

10-10. Crankshaft Nose Oil Seal Replacement

Replace the crankshaft nose oil seal if it is damaged or if the following conditions exist:

- Ram air is entering the engine interior
- Oil leaks from the nose seal or nose seal retainers

10-10.1. Solid Nose Oil Seal Removal

NOTE: Instructions in this section apply only to stretch over type oil seals.

WARNING

Turn the Ignition Switch OFF and disconnect engine electrical power before commencing maintenance or inspections. Confirm continuity between the magneto capacitor and aircraft ground to prevent accidental engine start during maintenance. Do not stand or place equipment within the arc of the propeller.

1. Turn the Ignition Switch OFF and disconnect engine electrical power.
2. Disconnect all spark plug leads.
3. Set the brakes and block the aircraft wheels.
4. Ensure that aircraft tie-downs are installed and the cabin door latch is open.
5. Remove the propeller according to the propeller and aircraft manufacturer's instructions.

CAUTION: Do not scratch, mar, or damage the crankshaft or crankcase while removing the crankshaft nose oil seal.

6. Remove the screws and the retainer plates (Figure 10-42) from the crankcase.

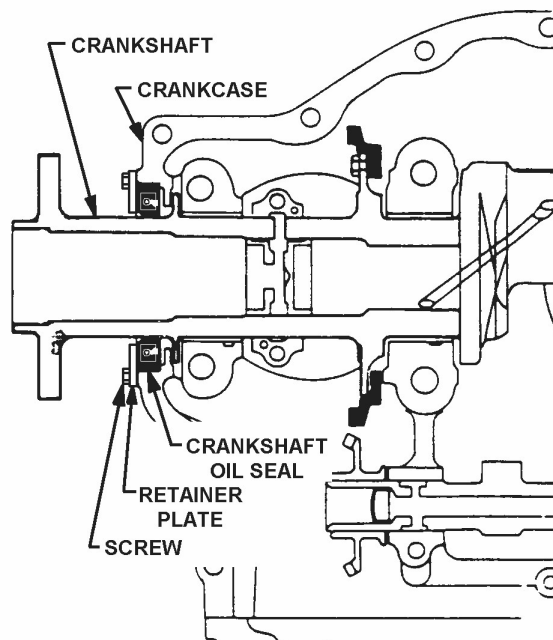


Figure 10-42. Retainer Plate and Screws on Front of Crankcase

7. Remove the crankshaft nose oil seal, reinforcing ring (if used), and spring as shown in Figure 10-43). Gentle force may be required to remove the nose oil seal parts from the counterbore.
8. Inspect the propeller mounting flange carefully to insure that no nicks, burrs or sharp edges are present which could damage the oil seal surface during installation.
9. Clean surfaces thoroughly making certain that no foreign material remains on the shaft or in the seal counterbore. Wash oil seal counterbore area with acetone. To remove the Gasket Maker residue out of the counterbore recess using a chlorinated solvent such as Loctite Chisel[®] or methylene chloride followed by a naphtha solvent such as Loctite ODC-Free Cleaner and Degreaser. Remove all residue and debris from the bore.

