



TECH BULLETIN

034
08/84

Published regarding engineering changes and improvements

SUBJECT: Servicing Crankcase Section: 3FR, 4FR, 5FR, 10FR, 25FR Piston Pumps

With proper installation and periodic maintenance, crankcase servicing is seldom necessary. **CRANKCASE SERVICING SHOULD BE PERFORMED ONLY BY TRAINED SERVICE TECHNICIANS.**

After removing the wet-end follow these steps to disassemble and service the drive end of your pump.

Disassembly

1. Drain all oil from the pump crankcase before servicing.
2. Remove discharge and inlet manifolds as described in Piston Pump Service Manual.
3. Remove the rear cover and both bearing covers.
4. Remove the rear half of the connecting rods.
NOTE: Front and rear halves of connecting rods are a matched set. **DO NOT MIX.**
5. Pull all three piston rods completely forward toward the wet-end.
6. Turn the crankshaft and check for clearance of the front half of the connecting rods.
7. Place the bearing block tool on the work surface. Slip the shaft into the female side of the bearing block and tap the opposite side of the crankshaft. Bearing will press into the bearing block.
NOTE: When removing the crankshaft, one bearing will remain in the pump and the other will stay on the shaft.
NOTE: The crankshaft can only be removed from one side on the 10 and 25 frame pumps. An arrow inside the rear of the crankcase indicates the direction.
8. Press bearing off the crankshaft. Using a soft mallet, tap other bearing from crankcase.
9. Pull the piston rods with front half of connecting rod from rear of crankcase.
10. Use the handle of a screwdriver or the crosshead end of the piston rod to drive out the crankcase oil seals from the back (inside the crankcase). The seal washer will come out with the oil seal.

Reassembly

1. Examine the crankcase oil seals for deterioration, cuts or scale build up and replace if worn.
2. Insert seal washer to rest on lip of each crankcase seal chamber.
3. Install the new oil seals from the front of the crankcase with the garter spring toward the crankcase of the pump.
4. Examine the piston rods for wear, straightness and snug wrist Pin (crosshead pin) fit and replace if worn.
5. Examine connecting rods for scoring, worn threads or loose nut and washer and replace if worn.
6. Connect the front half of connecting rod to piston rods and secure with the wrist pin (crosshead pin).
NOTE: Be certain the identification numbers on the front half of the connecting rod are up, so they can be easily matched to the back half.
7. Insert the piston rods from the rear of the crankcase through the crankcase oil seals and push completely forward.
NOTE: Exercise caution not to cut the crankcase oil seals with the threaded end of the piston rod.
8. Insert the new crankshaft into crankcase.

continued on back

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Reassembly Continued

9. Examine bearings and replace if worn.
10. Place bearing block over one of the shaft extensions and turn pump on its side on work surface.
11. Slip bearing and bearing driver tool over shaft and drive bearing onto shaft until completely seated.
12. Rotate pump to horizontal position, place bearing block and collar over opposite shaft.
13. Slip bearing over shaft and drive second bearing into position until completely seated.
NOTE: Be certain shaft is centered.
14. Replace back half of the connecting rods, matching the identification numbers with the front half. Torque per chart.
NOTE: On the 25 and 60FR models with the tab washers (locking washer), torque the top and bottom hex head screws to values as stated in torque chart. Continue tightening each screw until the flat section of the head of the screw is lined up with the tab, then flatten the tabs onto the flat surface of the hex screw.
15. Rotate shaft by hand to be certain shaft is free moving.
16. Examine crankshaft oil seals, bearing cover o-rings and rear cover o-ring and replace if cut or worn.
17. Replace new crankshaft oil seals in bearing covers and mount on crankshaft. Torque per chart.
18. Place new o-ring on rear cover and fasten to rear of crankcase. Torque per chart.

TORQUE CHART					
Pump Item Pump Frame/Model	Thread Size	Tool Size	in. lbs.	ft. lbs.	Nm
Connecting Rod Screws					
3, 4, 5FR.....280, 290, 323, 333, 430	M7	M10 Hex	95	8.0	11.0
10, 25FR.....623, 820, 1010, 1020, 1520, 2020, 2520 2520C	M8	M13 Hex	130	10.8	15.0
Bearing Cover Screws					
3, 4, 5, 10FR....280, 290, 323, 333, 430, 623, 820, 1010	M6	M10 Hex	50	4.0	5.4
25FR.....1020, 1520, 2020, 2520, 2520C	M8	M13 Hex	115	9.58	13.0
Rear Cover Screws					
3, 4, 5, 10FR....280, 290, 323, 430, 333, 623, 820, 1010	M6	M10 Hex	50	4.0	5.4
25FR.....1020, 1520, 2020, 2520, 2520C	M8	M13 Hex	115	9.58	13.0

CAT PUMPS

Technical Services Department