



AURORA[®]

MODEL 374
END SUCTION PUMP
INSTRUCTION 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.

SERVICE

Your Aurora pump requires no maintenance other than periodic inspection, occasional cleaning and lubrication of bearings. 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 374 pump is available with two options for lubricating the shaft bearings. They are:

1. Regreasable (standard)
2. Oil Lubrication

Regreasable bearings will require periodic lubrication and 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. Lime, lithium, lithium soda or calcium base grease is recommended as lubricants 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 vegetable or animal base which can develop acids, as well as grease containing rosin, graphite, talc and other impurities. Under no circumstances should used grease be reused.

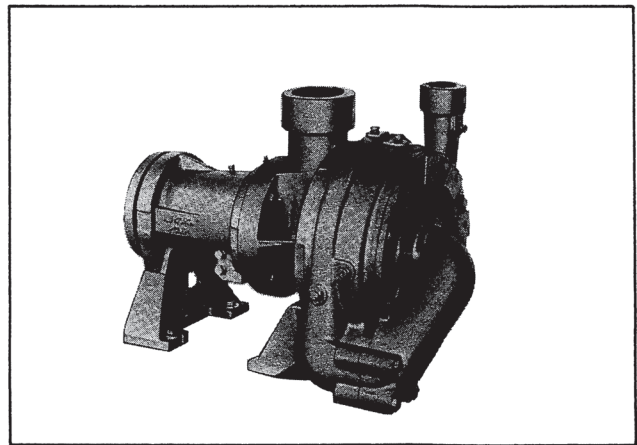
Over lubrication should be avoided as it may result in overheating and possible bearing failure. Under normal application, adequate lubrication is assured if the amount of grease is maintained at 1/3 to 1/2 the capacity of the bearing and adjacent space surrounding it.

In dry locations, each bearing will need lubrication at least every 600 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 300 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 Model 374 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 10/20 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 break down 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.



A. Assembled unit

At times it may be necessary to clean the bearings due to accumulated dirt or deteriorated lubricants. This can be accomplished by flushing the bearing with a light oil heated to 180 to 200° F. while rotating it on a spindle. Wipe the bearing housing with a clean rag soaked in a cleaning solvent, and flush all surfaces.

Dry bearing thoroughly before relubricating. Compressed air can be used to speed drying, but care should be taken not to let bearings rotate while being dried.

CAUTION

Use normal fire caution procedures when using any petroleum cleaner.

MODEL 374

The motor which drives your Aurora pump may or may not require lubrication. Consult the manufacturer's recommendations for proper maintenance instructions.

REPAIRS

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.

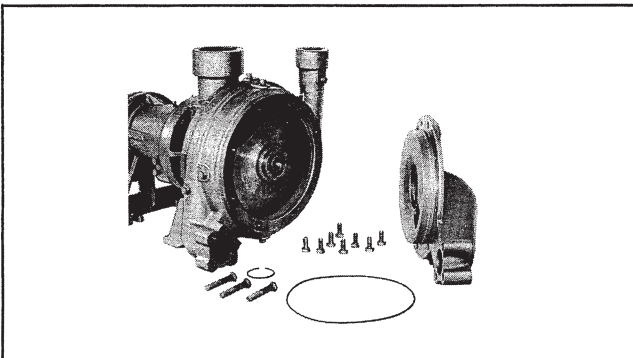
The illustrations accompanying the disassembly instructions show the pump at various stages of disassembly. The illustrations are intended to aid in the correct identification of the parts mentioned in the text.

Inspect removed parts at disassembly to determine their reusability. Cracked castings should never be reused. All gaskets should be replaced with new ones at reassembly simply as a matter of economy; they are much less expensive to replace routinely than to replace as the need occurs. In general it is economical to return to the manufacturer for repair only the motor and motor controller.

DISASSEMBLY

Disassemble only what is needed to make repairs or accomplish inspection. (See Figure 2.)

