

5. Tighten the hex nut by hand until all the slack is taken up. Use a ratchet and socket to tighten the hex nut, and install the wear sleeve to the crankshaft and the oil seal to the flywheel housing and/or gear case cover. See Figure 1-148.

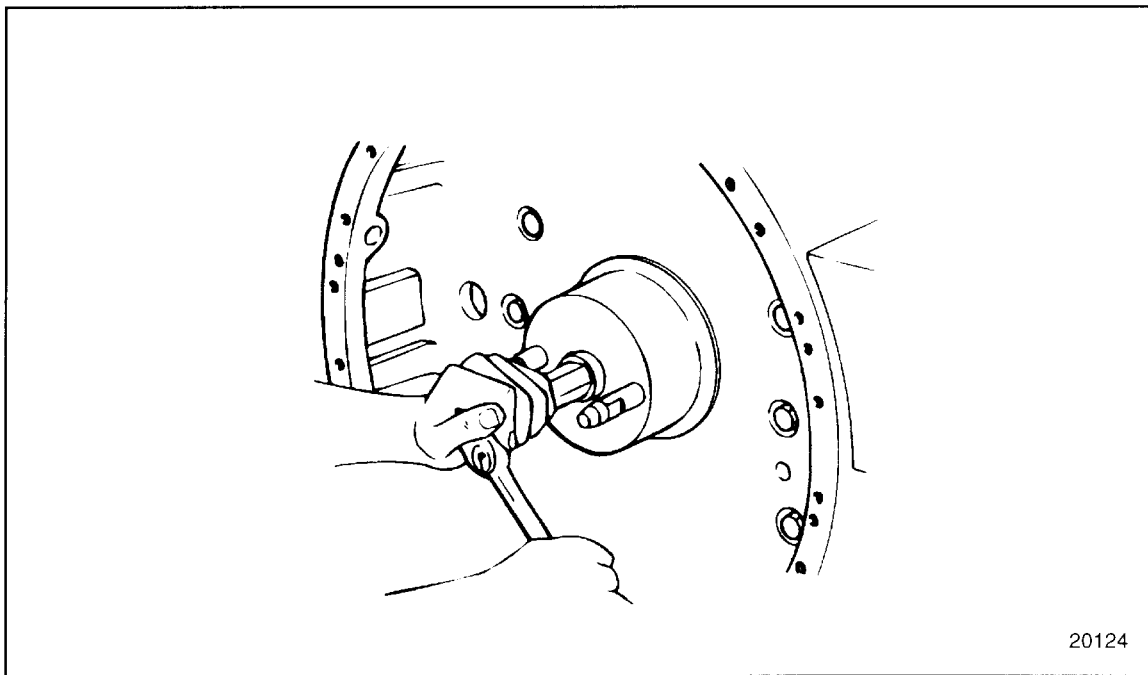
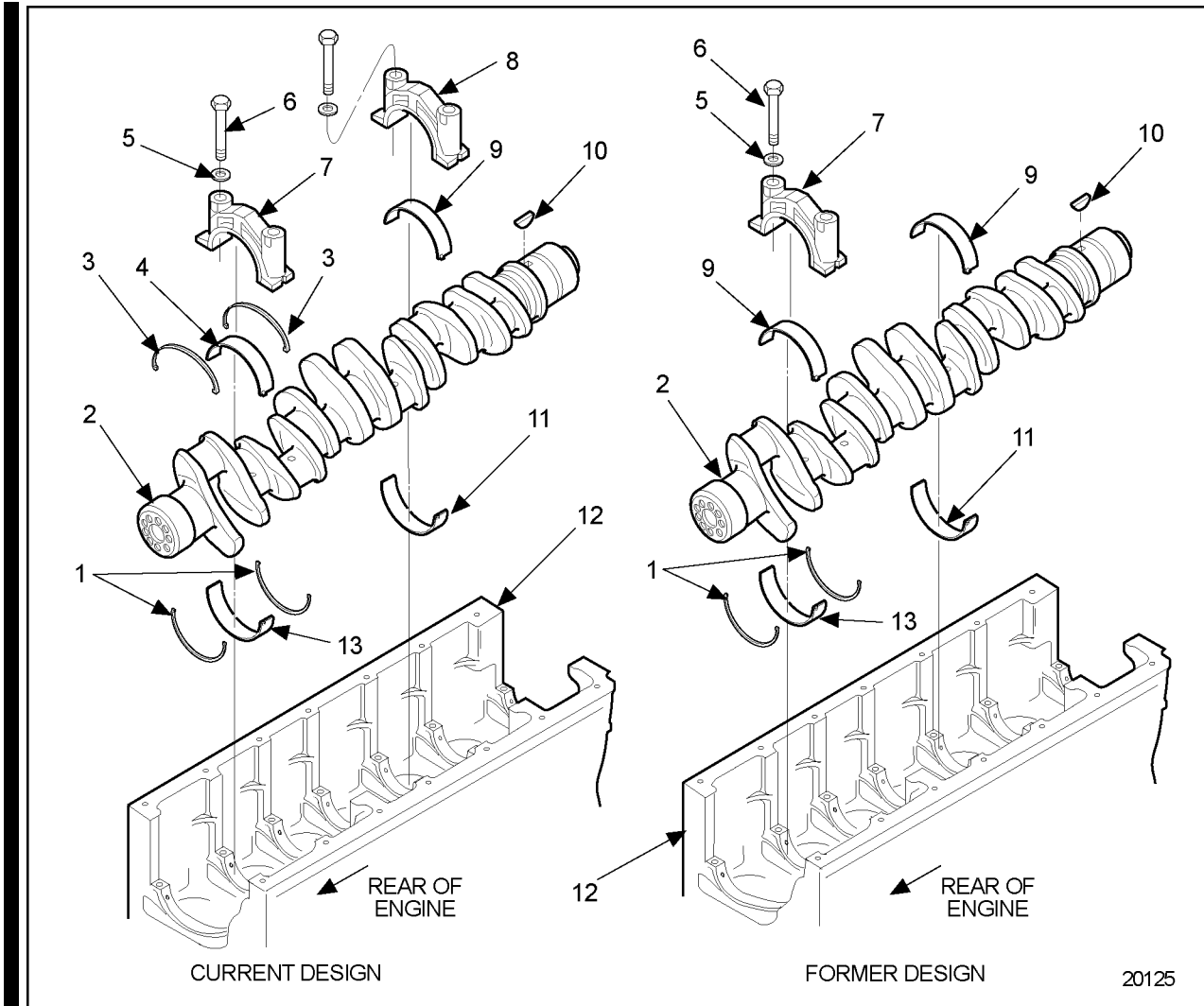


