BULLETIN NO. 2880550

# REPAIR INSTRUCTIONS
# TYPE AB CENTRIFUGAL PUMPS
## Grease Lubricated Ball Bearings

PEERLESS PUMP

## SECTION I
## DISASSEMBLY

**WARNING**

Shut down pump. Temporarily disable the pump driver before starting any repairs. Refer to Bulletin No. 2880549 for the procedure to follow.

1-1. Disengage the coupling halves. If pin and rubber bushing type, remove the pins; if other type, refer to the coupling manufacturer's instructions.

1-2. PUMP. (See Figure 1.) Disassemble pump (to the extent required) as follows:

a. Remove the nuts from the gland bolts (17B) and remove glands (17) from the shaft (6). The gland halves are separable.

b. Remove all nuts or cap screws from the upper casing (1B) and from the bearing caps (41).

c. Screw down the jack screws to separate the upper and lower casings. Turn the jack screws back after the case halves have separated to avoid interference at reassembly.

d. Match mark and remove both bearing caps (41).

e. Attach hoist to the eye bolt(s) to lift upper casing (1B).

f. Place slings around the shaft near the bearing housings and lift rotating element from lower casing (1A). Tap lightly on the underside of the bearing housings to separate the housings from the brackets.

g. Place rotating element in a convenient work place.

1-3. ROTATING ELEMENT. Disassemble in the following manner:

a. Loosen set screw and remove the coupling half. Tap from the back of the hub or use a puller. Remove coupling key (46).

b. Take out cap screws to remove bearing covers (35, 37) and the gaskets (73B).

c. Loosen and remove bearing locknut (22) and lockwasher (69A).

d. Remove housings (31), bearings (16) and deflectors (40A), as units with a bearing puller.

e. Withdraw casing rings (7). On most pumps these may be withdrawn before removing the coupling half.

f. Remove packing (13), lantern rings (29) and stuffing box bushings (63). Make note of the number of packing rings on each side of the lantern rings.

NOTE

If pump is equipped with a mechanical seal (in place of packing), refer to the seal manufacturer's maintenance and repair instructions.

g. Loosen the shaft sleeve (14) setscrews near impeller hub. With a spanner wrench turn the inboard sleeve in the same direction as shaft rotation to remove (shaft has right- and left-hand threads on opposite sides of impeller).

NOTE

A seal between the shaft and sleeve is made with a rubber O-ring in a groove in the sleeve. Use care not to damage the O-ring.

h. Remove the impeller with an arbor press or a tube and hammer (refer to bearing removal of Bulletin No. 2880549).