1. Break electrical connections to prevent drive unit from being energized during disassembly.
2. Remove drain plug(s) (4) from casing (6).
3. Remove all relief, cooling, flushing or drain lines from pump, including compression connections (1 and 2) and tubing (3). Break suction connection. If it is intended to leave casing (6) in the line it will not be necessary to break discharge connection.
4. Remove the flexible coupling from between the pump and motor. Next unscrew the bolts that hold supports (41 and 64) to the base and slide the pump out to be worked on.
5. Remove capscrews (18) and (19) to free suction cover (26), gaskets (8) and (8A), exposing second stage impeller (11A).

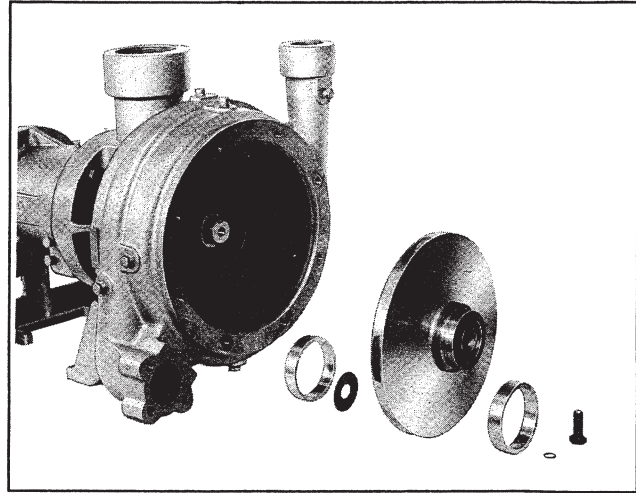


B. Cover and gaskets removed

6. Remove impeller (11A) by unscrewing impeller screw (9). Remove washer (9A) and gasket (9B).

7. Wearing rings (7), (13) and (16) are pressed into their housings with an interference fit, and must be removed with a puller. New ring(s) should be used for reassembly, since it is likely that during removal this fit will be lost.

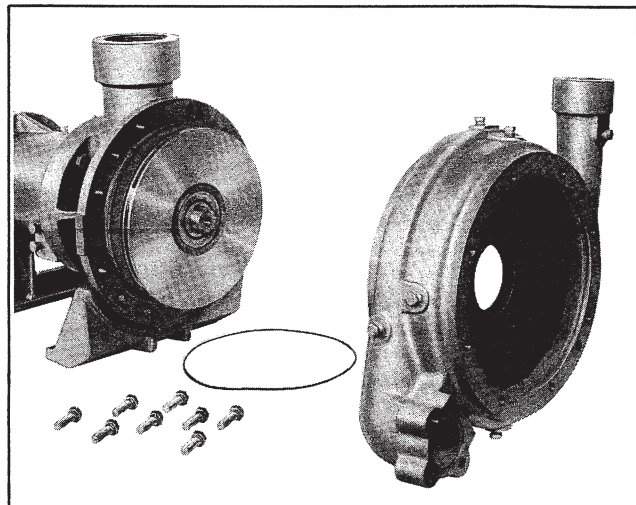
8. Impeller wear rings (optional-14, 15 and 17) are pressed on and must be cut off if replacement is necessary. If they are turned on a lathe, take care not to cut into the impeller. (Pumps prior to 1978 only.)



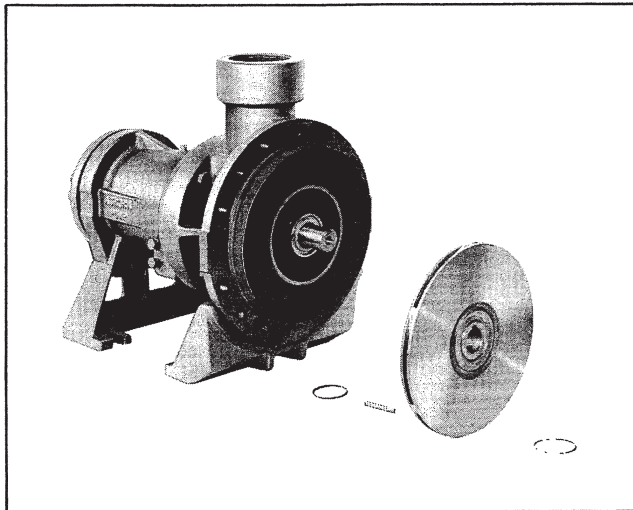
C. 2nd stage impeller and case wearing rings removed

9. Remove capscrews (5). If casing (6) was left in the line, slide remaining pump components from casing. If casing is free, remove from bracket (35). Remove gasket (8).

