



SERIES 55/77 CLOSE COUPLED PUMP REPAIR INSTRUCTIONS

This entire bulletin should be read before attempting pump repair.

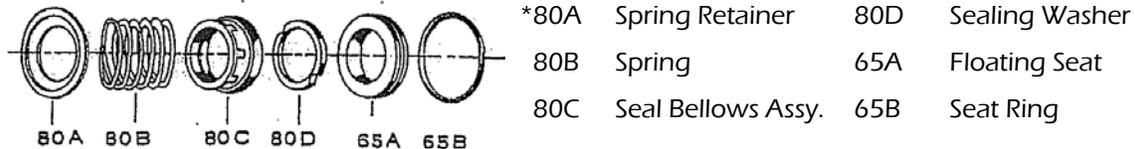
WARNING

Do not operate this pump at any pressure, flow rate, or liquid temperature other than those for which the pump was originally purchased. Do not pump any other liquid than the one for which the pump was originally purchased. Disregard of this warning can result in pump failure and serious personal injury or death.

PUMP TYPES

Series 22/44 pumps are furnished in two types, packed and mechanical seal. Either version may be furnished in bronze fitted or iron fitted construction.

MECHANICAL SEAL



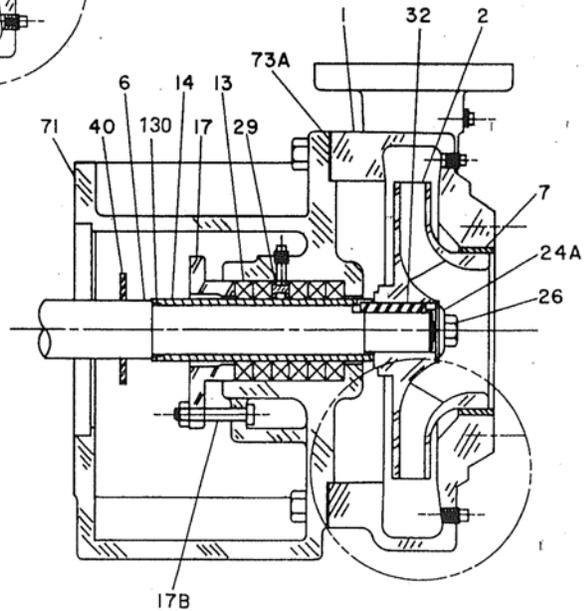
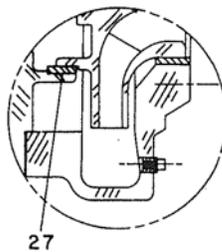
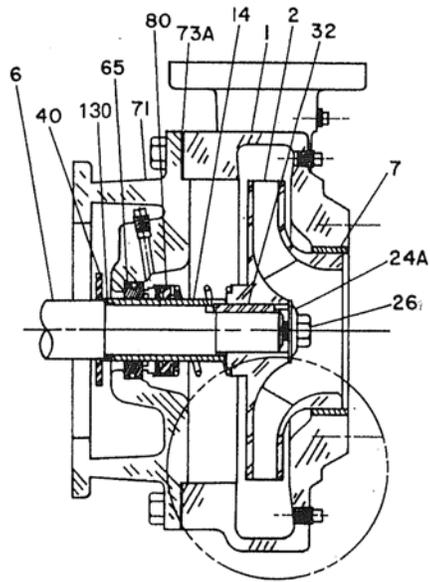
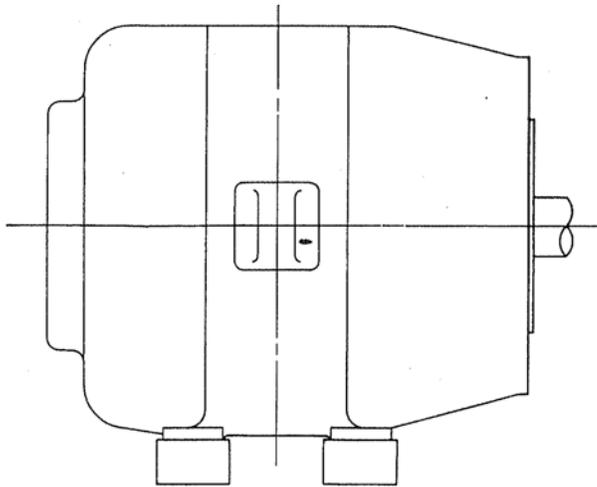
* Some pumps have a step turned on the impeller hub to accept the spring and therefore do not have or use a spring retainer.

