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Service Information Bulletin

SUBJECT	DATE
Inspection of the Main and Connecting Rod Bearings In-Chassis	January 2013

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0081	DD Platform	Inspection of the Main and Connecting Rod Bearings In-Chassis	This is a new section.



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2 Inspection of the Main and Connecting Rod Bearing in Chassis

Table 1.

Service Tools Used in the Procedure		
Tool Number	Tool Name	Engine
J-46392 or W904589046300	Engine Barring Tool	DD Platform
J-48884	Main Cap Puller	DD Platform

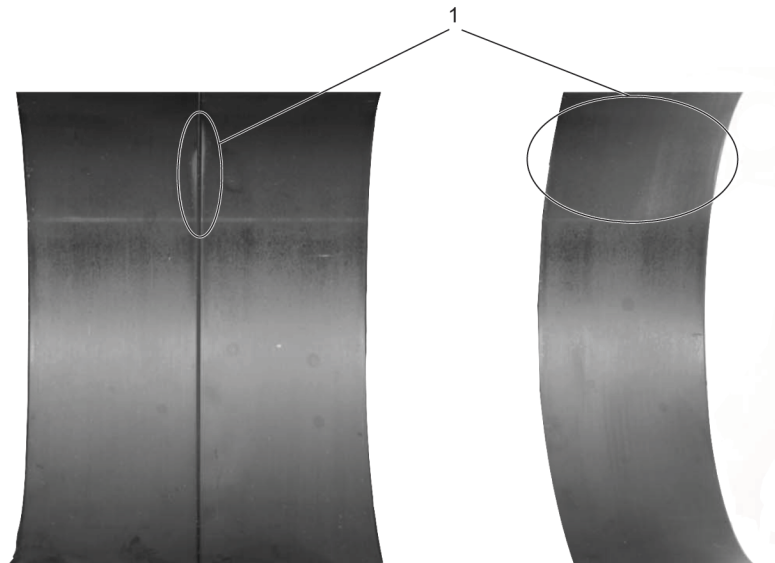
Inspect as follows:

1. Drain the lubricating oil. Refer to section "How to Replace the Lubricating Oil and Oil Filter".
2. Remove the oil pan. Refer to section "Removal of the Oil Pan".
3. Remove the oil pump. Refer to section "Removal of the Oil Pump, Oil Suction Manifold, and Oil Lines".
4. Using engine barring tool (J-46392 or W904589046300), position the crankshaft for each piston and connecting rod assembly to be removed at bottom dead center (BDC).

NOTICE: The connecting rod assembly is a cracked rod design. Ensure when the connecting rod bearing cap is removed that it is placed on its side. Damage to the connecting rod bearing cap will occur if it is placed on end; the connecting rod assembly will need to be replaced if the connecting rod bearing cap is damaged.

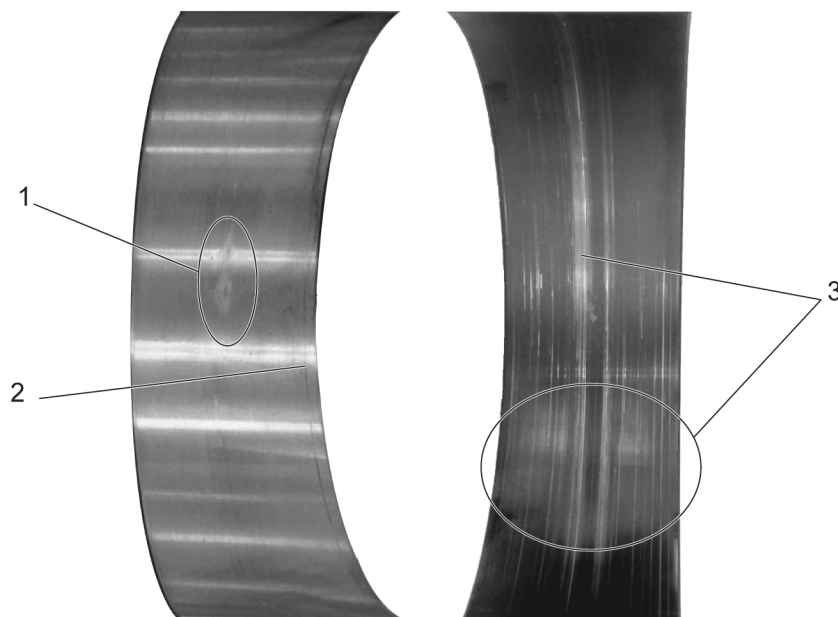
NOTICE: When removed, the connecting rod bearing cap and the connecting rod bearing must be assembled to its original connecting rod before another connecting rod bearing cap is removed.

