



TECH BULLETIN

035
09/84

Published regarding engineering changes and improvements

SUBJECT: Servicing Crankcase Section: 7CP, 7PFR-68PFR Plunger Pumps

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

The 3CP, 3PFR, 5CP and 5PFR, 25PFR and 28PFR plunger pump models (i.e, 3CP1120, 310) contain the same type roller bearing as used in the piston pumps and can be serviced by following the instructions in Tech Bulletin 034. The remaining plunger models have tapered roller bearings and are serviced differently.

After removing the pump wet-end, follow these steps to disassemble and service the drive-end of your 7CP, 7PFR, 8PFR, 15PFR, 18PFR, 35PFR, 38PFR, 60PFR and 68PFR plunger models.

Disassembly

1. Drain all oil from the pump crankcase before servicing.
2. Remove manifold head or discharge and inlet manifold as described in each respective service manual.
3. Remove the rear cover and one bearing cover.
NOTE: The bearing race and crankshaft oil seal will remain with the bearing cover. The bearings will remain on the crankshaft.
4. Remove the rear half of the connecting rods.
NOTE: Front and rear halves of connecting are a matched set. **DO NOT MIX.**
5. Pull all three plunger rods completely forward, toward the wet-end.
6. Turn the crankshaft and check for clearance of the front half of the connecting rods.
7. Pull the crankshaft from the pump.
8. Remove the other bearing cover with crankshaft seal and race.
NOTE: On 60PFR the race will remain with the inner bearing cover.
9. Drive or press bearings off shaft.
10. Pound bearing cover on a flat surface to loosen the race. Remove the bearing with an extractor tool.
11. Pull plunger rods with front half of connecting rod from rear of crankcase.
12. Use the handle of a screwdriver or the crosshead end of the plunger rod to drive out the crankcase oil seals from the back (inside the crankcase).

Reassembly

1. Examine the crankcase oil seals for deterioration, cuts or scale build-up and replace if worn.
2. Check for seal washer then install new crankcase oil seals from wet-end side of crankcase with the **garter spring toward the crankcase** of the pump.
3. Install one bearing cover with race, o-ring, and crankshaft oil seal.
4. Examine the plunger rods for scoring in oil seal area, and ensure there is a snug fit in the rist pin area, replace if worn.
5. Examine connecting rods for scoring, worn threads or loose nut and washer and replace if worn.

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Rev. 06/04

Reassembly Continued

6. Connect the front half of connecting rod to plunger rods and secure with the wrist pin (crosshead pin).
NOTE: Be certain the identification numbers on the front half of the connecting rods are up so they can be easily matched to the back half.
7. Insert the plunger rods from rear of crankcase through crankcase oil seals and gently push completely forward.
NOTE: Exercise caution not to cut or roll the crankcase oil seals with the threaded end of the plunger rods.
8. Examine crankshaft oil seals, bearing cover o-rings and rear cover o-ring and replace if cut or worn.
9. Examine crankshaft journals and replace if scored or grooved. Examine bearing for contamination or wear and replace as needed.
10. Press small diameter tapered end of new race into bearing cover until completely seated. Note: Inner bearing cover on 60PFR.
11. Mount the tapered roller bearing onto crankshaft with large O.D. toward crankshaft center and press onto the shoulder of crankshaft until completely seated.
12. Insert crankshaft into the crankcase and center.
13. Mount bearing cover onto crankshaft ends and press snug into crankcase. Torque per chart.
14. Rotate crankshaft by hand to be certain crankshaft is free moving. If side play is evidenced, remove one bearing cover shim. If extremely tight turning, add shims as needed to achieve free movement.
15. Line up back half of the connecting rods, matching the identification numbers with the front half. Replace the washer on hex screws, apply Loctite to threads and torque per chart.
NOTE: On the 25, 28,35,38,60 and 68PFR 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.
16. Rotate shaft again by hand to be certain connecting rods are free moving.
17. Mount crankcase cover on rear of pump and torque per chart.

TORQUE CHART					
Pump Item Pump Model/Frame	Thread Size	Tool Size	in. lbs.	Torque ft. lbs.	Nm
Connecting Rod Screws					
310, 7CP	M7	M10 Hex	95	8.0	11.0
7, 8, 15, 18, 25, 28 Frame	M8	M13 Hex	216	18.0	24.0
35, 38 Frame	M10	M17 Hex	395	33.0	45.0
60, 68 Frame	M10	M17 Hex	390	32.5	44.0
Bearing Cover Screws					
5, 15, 18 Frame	M6	M10 Hex	50	4.0	5.4
7, 8 Frame	M6	M10 Hex	115	9.58	13.0
7CP, 25, 28, 35, 38 Frame	M8	M13 Hex	115	9.58	13.0
60, 68 Frame	M10	M17 Hex	220	18.0	24.0
Rear Cover Screws					
7CP, 5, 15, 18 Frame	M6	M10 Hex	50	4.0	5.4
7, 8 Frame	M6	M10 Hex	115	9.58	13.0
25, 28, 35, 38 Frame	M8	M13 Hex	115	9.58	13.0
60, 68 Frame	M10	M17 Hex	220	18.0	24.0

CAT PUMPS

Technical Services Department