

Instruction

Disassembling and assembling

APP / APP S / APP S 674 53-86

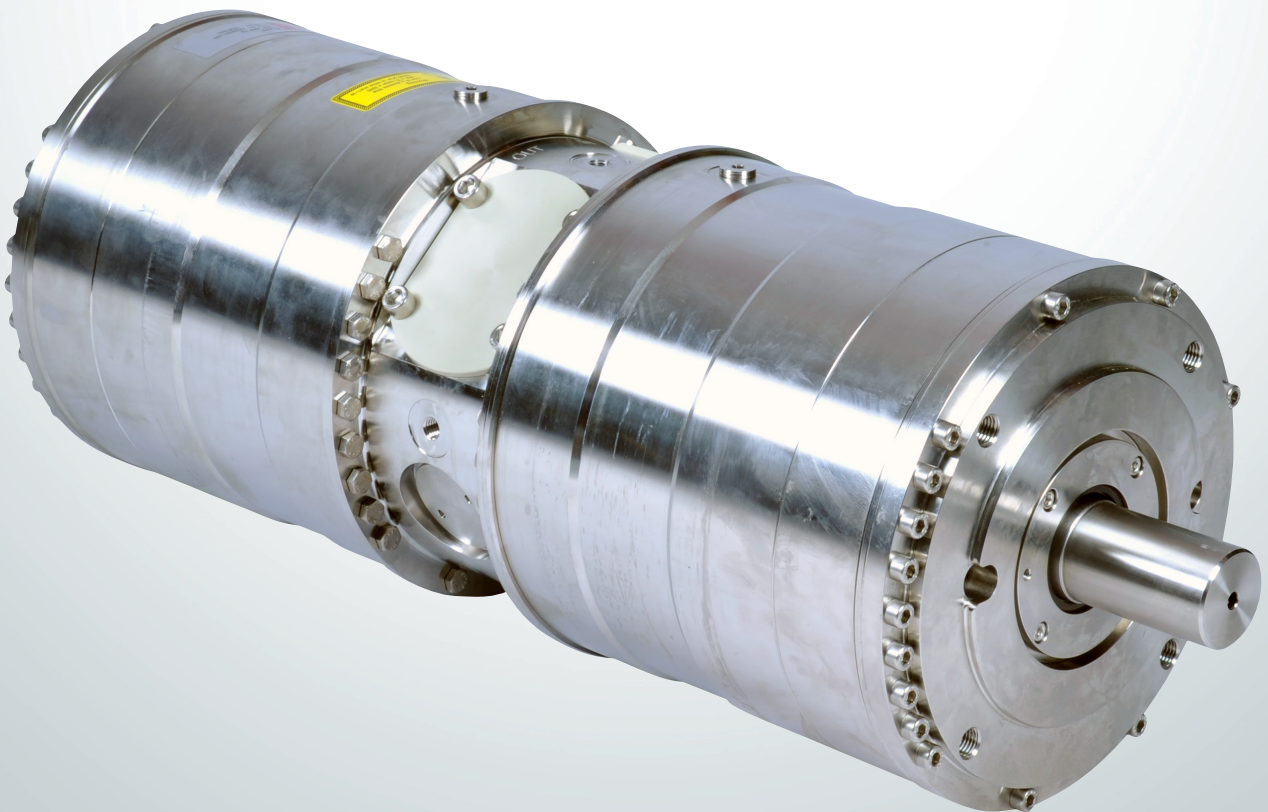


Table of Contents	1. Introduction	2
	2. Disassembling the pump in horizontal position	3
	3. Assembling the pump.....	9
	4. Disassembling and assembling of the flushing valve.....	14
	5. Changing pistons.....	14
	6. Exploded view.....	15
	6.1 Exploded view APP 53-86.....	15
	6.2 Exploded view APP S 53-86.....	16
	6.3 Exploded view APP S 674 53-86.....	17
	7. When should the pistons be replaced.....	18

1. Introduction

This document covers the instructions for disassembling and assembling the axial piston pumps APP / APP S / APP S 674 53-86.

Important: Place the pump horizontally on a pallet or other stable surface above the ground. Ensure that the pump cannot roll.

For a better understanding of the pump, please see the exploded view in section 6.


