6-5. Unscheduled Maintenance

6-5.1. Propeller Strike

A propeller strike is any incident (whether or not the engine is operating) in which the propeller contacts a foreign object that 1)results in the necessity to repair the propeller blade(s) (other than minor blade dressing) or 2)results in loss of engine RPM at the time of contact. Propeller strikes can cause engine and component damage even if the propeller continues to rotate. This damage can result in catastrophic engine failure.

WARNING

Do not attempt to dress a propeller blade without consulting the propeller manufacturer's instructions. Stresses imposed on the propeller are more concentrated in areas that are nicked and cut. They may act as stress risers. Stress risers weaken the blade and can eventually cause the blade to fracture.

In cases where a small foreign object such as a small stone, strikes the propeller during operation, inspect and repair the propeller according to the propeller manufacturer's instructions. If foreign object damage requires removal of the propeller for repair(s) perform the "Propeller Strike Inspection" in Section 6-5.1.1.

6-5.1.1. Propeller Strike Inspection

Following any propeller strike, disassemble and inspect all rotating engine components prior to further flight; correct all unserviceable conditions. Inspect all engine driven components according to the manufacturer's instructions for continued airworthiness.

Procedure

1. Remove the propeller; inspect according to propeller manufacturer's instructions.
2. Remove the engine from the aircraft according to the instructions in Section 5-1.
3. Disassemble the engine completely according to instructions in the primary ICA (reference Section 1-1.1).
4. Regardless of condition, replace all counterweight pins, bushings, end plates and snap rings. Replace all connecting rod nuts and bolts, regardless of condition.
5. Thoroughly clean the crankshaft according to instructions in Chapter 12; all surfaces, especially those forward of the front main bearing, must be free of paint, sludge, or any substance that may mask cracks.
6. Perform a "Magnetic Particle Inspection" on the crankshaft, connecting rods, gears and remaining steel internal engine parts according to instructions in Section 11-3.
7. Strip the crankcase of all paint and clean the crankcase thoroughly according to instructions in Chapter 12; all surfaces must be free of paint, sludge, or any substance that may mask reliable inspection.
8. Perform a "Fluorescent Penetrant Inspection" on the crankcase according to instructions in Section 11-2, paying particular attention to the forward crankcase bearing support and adjacent structure.
9. Inspect the remainder of the engine according to the instructions in the primary ICA (Section 1-1.1).

10. Perform the aircraft inspections required by the aircraft manufacturer.
11. Inspect all engine accessories according to the manufacturer's instructions.
12. Assemble the engine according to instructions in the primary ICA (Section 1-1.1).
13. Install the engine in the aircraft according to the instructions in Section 5-2.

6-5.2. Hydraulic Lock Inspection

WARNING

Do not attempt to start an engine with an over-primed or flooded induction system. Starting an engine with a flooded induction system can result in hydraulic lock and subsequent engine malfunction or failure. Allow excess fuel to drain from the intake manifold and/or cylinder prior to attempting to start the engine.

In the event the operator starts an over-primed/flooded engine or suspects a hydraulic lock has occurred, perform the steps in the inspection procedure below.

Hydraulic lock occurs when fluid accumulates in the induction system or the cylinder assembly. The fluid restricts piston travel during the compression stroke. Engine damage occurs when the other cylinders fire, forcing the piston in the fluid filled cylinder through the compression stroke. Engine damage from hydraulic lock can be extensive due to the high stresses generated, which can adversely affect connecting rods, pistons, cylinder assemblies, piston pins, the crankcase, and crankshaft. Hydraulic lock may occur because of any of the following:

- Restricted or improperly maintained induction system or cylinder intake port drains
- Extended operation of electric boost pump
  - During failed engine start
  - Following loss of power during ground operation
  - Following momentary engine shutdown
  - During single engine operation for training purposes on twin engine aircraft
- Over priming and attempting engine start with the aircraft parked on an incline that negates the effective operation of the drain system
- Failure to properly remove preservative oil from an engine returned from storage

WARNING

Do not operate the engine if hydraulic lock is suspected.

Inspection Procedure

1. Remove the engine from the aircraft according to instructions in Section 5-1.
2. Disassemble the engine and remove all cylinders and connecting rods according to instructions in the primary ICA (reference Section 1-1.1).