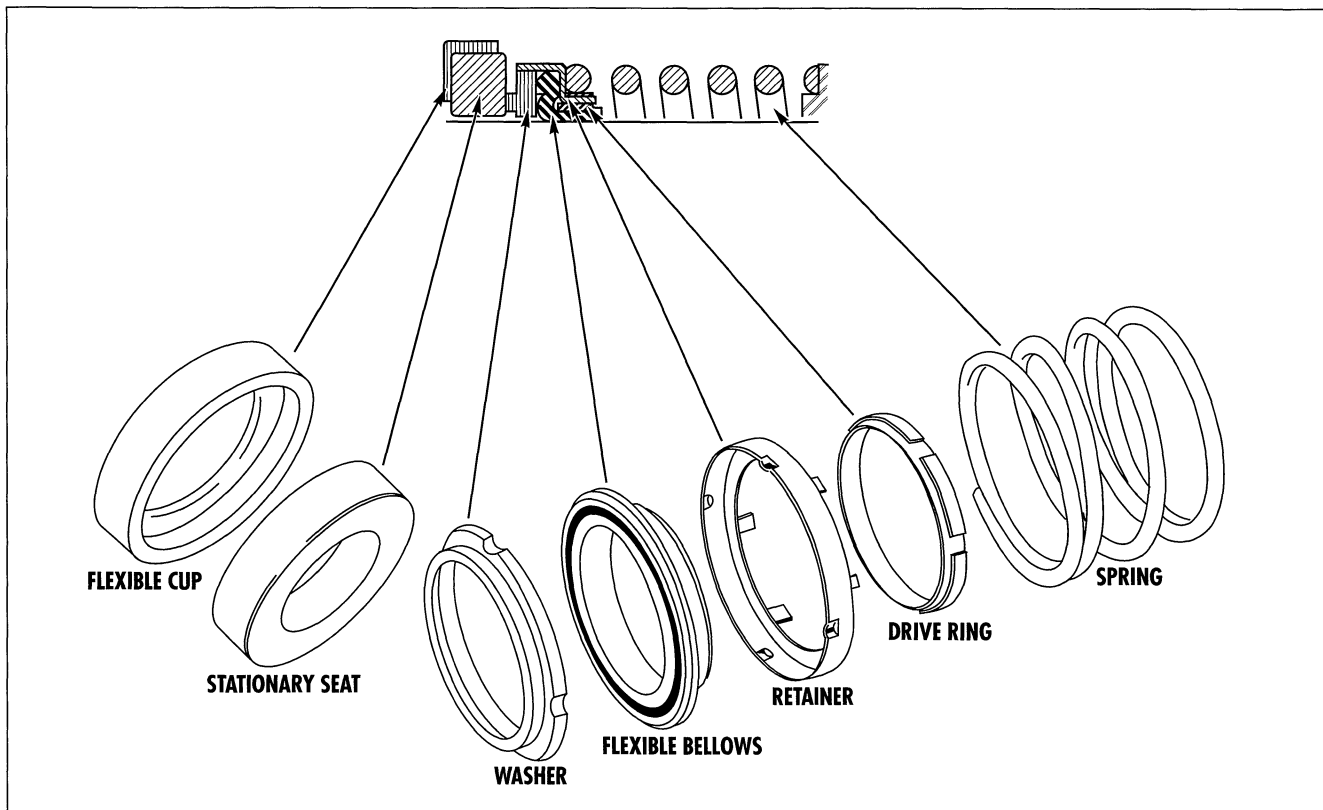