Tools provided with toolset 180Z0661:

- 1 x cone bushing extractor
- 1 x M8 x 140 bolt
- 3 x M8 x 60 bolts with nuts
- 3 x M6 x 150
- 2 x M6 x 65
- 2 x tool washer
- 1 x M16 pin and nut
- 1 x $\varnothing 17/30$ x 3 washer
- 1 x shaft seal press bush tool
- 1 x bracket
- 1 x M8 Allen key
- 1 x M8 x 40 with nut
- 2 x combination wrench 13mm
- 1 x combination wrench 24 mm
- 1 x M6 Allen key
- 1 x M16 socket (1/2")
- 1 x Torque wrench (1/2")
- 1 x valve plate tool
- 2 x screw drivers
- 1 x adjustable pin wrench
- 2 x M8 x 16 bolts
- 1 x combination wrench 30 mm


2. Disassembling the pump in horizontal position

Starting from the end flange side:

1. Disconnect the pump from the rest of the system.




2. Remove 3 screws equally distributed over the circumference of the end flange and insert 3 M8x60 screws with nuts in the threads. Fasten the screws with low torque. Screw the nuts until they are in contact with the end flange.




3. Remove one screw from the top of the end flange and insert one M8x140 to guide the end flange off the pump.



4. Remove the rest of the existing screws.



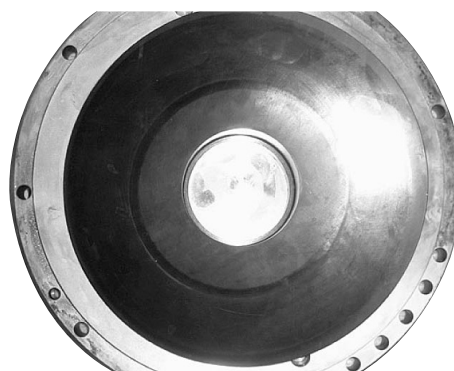
5. Loosen the three nuts sequentially one round at a time, so the end flange comes out as straight forward as possible. Use two combination wrenches so you do not unscrew the screws while loosening the nuts.



6. When the nuts loose contact with the end flange, there is further retainer force. Remove the 3 screws until the end flange is supported only by the long M8x140 screw.



7. Remove the long M8x140 screw and the end flange.
Warning: flange with swash plate is heavy, so make sure not to drop it. Risk of injury.



8. End flange should be placed so swash plate surface is not scratched. For further disassembling of swash plate, see section 4.



9. Remove the guidepin.



10. Remove by hand the pistons one by one. Be careful not to scratch the pistons. Tilt the retainer plate as needed for easy removal of pistons. When removing the last pistons, hold with one hand the retainer plate to make sure the retainer plate does not drop out. **WARNING: Do not use any tools.**



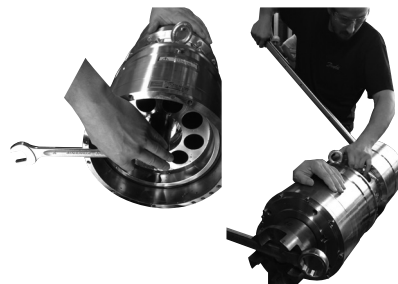
11. Remove the retainer plate.



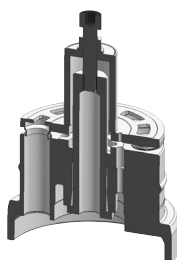
12. Remove the retainer ball.



13. Remove the distance washer (unless your pump is an APP / APP S / APP S 674 53), which is not having distance washer). Remove the spring package.
WARNING: Do not disassemble the spring package.



14. Continue with the next steps only if you need to fully disassembly the pump. Unscrew the M16 screw. It may be necessary to lock the shaft so it doesn't turn. Mount the coupling at the other end of the shaft and use it to lock the shaft.



15. Loosen the cone bushing using the cone bushing extractor, but do not remove it.

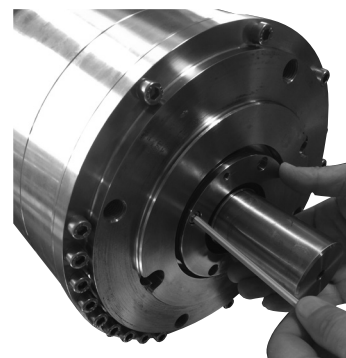
1. Mount extractor.
2. Screw in the M20 by hand, do not use any torque.
3. Use a 24 mm combination wrench to tighten the nut and washer. The cone bushing will pop out of the cylinder barrel. Do not remove it.

16. Remove cone bushing extractor and mount the M16 screw again by hand, do not use any torque.

Move to the motor flange side:



17. If not already done, remove the coupling and shaft key (if your pump model is an APP S / APP S 674 there are no shaft key. The shaft has a spline instead).