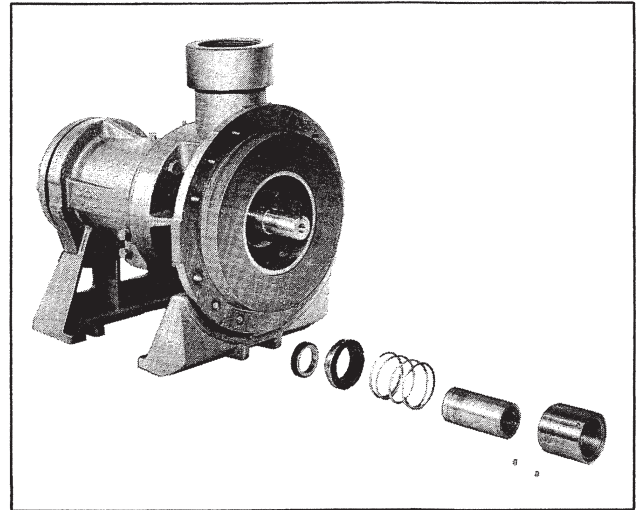
10. Remove gasket (10) from impeller (11) and slide from shaft. Remove impeller key (12) and gasket (10A).



D. Casing and gasket removed



E. 1st stage impeller, key and gaskets removed



F. Mechanical seal and sleeves removed

MECHANICAL SEAL



The mechanical seal 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. (See Figure 1.)

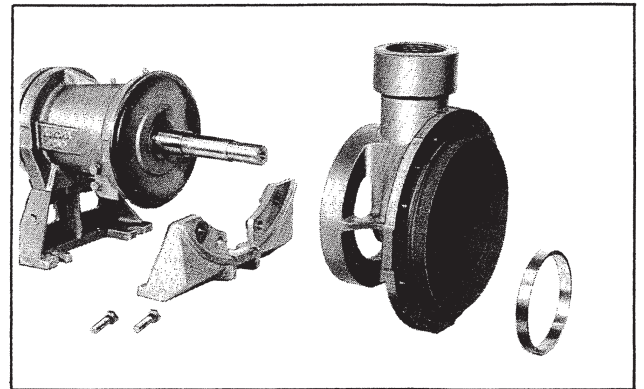
Take particular care not to scratch the lapped faces on the washer or the sealing seat. Do not put a seal back into service until the sealing faces of the washer and seat have been lapped or replaced.

A. Loosen setscrews (24) and slide collar (28) from sleeve (25).

B. Slide sleeve (25) with rotating parts of mechanical seal (27) from the shaft. The sleeve should be carefully cleaned to remove any residue that may be remaining in the seal area. The rubber in the seal may have become partially adhered to the sleeve. The sleeve must also be checked for abrasion or corrosion that can occur when fluid residue penetrates between the seal (27) and sleeve (25). The sleeve under the seal may be polished lightly to a 32RMS finish before reassembly. Do not reuse a pitted sleeve.

C. Remove capscrews (32) and carefully slide bracket (35) from frame (57).

D. The seal flexible cup and stationary seat should be pressed out of the bracket (35) and the cavity cleaned of all residue. Make sure that the 1/32 inch radius in the seal seat cavity is not damaged during disassembly since a sharp edge can easily cut the flexible cup during reassembly.