PUMP REMOVAL

Before starting disassembly of the pump, it is recommended that a set of spare parts be obtained. Reusing gaskets, o-rings, packing rings, or ball bearings is not recommended. Shut down the pump. Disconnect power to the pump driver before starting any repairs.

Thread depth for suction flanges:

2½"-4" dia. suction 5/8" dia. thread - .75" deep
 5"-8" dia. suction 3/4" dia. thread - .88" deep



- 1 Casing
- 2 Impeller
- 6 Shaft
- 7 Casing Ring
- 13 Packing
- 14 Shaft Sleeve
- 17 Gland
- 17B Gland Bolt
- 24A Impeller Washer
- 26 Impeller Lock Screw
- 27 Adapter Ring
- 29 Lantern Ring (optional)
- 32 Impeller Key
- 130 Shaft Sleeve O-ring
- 40 Deflector
- 65 Mechanical Seal, Stationary Element
- 71 Adapter
- 73A Casing Gasket
- 80 Mechanical Seal, Rotating Element

Figure 1. Type C End Suction Pumps

PUMP DISASSEMBLY

Disassemble pump in the following manner:

NOTE: The pump may be either packed or with a mechanical seal. Procedures for the two types of sealing differ slightly.

- 1) Remove any seal piping (tubing) that may be present between pump discharge and stuffing box of adapter (71, Figure 1).
- 2) Take out all screws and remove casing (1) and casing gasket (73A). If necessary, lightly tap with plastic hammer at several places to loosen casing from adapter.
- 3) Insert a rod of suitable diameter into a passage of impeller (2) and hold while loosening impeller lock screw (26). Remove lock screw and impeller washer (24A).
- 4) Slide impeller from end of shaft (6) and remove impeller key (32). If impeller is hard to remove, use a small wood block against adapter and pry carefully at several points around impeller to loosen.
- 5) For the mechanical seal pump, very carefully remove seal parts (80A through 80D). Be particularly careful not to scratch or damage lapped surface of sealing washer (80D). Store seal parts in suitable container; lapped surface of sealing washer must be up and covered.
- 6) For the packed pump, loosen both gland bolts (17B) and pull gland (17) out slightly to relax packing (13).
- 7) Remove screws and slide adapter (71) off from shaft. Use care not to scratch shaft sleeve (14).
- 8) Carefully push floating seat (65A) from adapter, avoiding scratching or other damage to lapped surface. Use narrow, flat screwdriver to lift and work o-ring (65B) from seat. Store seat with remaining mechanical seal parts with lapped surface up and covered.
- 9) Remove gland (17), packing (13) and lantern ring (29) (if furnished) from adapter (for packed pump).
- 10) Slide shaft sleeve (14) and deflector (40) from shaft. Remove o-ring (130) from shaft sleeve.
- 11) Remove casing ring (7) from casing only if damaged or work to excess (refer to REPAIR).

CLEANING

WARNING

Petroleum-base cleaning solvents are flammable. Smoking or open flames in the vicinity of these solvents are extremely hazardous and must not be permitted. Disregard of this warning could result in grave personal injury.

Clean all metal parts 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. Blow dry with clean dry compressed air.

CAUTION: Never use hydrocarbon liquids (oil or solvent) to clean mechanical seal parts. Use of oil or solvent will deteriorate material used for manufacture of the seal.

Clean seal parts using a mild soap solution. Rub only with finger to remove dirt. Rinse with clear water and dry with mild air stream. Use care not to damage or scratch lapped surfaces.

INSPECTION

Visually inspect and replace parts that are damaged and affecting the serviceability of sealing. Emphasize inspection of mating parts having relative motion – casing rings, for example. Perform detailed inspection as follows:

- 1) Check o-rings, gaskets, and seals for shrinkage, cracks, nicks or tears.
- 2) Check packing rings for excessive compression, fraying or shredding, embedded particles (dirt or metal). Replace if defective in any way.

- 3) Examine impeller passages for cracks, dents, gouges or embedded material.
- 4) Inspect shaft sleeves (14) for excessive wear. Replace sleeves that are worn.
- 5) Inspect lapped surfaces of sealing washer and floating seat for chipping, gouges, nicks, scratches or other damage. These surfaces must be free from any defect. If lapped surfaces are damaged, replace the entire seal.

REPAIR

When ordering repair parts give the complete pump nameplate data (nameplate on the pump casing) plus the name and item number of the part shown in Figure 1.