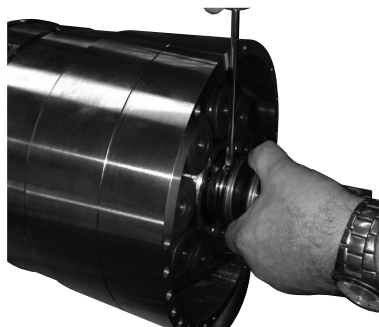
18. Remove the 4 M6 screws from the cover for shaft seal. Use 2 M6 screws to extract the cover mounting them into the treads in the cover for shaft seal.



19. Remove ceramic ring from the cover for shaft seal by gently pushing it from the back of the sealing ring.



20. Remove the motor flange following the same steps described for the end flange (steps 2 to 9). Using the M8 x 140 mm is optional.



21. Remove the shaft seal by hand or using a screw driver between the washer and the shaft seal, if needed.

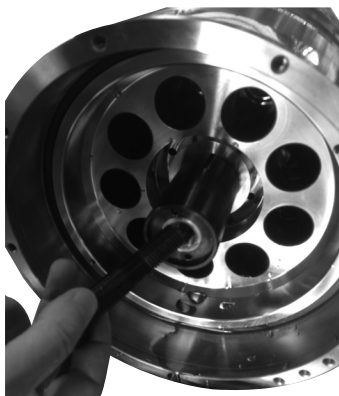


22. Remove pistons, retainer plate, retainer ball and spring package following the same steps described before for the end flange side (steps 10 to 13).



23. Mount 3 M10x15 in the valve plate through the holes in the cylinder barrel and fasten them with low torque. Be aware that only three holes in the valve plate have a thread.

Move to the end flange side:



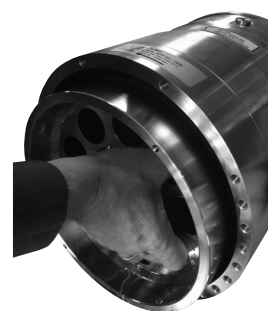
24. Remove the M16 screw in the end flange side.



25. Remove the cone bushing. It was previously loosened in step 15 but if it is too tight using the cone bushing extractor again as described there.



26. Screw 2 M6 x 65 screws in the cylinder barrel.



27. Remove the cylinder barrel and valve plate slowly, using the two screws to grasp it, as needed. **WARNING:** Do not scratch the main bearing inside the housing. The assembly is heavy and can be slippery, risk of personal injury.



28. Remove the 2 M6 x 65 screws and place the cylinder barrel on a clean surface with the valve plate on top. For further disassembling of cylinder barrel and valve plate consult Danfoss.



29. Remove the port plate.

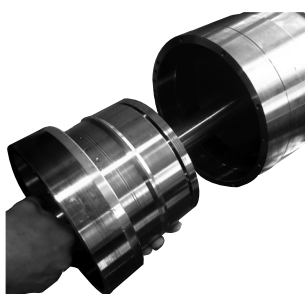


30. Remove guide pins.



31. Remove the distance pipe.

Move to the motor flange side:



32. Remove the cylinder barrel with shaft and valve plate following steps 26 to 28.
WARNING: Do not scratch the main bearing inside the housing. The assembly is heavy and can be slippery, risk of personal injury.



33. Remove the port plate and guide pins as described before for the end flange side (steps 29 and 30).

3. Assembling the pump

WARNING:
Do not use silicone when assembling the pump. Do not reuse disassembled O-rings; they might be damaged. Always use new O-rings.

Important:
It is essential that the pump is serviced in conditions of absolute cleanliness. All parts must be absolute clean before mounting.



1. Lubrication:
 - To prevent seizing-up, lubricate all threads with PTFE lubrication type.
 - O-rings inside pump may be lubricated only with clean filtered water.
 - O-rings for port flange, mounting flange and flushing valve must be lubricated.
 - It is important to lubricate ALL parts to be assembled with clean filtered water (Especially all PEEK (plastic) parts).



2. Place pump horizontally on a pallet or other stable surface above the ground. Ensure that the pump cannot roll.

Go to the motor flange side (follow arrow on the center flange indicating motor flange side)



3. Mount the port plate guide pins on the center flange.

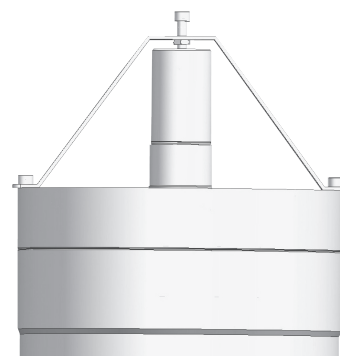


4. Spray center flange with clean filtered water so the port plate sticks to the center flange. Mount the port plate. Notice that the port plate for the motor flange side has additional machined pinholes.