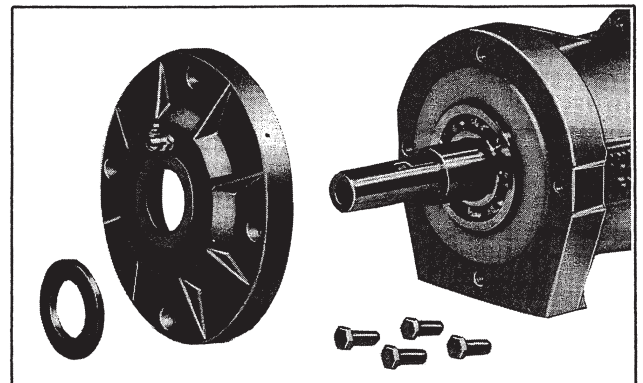


G. Bracket, support and case wearing ring removed

11. Remove capscrews (39 and 62) and washers (63) to take off supports (41 and 64).

12. Remove key (42) from the shaft and remove slingers (47).

13. Unscrew capscrews (48) and remove bearing cap (49). Remove gasket (50) and retainer ring (52).

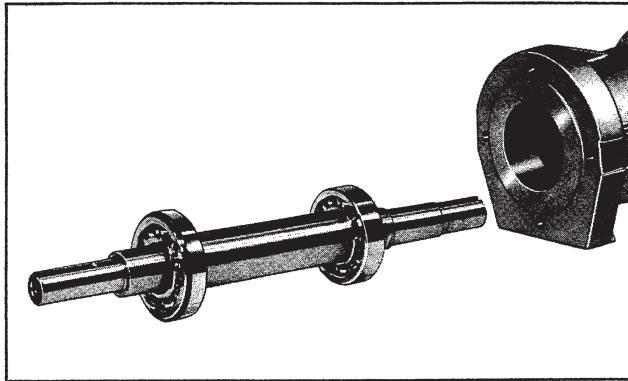


H. Bearing cap and slinger removed

*NOTE

14. Slide out shaft (55), bearings (53 and 54) and retainer (66). Since bearings (53 and 54) are press fitted on the shaft, they will have to be pulled or pressed off the shaft. Remove grease seals (51) from frame (57), and bearing cap (49). Remove spring washer (65).

15. Remove screws (33) and nameplate (34) only if replacement is necessary.



1. Shaft assembly removed

REASSEMBLY

Reassembly will generally be in reverse order of disassembly. If disassembly was not complete, use only those steps related to your particular repair program.

1. Press grease seals (51) into frame (57) and bearing cap (49).

2. Slide grease retainer (66) onto shaft (55) and locate 1/16 inch from shoulder for bearings (53). Fasten with set screws (67).

3. Press bearings (53* and 54) onto shaft (55). Snap retainer ring (52) into place. Replace washer (65).

Bearings (53), a duplex matched set of bearings, must be placed on the shaft as follows: The inside bearing, an angular contact bearing, must be mounted with the narrowest face of the outer race toward the pump end of the shaft.

4. With frame (57) in verticle position, slide shaft (55), bearings (53 and 54) and retainer (66) into frame. Place gasket (50) in place.

5. Fasten bearing cap (49) in position with cap-screws (48). Position slingers (47) on the shaft.

6. Replace wear rings (7), (13) and (16) in cover (26), casing (6) and bracket (35). Rings should not be hammered into place. Use a press, or clamp the parts in a bench vise, using wooden blocks to protect the rings. It may be necessary to pin or dowel the rings after assembly if the cover, casing or bracket has had rings replaced before, since each reassembly can stretch or tear metal and thereby loosen the fits. If the facilities are available, it is good practice to take a very light finish cut or to ream the inside diameter of the casing rings after pressing to restore roundness. When rings are pressed, they may get squeezed out of shape.

7. Coat the mating surfaces of impeller wear rings (optional-14, 15 and 17) and impellers (11 and 11A) with Locktite sealant grade AV. Replace wear rings, using the same care as for the case wear rings. If the rings are to be trued on a lathe, do not clamp the impeller so tightly that it is permanently distorted. (Pumps prior to 1978 only.)