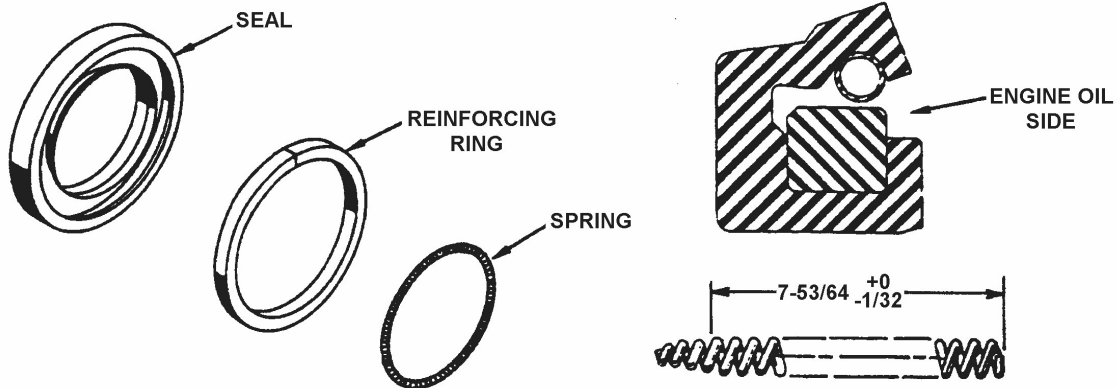


Figure 10-43. Crankshaft Nose Oil Seal Parts

10. Prepare the exposed portion of the crankshaft according to the instructions in Section 10-9.3.

10-10.2. Solid Nose Oil Seal Installation

WARNING

Turn the Ignition Switch OFF and disconnect engine electrical power before commencing maintenance or inspections. Confirm continuity between the magneto capacitor and aircraft ground to prevent accidental engine start during maintenance. Do not stand or place equipment within the arc of the propeller.

1. Prepare the exposed portion of the crankshaft with a fresh helix pattern according to instructions in Section 10-9.3.
2. Remove the spring and reinforcing ring from the crankshaft nose oil seal.
3. Unhook the spring ends using an unwinding motion.
4. Verify the seal spring length is 7.80" to 7.83" as illustrated in Figure 10-43. If the spring length is not within this tolerance, replace it.
5. Place the spring around the crankshaft in the helix area.

6. Turn the spring ends in a winding direction and allow one end to wind into the other end.
7. Apply Part No. 654561 Grease to the lip of the new seal and the propeller flange.
8. Squeeze the seal until it is egg shaped and install it on the crankshaft, groove side in, starting from the bottom of the propeller flange using the Crankshaft Oil Seal Installer Tool (Chapter 3, Kent-Moore Part No. 5209).
9. After the oil seal is installed on the crankshaft, wipe the grease from the oil seal and crankshaft. Verify the outer diameter of the oil seal is clean and dry.
10. Press the reinforcing ring into the oil seal recess in both directions from the split. Ensure the reinforcing ring is in the deepest part of the recess all the way around.
11. Install the spring in the oil seal cavity.
12. Spray a thin film of Part No. 653692 Primer on the oil seal counterbore and allow it to dry for 1 to 2 minutes.
13. Apply a translucent coat of Gasket Maker (Part No. 646942) to the oil seal counterbore. Refer to Gasket Maker application instructions in Appendix C.
14. Apply Gasket Sealant (Part No. 654663) to the outside diameter of the oil seal.
15. Using thumb pressure, work the seal into the crankcase counterbore.
16. After the seal is in place, wipe any remaining sealant from the seal and crankshaft.
17. Spray the exposed portion of the lightly scratched crisscross area with aluminum paint and allow it to dry.
18. Apply Part No. 653693, General Purpose Primer, to the crankcase oil seal retainer screw holes.
19. Apply Part No. 646941, High Strength Adhesive Sealant, to the oil seal retainer screws.
20. Install the crankshaft nose oil seal retainer plates and secure them with the nose oil seal retainer screws. Torque the screws to Appendix B specifications.
21. Inspect the propeller according to the propeller manufacturer's and aircraft manufacturer's instructions.
22. Install the propeller, if serviceable, according to the propeller manufacturer's and aircraft manufacturer's instructions.
23. Perform a normal "Engine Start" (Section 7-3.2) and "Ground Run-up" (Section 7-3.3). Run the engine for a minimum of five minutes to reach normal operating temperatures. Shut down the engine according to the "Engine Shutdown" (Section 7-3.4) instructions and inspect the Crankcase Nose Oil Seal area for leaks.

10-10.3. Split Nose Oil Seal Removal

Follow same procedures listed for stretch type oil seals except it is not necessary to remove the propeller. With the propeller installed, any removal of plating or blending of the 1” area referred to in Section 10-10.1 will have to be accomplished manually without engine rotation.

NOTE: On left hand rotating engines (LTSIO360) the helix must be applied in the opposite direction as shown in Figure 10-40. Stroke the strip of emery cloth outward toward the flange in the direction of rotation (CW toward you using maximum hand pressure.).

10-10.4. Split Type Nose Oil Seal Installation

1. Prepare the exposed portion of the crankshaft with a fresh helix pattern according to the instructions in Section 10-9.3.
2. Use appropriate split type nose oil seal depending on engine model (refer to illustrated parts catalog).
3. Remove the spring (Figure 10-44) from the new crankshaft nose oil seal assembly and unhook the spring ends.
4. Verify the seal spring length is 7.53” to 7.59” as illustrated in Figure 10-44. If the spring length is not within this tolerance, replace it.
5. Place the spring around the crankshaft in the helix area and connect the ends of the spring.
6. Apply Part No. 654561 Grease to the lip of the new oil seal and the crankshaft propeller flange.
7. Install a new oil seal on the crankshaft outboard of the spring with the opening facing the crankcase.