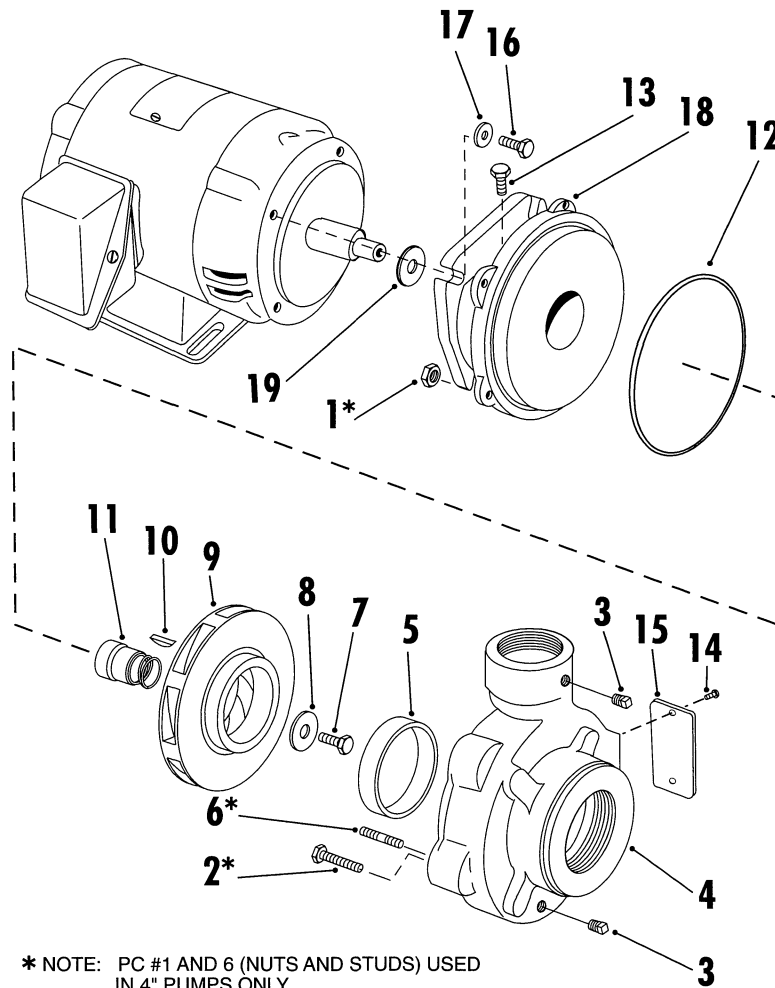