8. Position bracket (35) on the frame (57) and secure with capscrews (32). Tighten screws evenly to assure proper alignment.

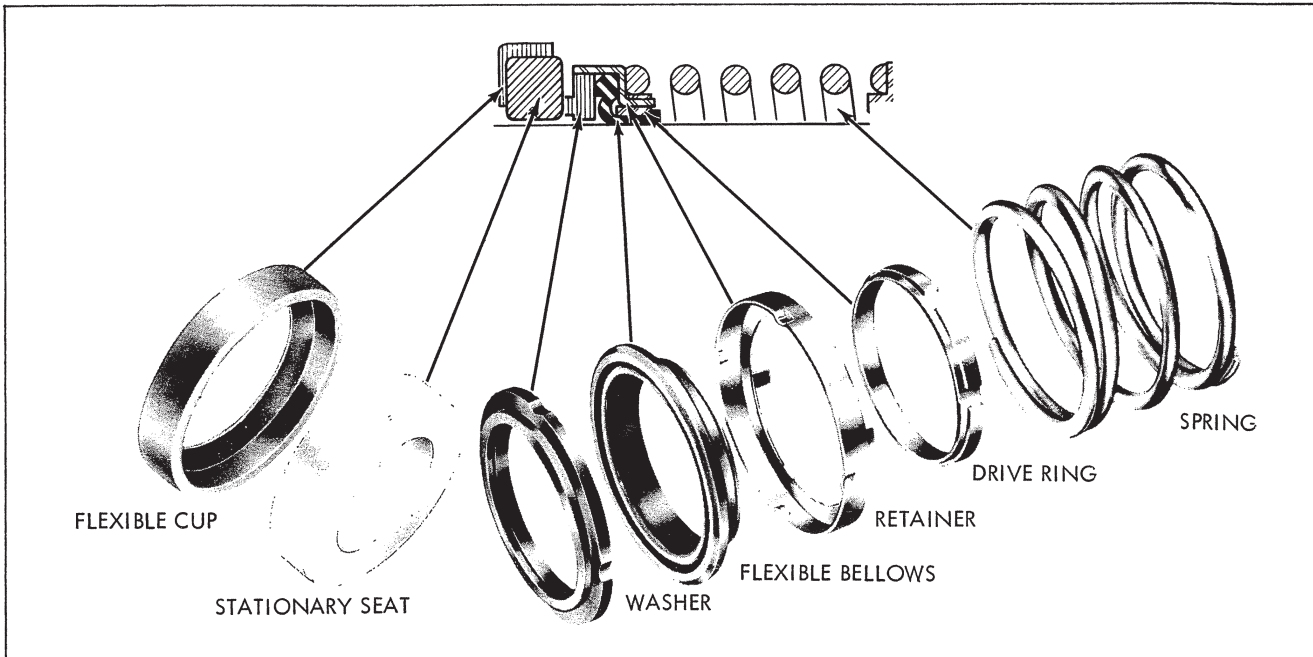


Figure 1. Mechanical Seal (Optional)

MODEL 374

9. Fasten the supports (41 and 64) to bracket (35) and frame (57) with washers (63) and capscrews (39 and 62).

10. If nameplate (34) was removed, install and attach with screws (33).

MECHANICAL SEAL

The mechanical seal (27), (see Figure 1), should not be installed as an assembly. It is necessary to have the seal seat properly in place before the balance of parts can be added.

A. Wipe the sealing faces of the seat and seal washer clean. Lightly oil the shaft sleeve (25). Slide the entire rotating assembly onto the sleeve.

B. Thoroughly inspect the seal cavity in the bracket (35) for burrs or nicks which could damage the seat of the seal. Apply a film of soap paste or flax soap, (do not use oil or grease) to the seal seat. Replace flexible cup in bracket (35).

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. The tubing should be slightly larger than the diameter of the shaft. Remove cardboard after seat is firmly in place.