5. Spray with clean filtered water and insert the cylinder barrel with shaft and valve plate. After inserting it look through the inlet port and double check that the port plate remains in its position, fit tight between the center flange and the valve plate).

WARNING: Do not scratch the main bearing inside the housing.

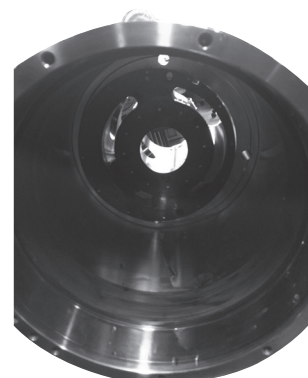


6. Screw the bracket in the housing using two treads opposite each other. Screw the bracket to the tread in the shaft.

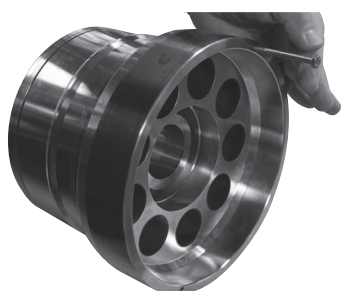
Move to end flange side:



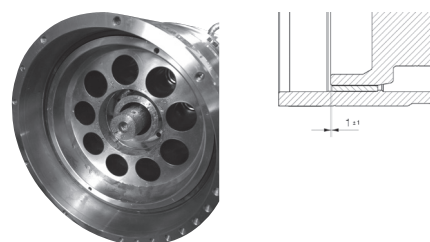
7. Insert the distance pipe. Rotate the distance pipe till the notch finds the guide pin in the cylinder barrel at the opposite side.



8. Assemble center flange pins and port plate as described before for the motor flange side (steps 3 to 5).



9. Screw the 2 M6 x 65 screws on the cylinder barrel to ease cylinder barrel installation.



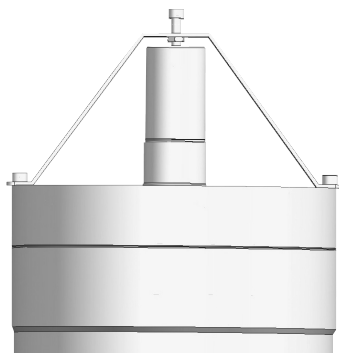
10. Spray with clean filtered water and insert the cylinder barrel. The cylinder barrel fits only in one position because there is a guide pin in the cylinder barrel.

WARNING: The cylinder barrel is well mounted when the main bearing is aligned with the end of the cylinder barrel (see 2D drawing above). Remove the 2 M6 x 65.



11. Spray the shaft with clean filtered water and mount the cone bushing. Fasten slightly the M16 screw to hold the assembly on place.

Move to motor flange side:



12. Dismount the bracket from shaft and housing.



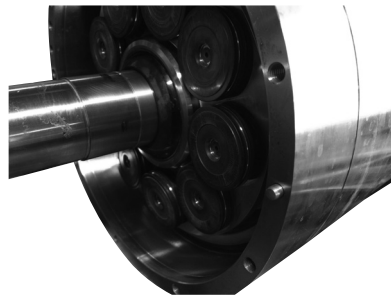
13. Unscrew the 3 screws M10x150 that you mounted during disassembly to keep the valve plate connected with the cylinder barrel (step 23 of the horizontal disassembling).



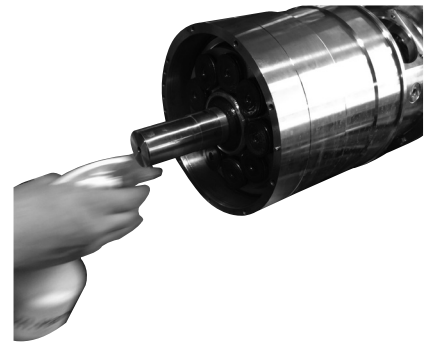
14. Spray the shaft with clean filtered water and mount the spring package, the distance washer and the retainer ball (with the spherical surface towards you) (if your pump is an APP / APP S / APP S 674 53 there is no distance washer in the pump).



15. Spray clean filtered water over all the pistons and inside the cylinder barrel. Mount the retainer plate and while holding the retainer plate with one hand insert carefully two pistons to keep the retainer plate on place.



