

INSTALLATION AND OPERATING INSTRUCTIONS

Operation Instructions Seal Replacement on VIL 4300 - 20x20x19 Pump

Avoid any excessive force during the assembly procedure. Use only rubber or plastic mallet, if gentle persuasion is necessary. Ensure that all parts are clean and fit properly. Ensure all bolts are tightened to the level noted below.

Disassembly following lowering of the rotating assembly and removal of coupling
(See also File No: 43.803 for instructions regarding the 20x20x19 rotating assembly lifting mechanism)

Servicing a 4300 - 20x20x19 size pump is similar to that for other large 4300 units. However some differences do exist as there is a bearing installed in the motor bracket and the motor is positioned differently. Instructions for removal and replacement of these items are detailed in the following notes

1. Remove the pump shaft split-collar
2. Unbolt and remove the bearing housing cover, with the upper lip seal. Slide it up over the shaft carefully, so as not to damage the lip seal, and remove through the gap between the pump and motor shafts
3. Unbolt the bearing housing and lift it over the inner bearing race. Slide it up over the shaft carefully, so as not to damage the lip seal, and remove through the gap between the pump and motor shafts
4. Remove upper bearing retaining ring from the shaft
5. Remove the shaft sleeve together with inner bearing race
6. Remove mechanical seal rotating assembly
7. Unbolts the seal gland plate and remove through the gap between the pump and motor shafts. NOTE: The mechanical seal stationary seat may be retained by the seal gland plate and be removed at the same time. Place your hand under the seal seat to prevent it from falling away from the seal gland plate as it is being raised. Should the seal seat not be retained in the seal gland plate it is now visible and free to remove as the last piece of the mechanical seal and the unit is ready for replacement parts

Assembling Procedure

8. At this stage the shaft and impeller rotating assembly has been lowered into the pump casing and the mechanical seal and bearing assembly have been removed. The impeller is resting on the casing lower surface and cannot be rotated freely.
9. Hold the seal gland plate upside-down and place the mechanical seal seat, with gaskets, into the seal gland plate cavity, with the lapped (Shiniest) surface of the seat placed downwards. In this manner the lapped surface of the seat will face upwards when the seal gland plate is inverted and placed through gap in the pump and motor shafts for installation on the pump. Carefully slide this assembly over the pump shaft onto the volute cover. The seal seat will be positioned in the seal chamber. Bolt the seal gland plate lightly into place, by hand. Loosen the set screws on the replacement seal rotating element and lubricate the O-ring with suitable lubricant, such as silicone or soft soap, and slide it over the pump shaft, carbon face downwards to rest on the seal seat; taking care not to damage the O-ring at the shaft shoulder and keyways. Ensure the [3] seal working length setting clips are in place in the rotating assembly and that all parts of the seal assembly slide freely down the pump shaft. The seal assembly is now in position but is not set.

10. Carefully insert the bronze sleeve over the pump shaft and slide down to seat on the shaft shoulder. Position the bearing inner race over the sleeve. The bearing inner race needs to slide down the sleeve to the bearing shoulder. **NOTE** that the sleeve and bearing inner race have tight tolerances. Ensure they slide evenly and do not get misaligned as this may jam the component before getting to the final position. Place the bearing inner race retaining clip onto the sleeve above the bearing inner race.
11. Assemble the lip seal and bearing outer race / roller ring, into the bearing housing. Lubricate the roller ring generously with synthetic grease. (See Notes below) As the outer race is a tight fit into the bearing housing, it is permissible to gently tap into place with a rubber or plastic mallet. Place the assembly between the shaft gap and slide down the pump shaft to locate on the motor bracket supports. Do not bolt into place at this stage. (See note 23) When in position the outer race will be slightly higher (About 1/8" /3mm) than the inner race, as the pump rotating assembly is not in the final position.
12. Install the bearing housing cover with lip seal and bolt to bearing housing.
13. Position the motor to generally align the pump and motor shafts (Straight edge alignment is suitable at this point) and bolt the motor lightly into place. Use hand-tightness at this point as the motor position will be adjusted later.
14. Assemble the appropriate split-collars onto the pump and motor shafts.
15. Use the lifting mechanism (See File No: 43.803) to lift the pump shaft sufficiently for the coupling cavities to align with the shaft collars. Ensuring that both shaft drive keys are in place, pull one half of the coupling (With keyways) into place over the shaft, shaft drive keys and split collars. The assembler should be aware at this point that motor and pump shafts are only generally aligned.
16. Remove the lifting mechanism. The shafts are now connected by one coupling half only.
17. Install the other coupling half. Tighten the coupling bolts diagonally and evenly, ensuring the coupling halves remain parallel and the gaps between them even.
18. Now that the shafts are connected and secured. Loosen the bolts securing the motor to the motor bracket.
19. Position motor horizontal adjusters and bolt into the motor bracket upper flange. Thread adjusting bolts into adjusters, typically by hand. There will be 4 adjusters at 90 degrees to each other. Loosen the adjustment bolts to leave a small gap (1/16" /1.5mm or so) between motor flange radial surface and each bolt.
20. Attempt to rotate the pump coupling 360 degrees, full circle. If the rotating assembly rotates freely skip to note 21. The rotating assembly should be able to be turned by hand. Help in the form of a strap lever or Allen wrench in a coupling bolt may be used, only if used gently. If the coupling turns but does not turn freely, find the "high-spot" and adjust the appropriate motor adjusting bolt to move the assembly away from the high-spot and continue in this manner until the coupling turns freely. If the coupling does not turn at all, adjust each adjusting bolt in turn until some relief is felt. Then find the "high-spot" and adjust as previous. An adjustment tip is to adjust the adjusting bolts, counting the number of turns until the assembly becomes freer and continuing until the assemble binds once more. Return the adjusting bolt to approximately half the number of turns from that count. Repeat this process at 90 degrees.
21. Now shaft should be able to be rotated by hand. The motor bolts should be tightened at this stage.
22. Drill and dowel-pin (1/4") two holes through the motor bracket flange and motor flange at 180 degrees. These will re-locate the motor if the motor needs to be removed. If a motor replacement is necessary, the alignment adjusting procedure must be repeated and motor flange re-drilled and pinned as described above.
23. Bearing Assembly bolts are now to be placed and tightened.
24. Set the seal gland plate concentric with the shaft and tighten the seal gland plate bolts. Push the seal rotating element securely against the seal seat and tighten the set screws on the rotating assembly. When securely in place remove the [3] seal working-length setting clips from the seal rotating assembly.
25. Attach the seal flush line and any environmental accessories.



NOTES:

Proper bearing lubrication must be provided to achieve designed service. Recommended Grease: AMSOIL Synthetic GL Series multi-purpose EP grease; AMSOIL Synthetic Water Resistant Lithium Complex grease; Shell Cassida EPS 2 or similar synthetic grease.

Bolt tightening force requirements:

Where Used	Bolt Type	Qty	Size	Force [ft lb]
Seal Gland Plate	Capscrew	4	5/8" – 11NC x 2-1/4"	90
Bearing Housing	Capscrew	4	3/8" – 16NC x 1"	20
Coupling	Setscrew	8	1/2" – 13NC x 6"	50
Lifting Mechanism	Capscrews	2	7/16" – 14NC x 1-3/4"	30

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