C. The shaft sleeve with the seal rotating assembly on it may now be replaced on the motor shaft. Seat the sleeve (25) against the shaft shoulder.

D. Slide collar (28) over sleeve (25) and secure in position flush with liquid end of sleeve (25) with setscrews (24). Spring tension will probably prevent the sleeve from remaining in position axially

until impeller is locked against it.

10. Carefully place gasket (10A) on shaft in recess of collar (28). Slide key (12) and impeller (11) onto shaft being careful to maintain position of gasket (10A).

11. Replace gasket (8) on bracket (35) and gasket (10) in impeller (11). Secure casing (6) to bracket (35) with capscrews (5).

12. Slide impeller (11A) over motor shaft and secure with gasket (9B), washer (9A) and impeller screw (9).

13. Position gasket (8A) in casing (6) and gasket (8) on cover (26). Secure cover (26) to casing (6) with capscrews (18 and 19).

14. Install the pipe plugs (4) in the pump casing (6). Replace all relief, cooling, flushing or drain lines from the pump including compression connections (1 and 2) and tubing (3).

15. Secure suction and discharge piping to the pump.

16. Connect electricity to the motor.

17. Read carefully the section of the manual titled INSTALLATION, especially those paragraphs referring to pump and coupling alignment.

STARTING PUMP AFTER REASSEMBLY

Do not start pump until all air and vapor has been bled and until making sure that there is liquid in the pump to provide the necessary lubrication. Without the fluid around it, the seal may be ruined in a few seconds of operation. It is possible that the mechanical seal may drip during the first few minutes to one hour of operation.

MODEL 374

MODEL 374 LIST OF PARTS

1. Elbow	18. Capscrew	48. Capscrew
2. Connector	19. Capscrew	49. Bearing Cap
3. Tubing	24. Setscrew	50. Gasket
4. Plug, Pipe	25. Sleeve	51. Seal
5. Capscrew	26. Cover	51A. Seal
6. Casing	27. Seal	52. Retaining Ring
7. Wear Ring	28. Collar	53. Bearing
8. Gasket	32. Capscrew	54. Bearing
8A. Gasket	33. Screw	55. Shaft
9. Impeller Screw w/"O" Ring	34. Nameplate	56. Plug, Pipe
9A. Washer	35. Bracket	57. Frame
9B. Gasket	39. Capscrew	58. Grease Fitting
10. Gasket	41. Support	59. Plug, Pipe
10A. Gasket	42. Key	60. Oiler Assy.
11. Impeller	43. Grease Fitting	62. Capscrew
11A. Impeller	44. Tube, Vent	63. Washer
12. Impeller Key	46. Plug, Pipe	64. Support
13. Wear Ring	47. Slinger	65. Spring Washer
16. Wear Ring	47A. Slinger	66. Retainer
		67. Setscrew

- NOTES: 1. IRON FITTED CONSTRUCTION WILL BE FURNISHED AS STANDARD UNLESS SPECIFIED.
2. REFER TO FACTORY FOR SPECIAL ALLOYS.
3. AURORA PUMP RESERVES THE RIGHT TO SUBSTITUTE MATERIALS WITHOUT NOTICE.
4. PIECE NUMBERS 14, 15 AND 17 ARE NOT FURNISHED AS STANDARD. WHEN FURNISHED IMPELLER MUST BE MODIFIED.