16. Insert the rest of the pistons. Tilt the retainer plate as needed, for easier assembling.



17. Mount the motor flange pin on the housing and wet the piston shoes with clean filtered water.



18. Screw the 3 M8x60 screws with nut in three treads so they are equally separated from each other. Torque the screws slightly and fasten the nuts until they make contact with the motor flange.



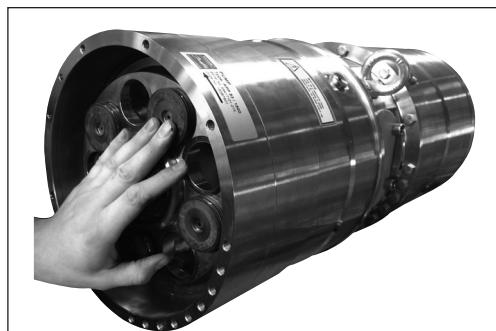
19. Fasten the 3 nuts one turn at a time to press the motor flange into the housing as straight forward as possible.



20. When the motor flange reaches the housing, the motor flange is on the right position. Mount the rest of the screws, replace the 3 M8x60 with normal screws and fasten all of them to 30 Nm \pm 3 Nm using the torque wrench.



21. Lubricate shaft and shaft seal with clean filtered water. Mount washer for shaft seal. Mount shaft seal and use the shaft seal press bush to press it in.



22. Mount cover for shaft seal and torque the 4 M6 screws to $15 \text{ Nm} \pm 1.5 \text{ Nm}$ using the torque wrench.

Move to the end flange side:



23. Fasten the M16 screw to $250 \text{ Nm} \pm 25 \text{ Nm}$ using the torque wrench. To give this torque it will be necessary to lock the shaft so it doesn't turn. Mount the key (only for APP 53 to 86) and the coupling on the motor flange side and use it to lock the shaft.

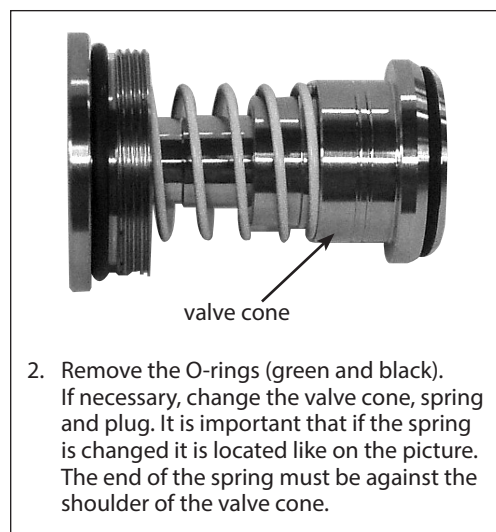
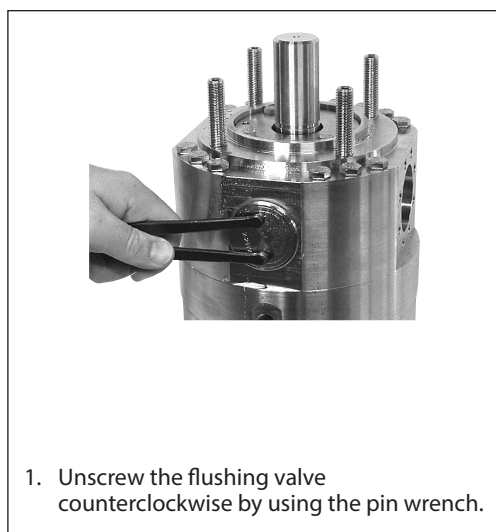


24. Mount spring package, distance washer, retainer ball, retainer plate and pistons as described before for the motor flange side (steps 14 to 16).



