



Enriching Lives

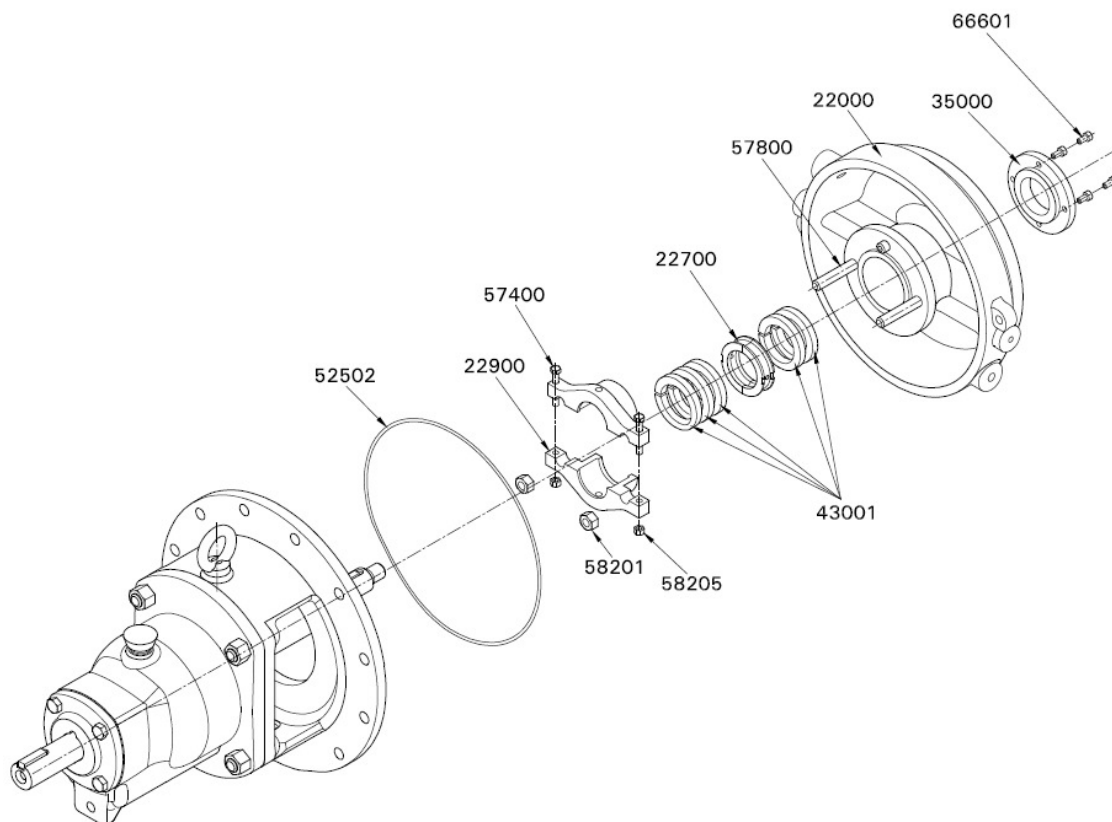


Fig. 14. Removal of stuffing box bush, gland, gland packing & lantern ring

- e) Remove gland packing rings (43000) and lantern ring (22700).
- f) Remove shaft sleeve (31100) along with liquid deflector (23600).

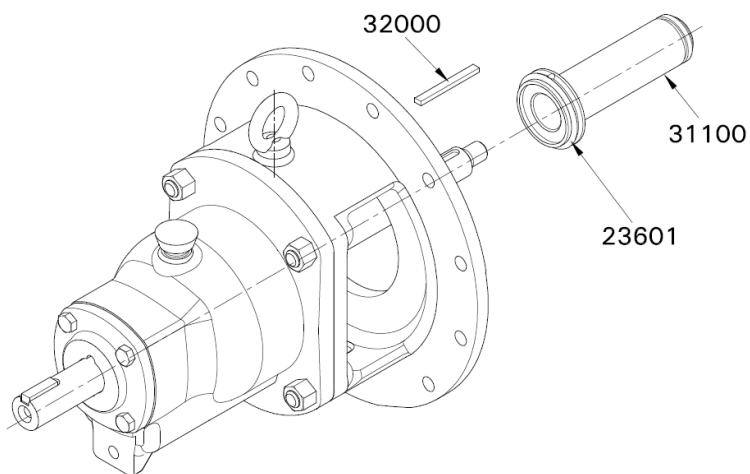


Fig. 15 Removal of sleeve and deflector

- g) Remove impeller key.