Figure 1. Mechanical Seal

MODEL 321



* NOTE: PC #1 AND 6 (NUTS AND STUDS) USED
IN 4" PUMPS ONLY.
PC #2 (CAPSCREWS) USED IN
5", 6", 7" AND 9" PUMPS.

Figure 2. Model 321 Exploded View

MODEL 321 LIST OF PARTS

- | | | |
|-----------------|---------------|---------------|
| 1. Nut | 8. Washer | 14. Screw |
| 2. Capscrew | 9. Impeller | 15. Nameplate |
| 3. Pipe Plug | 10. Key | 16. Capscrew |
| 4. Casing | 11. Seal | 17. Washer |
| 5. Wearing Ring | 12. Gasket | 18. Bracket |
| 6. Stud | 13. Pipe Plug | 19. Slinger |
| 7. Capscrew | | |

NOTE

WHEN ORDERING SPARE PARTS ALWAYS INCLUDE THE PUMP TYPE, SIZE, SERIAL NUMBER, AND THE PIECE NUMBER FROM THE EXPLODED VIEW IN THIS MANUAL.

MODEL 323

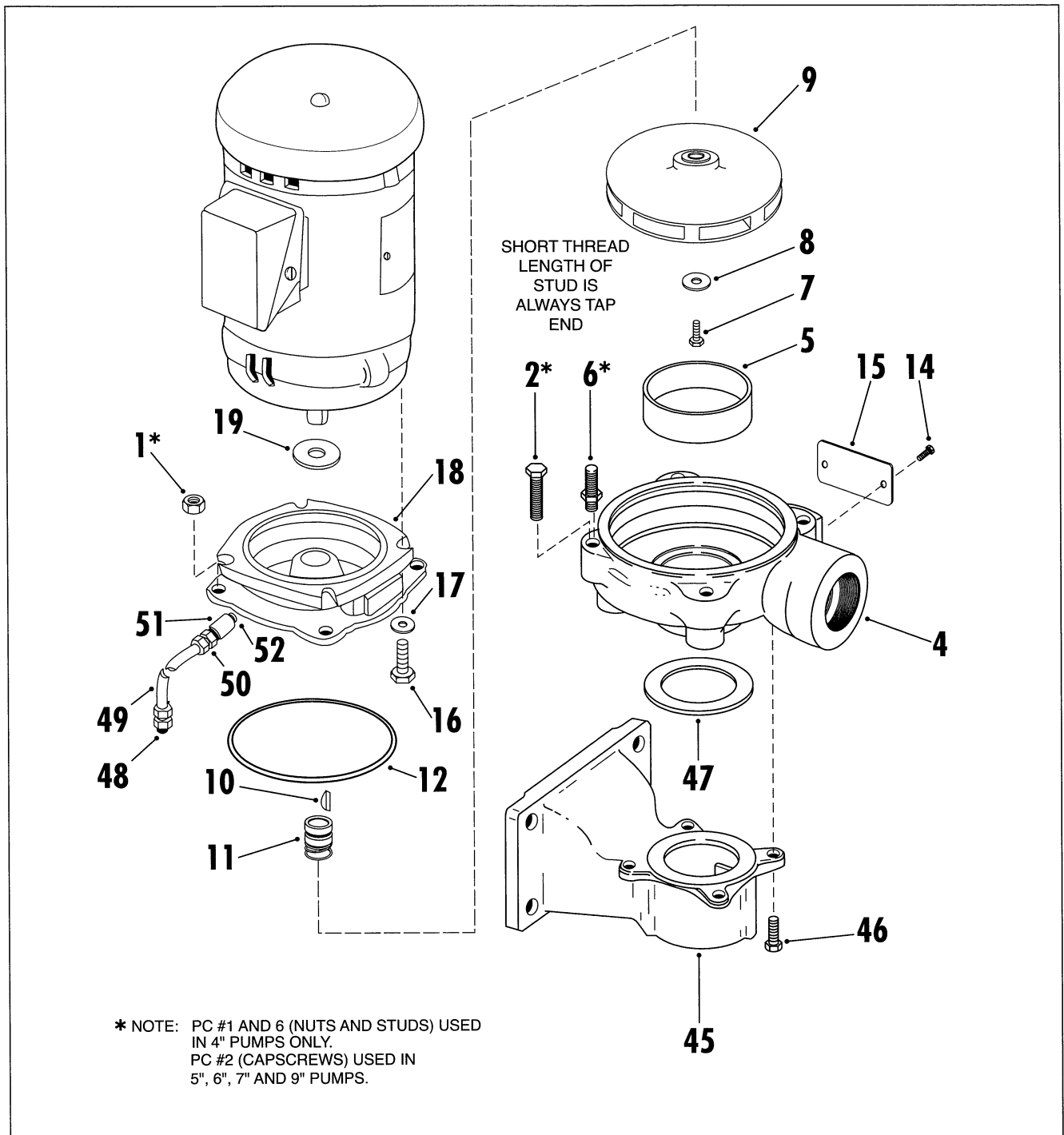


Figure 3. Model 323 Exploded View

MODEL 323 LIST OF PARTS

- | | | |
|-----------------|---------------|---------------|
| 1. Nut | 10. Key | 45. Base |
| 2. Capscrew | 11. Seal | 46. Capscrew |
| 4. Casing | 12. Gasket | 47. Gasket |
| 5. Wearing Ring | 14. Screw | 48. Connector |
| 6. Stud | 15. Nameplate | 49. Tubing |
| 7. Capscrew | 16. Capscrew | 50. Connector |
| 8. Washer | 17. Washer | 51. Coupling |
| 9. Impeller | 18. Bracket | 52. Nipple |
| | 19. Slinger | |

