SECTION 4
PERIODIC INSPECTIONS

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PERIODIC INSPECTIONS

NOTE

Perhaps no other factor is quite so important to safety and durability of the aircraft and its components as faithful and diligent attention to regular checks for minor troubles and prompt repair when they are made.

The operator should bear in mind that the items listed in the following pages do not constitute a complete aircraft inspection, but are meant for the engine only. Consult the airframe manufacturer's handbook for additional instructions.

Pre-Starting Inspection – The daily pre-flight inspection is a check of the aircraft prior to the first flight of the day. This inspection is to determine the general condition of the aircraft and engine.

The importance of proper pre-flight inspection cannot be over emphasized. Statistics prove several hundred accidents occur yearly directly responsible to poor pre-flight inspections.

Among the major causes of poor pre-flight inspection are lack of concentration, reluctance to acknowledge the need for a check list, carelessness bred by familiarity and haste.

1. DAILY PRE-FLIGHT (ENGINE).

a. Be sure all switches are in the "Off" position.

b. Be sure magneto ground wires are connected.

c. Check oil level.

d. See that fuel tanks are full.

e. Check fuel and oil line connections, note minor indications for repair at 50-hour inspections. Repair any leaks before aircraft is flown.

f. Open the fuel drain to remove any accumulation of water and sediment.

g. Make sure all shields and cowling are in place and secure. If any are missing or damaged, repair, or replacement should be made before the aircraft is flown.

h. Check controls for general condition, travel, and freedom of operation.

i. Induction system air filter should be inspected and serviced in accordance with the airframe manufacturer's recommendations.

2. DAILY PRE-FLIGHT (TURBOCHARGER).

a. Inspect mounting and connections of turbocharger for security, oil leakage, and air or exhaust gas leakage.

b. Check engine crankcase breather for restrictions to breather.

3. 10-HOUR INSPECTION (ENGINE). Within ten (10) hours of operating time, for new, rebuilt, or newly overhauled engines, replace the oil filter, and conduct an inspection of the contents of the used oil filter for traces of metal particles.

4. 25-HOUR INSPECTION (ENGINE). After twenty-five (25) hours of operating time since the first inspection, new, rebuilt, or newly overhauled engines should undergo a 50-hour inspection including draining and renewing lubricating oil, replacing the oil filter, and inspecting the contents of the used oil filter.

NOTE

If an engine does not have a full-flow oil filter, change oil every 25 hours; also, inspect oil pressure and suction screens for metal contamination, and clean thoroughly before reinstallation.

5. 50-HOUR INSPECTION (ENGINE). In addition to the items listed for daily pre-flight inspection, the following maintenance checks should be made after every fifty (50) hours of operation.

a. Ignition System –

(1) If fouling of spark plugs has been apparent, rotate bottom plugs to upper position.

(2) Examine spark plug leads of cable and ceramics for corrosion and deposits. This condition is evidence of either leaking spark plugs, improper cleaning of the spark plug walls or connector ends. Where this condition is found, clean the cable ends, spark plug walls and ceramics with a dry, clean cloth or a clean cloth moistened with methyl-ethyl ketone. All parts should be clean and dry before reassembly.

(3) Check ignition harness for security of mounting clamps and be sure connections are tight at spark plug and magnetic terminals.

b. Fuel and Induction System – Check the primer lines for leaks and security of the clamps. Remove and clean the fuel inlet strainers. Check the mixture control and throttle linkage for travel, freedom of movement, security of the clamps and lubricate if necessary. Check the air intake ducts for leaks, security, filter damage; evidence of dust or other solid material in the ducts is indicative of inadequate filter care or damaged filter. Check vent lines for evidence of fuel or oil seepage; if present, fuel pump may require replacement.

c. Lubrication System –

(1) Check oil lines for leaks, particularly at connections; for security of anchorage and for wear due to rubbing or vibration, for dents and cracks.