5.2.1.1.19 A) Removal of single mechanical seal from stuffing box:

For this, following steps should be taken – (Refer mechanical seal drawing)

- a) Remove auxiliary piping connections viz. sealing, flushing, of mechanical seal cover.
- b) Before any action to be taken for cartridge seal removal, **FIRST SLIDE THE SLIDING WASHERS AND ENGAGE THEM IN THE GROOVE ON DRIVE COLLAR FIRMLY.**
- c) Remove Impeller from rotating unit.
- d) Remove Stuffing box bush (35000) from casing cover (22000) by removing cap screws.
- e) Remove hex. nuts from casing cover (22000) studs holding the cover of mechanical seal.
- f) Then remove Casing cover (22000) from rotating unit.

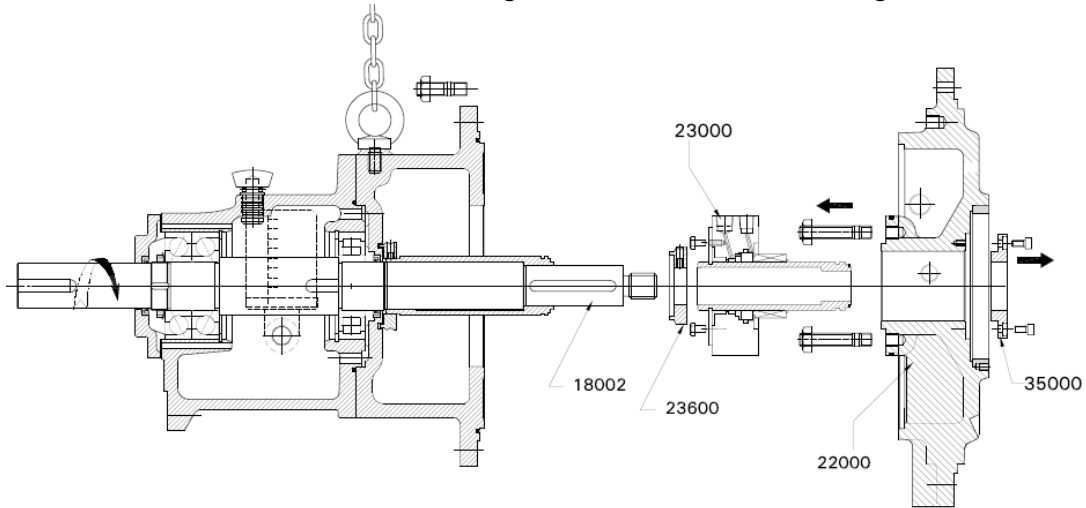


Fig. 16 Removal of mechanical seal

- g) Remove Cartridge seal assembly from shaft.
- h) Loosen grub screw holding the liquid deflector (23600). Take out liquid deflector.

B) Removal of Double mechanical seal from stuffing box:

For this, following steps should be taken – (Refer mechanical seal drawing)

- i) Remove auxiliary piping connections viz. sealing, flushing, of mechanical seal cover.
- j) (Refer- mechanical seal drawing) Remove Mating ring carrier Inboard (IB) along with mating ring (IB) from casing cover (22000) by removing cap screws.
- k) Remove IB mating ring from mating ring carrier and keep aside.
- l) Remove sleeve alongwith rotating seal ring assemblies (IB & OB).
- m) Remove seal ring assemblies IB & Outboard (OB) from sleeve by loosening screws and keep them such that IB & OB seal ring assembly can be identified easily.