MODEL 324A

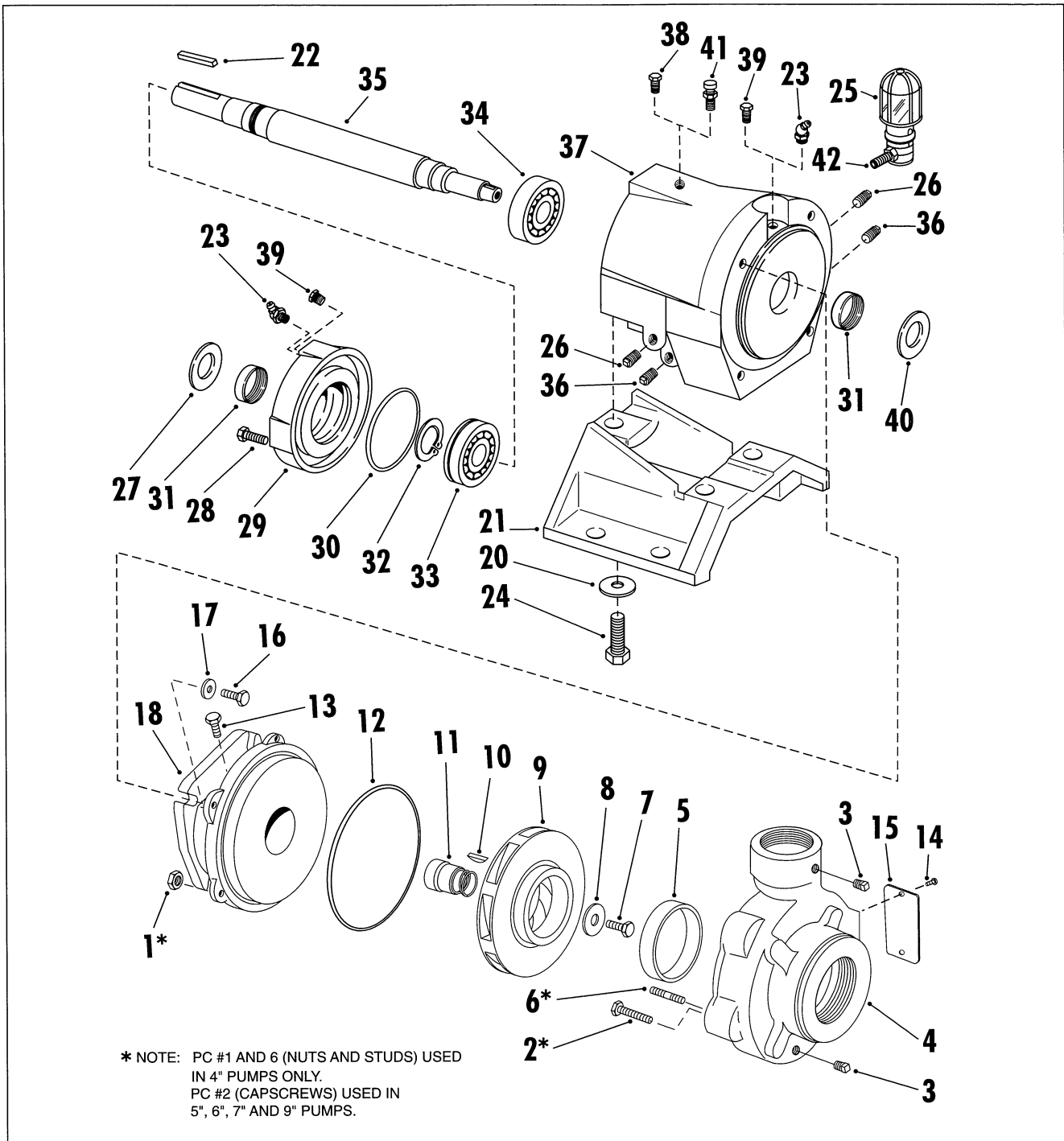


Figure 4. Model 324A Exploded View

MODEL 324A LIST OF PARTS

- | | | | |
|-----------------|------------------|--------------------|---------------|
| 1. Nut | 12. Gasket | 23. Grease Fitting | 33. Bearing |
| 2. Capscrew | 13. Pipe Plug | 24. Capscrew | 34. Bearing |
| 3. Pipe Plug | 14. Drivescrew | 25. Oiler Assembly | 35. Shaft |
| 4. Casing | 15. Nameplate | 26. Pipe Plug | 36. Pipe Plug |
| 5. Wearing Ring | 16. Capscrew | 27. Slinger | 37. Frame |
| 6. Stud | 17. Washer | 28. Capscrew | 38. Pipe Plug |
| 7. Capscrew | 18. Seal Bracket | 29. Bearing Cap | 39. Pipe Plug |
| 8. Washer | 20. Washer | 30. "O" Ring | 40. Slinger |
| 9. Impeller | 21. Support | 31. Seal | 41. Breather |
| 10. Key | 22. Key | 32. Retaining Ring | 42. Nipple |
| 11. Seal | | | |