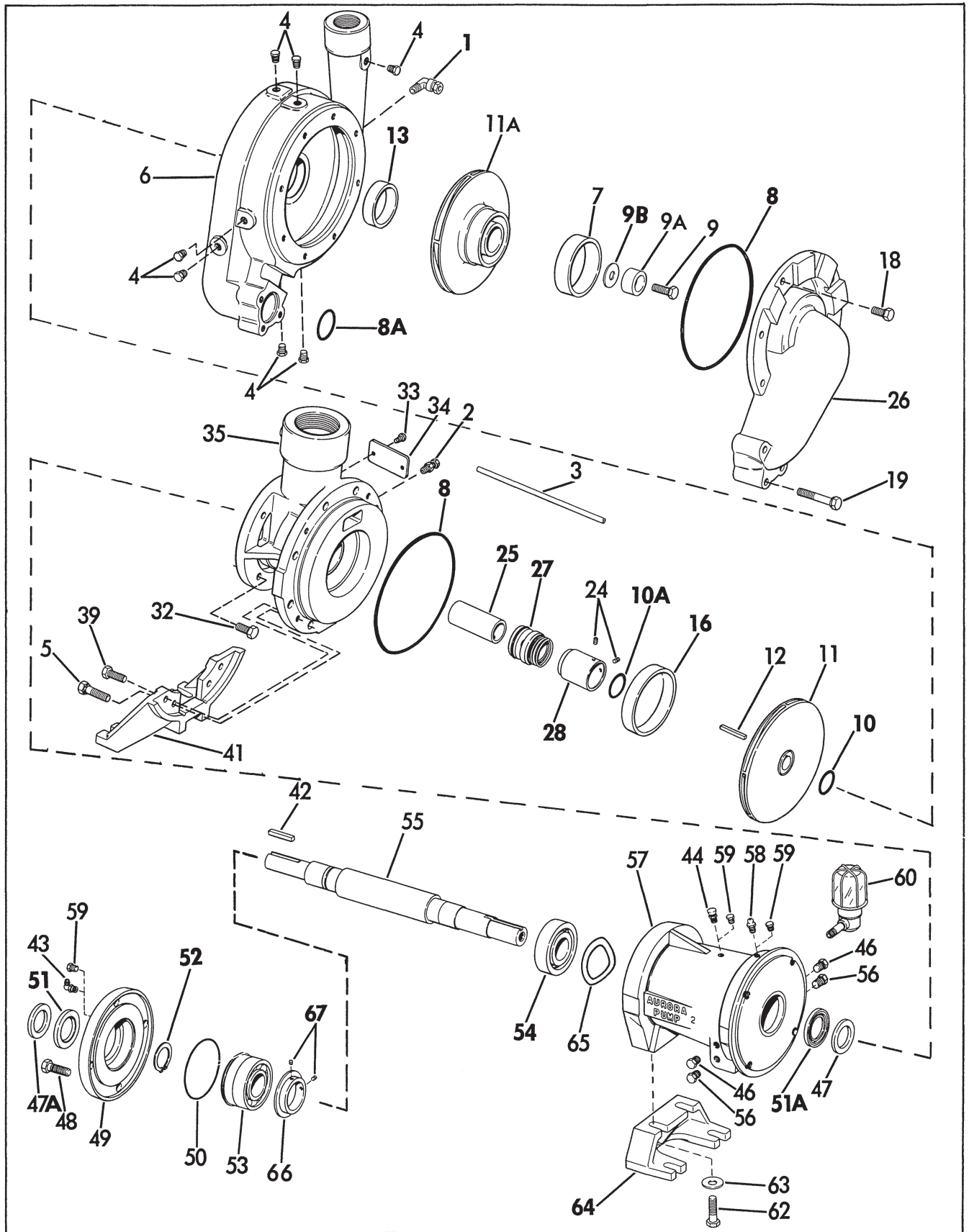
NOTES

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

ORDER ALL PARTS FROM YOUR LOCAL AUTHORIZED DISTRIBUTOR, FACTORY BRANCH SALES OFFICE OR THE FACTORY AT NO. AURORA, ILLINOIS.

THIS MANUAL COVERS THE ASSEMBLY AND DISASSEMBLY FOR PUMP MODELS 374, 374A and 374B. MODEL 374 PUMPS DID NOT USE PIECE NUMBERS (50), (66) OR (67) AND PIECE NUMBER (53) WAS A SINGLE ROW BEARING. REFER TO CURRENT REPAIR PARTS MANUAL TO CONVERT MODEL 374 PUMPS TO LATEST MODEL 374B DESIGN.

