

SERVICE INSTRUCTION

DATE: June 15, 2007

Service Instruction No. 1080C
(Supersedes Service Instruction No. 1080B)

SUBJECT: Maintenance Items for Special Attention

MODELS AFFECTED: All Lycoming opposed series aircraft engines.

TIME OF COMPLIANCE: During periodic inspection of the engine.

It has been determined that careful inspection and maintenance at precise, specified intervals will contribute immeasurably to the life of the engine and the avoidance of eventual damage or failure of the engine. It is the purpose of this instruction to point out items for inspection that are areas of extreme importance in detecting symptoms of abnormal engine condition; that is, conditions that if left uncorrected will eventually result in shortened engine life or actual engine failure.

CARBURETOR AIR FILTER. Excessive wear and early failure of reciprocating parts is due in many instances to contaminants introduced through the carburetor air intake. This condition can only be controlled by strictly following the aircraft manufacturer's instructions for maintenance. When operating in extreme dusty or sandy conditions clean the filters daily or when otherwise indicated in accordance with the aircraft manufacturer's recommendations. Refer to the latest revision of Service Instruction No. 1002 for additional information.

CYLINDER BAFFLES. Loose or damaged cylinder baffles may seem trivial; however, their effect on the temperature characteristics of the cylinders may be considerable. Therefore, inspect the cylinder baffle at every 50 hours of operation.

OVERHEATING. Overheating of the engine may be due to a variety of causes; among them are improper operation, faulty exhaust connections, incorrect grade of fuel, incorrect magneto timing, loose cylinder baffles or an improperly installed cowling. This condition is evidenced by paint burned off of the cylinder assembly. Inspect the cylinder assembly for this condition after every 50 hours of operation. If discoloration is found, the cause should be determined and corrected before further operation of the aircraft is attempted. When making this check it is important to distinguish between areas where paint has scaled or peeled from the cylinder and areas where the paint has actually burned. Burned or overheated areas have a dark or discolored and blistered paint appearance. Unburned metallic surfaces appear bright or clean with definite sharp edges where paint has chipped.

MAGNETOS. Inefficient engine operation, roughness, loss of power, and detonation developing into pre-ignition can all be the result of a lack of magneto maintenance. Check the magneto-to-engine timing at each 100 hours of service or at each annual inspection, whichever occurs first. Should the magneto-to-engine timing require an adjustment, then inspect and service magnetos per the magneto manufacturer's recommended maintenance and inspection procedures.

EXHAUST SYSTEM. Leaking connections between the exhaust system and the exhaust ports of the cylinders can cause excessive heat damage to the spark plugs, ignition cables, and the cylinder head. Inspect the exhaust system for leaks at 50-hour intervals. A leaking exhaust connection can be detected by paint burned off around spark plug and exhaust flange bosses or light gray deposits on surfaces near the leak. Warping of the exhaust flange adjacent to the exhaust port generally causes such leaks. These leaks can only be repaired by removing the exhaust manifold and regrinding or lapping the flange flat. Merely tightening the attaching nuts will not seal the leak. Check the mufflers for loose baffles.

SPARK PLUGS. Make certain that only approved spark plugs are used in the engine. The latest revision of Lycoming Service Instruction No. 1042 gives the specified plugs for all engine models.

MANUAL MIXTURE CONTROL. Insufficient travel of the manual mixture control will not permit the mixture control valve on the carburetor to be set in the full rich position. Check the mixture control linkage at 50-hour intervals for this condition as well as for freedom of movement, security and adequate lubrication. When making this check be certain that there is no interference between the control linkage and the web on the carburetor.

SUPERCHARGER OIL SEALS (GSO & IGSO Series Only). Failure of the supercharger oil seal permits oil to enter the supercharger housing where it becomes mixed with the fuel. The presence of oil reduces the octane rating of the fuel and increases combustion chamber deposits. Erratic or increasing oil consumption and possible discoloration of deposits in the augments tubes are indications of supercharger oil seal failure. After each 50 hours of operation, or at any time any of these conditions are observed, remove the supercharger drain cover, located at the bottom of the supercharger housing, and drain the housing into a small container. The drainage will normally consist of fuel or fuel dye; however, if a visible quantity of oil is also present the supercharger oil seal must be replaced.

TURBOCHARGER. Inspect the turbocharger mounting brackets and attaching parts for tightness and security. Check all connections in the induction and exhaust system for air leaks. Pay particular attention to the flexible hoses used in the induction system. Stiffness of these hoses is indicative of deterioration and sufficient cause for replacement.

Check for dirt or carbon build-up within the turbocharger and uneven deposits on the compressor or turbine wheel. Consult the applicable turbocharger overhaul manual for the detailed service and repair procedure.

FUEL INJECTORS. Check tightness and lock wiring of all nuts and screws, which fasten the injector to the engine. Check all fuel lines and nozzles for tightness and evidence of leakage. A slight fuel stain adjacent to the air bleed nozzles is not a cause for concern. Inspect throttle and mixture control rods and levers for tightness, lock wiring, and correct travel. Remove and clean the injector fuel inlet strainer at the first 25-hour inspection and each 50-hour inspection thereafter. Damaged strainer "O" rings should be replaced.

STICKING VALVES. Sticking between the valve stem and guide can severely restrict the valve's opening and closing movements. Considering that the properly timed sequence of valve opening and closing is essential to efficient and reliable engine operation, it is a serious problem any time those valves stick for any reason. An intermittent hesitation, or a miss, in engine speed, often identifies a sticking valve condition.

There can be various causes of valve sticking. The extensive use of a fuel with a lead content that is higher than recommended can intensify the formation of lead deposits. These lead deposits can interfere with the valve stem's movements. Refer to the latest revision of Service Instruction No. 1070 for further information on which grade of fuel to use with a specific engine model.

Be sure that the engine operates with a clean carburetor air filter. As previously noted on Page 1, when operating in extreme dusty or sandy conditions clean the filters daily or when otherwise indicated in accordance with the aircraft manufacturer's recommendations.

Another cause of valve sticking is contaminants in the lubrication system. For all new, rebuilt, newly overhauled engines, or for engines with newly installed cylinders, change the oil after either 25 hours or at a total of four months maximum, whichever comes first, after the first oil change. For all engines using the full-flow filtration system change the oil at every 50 hours or at a total of four months maximum between oil changes; whichever comes first (except for engine models TIO-540-AF1A and -AF1B which require 25 hour interval changes or at a total of four months maximum between oil changes; whichever comes first). For all engines using pressure screen systems, change the oil and clean the screen at every 25 hours or at a total of four months maximum between oil changes; whichever comes first. Refer the latest revisions of Service Bulletin No. 480 and Service Instruction No. 1425 for additional information.

Refer to the latest revisions of Service Letter No. L197 and Service Instruction No. 1116 for additional information on valve sticking.