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WARRANTY

Seller warrants equipment (and its component parts) of its own manufacture against defects in materials and workmanship under normal use and service for one (1) year from the date of installation or start-up, or for eighteen (18) months after the date of shipment, whichever occurs first. Seller does not warrant accessories or components that are not manufactured by Seller; however, to the extent possible, Seller agrees to assign to Buyer its rights under the original manufacturer's warranty, without recourse to Seller. Buyer must give Seller notice in writing of any alleged defect covered by this warranty (together with all identifying details, including the serial number, the type of equipment, and the date of purchase) within thirty (30) days of the discovery of such defect during the warranty period. No claim made more than 30 days after the expiration of the warranty period shall be valid. Guarantees of performance and warranties are based on the use of original equipment manufactured (OEM) replacement parts. Seller assumes no responsibility or liability if alterations, non-authorized design modifications and/or non-OEM replacement parts are incorporated. If requested by Seller, any equipment (or its component parts) must be promptly returned to Seller prior to any attempted repair, or sent to an authorized service station designated by Seller, and Buyer shall prepay all shipping expenses. Seller shall not be liable for any loss or damage to goods in transit, nor will any warranty claim be valid unless the returned goods are received intact and undamaged as a result of shipment. Repaired or replaced material returned to customer will be shipped F.O.B., Seller's factory. Seller will not give Buyer credit for parts or equipment returned to Seller, and will not accept delivery of any such parts or equipment, unless Buyer has obtained Seller's approval in writing. The warranty extends to repaired or replaced parts of Seller's manufacture for ninety (90) days or for the remainder of the original warranty period applicable to the equipment or parts being repaired or replaced, whichever is greater. This warranty applies to the repaired or replaced part and is not extended to the product or any other component of the product being repaired. Repair parts of its own manufacture sold after the original warranty period are warranted for a period of one (1) year from shipment against defects in materials and workmanship under normal use and service. This warranty applies to the replacement part only and is not extended to the product or any other component of the product being repaired. Seller may substitute new equipment or improve part(s) of any equipment judged defective without further liability. All repairs or services performed by Seller, which are not covered by this warranty, will be charged in accordance with Seller's standard prices then in effect.

THIS WARRANTY IS THE SOLE WARRANTY OF SELLER AND SELLER HEREBY EXPRESSLY DISCLAIMS AND BUYER WAIVES ALL OTHER WARRANTIES EXPRESSED, IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Seller's sole obligation under this warranty shall be, at its option, to repair or replace any equipment (or its component parts) which has a defect covered by this warranty, or to refund the purchase price of such equipment or part. Under the terms of this warranty, Seller shall not be liable for (a) consequential, collateral, special or liquidated losses or damages; (b) equipment conditions caused by normal wear and tear, abnormal conditions of use, accident, neglect, or misuse of said equipment; (c) the expense of, and loss or damage caused by, repairs or alterations made by anyone other than the Seller; (d) damage caused by abrasive materials, chemicals, scale deposits, corrosion, lightning, improper voltage, mishandling, or other similar conditions; (e) any loss, damage, or expense relating to or resulting from installation, removal or reinstallation of equipment; (f) any labor costs or charges incurred in repairing or replacing defective equipment or parts, including the cost of reinstalling parts that are repaired or replaced by Seller; (g) any expense of shipment of equipment or repaired or replacement parts; or (h) any other loss, damage or expense of any nature.

The above warranty shall not apply to any equipment which may be separately covered by any alternate or special warranties.

PERFORMANCE: In the absence of Certified Pump Performance Tests, equipment performance is not warranted or guaranteed. Performance curves and other information submitted to Buyer are approximate and no warranty or guarantee shall be deemed to arise as a result of such submittal. All testing shall be done in accordance with Seller's standard policy under Hydraulic Institute procedures.

LIABILITY LIMITATIONS: Under no circumstances shall the Seller have any liability under the Order or otherwise for liquidated damages or for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, regardless of the cause of such damages or losses. In any event, Seller's aggregate total liability under the Order or otherwise shall not exceed the contract price.

ACTS OF GOD: Seller shall in no event be liable for delays in delivery of the equipment or other failures to perform caused by fires, acts of God, strikes, labor difficulties, acts of governmental or military authorities, delays in transportation or procuring materials, or causes of any kind beyond Seller's control.

COMPLIANCE WITH LAW: Seller agrees to comply with all United States laws and regulations applicable to the manufacturing of the subject equipment. Such compliance shall include: The Fair Labor Standards Acts of 1938, as amended; Equal Employment Opportunity clauses of Executive Order 11246, as amended; Occupational Safety and Health Act of 1970 and the standards promulgated thereunder, if applicable. Since compliance with the various Federal, State, and Local laws and regulations concerning occupational health and safety, pollution or local codes are affected by the use, installation and operation of the equipment and other matters over which Seller has no control, Seller assumes no responsibility for compliance with those laws and regulations, whether by way of indemnity, warranty, or otherwise. It is incumbent upon the Buyer to specify equipment which complies with local codes and ordinances.



AURORA®

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