AIRCRAFT MAINTENANCE MANUAL
Section: Engine Maintenance Procedures
Document Type: Maintenance Instructions
Classification: Technical Documentation

OVERVIEW
This document provides comprehensive maintenance procedures for aircraft engines including inspection, repair, and replacement procedures.
All procedures must be followed according to S1000D standards.

SAFETY REQUIREMENTS
WARNING: Always ensure engine is completely shut down before maintenance.
CAUTION: Use proper protective equipment during all procedures.
NOTE: Refer to technical specifications for torque values.

ENGINE INSPECTION PROCEDURE

Type: Periodic Inspection

Frequency: Every 100 flight hours

PREREQUISITES

- Engine must be shut down for at least 30 minutes
- Aircraft must be properly grounded
- All safety equipment must be available

REQUIRED TOOLS AND EQUIPMENT

- Standard socket wrench set
- Torque wrench (0-150 ft-lbs)
- Inspection mirror
- Flashlight
- Clean rags

INSPECTION STEPS

1. Remove engine cowling panels
2. Inspect engine mounts for cracks or damage
3. Check all visible bolts and connections
4. Examine fuel lines for leaks or deterioration
5. Inspect electrical connections and wiring
6. Check oil level and quality
7. Examine exhaust system for damage
8. Replace engine cowling panels

ENGINE OIL CHANGE PROCEDURE

Type: Maintenance Procedure

Frequency: Every 50 flight hours or 6 months

MATERIALS REQUIRED

- Engine oil (specification: SAE 20W-50)
- Oil filter (Part Number: OF-12345)
- Drain pan (minimum 6 quart capacity)
- New drain plug gasket

PROCEDURE STEPS

1. Warm engine to operating temperature
2. Shut down engine and wait 10 minutes
3. Position drain pan under oil drain plug
4. Remove drain plug and allow oil to drain completely
5. Remove old oil filter using filter wrench
6. Clean filter mounting surface
7. Install new filter with light coat of oil on gasket
8. Reinstall drain plug with new gasket
9. Add new oil through oil filler opening
10. Check oil level with dipstick
11. Run engine and check for leaks
12. Recheck oil level after shutdown

EXPECTED RESULTS

- Oil level should be between MIN and MAX marks
- No oil leaks should be present
- Engine should run smoothly without abnormal noises

ENGINE TROUBLESHOOTING GUIDE

Type: Fault Isolation Procedure

PROBLEM: Engine will not start

POSSIBLE CAUSES:

1. Fuel system problems
   - Check fuel quantity
   - Inspect fuel lines for blockages
   - Verify fuel pump operation
2. Ignition system problems
   - Check spark plugs
   - Test ignition coils
   - Verify ignition timing
3. Electrical system problems
   - Check battery voltage
   - Inspect wiring connections
   - Test starter motor

PROBLEM: Engine runs rough

POSSIBLE CAUSES:

1. Fuel contamination
2. Dirty air filter
3. Worn spark plugs
4. Carburetor adjustment needed
5. Compression problems

TECHNICAL SPECIFICATIONS

Type: Reference Information

ENGINE SPECIFICATIONS

Model: Lycoming O-360-A4A

Displacement: 361.0 cubic inches

Horsepower: 180 HP @ 2700 RPM

Compression Ratio: 8.5:1

Fuel System: Carburetor

Ignition: Dual magneto

Oil Capacity: 8 quarts

Dry Weight: 325 lbs

TORQUE SPECIFICATIONS

Spark plugs: 30-35 ft-lbs

Oil drain plug: 25-30 ft-lbs

Oil filter: 15-20 ft-lbs

Cylinder head bolts: 35-40 ft-lbs

Propeller bolts: 50-55 ft-lbs

OPERATING LIMITS

Maximum RPM: 2700

Oil temperature: 100-245°F

Oil pressure: 60-90 PSI

Fuel pressure: 0.5-8.0 PSI

Manifold pressure: 15-29 inches Hg