- n) Then remove Casing cover (22000) alongwith gland from rotating unit.
 - o) Remove hex. nuts from casing cover (22000) studs holding the gland (seal cover) of mechanical seal.
 - p) Remove gland from casing cover & then remove OB mating ring from gland and keep aside.
 - q) Check the condition of sleeve, mating ring / seal ring faces, packings, o-rings & replace them if necessary. Handle all seal parts with care; they are manufactured to precise tolerances.
 - r) Loosen grub screw holding the liquid deflector (23600). Take out liquid deflector.
- 5.2.1.1.20 Remove impeller key (32000)
- 5.2.1.1.21 Remove the nuts holding the lantern bracket (24800) and bearing housing (24000).
- 5.2.1.1.22 Take out lantern bracket (24800).
- 5.2.1.1.23 Take out 'o' ring for bearing housing (52310) carefully.

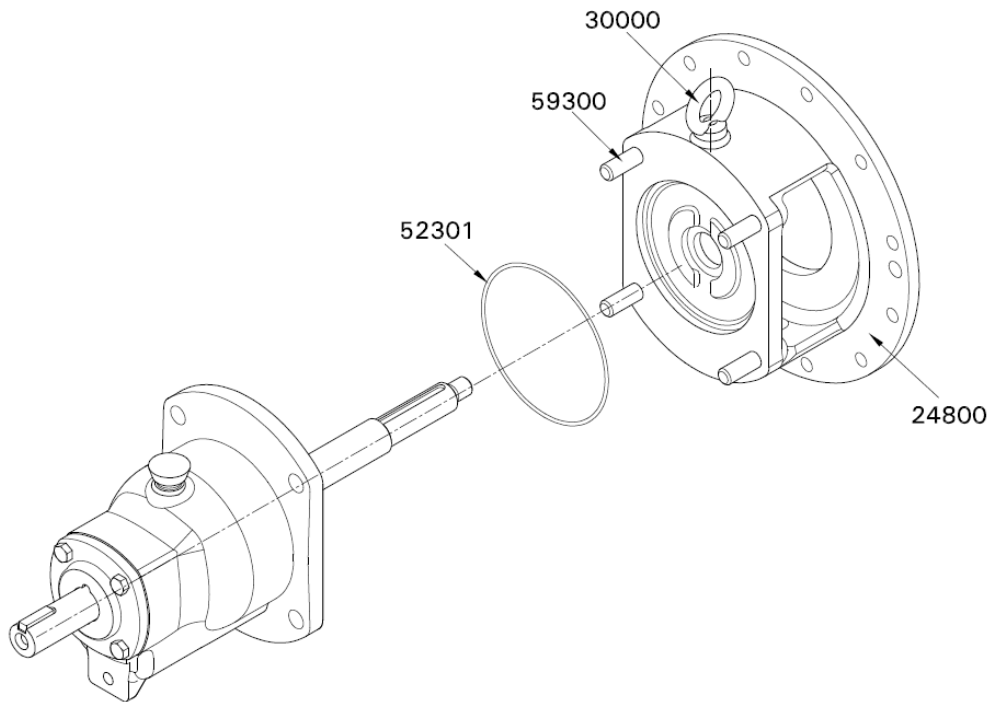


Fig. 17. Removal of Lantern bracket & 'O'ring

- 5.2.1.1.24 Remove pump half coupling (39700) after unscrewing grub screw.

Caution

Coupling half should be removed with the help of suitable extraction device. To avoid damage to the bearings, coupling half should not be knocked out of shaft.



- 5.2.1.2.4 Tighten bearing lock nut (33600) after inserting washer for bearing locking in proper position. Fold one lip of lock washer in slot of bearing lock nut to lock it.
- 5.2.1.2.5 Insert circlips at driving end (48500) in the grooves of the bearing housing (24000 / 24200). Check returning duct holes in bearing housing and bearing cover at driving end are clean.
- 5.2.1.2.6 Insert shaft (18001 / 18002) along with bearings (viz. angular contact bearings at driving end and inner race of roller bearing at non-driving end) in to the bearing housing from driving end.
- 5.2.1.2.7 Replace oil seals (if applicable) in bearing cover (27000) if they are removed.
- 5.2.1.2.8 Put gasket (51400) of bearing cover at driving end (27000) and tighten bearing cover (27000) with the aid of hexagonal headed screws. Fix DE side labyrinth liquid deflector on shaft with grub screw over DE bearing cover.
- 5.2.1.2.9 Place 'O' ring (52300) on bearing housing (24000). Lubricate 'O' ring with grease or with an 'O' ring lubricant before placing it on the bearing housing.
- 5.2.1.2.10 Mount lantern bracket (24800) on bearing housing (24000) and tighten the nuts.
- 5.2.1.2.11 Put the drip pan (22600) if it was removed from lantern bracket. (if applicable)
- 5.2.1.2.12 For pumps with gland packing arrangement, follow the instructions given below.
- Mount liquid deflector (23601) on shaft sleeve (31100) with the help of grub screws (65400).
 - Apply some oil or grease on the shaft under sleeve position. Mount impeller key (32000) on the shaft and insert shaft sleeve (31100) along with deflector (65400) mounted on it.
 - Fit the hex socketted screw clamped on stuffing box bush (35000) to casing cover (22000).
 - Insert gland packing (43000) and lantern ring (22700) in order of 2 rings first, then lantern ring and finally 3 ring joints should be staggered in casing cover.
 - Put gland in two halves (22900), clamp them with gland bolts (57400). Tighten gland stud nuts on casing cover.