(2) Replace elements on external full flow oil filters. Before disposing of used element check interior folds for traces of metal particles that might be evidence of internal engine damage. Drain and renew lubricating oil on installations not employing replaceable full flow filters.

d. Exhaust System – Check attaching flanges at exhaust ports on cylinders for evidence of leakage. If they are loose, they must be removed and machined flat before they are reassembled and tightened. Examine exhaust manifold for general condition.

e. Cooling System – Check cowling and baffles for damage and secure anchorage. Any damaged or missing part of the cooling system must be repaired or replaced before the aircraft resumes operation.

f. Cylinders – Check rocker box covers for evidence of oil leaks. If found, replace gasket and tighten screws to specified torque (50 in.-lbs.).

Check cylinders for evidence of excessive heat which is indicated by burned paint on the cylinder. This condition is indicative of internal damage to the cylinder and, if found, its cause must be determined and corrected before the aircraft resumes operation.

Heavy discoloration and appearance of seepage at cylinder head and barrel attachment area is usually due to emission of thread lubricant used during assembly of the barrel at the factory, or by slight gas leakage which stops after the cylinder has been in service for a while. This condition is neither harmful nor detrimental to engine performance and operation. If it can be proven that leakage exceeds these conditions, the cylinder should be replaced.

g. Turbocharger – All fluid power lines and mounting brackets incorporated in turbocharger system should be checked for leaks, tightness and any damage that may cause a restriction.

Check for accumulation of dirt or other interference with the linkage between the bypass valve and the actuator which may impair operation of turbocharger. Clean or correct cause for interference.

The vent line from the actuator should be checked for oil leakage. Any constant oil leakage is cause for replacement of piston seal.

Check alternate air valve to be sure it swings free and seals tightly.

6. 100-HOUR INSPECTION. In addition to the items listed for daily pre-flight and 50-hour inspection, the following maintenance checks should be made after every 100 hours of operation.

a. Electrical System –

(1) Check all wiring connected to the engine or accessories. Any shielded cables that are damaged should be replaced. Replace clamps or loose wires and check terminals for security and cleanliness.

(2) Remove spark plugs; test, clean and regap. Replace if necessary.

b. Lubrication System – Drain and renew lubricating oil.

c. Magnetos – Check breaker points for pitting and minimum gap. Check for excessive oil in the breaker compartment; if found, wipe dry with a clean lintless cloth. The felt located at the breaker points should be lubricated in accordance with the magneto manufacturer's instructions. Check magneto to engine timing. Timing procedure is described in Section 5, 1, b of this manual.

NOTE

Engines equipped with pressurized ignition system should be checked using the Bendix Model 11-10090 airflow tester as described in latest revision of Service Instruction No. 1308.

d. Engine Accessories – Engine mounted accessories such as pumps, temperature and pressure sensing units should be checked for secure mounting, tight connections.

e. Cylinders – Check cylinders visually for cracked or broken fins.

f. Engine Mounts – Check engine mounting bolts and bushings for security and excessive wear. Replace any bushings that are excessively worn.

g. Fuel Injector Nozzles and Lines – Check fuel injector nozzles for looseness. Tighten to 60 in.-lbs. torque. Check fuel line for dye stains at connections (indicating linkage) and security of lines. Repair or replacement must be accomplished before aircraft resumes operation.

h. Turbocharger – Inspect all air ducting and connections in turbocharger system for leaks. Make inspection both with engine shut down and with engine running. Check at manifold connections to turbine inlet and at engine exhaust manifold gasket, for possible air leakage.

CAUTION

DO NOT OPERATE THE TURBOCHARGER IF LEAKS EXIST IN THE DUCTING, OR IF AIR CLEANER IS NOT FILTERING EFFICIENTLY. DUST LEAKING INTO AIR DUCTING CAN DAMAGE TURBOCHARGER AND ENGINE.