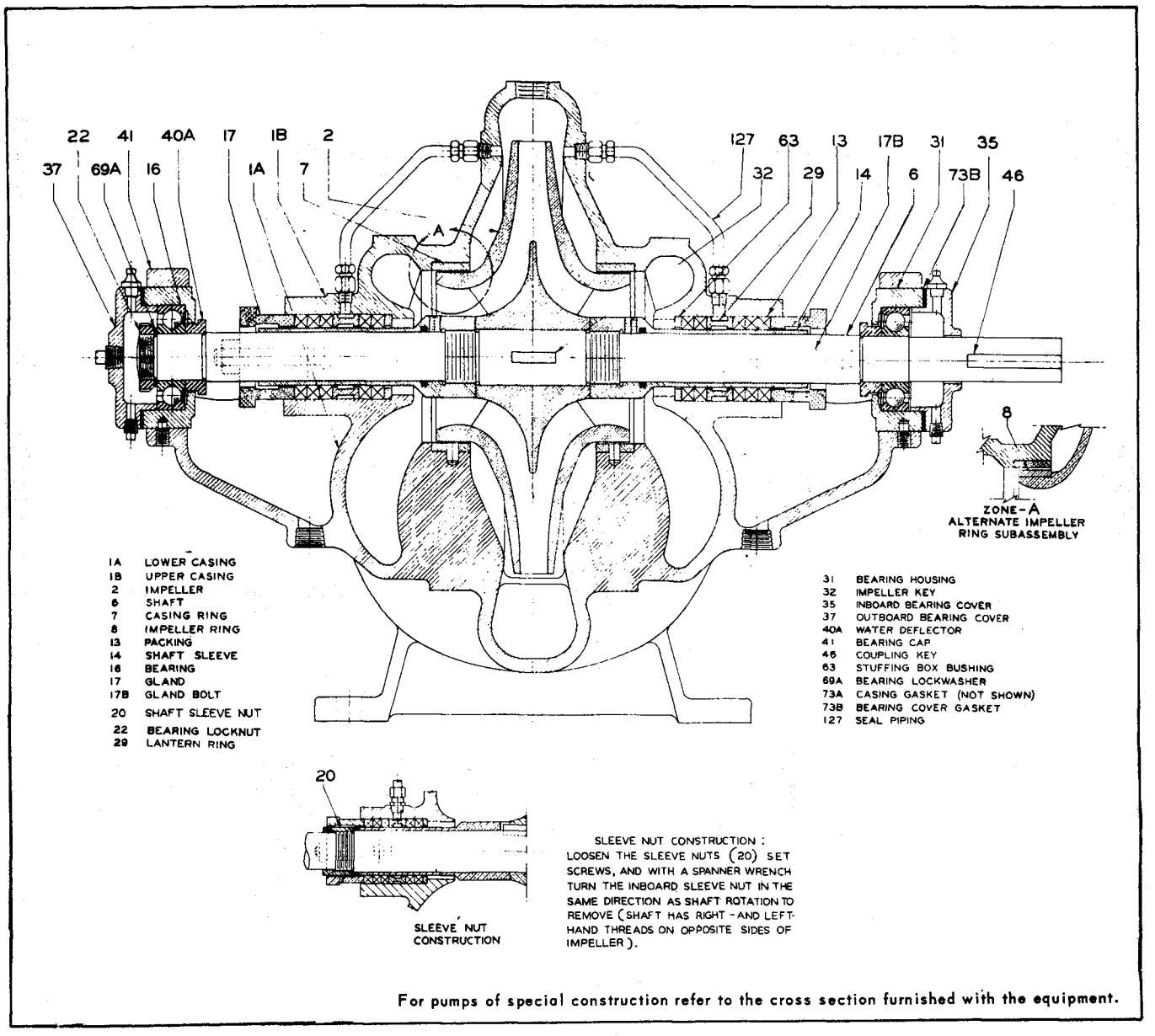


FIGURE 1. PUMP CROSS SECTION (TYPICAL)

NOTE

The interference between impeller hub ID and shaft OD meets ASA B4.1 -1955 standards for "Preferred Limits and Fits for Cylindrical Parts" and corresponds to standard fit LC-1.

i. Remove keys (32).

1-4. CLEANING. Clean all metal parts (except bearings) with a solvent. Use a bristle brush (NOT metal or wire) to remove tightly adhering deposits. A fiber scraper may be used to remove the gasket and shellac from casing flanges.

a. Blow dry with clean dry compressed air.

b. Clean bearings as described in Bulletin No. 2880549.

PEERLESS PUMP

# SECTION II

# INSPECTION AND REPAIR

2-1. INSPECTION. Visually inspect parts for damage affecting serviceability or sealing. Emphasize inspection of mating parts having relative motion - wear rings, for example. Perform detail inspection as follows:

a. Check O-rings and bearing cover gaskets for cracks, nicks or tears; packing rings for excessive compression, fraying or shredding, embedded particles (dirt or metal). Replace if defective in any way.

b. Mount the shaft between lathe centers. Check the eccentricity throughout entire length with a dial indicator to be not more than 0.002 inch total indicator reading. Check that threads are clean and sharp. Surfaces on which bearings mount must be smooth, have a finish not less than 32 microinches and the shoulders square and free from nicks.

c. Measure the OD of the impeller (2) wear surface or ring (8) and the ID of the casing ring (7). Compute the diametrical clearance (ID minus OD) and compare with the limits given in Bulletin No. 2880549. ID surface of casing ring must be smooth and concentric.

d. Examine impeller passages for cracks, dents, gouges or embedded material.

2-2. REPAIR. Make needed repairs in the following manner:

a. If ID of casing ring (7) is grooved, scored or eccentric, bore to produce a smooth, concentric surface. Measure and record the new ID.

b. If impeller rings (8) are defective, or mating casing rings require boring, remove the old rings by turning in a lathe - be sure machining is concentric with impeller ID. Use care NOT to reduce hub OD.

NOTE

For bronze impellers and rings, the ring is shrunk on the hub according to standard fit FN-4 of ASA B4.1-1955 standards. For pumps of 10-inch discharge and larger, the rings are also tack welded to the hub at 3 places 120° apart. Hardened impeller rings are installed according to ASA B4.1-1955, standard fit FN-1.

c. Install new rings (8) on the impeller (shrink or press depending on material) and tack weld, if old rings were tacked. The ID is factory-machined for proper fit.

d. Turn the OD of the new rings to provide the proper diametrical clearance and to be smooth and concentric with hub bore. Use clearance limit from Bulletin No. 2880549 and ID of casing ring from paragraph 2-2a to compute OD of impeller rings.

NOTE

Six-inch and smaller discharge pumps may be furnished without impeller rings; the wear-surface is an integral part of the impeller. On all but two sizes of such pumps, wear rings may be field-installed by machining the hub. Refer to note following paragraph 2-2b for standard fits to be produced by machining when making such repair. Replace defective impellers which cannot be salvaged by such repair.

e. Replace worn shaft sleeves.

f. Straighten or replace shafts having excessive run-out (eccentricity).

