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SERVICE INSTRUCTION

DATE: June 18, 2010

Service Instruction No. 1132B
 (Supersedes Service Instruction No. 1132A)
 Engineering Aspects are
 FAA (DER) Approved

SUBJECT: Magneto Drop-off

MODELS AFFECTED: All Lycoming Opposed Series Aircraft Engines with Magnetos.

TIME OF COMPLIANCE: During Pre-Flight Inspection

A basic magneto drop-off check based on engine speed is typically done during the pre-flight inspection to determine the loss of engine speed that occurs when magnetos are switched from BOTH magnetos to one (LEFT or RIGHT) magneto. The maximum drop-off limit is specified in most Lycoming publications as Revolutions Per Minute (RPM) from a stated engine speed.

Although this basic drop-off check, based on just engine speed, is satisfactory under most normal conditions, it does not take into account unusual circumstances of temperature, humidity, and engine wear. In those cases, use the following procedure to measure the magneto drop-off as a ground check based on manifold pressure on Lycoming opposed series aircraft engines equipped with a manifold pressure gage or a constant speed propeller. This procedure will be incorporated in all new editions of Lycoming Operator's Manuals.

- A. Warm up the engine in accordance with the airframe manufacturer's instructions.
- B. Check that both the oil pressure and the oil temperature are within the prescribed limits.
- C. Leave the mixture control in "Full Rich."
- D. *Fixed Wing Aircraft (where applicable)*. Move the propeller control through its complete range to check operation and return to full low pitch position. Full feathering check (twin engine) on the ground is not recommended but the feathering action can be checked by running the engine between 1000-1500 RPM, then momentarily pulling the propeller control into the feathering position. Do not allow the RPM to drop more than 500 RPM.
- E. A proper magneto check is important. Additional factors, other than the ignition system, affect magneto drop-off. They are load-power output, propeller pitch, and mixture strength. The important point is that the engine runs smoothly because magneto drop-off is affected by the variables listed above. Make the magneto check in accordance with the following procedures.

(1) *Fixed Wing Aircraft*.

- (a) *(Controllable pitch propeller)*. With the propeller in minimum pitch angle, set the engine to produce 50-65% power as indicated by the manifold pressure gage unless otherwise specified in the aircraft manufacturer's manual. At these settings, the ignition system and spark plugs must work harder because of the greater pressure within the cylinders. Under these



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conditions, ignition problems can occur. Magneto checks at low power settings will only indicate fuel/air distribution quality.

- (b) (*Fixed pitch propeller*). Aircraft that are equipped with fixed pitch propellers, or not equipped with a manifold pressure gage, may check magneto drop-off with the engine operating at approximately 1800 RPM (2000 RPM maximum).
- (c) Switch from both magnetos to one and note the drop-off; return to BOTH until the engine regains speed and switch to the other magneto and note the drop-off, then return to BOTH. Drop-off must not exceed 175 RPM and must not exceed 50 RPM between magnetos. Smooth operation of the engine but with a drop-off that exceeds the normal specification of 175 RPM is usually a sign of propeller load condition at a rich mixture. Proceed to step E.(1)(d).

NOTE

Lycoming Operator's Manual for O-290-D2 engines specifies 100 RPM maximum magneto drop-off when the engine is properly timed at 18 degrees spark advance. Since 100 RPM drop-off is sometimes difficult to obtain at this critical spark setting, it is recommended that spark plug gaps be maintained at .025 inch for best results. The 175 RPM maximum magneto drop-off is permissible.

- (d) If the RPM drop exceeds 175 RPM, slowly lean the mixture until the RPM peaks. Then retard the throttle to the RPM specified in step E.(1)(a) or E.(1)(b) for the magneto drop-off check and repeat the check. If the drop-off does not exceed 175 RPM, the difference between the drop-off values for both magnetos does not exceed 50 RPM, and the engine is running smoothly, then the ignition system is operating properly. Return the mixture to full rich.

(2) *Helicopter.*

NOTE

Helicopter recommendations herein are general. Use airframe recommendations when available.

Raise the collective pitch stick to obtain 15 inches manifold pressure at 2000 RPM.

Switch from both magnetos to one and note the drop-off; return to BOTH until the engine regains speed and switch to the other magneto and note the drop-off. Drop-off must not exceed 200 RPM. The difference between the drop-off values for both magnetos must not exceed 50 RPM. A smooth drop-off past normal is usually a sign of a too lean or too rich mixture.

- F. For both fixed and rotor wing installations, do not operate on a single magneto for too long a period; a few seconds is usually sufficient to check drop-off and to minimize plug fouling.

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