5. Remove the connecting rod bearing cap with the connecting rod bearing.
6. Inspect the connecting rod bearing for damage. If the connecting rod bearing is damaged, replace all main and connecting rod bearings.
 - a. Acceptable bearing wear (1).



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- b. Unacceptable wear on bearings may be noted by cavitation (1), debris scratch (2), or high debris scratches (3).



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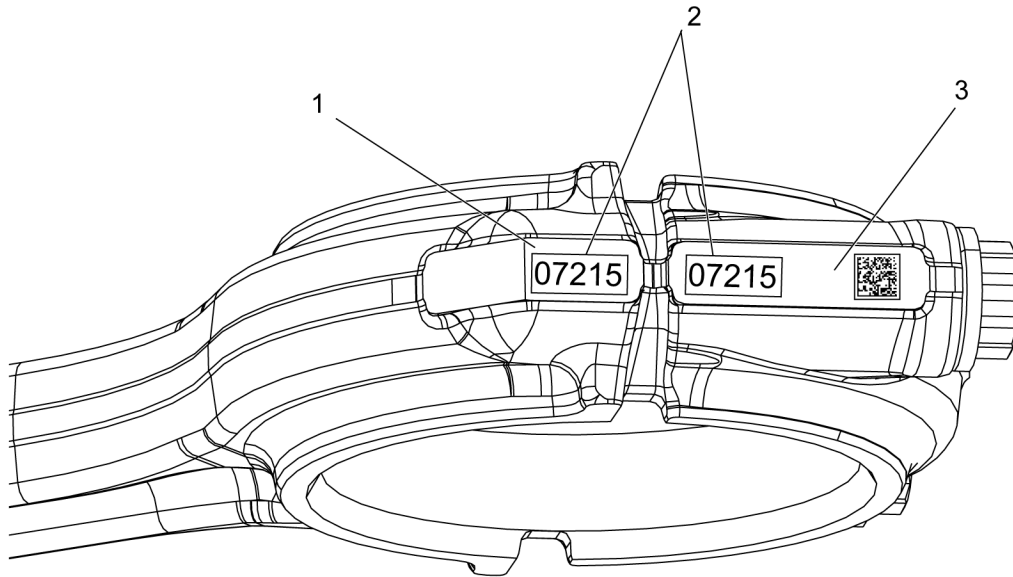
7. Inspect the connecting rod journal on the crankshaft for score marks, bearing material and discoloration. If score marks, bearing material or discoloration is present, replace the crankshaft.
8. Check the connecting rod bearing cap bolts for maximum length. If any connecting rod bearing cap bolt is out of specification, replace the out of specification connecting rod bearing cap bolt.

Table 2.

Connecting Rod Bearing Cap Bolt Maximum Length		
DD13	DD15	DD16
79 mm (3.11 in.)	82.3 mm (3.240 in.)	82.3 mm (3.240 in.)

NOTICE: Connecting rod cap number (2) and connecting rod number (2) must match.

9. Install the connecting rod bearing cap with bearing on to the connecting rod so that the connecting rod cap machined side (3) is mated to the connecting rod machined side (1).