## SECTION III
## REASSEMBLY

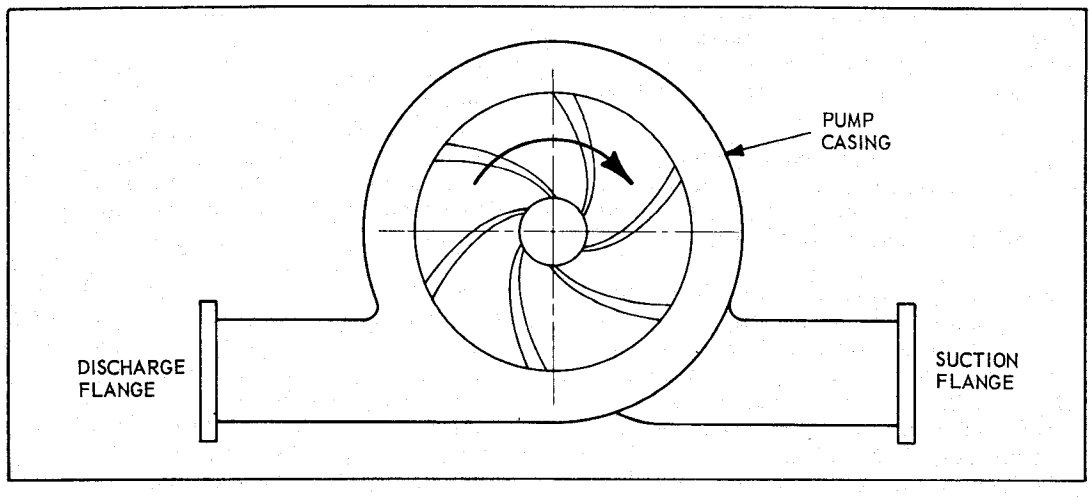


FIGURE 2. VANE POSITION FOR PROPER ROTATION

3-1 ROTATING ELEMENT. (See Figure 1.) Reassemble as follows:

a. Coat the shaft (6) lightly with oil.

b. Place impeller keys (32) on shaft.

c. Align impeller (2) on shaft and install with an arbor press or with brass tubular sleeve and hammer. Guard against bending shaft. When assembled the impeller vanes must rotate in the proper direction. (See Figure 2.)

d. Install O-rings in shaft sleeves (14), coat with oil and screw sleeves on shaft to loosely butt the impeller hub.

e. Install the stuffing box bushing (63) and lantern ring (29) on the shaft. If a mechanical seal is used, install according to the seal manufacturer's instructions.

f. Locate casing rings (7) on impeller.

g. Place water deflectors (40A) on shaft.

h. Insert bearings (16), shield side first, into housings (31).

i. Press housing-bearing assemblies on shaft to bottom with water deflectors. Refer to Bulletin No. 2880549 for procedure (mounting bearings).

j. Install bearing lockwasher (69A) and locknut (22) and tighten against the outboard bearing.

k. Install gaskets (73B) on bearing covers. Cut replacement gaskets from 1/16 inch No. 444 Vellumoid.

l. Attach bearing covers (35, 37). In the assembled position the grease fittings must be located on top.

m. Install coupling key; assemble coupling half on the shaft and tighten the setscrew.

3-2. PUMP. Complete the assembly of pump as follows:

a. Use the upper casing (1B) as a template to cut a gasket (73A) from 1/64 inch Vellumoid. Machined surfaces of both casings must be perfectly clean and free from burrs and nicks.

b. Affix the new gasket to lower casing (1A) with shellac.

c. Use slings around the shaft near bearings to set rotating element into lower casing. Position the casing rings (7) and both bearing housings so that all dowel pins engage.

d. Assemble both bearing caps and tighten the cap screws.

e. Adjust the shaft sleeves (14) to center the impeller in the lower casing. Tighten the setscrews. Make sure that impeller is centered.

f. Cover the top side of the casing gasket with a mixture of graphite and oil. Install the gland bolts. Carefully locate the upper casing on the lower, making certain the dowel pins engage. Attach case nuts and alternately tighten at diagonally opposite positions. Rotate shaft by hand to check that it runs free.

g. Withdraw the lantern rings (29) and push the bushings (63) to the rear of the stuffing boxes. Insert the same number of packing rings as were found during disassembly, on each side of the lantern ring. Insert each ring separately and stagger the joints of successive rings 90°. Insert the glands (17) and set the nuts finger tight - DO NOT USE A WRENCH.

h. Rotate shaft by hand to check that it runs free.

i. Replace all drain plugs removed during disassembly.

j. Relubricate the bearings. Refer to Bulletin No. 2880549.

3-3. Follow instructions in Bulletin No. 2880549 to check out the pump after repair and place the pump in service.



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