Caution

New packing has to be run-in and it is good practice to start the pump with the stuffing box gland quite loose. Packing that is too tight in the box will cause undue friction, creating heat which will glaze the packing and possible score the shaft sleeves. To be effective, the packing must remain soft and pliable. If stuffing box friction is so great that the pump shaft cannot be turned by hand, the box is not properly packed.

- 5.2.1.2.13 For fitting cartridge type single mechanical seal, follow the instructions given below –(Refer mechanical seal drawing)
- Mount deflector (23600) on shaft (18002).



- b) Mount impeller key (32000) on the shaft.
- c) Take the complete cartridge from its package. Do not disassemble or alter the unit. Gently insert assembly of the cartridge on the shaft and let it rest on shaft.

IMPORTANT: While sliding the cartridge assembly, ensure the sleeve slides forward easily to avoid the seals getting over compressed and damaged. Do not give jerks to the assembly, which may damage the mating ring. While sliding the complete assembly do not hammer on the gland. Apply grease or oil on the shaft while sliding the assembly. This will ease the sliding of O-ring.

- d) Then put casing cover (22000) & guide it into the lantern bracket (24800) over the shaft.
- e) Fix stuffing box bush (35000) with the help of cap screw in casing cover.
- f) Tighten the mechanical seal cover with casing cover stud only finger tight. Do not distort the gland by over tightening.
- g) Put the impeller (15100) over shaft and rest it on shaft sleeve face. Complete the pump assembly.
- h) Then loosen the bolt hex head of sliding washers and then offset it so as to clear the slots in the drive collar. Then tighten the hex bolts completely to avoid falling of sliding washers and rubbing on drive collar in running condition.
- i) Connect the auxiliary piping connections viz. sealing, flushing of mechanical seal cover.

For fitting double mechanical seal, follow the instructions given below – (Refer mechanical seal drawing)

- j) Mount deflector (23600) on shaft (18002).
- k) Mount impeller key (32000) on the shaft.
- l) Identify & take the Inboard (IB) & Outboard (OB) seal ring assemblies.
- m) Mark in the sleeve location of inboard and outboard seal ring assemblies with respect to casing cover guide diameter as shown on the drawing based on operating length as specified on the drawings.
- n) Mount / fix seal ring IB & OB assemblies on marked location. Apply lightly grease or oil on sleeve to slide seal ring assembly.
- o) Install Inboard o-ring, gasket, mating ring in inboard mating ring carrier at location as shown in drawing. Similarly install out board o-ring, gasket, mating ring in the gland plate at location as shown in drawing.
- p) Apply lightly grease on gasket / 'O' ring of the gland / mating ring carrier to prevent them to fall off.
- q) Mount gland along with mating ring carrier (OB) on casing cover studs keeping in view the barrier fluid outlet direction as shown in drawing. Tighten the gland with casing cover stud. Do not distort the gland by over tightening.
- r) Place 'O' ring (52501) on casing cover (22000) after lubricating it properly. Then put casing cover (22000) & guide it into the lantern bracket (24800) over the shaft.
- s) Slide seal sleeve assembly on the shaft.



Quantity of cooling water to pad – 0.2 to 0.3 m³/hr.
Maximum permissible cooling water pressure – 6.0 kg/cm².

