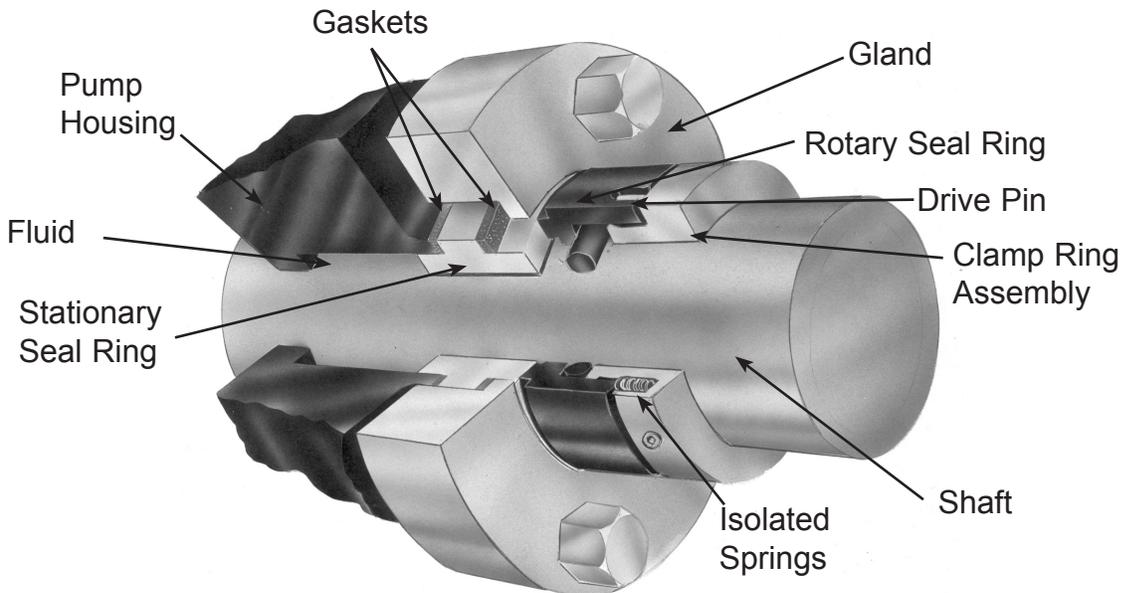


Installation Instructions: CSO Outside Mounted Seal



Part 1. Standard Installation Procedure: Single Ended Pump

Part 2. Installation Procedure: TFE or Glass Lined Single Ended Pump

Part 3. Repair or Adjustment Procedure

Part 4. Installation Procedure: Double Ended Pump

Part 5. Installation Procedure: Double Ended Pump Continued

Part 6. Installation Procedure: Double Ended Pump Continued

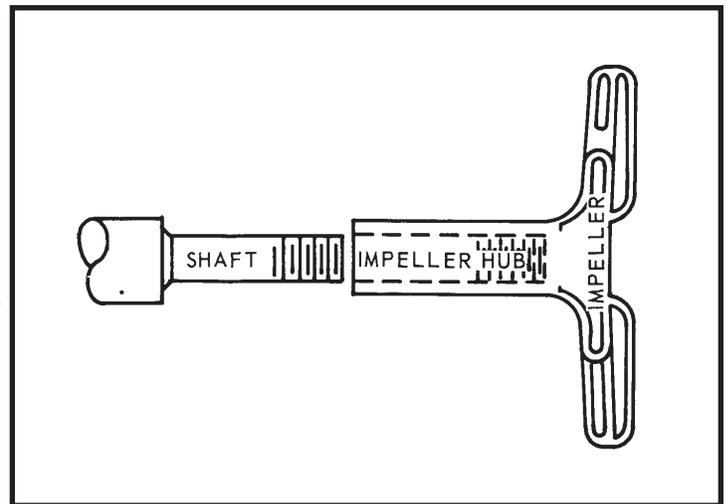
Part 7. Installation Procedure: Vertical Single Ended Pump

- 1.** For installation on single ended pumps, (standard construction):
 - a. Leave all seal parts in protective package until equipment has been inspected and repaired.
 - b. Check and pre-set impeller clearances before disassembling pump.
 - c. Disassemble and clean equipment.
 - d. Remove all burrs and marks from pump shaft or shaft sleeve and break all sharp edges.
 - e. Dial indicate the shaft. Allowable runout is .003", allowable end play +.005". Excessive runout or end play must be corrected.
 - f. Remove seal parts from protective package, keeping seal faces clean. Do not lubricate seal faces. Do not remove retainer clips.
 - g. Lubricate seal O-ring with silicone lubricant provided. Do not use petroleum based lubricants.
 - h. Carefully slide seal rotary unit over end of shaft or sleeve, taking care not to cut O-ring. A slight twisting action will help compress the O-ring. Slide rotary back to first obstruction, do not remove retainer clips.
 - i. Place stationary seat and stuffing box gasket against stuffing box face. Apply second gasket provided to outer portion of stationary seat.