25. Mount the end flange pin and the end flange as described before for the motor flange side (steps 17 to 20).

4. Disassembling and assembling of the flushing valve



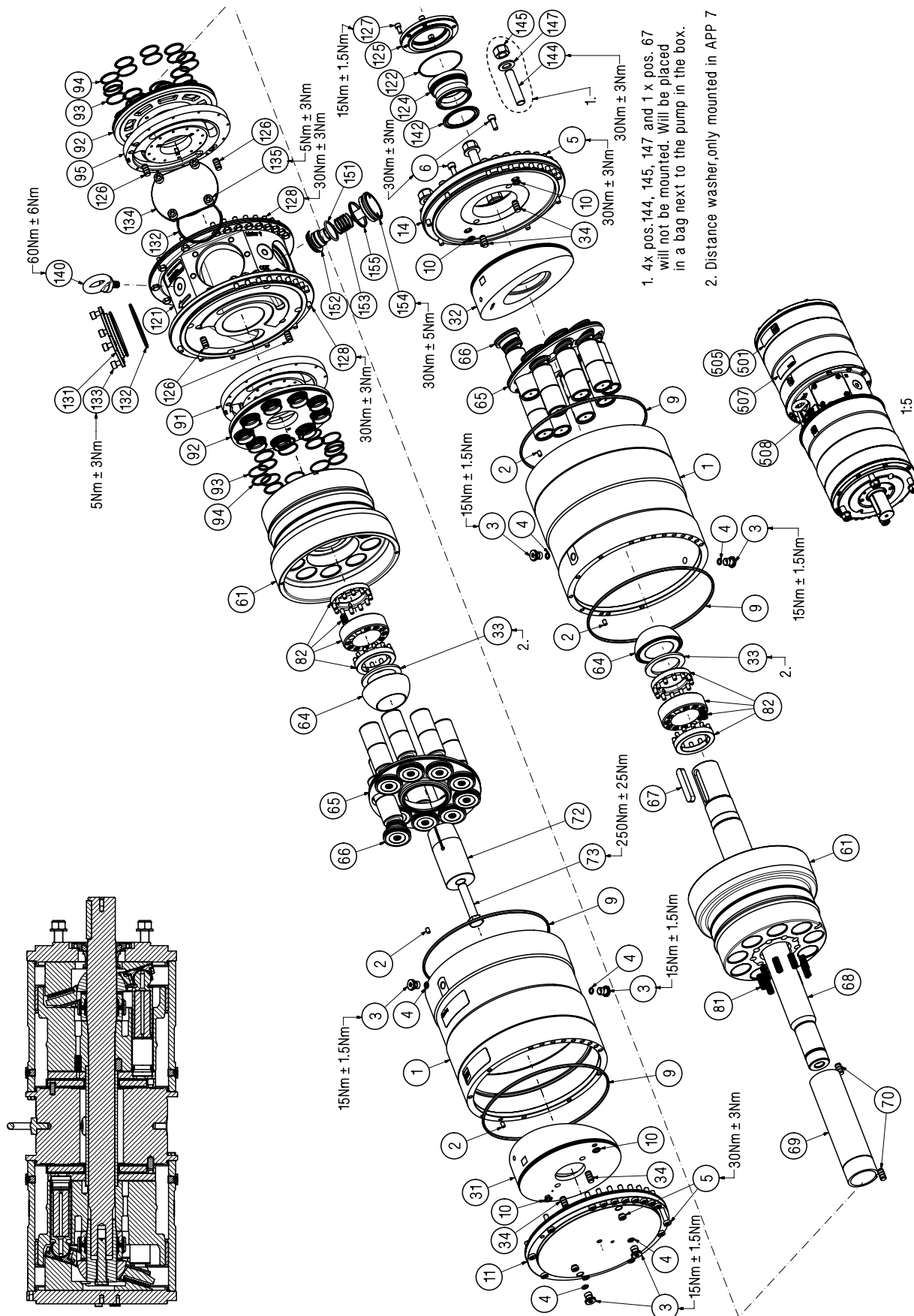
3. Place a bit of grease on the thread on the plug. Screw it into the port flange. Tighten with a torque of 30 Nm \pm 3 Nm.