Figure 1-148 Oil Seal and Sleeve Installation

6. When the inside surface of the housing is seated against the base (spacers on rear oil seal installation), the seal and sleeve are properly positioned and installed.

1.9 CRANKSHAFT MAIN BEARINGS

The crankshaft main bearing shells are precision made and are replaceable without machining. They consist of an upper bearing shell seated in each cylinder block main bearing support and a lower bearing shell seated in each main bearing cap. See Figure 1-149.



- 1. Upper No. 6 Thrust Washers
- 2. Crankshaft
- 3. Lower No. 6 Thrust Washers
- 4. Lower No. 6 Thrust Bearing Shell
- 5. Washer
- 6. Bolt
- 7. No. 6 Main Cap

- 8. Main Cap No. 1, 2, 3, 4, 5 & 7
- 9. Lower Thrust Bearing Shell
- 10. Woodruff Key
- 11. Upper Thrust Bearing Shell No. 1, 2, 3, 4, 5 & 7
- 12. Cylinder Block
- 13. Upper No. 6 Thrust Bearing Shell

Figure 1-149 Main Bearing Caps, Bearing Shells and Crankshaft Thrust Washers

The upper and lower bearing shells are located in the respective block and bearing cap by a tang. The tang is located at the parting line at one end of each bearing shell. The tangs are offset from center to aid correct insertion. Bearing shell sets are supplied as a matched assembly and should not be mixed.

