

SPARK PLUG FOULING

Spark plug fouling in your aircraft engine may be a problem. It is desirable to reduce the problem as much as possible. Textron Lycoming Service Letter L192 provides information that may be very helpful in reducing spark plug fouling. To aid our readers, the entire text of the latest revision to Service Letter L192 is printed here:

"In many cases spark plug fouling resulting from the tetraethyl lead (TEL) in aviation fuels can be reduced or eliminated by proper operating techniques.

"The problem of lead fouling arises when low engine operating temperatures coupled with a rich mixture prevent the complete vaporization of the TEL. Under these conditions, lead deposits can form in the spark plug electrodes, causing misfiring. By establishing and maintaining proper engine operating temperatures, the TEL can be kept properly vaporized and pass out the exhaust system.

"However, the Champion Spark Plug Company has designed a spark plug which will reduce or eliminate the effects of lead fouling. The spark plug REM-37-BY can be used in the following engines: O-235; O-320; IO-320-B, -F, AIO-320; LIO-320-B; IO-320-A, -D, -E; AEIO-320; HIO-360-B; HO-360; O-360-A, -C, -E, -F; IO-360-B, -E, -F; AEIO-360-B, -H; O-360-B, -D; IVO-360; VO-360-A, B.

"For operators experiencing lead fouling, the following operating recommendations are made:

1. By use of the spark plug recommendation charts, be certain the proper plugs are installed. Do not simply replace the same part number of those removed. A previous mechanic may have installed the wrong plugs. Reference latest edition of Service Instruction No. 1042.
2. Rotate top and bottom spark plugs every 25 to 50 hours. Top plugs scavenge better than the bottom ones.
3. Proper adjustment of the idle speed (600 to 650 RPM) fuel mixture, and maintenance of the induction air system, will ensure smooth engine operation and eliminate excessively rich fuel/air mixtures at idle speeds. This will minimize the separation of the non-volatile components of the high leaded aviation fuels greatly retarding the deposition rate.
4. The engine should be operated at engine speeds between 1000 and 1200 RPM after starting and during the initial warm-up period. Avoid prolonged closed throttle idle engine speed operation (when possible). At engine speeds from 1000 to 1200 RPM, the spark plug core temperatures are hot enough to activate the lead scavenging agents contained in the fuel which retards the formation of the lead salt deposits on the spark plugs and exhaust valve stems. Avoid rapid engine speed changes after start-up and use only the power settings required to taxi.

5. After a flooded start, slowly run the engine to high power to burn off harmful lead deposits, then return the engine to normal power.
6. Keep engine operating temperatures in the normal operating range. Too many people think the lower the temperatures the better. Keep cylinder head temperatures in normal operating range by use of normal power and proper leaning. Use oil cooler baffles to keep oil temperature up in winter.
7. Use normal recommended leaning techniques at cruise conditions regardless of altitude and re-lean the mixture with application of alternate air or carburetor heat. If aircraft is used as a trainer, schedule cross country operation whenever possible.
8. Rapid engine cool down from low power altitude changes, low power landing approach and/or engine shut-down too soon after landing or ground runs should be avoided.
9. Prior to engine shut-down the engine speed should be maintained between 1000 and 1200 RPM until the operating temperatures have stabilized. At this time the engine speed should be increased to approximately 1800 RPM for 15 to 20 seconds, then reduced to 1000 to 1200 RPM and shut-down immediately using the mixture control."