- 6.9 Clearance between impeller
- 6.9 Steam or hot water circulation in KPD jacketed pump:
Before start up the pump hot water circulation should be started through casing jacket, casing cover jacket, and mechanical seal cover (in case of pump with mechanical seal) for a period of minimum half an hour to ensure that all solidified liquid shall melt.
- 6.10 Interchangeability:
Parts standardization is optimized utilizing interchangeable components to cover a very wide performance. This unique feature enables the customer to have a very low spare parts inventory even though he may have many sizes of these pumps.

PART NUMBER AND DESCRIPTION

Sr. No.	Part no	Description
1	10500	Pump Casing (Foot Mounted)
2	10600	Pump Casing (Centre Line Mounted)
3	15100*	Impeller
4	15300*	Semiopen Impeller
5	18001*	Pump Shaft Std Brg Arrgt.
6	18002*	Pump Shaft Reinforced Brg Arrgt.
7	19000*	Casing Ring (Suction Side)
8	19100*	Casing Ring (Delivery Side)
9	19200*	Impeller Ring (Suction Side)
10	19300*	Impeller Ring (Delivery Side)
11	19800	Spacer
12	19900	Shoulder Ring
13	20900	Spacer Ring
14	22000	Casing Cover
15	22600	Drip Pan
16	22700	Lantern Ring
17	22900	Split Gland
18	23000*	Mechanical Seal
19	23100	Mechanical Seal Cover
20	23600	Liquid Deflector (Mechanical Seal Arrg.)
21	23601	Liquid Deflector (Gland Packed Arrg.)
22	24000	Bearing Housing



- 5.1.10 Remove the hex nuts from casing studs holding the bearing housing (24000) in case of KPD 20/13 QF pump. Remove the hex nuts from casing studs holding the casing cover (22000) in case of KPD 20/16 QF and KPD 20/20 QF pumps.
- 5.1.11 Screw the release bolts provided in the casing cover. Turn the bolts evenly through a quarter turn at both sides.
- 5.1.12 Slightly pull out the driving unit, till impeller (15300) clears the pump casing (10500/10600).
- 5.1.13 Place this rotating unit on a table or clear place for further dismantling.
- 5.1.14 Remove casing gasket (51101).
- 5.1.15 Unscrew the impeller (15300). Remove the gasket between impeller and shaft sleeve (51500) after taking out the impeller from pump shaft (18000).
- 5.1.16 Removal of stuffing box with gland packing:
For this, following steps should be taken:
 - a. Remove the split gland (22900) by taking out the bolts for clamping of the split positions.
 - b. Take out the casing cover (22000) along with stuffing box bush (35000), gland packing (43000), and lantern ring (22700), 'O' ring (52501) will also come out along with it.
 - c. Take out 'O' ring (52502) for bearing housing.
 - d. Unscrew the hex socketted screw clamping stuffing box bush (35000) to casing cover (22000) and remove the stuffing box bush (35000).
 - e. Remove gland packing rings (43000) and lantern ring (22700).
 - f. Remove shaft sleeve (31100) and key(32000) along with liquid deflector (23600).
- 5.1.17 Removal of stuffing box with mechanical seal.
(Applicable for single and double mechanical seals). Follow the steps given below:
 - a. Unscrew the hex socketted cap screw clamping the stuffing box bush (35000) to the casing cover (22000) and remove the stuffing box bush.
 - b. Seal seat will come out along with the throat bush (35000) in case of double mechanical seal.
 - c. Pull shaft sleeve under mechanical seal (31500). Use the groove on the shaft sleeve for pulling it out. Be careful while removing shaft sleeve since sleeve comes out alongwith rotating unit of the mechanical seal.
 - d. Remove the mechanical seal from the shaft sleeve and keep it in a clean place.
 - e. Remove hex nuts from casing cover (22000) studs, for 20/16 QF and 20/20 QF pumps. For 20/13 QF pump no necessity of studs is there because the casing cover is of sandwich type.
 - f. Take out the casing cover (22000) along with the mechanical seal cover taking care of mating ring face. 'O' ring for casing cover (52501) will also come out along with it.
 - g. Unscrew the nuts of mechanical seal cover studs and remove mechanical seal cover studs and remove mechanical seal covers (23100) from casing cover (22000).