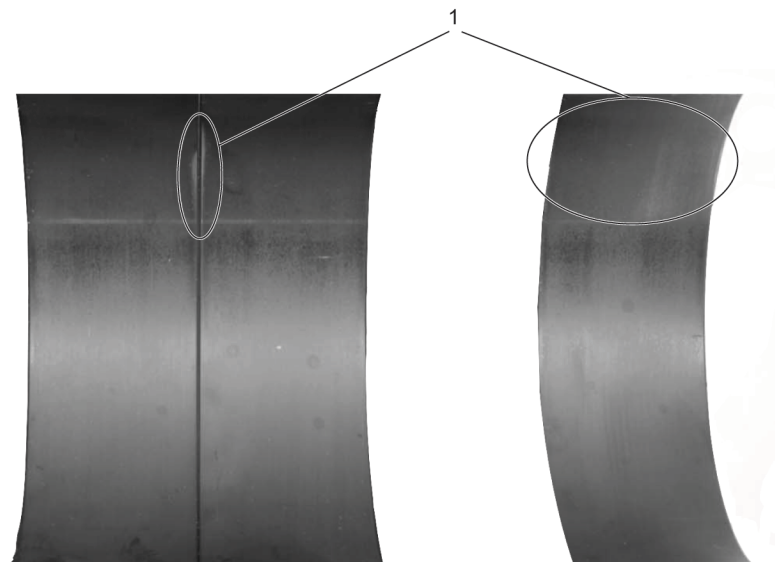


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10. Torque the connecting rod bearing cap bolts alternately to the following:
 - For the DD13: 190 N·m (140 lb·ft) + 90° torque turn
 - For the DD15: 115 N·m (85 lb·ft) + 180° torque turn
 - For the DD16: 115 N·m (85 lb·ft) + 180° torque turn
11. Check connecting rod axial clearance by moving the connecting rod from side to side on the crankshaft journal. If there is no clearance, check for proper connecting rod bearing cap installation.
12. Repeat steps 4 through 10 for the remaining connecting rod bearings.

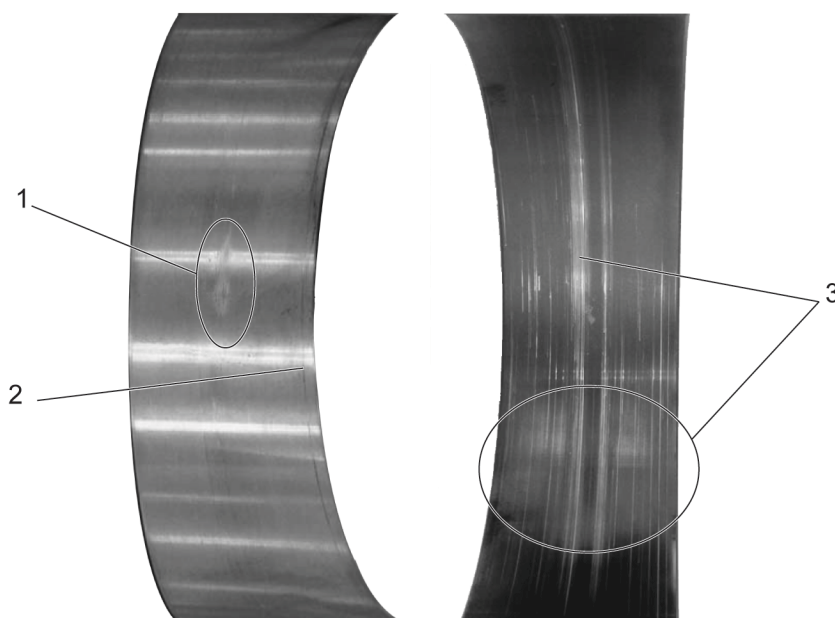
NOTICE: When removed, the main bearing cap and the main bearing must be assembled to its original location before another main bearing cap is removed.

13. Remove one pair of main bearing cap bolts.
14. Using the main cap puller tool (J-48884), remove one main bearing cap from the cylinder block.
15. Inspect the main bearing for damage. Refer to the illustration below. If the main bearing is damaged, replace all main bearings.
 - a. Acceptable bearing wear (1).



