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MANDATORY

SERVICE BULLETIN

DATE: November 22, 2010 Service Bulletin No. 398B
(Supersedes Service Bulletin No. 398A)
Engineering Aspects are
FAA (DER) Approved

SUBJECT: Recommended Corrective Action for Use of Incorrect Fuel

MODELS AFFECTED: All Lycoming aircraft engines

TIME OF COMPLIANCE: Preventive and Corrective Action for Engines Operated with Incorrect Fuel

NOTE

Before maintenance, read the entire Service Bulletin to make sure you have a complete understanding of the procedure and requirements to prevent errors from an incomplete review of all the information in this document.

This Service Bulletin gives guidance when a Lycoming engine has been operated with incorrect fuel. Engine malfunction and damage could occur because of the use of incorrect fuels.

Actual damage to the engine from incorrect fuel could be in a range from unnoticeable to severe damage or failure. Primary damage to the engine caused by incorrect fuel occurs in the combustion chambers. Tuliped intake valves and burned pistons from excessive cylinder head and oil temperatures are evidence of primary damage. If detonation has been severe enough, further damage will occur to crank pins, main bearings, counterweights, and valve train components. The extent of damage can vary accordingly as the duration of run, engine power level and the type of fuel used.

Any mixture of unapproved fuels and additive materials that change the octane rating from the specifications in the latest revision of Service Instruction No. 1070 could be harmful to the engine. For example, a blend of turbine fuel and piston gasoline can be a devastating mixture in a very short time. Refer to the latest revision of Service Instruction No. 1070 for a list of approved fuels, octane ratings, and the use of a higher grade fuel for Lycoming engines.

Because of the many variables, it is impossible to be sure of the airworthiness of an engine that has been operated with incorrect fuel - except by detailed inspection of the engine by qualified personnel. Therefore, after a Lycoming engine has been operated with incorrect fuel, regardless of the power setting or time of operation, Lycoming recommends:

1. Do not continue flight and engine operation with the incorrect fuel.
2. Drain the aircraft fuel system until all fuel tanks are empty in accordance with the aircraft manufacturer's instructions.
3. If the aircraft manufacturer has a procedure for cleaning and/or purging the aircraft fuel system after the use of incorrect fuel, follow the aircraft manufacturer's procedure. If there is no aircraft cleaning



ISSUED			REVISED			PAGE NO.	REVISION
MO	DAY	YEAR	MO	DAY	YEAR	1 of 2	B
04	30	76	11	22	10		

and/or purging procedure, do service on the aircraft fuel tanks in accordance with the aircraft manufacturer's instructions.

4. Remove the engine in accordance with the applicable Lycoming Maintenance Manual.
5. At this point, the operator can either:
 - A. Send the engine to Lycoming for customized evaluation and advisory on whether an engine repair or overhaul is necessary
or
 - B. Do the following in the field:
 - (1) Disassemble and clean the engine in accordance with the applicable Lycoming Engine Overhaul Manual.
 - (2) Do an inspection of the engine in accordance with the applicable Lycoming Engine Overhaul Manual
 - (3) During inspection of engine components, carefully look for signs of detonation such as tuliped intake valves, burnt pistons, and damage to: crankpins, main bearings, counterweights and drive train components, and other conditions that can cause engine failure.
 - (4) Do an engine repair or overhaul, if necessary, in accordance with the applicable Engine Overhaul Manual.
 - (5) Refer to the latest revision of Service Bulletin No. 240 which identifies certain parts that must be replaced on engine reassembly.
 - (6) Assemble the engine and do an operational test in accordance with the applicable Lycoming Engine Overhaul Manual.

To prevent refueling with incorrect fuel, Lycoming recommends the following steps:

1. Know the specified fuel grades for your engine and their color code. Refer to the latest revision of Service Instruction No. 1070.
2. Do not accept any fuel that has a lower octane rating than the fuel specified for your engine in the latest revision of Service Instruction No. 1070.

ISSUED			REVISED			PAGE NO.	REVISION	S.B. 398
MO	DAY	YEAR	MO	DAY	YEAR			
04	30	76	11	22	10	2 of 2	B	