Remove burrs, nicks, and scratches from non-critical areas with a fine stone or crocus cloth.

- 1) Impeller and Casing Wear. If the pump capacity falls off due to wear on the impeller and casing ring, repair is made by replacing the casing ring. The inside diameter of the casing ring should be 0.008" to 0.012" larger than the impeller skirt diameter.
- 2) Normally, when the pump is completely disassembled, all gaskets, o-rings, and seals should be replaced at reassembly. If the o-rings for the floating seat of the mechanical seal or shaft sleeve are not damaged, they may be reused with the other, satisfactory seal parts.

REASSEMBLY

WARNING

The replacement electric motor must be of the same voltage, RPM and frame number as original motor. If replacement motor is of higher RPM, pump will develop excessive pressure and horsepower causing pump and equipment damage and personal injury.

Reassemble pump in the following manner:

- 1) Install o-ring (130) in sleeve (14). Install deflector and shaft sleeve over shaft, making sure sleeve bottoms on shoulder. Position deflector midway between end of sleeve and grease retainer. Align sleeve slot with key slot of shaft.
- 2) For the packed pump, slide the gland (17) and lantern ring (29) over the shaft sleeve to abut the deflector.

CAUTION: Use care not to mar or scratch the lapped surfaces of floating seat and sealing washer when installing mechanical seal. Damage to these surfaces will result in leakage and will require replacement of the entire seal.

- 3) For the mechanical seal pump, lubricate the o-ring (65B), groove in floating seat (65A) and seat cavity in adapter (71) with any of MOLYKOTE® DC No. 55, silicone grease, 3% detergent solution, glycerine or ethylene glycol.
- 4) Install floating seat in the adapter with lapped surface facing away from adapter shoulder. Apply lubricant (step 3 above) to entire surface of shaft sleeve and carefully install adapter. Use care not to cock or scrape floating seat on sleeve. Seat adapter (71) against motor, tapping very lightly with plastic hammer, then install screws and tighten uniformly. Rotate shaft by hand to check that there is no binding or hang-up.
- 5) In the same manner as in step 4, lubricate the entire surface of shaft sleeve and the bores of sealing washer (80D) and spring bellows assembly (80C). Carefully install sealing washer, lapped surface toward floating seat and spring bellows assembly on shaft sleeve and slide long to contact floating seat. Install spring (80B) and spring retainer (80A) if used.
- 6) For the packed pump, install the adapter (71) in the same manner as in step 4 except shaft sleeve need not be lubricated.

CAUTION: Be sure at all times that the gland enters the box square to the shaft so that uniform pressure is exerted around the packing. A tipped gland is an invitation for binding and leakage.

- 7) In order, install 3 rings of packing (13), the lantern ring (29) (if furnished) and 2 rings or packing in adapter cavity. When lantern ring is not furnished, install 6 rings of packing. Stagger the joint of each packing ring approximately 180° from adjacent rings. Be sure each ring is square with the shaft. Use a split bushing and the gland (17) to move rings to the bottom of the cavity. When all packing rings are in place, position the gland (17) and loosely seat on packing, using gland bolts (17B). Tighten as required to limit leakage after pump is running.
- 8) Install impeller key (32) in shaft keyway. Make sure that key enters slot in shaft sleeve. Align impeller (2) with key and install on shaft. Tap impeller hub lightly with plastic hammer to seat against shaft sleeve. For the mechanical seal pump, guide the spring retainer and spring to seat on the shoulder as impeller is installed. Be sure spring is correctly seated against bellows assembly.
- 9) Install impeller washer (24A) and impeller lock screw (26). Restrain impeller with rod inserted in one passage and securely tighten screw. Rotate shaft by hand to check for free movement.
- 10) Lightly coat both sides of casing gasket (73A) with a non-hardening sealing compound, such as grease and graphite. Position on adapter making sure that holes are aligned. Install casing (1), tapping lightly with plastic hammer to seat on adapter. Install screws and tighten uniformly in a star pattern. The cap screws are SAE Grade 5 and are to be tightened to the following minimum torque values for dry threads:

Size	Torque
3/8	30 ft-lbs
7/16	50 ft-lbs
1/2	75 ft-lbs
5/8	155 ft-lbs

- 11) Install seal piping (tubing) (if used) between pump discharge and stuffing box of adapter.

NOTICE: Materials of construction, specifications, dimensions, design features, and application information, where shown in this document, are subject to change and/or modification without notice.

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