CAUTION: The nose oil seal split line must not align with the crankcase mating flanges.

8. Position the split line of the crankshaft nose oil seal at the 2:00 or 4:00 o'clock position of the crankcase.
9. Position the spring hooks 180° away from the split line of the nose oil seal and install the spring in the oil seal cavity.
10. After the seal is positioned on the crankshaft, wipe the grease from the oil seal and crankshaft. Verify the outer diameter of the oil seal is clean and dry.
11. Mask the crankshaft where it exits the crankcase. Spray a thin film of Part No. 653692, Primer, on the oil seal counterbore and allow it to dry for one to two minutes.
12. Apply Part No. 646942, Gasket Maker to the crankcase oil seal counterbore. Remove the masking tape from the crankshaft.
13. Apply a translucent coat of Part No. 654663 Gasket Sealant on the outer diameter of the oil seal.

14. Using thumb pressure, work the seal and spring into the crankcase counterbore. Ensure the seal is in the deepest part of the recess all the way around.

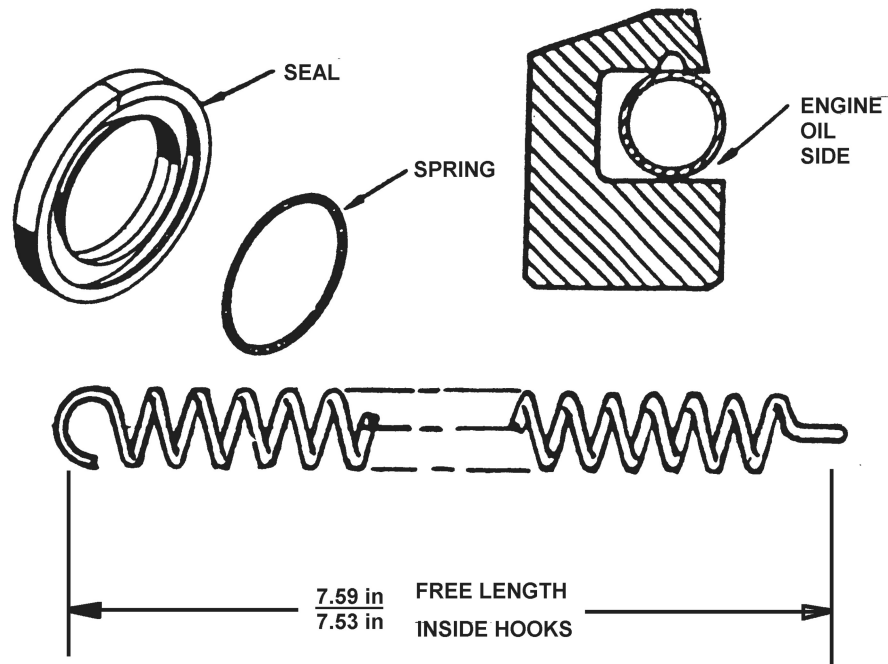


Figure 10-44. Split Nose Oil Seal Parts

15. After the seal is in place, wipe any remaining sealant from the seal and crankshaft.
16. Spray the exposed portion of the lightly scratched crisscross area with aluminum paint and allow it to dry.

NOTE: The following steps apply only to engines utilizing oil seal retainer plates.

17. Apply Part No. 653693, General Purpose Primer, to the crankcase oil seal retainer screw holes.
18. Apply Part No. 646941, High Strength Adhesive Sealant, to the oil seal retainer screws.
19. Install the crankshaft nose oil seal retainer plates and secure them with screws. Torque the screws to the value specified in Appendix B.
20. Perform a normal “Engine Start” (Section 7-3.2) and “Ground Run-up” (Section 7-3.3). Run the engine for a minimum of five minutes to reach normal operating temperatures. Shut down the engine according to the “Engine Shutdown” (Section 7-3.4) instructions and inspect the Crankcase Nose Oil Seal area for leaks.