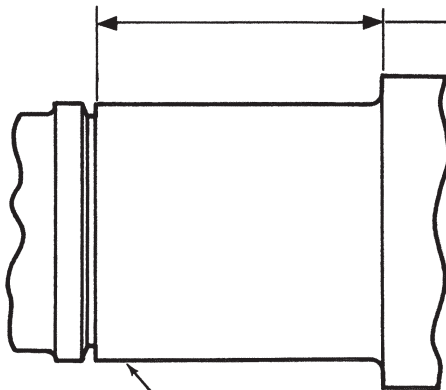
SEE THE ILLUSTRATION ON PAGE 8 OF THIS MANUAL TO IDENTIFY MODELS 374, 374A AND 374B.



BOLD FACE PIECE NUMBERS INDICATE RECOMMENDED SPARE PARTS

Figure 2. Exploded View

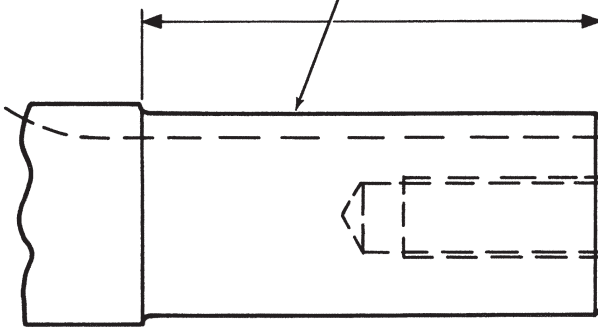
374 MODEL IDENTIFICATION



BEARING SHOULDER TO SNAP RING
GROOVE OF THRUST BEARING

<u>PART NO.</u>	<u>DIM.</u>	<u>MODEL</u>	<u>PUMP SIZE</u>
7284985063	55/64	374	1-1/2 x 3 x 10
7284990063	1-25/32	374A	1-1/2 x 3 x 10
7284991063	1-25/32	374B	1-1/2 x 3 x 10
7280140063	1-1/64	374	2 x 4 x 10
7280406063	2-5/64	374B	2 x 4 x 10
7287103063	2-5/64	374B	1-1/2 x 3 x 10 Powerframe 3A

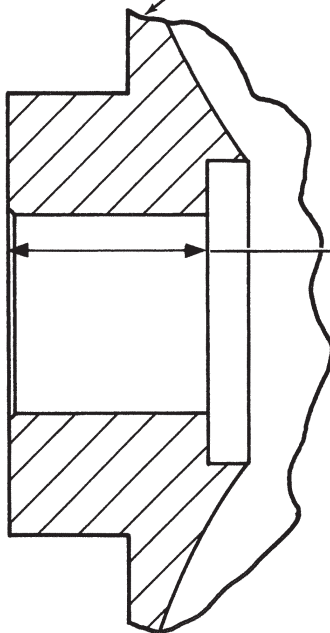
PIECE 55



END OF SHAFT TO SHOULDER AT
IMPELLER END

<u>PART NO.</u>	<u>DIM.</u>	<u>MODEL</u>	<u>PUMP SIZE</u>
7284985063	2-1/4	374	1-1/2 x 3 x 10
7284990063	2-1/4	374A	1-1/2 x 3 x 10
7284991063	2-7/8	374B	1-1/2 x 3 x 10
7287103063	2-7/8	374B	1-1/2 x 3 x 10 Powerframe 3A

PIECE 11A



BORE LENGTH SECOND STAGE IMPELLER

<u>PART NO.</u>	<u>DIM.</u>	<u>MODEL</u>	<u>PUMP SIZE</u>
4430531010	23/32	374 & 374A	1-1/2 x 3 x 10
4430533010	23/32	374 & 374A	1-1/2 x 3 x 10
4432262010	1-1/4	374B	1-1/2 x 3 x 10
4432263010	1-1/4	374B	1-1/2 x 3 x 10

Refer to PARTS LISTS of individual model
for part numbers.

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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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