Check for dirt or dust build-up within the turbocharger. Check for uneven deposits on the impeller. Consult AiResearch Industrial Div. Manual TP-21 for method to remove all such foreign matter.

Check the condition of the flexible hoses in the turbocharger system. Stiffness of the hose is indicative of deterioration and if this condition is noted the hose should be replaced before further flight.

7. 400-HOUR INSPECTION. In addition to the items listed for daily pre-flight, 50-hour and 100-hour inspections, the following maintenance check should be made after every 400 hours of operation.

Valve Inspection – Remove rocker box covers and check for freedom of valve rockers when valves are closed. Look for evidence of abnormal wear or broken parts in the area of the valve tips, valve keeper, springs and spring seats. If any indications are found, the cylinder and all of its components should be removed (including the piston and connecting rod assembly) and inspected for further damage. Replace any parts that do not conform to limits shown in the latest revision of Special Service Publication No. SSP-1776.

8. NON-SCHEDULED INSPECTIONS. Occasionally, service bulletins or service instructions are issued by Lycoming that require inspection procedures that are not listed in this manual. Such publications, usually are limited to specified engine models and become obsolete after corrective modification has been accomplished. All such publications are available from Lycoming distributors, or from the factory by subscription. Consult the latest revision of Service Letter No. L114 for subscription information. Maintenance facilities should have an up-to-date file of these publications available at all times.

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If step (4) indicates that the idle adjustment is too rich or too lean, turn the idle mixture adjustment in the direction required for correction, and check this new position by repeating the procedure in step (4). Make additional adjustments as necessary until a check results in a momentary pick-up of approximately 50 RPM. Each time the adjustment is changed, the engine should be run up to 2000 RPM to clear the engine before proceeding with the RPM check. Make final adjustment of the idle speed adjustment to obtain the desired idling RPM with closed throttle. The above method aims at a setting that will obtain maximum RPM with minimum manifold pressure. In case the setting does not remain stable, check the idle linkage; any looseness in this linkage would cause erratic idling. In all cases, allowance should be made for the effect of weather conditions and field altitude upon idling adjustment.

3. LUBRICATION SYSTEM.

a. Oil Grades and Limitations – Service the engine in accordance with the recommendations shown in Section 3.

b. Oil Suction and Oil Pressure Screens – At each fifty hours inspection remove, inspect for metal particles, clean and reinstall.

NOTE

On installations employing external oil filters, step 3, b is not practical at this time. But should be observed at the 100-hour inspection

c. Oil Relief Valve (Non-Adjustable) – The function of the oil pressure relief valve is to maintain engine oil pressure within specified limits. The valve, although not adjustable, may be controlled by the addition of a maximum of nine STD-425 washers under the cap to increase pressure or the use of a spacer (Lycoming P/N 73629 or 73630) to decrease pressure. A modification on later models has eliminated the need for the spacers. Particles of metal or other foreign matter lodged between the ball and seat will result in faulty readings. It is advisable, therefore, to disassemble, inspect and clean the valve if excessive pressure fluctuations are noted.

d. Oil Relief Valve (Adjustable) – The adjustable oil relief valve enables the operator to maintain engine oil pressure within the specified limits. If the pressure under normal operating conditions should consistently exceed the maximum or minimum specified limits, adjust the valve as follows:

With the engine warmed up and running at approximately 2000 RPM, observe the reading on the oil pressure gage. If the pressure is above maximum or below minimum specified limits, stop engine and screw the adjusting screw out to decrease pressure and in to increase pressure. Depending on installation, the adjusting screw may have only a screw driver slot and is turned with a screw driver; or may have the screw driver slot plus a pinned .375-24 castellated nut and may be turned with either a screw driver or a box wrench.

4. CYLINDERS. It is recommended that as field operation, cylinder maintenance be confined to replacement of the entire assembly. For valve replacement, consult the proper Overhaul Manual. This should be undertaken only as an emergency measure.