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- b. Unacceptable wear on bearings may be noted by cavitation (1), debris scratch (2), or high debris scratches (3).

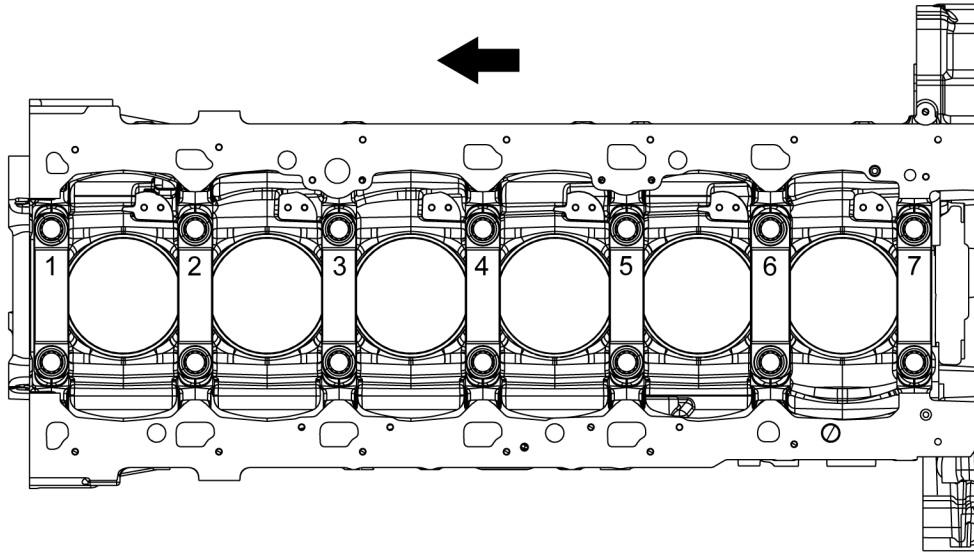


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16. Inspect the crankshaft journal for score marks, bearing material and discoloration. If score marks, bearing material or discoloration is present, replace the crankshaft.
17. Check the main bearing cap bolts for maximum length. If main bearing cap bolt is out of specification, replace the main bearing cap bolt.

Table 3.

Main Bearing Cap Bolt Maximum Length	
DD13	175.5 mm (6.909 in.)
DD15 and DD16	200.5 mm (7.894 in.)



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NOTICE: The main bearing caps are bored in position and stamped with a position number. They must be installed in their original positions with the marked (numbered) side of each cap toward the intake side of the cylinder block.

18. Install the main bearing cap with the main bearing on to the cylinder block.
19. Torque the main bearing cap bolts to 50 N·m (37 lb·ft).
20. For the DD13; torque the main bearing cap bolts, in three steps, using the sequence shown below. Torque the main bearing cap bolts to:
 - a. 150 N·m (111 lb·ft)
 - b. 300 N·m (221 lb·ft)
 - c. 90° torque turn
21. For the DD15 and DD16; torque the main bearing cap bolts, in four steps, using the sequence shown below. Torque the main bearing cap bolts to:
 - a. 150 N·m (111 lb·ft)
 - b. 250 N·m (184 lb·ft)
 - c. 1st 90° torque turn
 - d. 2nd 90° torque turn

NOTE: If the bearings have been installed properly, the crankshaft will turn freely with all of the main bearing cap bolts drawn to the specified torque.

22. Repeat steps 12 thru 19 for the remaining main bearings.
23. Install the oil pump, inlet and outlet pipes. Refer to section "Installation of the Oil Pump, Oil Suction Manifold, and Oil Lines".

24. Install the oil pan. Refer to section "Installation of the Oil Pan".
25. Prime engine lubrication system. Refer to section "Priming the Engine Lubrication System".
26. If new main or connecting rod bearings were installed, verify correct engine oil pressure.
For DD13 engines, Refer to section "DD13 Oil Pressure Specifications".
For DD15 and DD16 engines, Refer to section "DD15 and DD16 Oil Pressure Specifications".