- j. Place seal gland plate over gland studs and bring up to hold stationary seat in place at stuffing box.
- k. Tighten gland nuts enough to compress gaskets. Do not over tighten.
- l. Install stuffing box assembly (stuffing box, stationary face and gland plate) into pump.
- m. Install impeller.
- n. Slide seal rotary up to stationary seat and touch the two seal faces together, making certain seal is compressed with clips.
- o. Tighten set screws.
- p. Remove retainer clips.
- q. Reassemble remaining pump parts.
- r. Install pump online, making certain that all flush connections are attached and open.

2. TFE or glass lined single ended pumps:

- a. Most common glass lined or TFE lined pumps utilize an impeller hub which acts as a sleeve made in one piece. (See sketch). This type of equipment requires a slightly different installation procedure from the one above.
- b. Follow steps A through G under Part 1 of these instructions.
- c. Assemble stationary seat using TFE gasket against stuffing box face and tighten studs. Because of shallow stuffing box, an OEM clamp type seat should be used on this installation.
- d. Hold rotary between stationary seat and bearing housing and insert impeller hub through stuffing box and stationary seat and rotary. To protect glass line shafts, a protective sleeve can be provided on special request. This protective sleeve is installed between the set screws and the shaft.
- e. Tighten impeller assembly to shaft.
- f. Follow steps N through R under Part 1 of these instructions.



3. To repair or clean a mechanical seal or to adjust the impeller clearance:

- a. Re-install retainer clips on rotary.
- b. Loosen set screws and move rotary away from stationary seat.
- c. When adjustments have been made, move seal faces together so that they just touch.
- d. Tighten set screws and remove retaining clips.

4. Double ended pumps: An outside CSO seal may be installed without completely removing the pump head but only if the following conditions exist:

- a. Bearing housings can be removed one at a time and bearing assembly can be removed from shaft.
- b. Shaft sleeve extends 2-1/4" beyond the stuffing box face, or a straight shaft has a minimum of 2-1/4" to the first obstruction.
- c. Sleeve nuts, if used, have the same maximum O.D. as the shaft sleeve.
- d. A split stuffing box face can accept a gasket.

5. Installation instructions for CSO seal on double ended pumps not requiring the complete removal

of the pump head; meeting the requirements of Part 4.

- a. Dial indicate equipment before disassembly.
- b. Remove bearing housing from one end of the pump and remove bearings.
- c. Clean, deburr and remove any rough edges from shaft or sleeve.
- d. Remove packing or seal gland.
- e. Install stationary seat, gaskets and seal gland on gland bolts.
- f. Slide rotary unit onto shaft. Do not fasten set screws.
- g. Replace bearings in bearing housing.
- h. Repeat same procedure on other end of pump.
- i. When bearing housings are back in place, check clearances on impellers by rotating shaft and making any necessary adjustments.
- j. Tighten gland and stationary seat enough to compress gasket to face of stuffing box.
- k. Follow same procedure as steps N through R, Part 1 of these instructions.

6. Installation instructions for CSO seal installed on double ended pumps requiring the removal of the pump head not meeting the conditions described in Part 4 of these instructions:

- a. Remove bearing housings, bearings, etc.
- b. Install gaskets, stationary seats, glands and seal rotary unit on shaft.
- c. Install bearings and bearing housings on shaft.
- d. Return shaft to pump housing and set clearances. Take care not to damage seal parts when setting pump rotating unit back into pump.
- e. Replace pump head. Check head gasket at face of stuffing box to insure that the gasket is flush with the face of the stuffing box.
- f. Install gaskets, stationary seats and seal glands on gland bolts and tighten enough to compress gaskets. Do not over tighten.
- g. Slide seal rotary unit up to stationary face.
- h. Tighten set screws.
- i. Remove retainer clips.

7. Vertical single ended pumps: Many vertical pumps have a coupling on the shaft between the bearing housing and stuffing box which is used to adjust the impeller clearance. When the coupling is removed, there is a 1" minimum clearance between the shaft parts. The seals can be installed by disassembling the seal rotary unit and reassembling it on the shaft after installing the stationary seat and gland. Follow the same procedure as steps N through R, Part 1 of these instructions.

If you need further assistance, please call
our Mechanical Seal Department at:

1-800-633-4770