5. Changing pistons

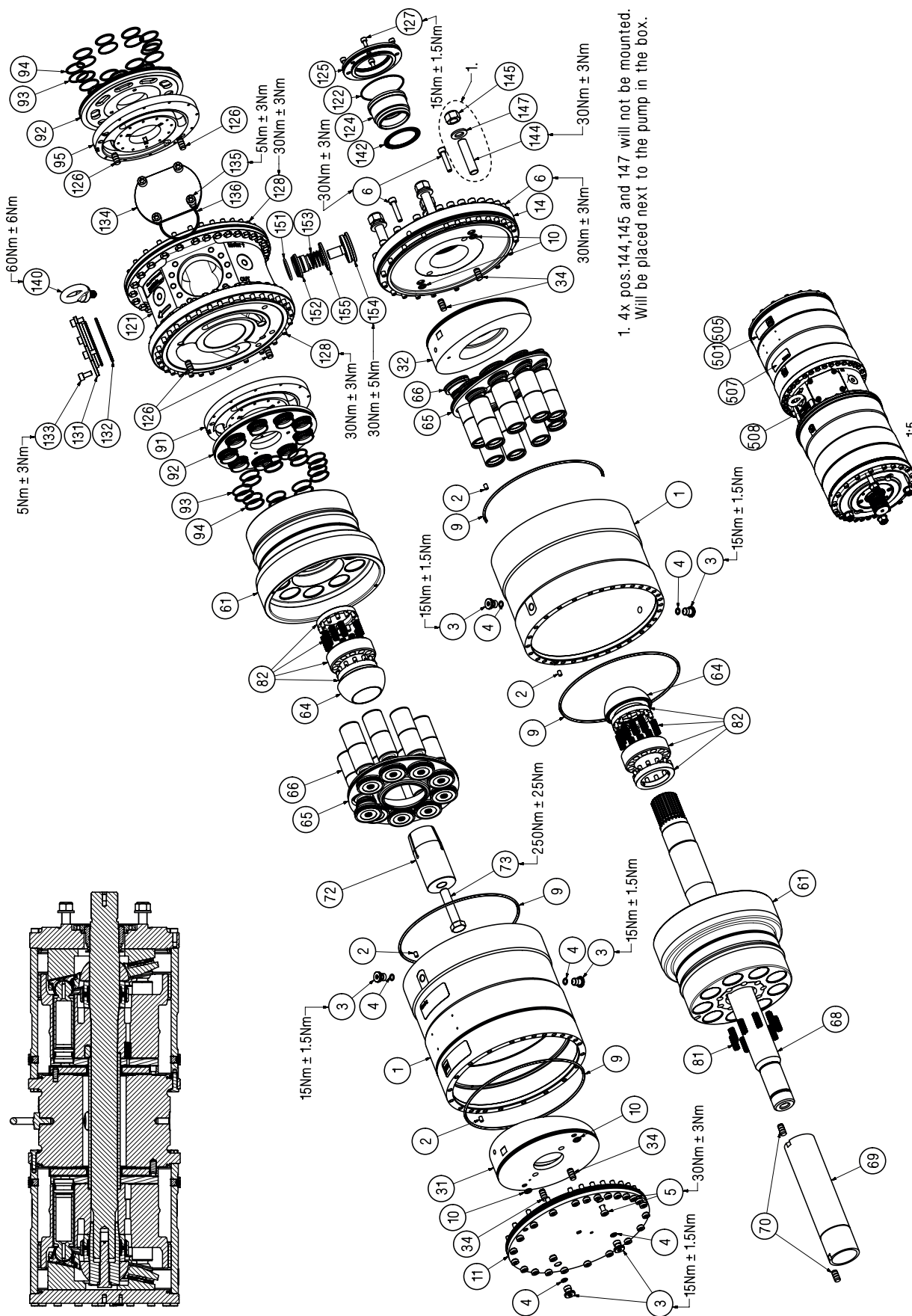
1. Follow disassembly steps 1 to 11 for disassembly
2. Follow assembly steps 14 to 20 for assembly