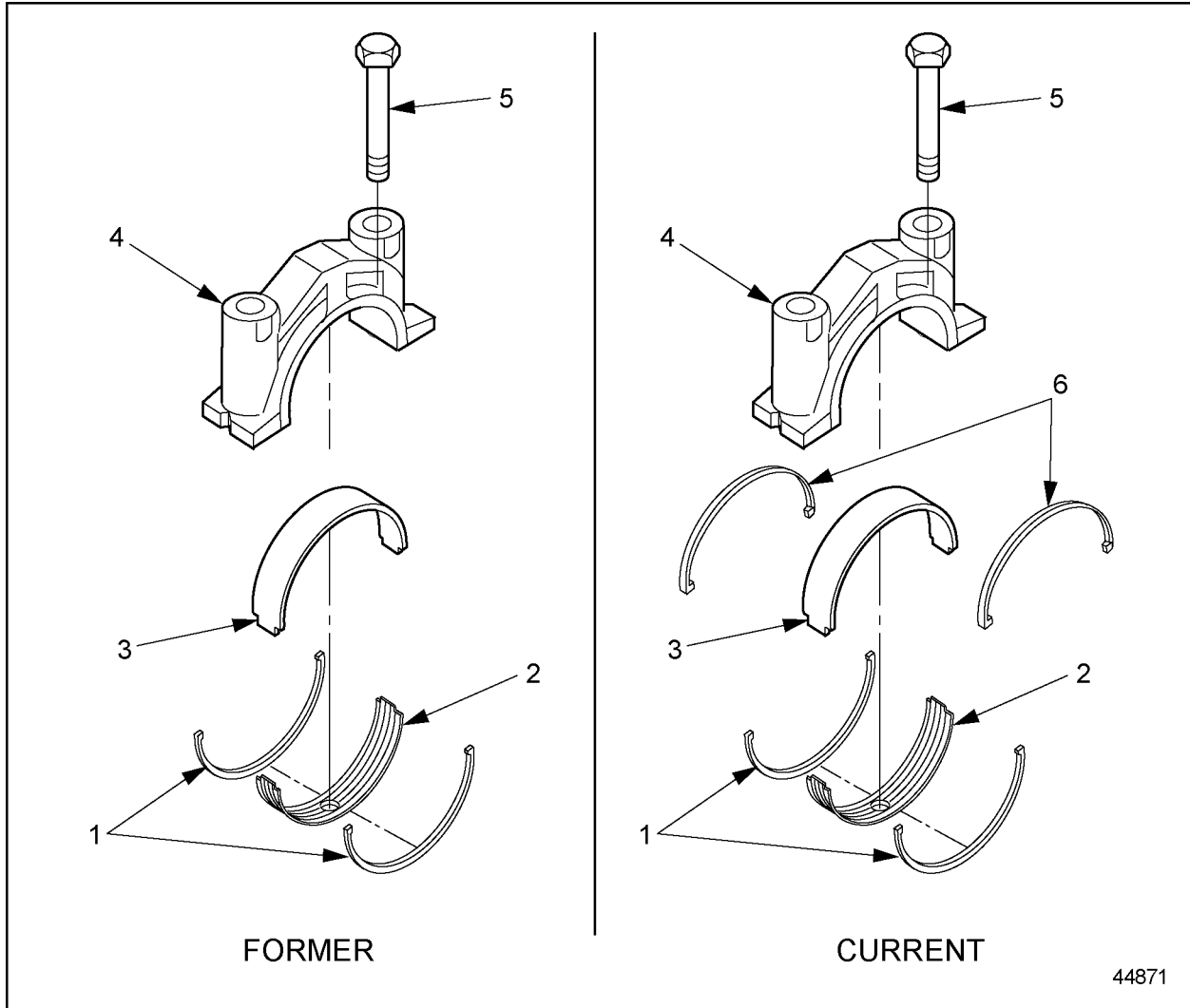
A hole in each upper bearing shell registers with a vertical oil passage in the cylinder block. Lubricating oil, under pressure, passes from the cylinder block oil gallery by way of the bearing shells to the drilled passage in the crankshaft, then to the connecting rods and connecting rod bearings. The upper bearing shell is also grooved.

The lower main bearing shells have no oil holes or grooves. Therefore, the upper and lower main bearing shells must not be interchanged.

Thrust washers on each side of the No. 6 main bearing absorb the crankshaft thrust. Engines built prior to 06R0762048 use the two-piece washers with locking tangs that register with locating notches in the bearing shell. See Figure 1-149.

NOTICE:
Do not mix old and new style thrust washers in the same engine.

Engines built after serial number 06R0762048 will accommodate the current style four-piece thrust washer as well as the former style two thrust washer version. See Figure 1-149. The current style thrust washers are marked for front and rear and are designed to directionally rotate into the same upper position with the main bearing cap removed. The No. 6 position main bearings are the same as the other position.



- | | |
|------------------------------|---------------------------|
| 1. Upper Thrust Washer (2) | 4. No. 6 Main Bearing Cap |
| 2. Upper No. 6 Bearing Shell | 5. Bolt |
| 3. Lower No. 6 Bearing Shell | 6. Thrust Washer (2) |

Figure 1-149 No. 6 Thrust Bearing Detail

The condition of the lower bearing shells may be observed by removing the main bearing caps.