6. Exploded view

6.1 Exploded view
APP 53-86

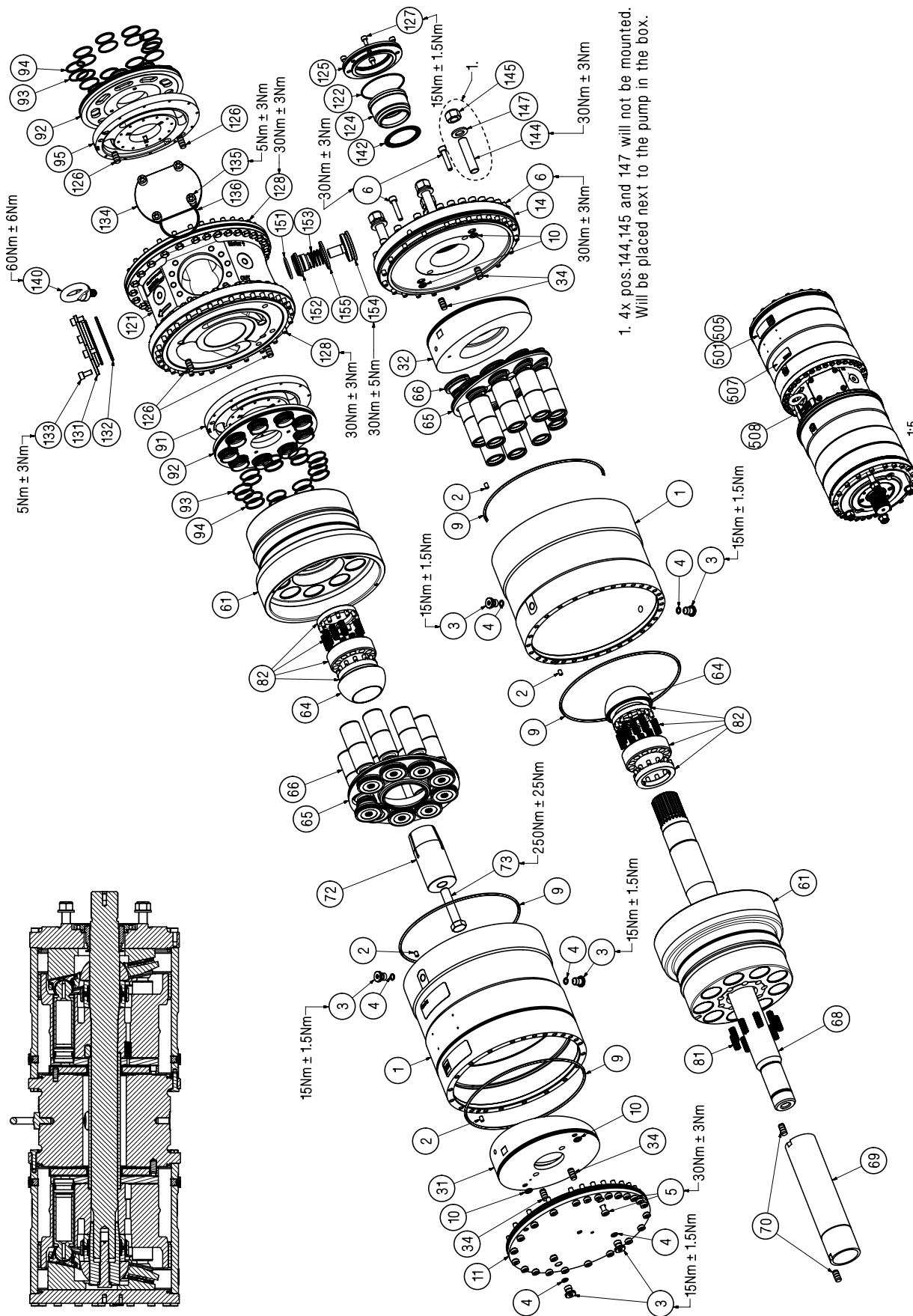


6.2 Exploded view
APP S 53-86



1. 4x pos.144,145 and 147 will not be mounted.
Will be placed next to the pump in the box.

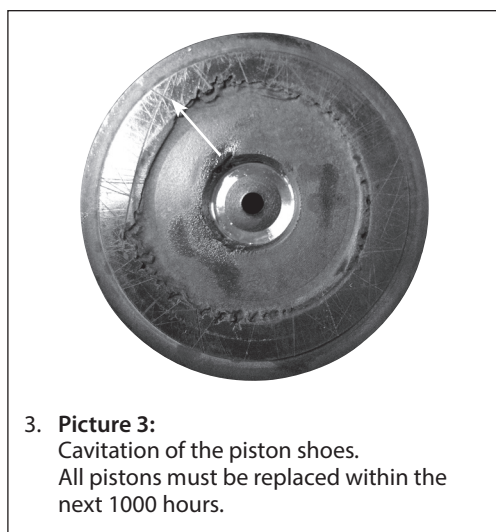
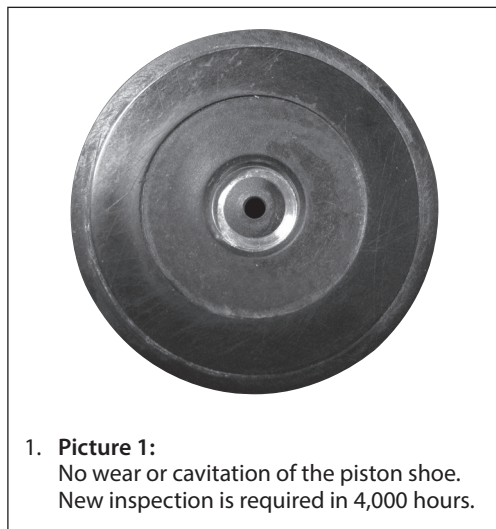
6.3 Exploded view
APP S 674 53-86



7. When should the pistons be replaced

This section provides guidance on, how to determine whether the parts of the pump are worn and should be replaced. In case of doubt - the pistons must be replaced. The pictures below are meant as a guideline for evaluating the wear of the sliding surface.

Note: If the pistons break down, the pump will suffer a disastrous breakdown.



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