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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-0218; Directorate Identifier 92-ANE-56-AD; Amendment 39-15602; AD 2008-14-07]

RIN 2120-AA64

Airworthiness Directives; Lycoming Engines, Fuel Injected Reciprocating Engines

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is superseding an existing airworthiness directive (AD) for certain fuel injected reciprocating engines manufactured by Lycoming Engines. That AD currently requires inspection, and replacement if necessary, of externally mounted fuel injector fuel lines. This AD requires the same actions but adds additional engine models and clarifies certain compliance time wording. This AD also exempts engines that have a Maintenance and Overhaul Manual with an Airworthiness Limitations Section that requires inspection and replacement, if necessary, of externally mounted fuel injector lines. This AD results from Lycoming Engines revising their Mandatory Service Bulletin to add new engine models requiring inspection, and from the need to clarify a repetitive inspection compliance time. We are issuing this AD to prevent failure of the fuel injector fuel lines that would allow fuel to spray into the engine compartment, resulting in an engine fire.

DATES: This AD becomes effective August 14, 2008. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of August 14, 2008.

ADDRESSES: You can get the service information identified in this AD from Lycoming Engines, 652 Oliver Street, Williamsport, PA 17701, or go to <http://www.lycoming.textron.com>.

The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

FOR FURTHER INFORMATION CONTACT: Norm Perenson, Aerospace Engineer, New York Aircraft Certification Office, FAA, Engine & Propeller Directorate, 1600 Stewart Avenue, Suite 410,

Westbury, NY 11590; e-mail: Norman.perenson@faa.gov; telephone (516) 228-7337; fax (516) 794-5531.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 by superseding AD 2002-26-01, Amendment 39-12986 (67 FR 78965, December 27, 2002), with a proposed AD. The proposed AD applies to certain fuel injected reciprocating engines manufactured by Lycoming Engines. We published the proposed AD in the Federal Register on January 2, 2008 (73 FR 87). That action proposed to:

- Require the same actions as AD 2002-26-01; and
- Add additional engine models, clarify certain compliance time wording; and
- Exempt engines that have a Maintenance and Overhaul Manual with an Airworthiness Limitations Section that requires inspection and replacement, if necessary, of externally mounted fuel injector lines.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Operations office (telephone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

Comments

We provided the public the opportunity to participate in the development of this AD. We have considered the comments received.

One commenter, a private citizen, states that in the proposed AD, we wish to exempt engines that have a maintenance manual that deals with this subject. He asks how the mechanic is to know if an engine has a maintenance manual, if the mechanic does not have access to that manual, unless we list the specific engines that are not applicable to the proposed AD. He states that we should either make the AD applicable to fuel injected Lycoming Engines and then list the applicable and nonapplicable engines, or do not change the AD.

We do not agree. If the engine has an "I" in the prefix of the engine model and the engine has external fuel lines, the fuel lines require inspection. For engines that have a Maintenance Manual, the required inspection will be described in the Airworthiness Limitations Section (ALS) in the engine's Maintenance Manual. For engines that do not have a Maintenance Manual, the required inspection will be described in this AD and Lycoming Mandatory Service Bulletin No. 342E. The mechanic is required to have the Instructions for Continued Airworthiness when performing maintenance (refer to 14 CFR 43.13). Having the manual or access to the manual, of an airplane or engine undergoing maintenance is just as important as having the proper tools to perform the maintenance on an aircraft or engine. We added language in paragraph (e) to clarify that engine models with an ALS are not included in Table 1 and therefore are exempted from compliance with this AD.

One commenter, a private citizen, states that the proposed AD should be expanded to include any other certified engines utilizing the same fuel injection setup and parts as the Lycoming engines. One example is the Jacobs R-755 engine that can be converted to a fuel injection system via Supplemental Type Certificate held by Radial Engines, LTD. This installation uses a modified IO-720 fuel injection system, including the same fuel injection lines that are the subject of the AD.

We do not agree. The unsafe condition for this AD is the lack of proper maintenance of the fuel injector lines and support clamps. The unsafe condition is not a problem with the design or manufacture of fuel injector lines. Some of the clamps are difficult to install on the fuel injector lines and then to the engine, resulting in support clamps being omitted during field overhaul or repair. The

support clamps dampen fuel line vibration due to the impact of cooling air and vibration from the aircraft/engine. When the lines and clamps are accessible and support clamp installation is easier, as in the case of the Jacobs R-755 engine, the clamps are properly installed and there has not been a reported problem. Since there has not been a reported problem with the fuel injector lines on the R-755 engine, or any other engine, there is no reason to include any other engine in the AD. We did not change the AD.

Conclusion

We have carefully reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD as proposed.

Costs of Compliance

We estimate that 17,740 engines installed on aircraft of U.S. registry will be affected by this AD. We also estimate that it will take about 1 work-hour to inspect and replace all lines on a four-cylinder engine, 1.5 work-hours to inspect and replace all lines on a six-cylinder engine, and 2 work-hours to inspect and replace all lines on an eight-cylinder engine. We also estimate that the average labor rate is \$80 per work-hour. Required parts will cost about \$484 for a four-cylinder engine, \$726 for a six-cylinder engine, and \$968 for an eight-cylinder engine. Based on these figures, the total cost per airplane of the AD to U.S. operators is estimated as follows:

- \$564 for a four-cylinder engine.
 - \$846 for a six-cylinder engine.
 - \$1,128 for an eight-cylinder engine.
- We estimate the total cost to U.S. operators to be \$11,062,860.

Special Flight Permits Paragraph Removed

Paragraph (e) of the superseded AD, AD 2002-26-01, contains a paragraph pertaining to special flight permits. Even though this final rule does not contain a similar paragraph, we have made no changes with regard to the use of special flight permits to operate the airplane to a repair facility to do the work required by this AD. In July 2002, we published a new Part 39 that contains a general authority regarding special flight permits and airworthiness directives. See Docket No. FAA-2004-8460, Amendment 39-9474 (69 FR 47998, July 22, 2002). Thus, when we now supersede ADs we will not include a specific paragraph on special flight permits unless we want to limit the use of that general authority granted in section 39.23.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We have determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866;
- (2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

We prepared a summary of the costs to comply with this AD and placed it in the AD Docket. You may get a copy of this summary at the address listed under ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the Federal Aviation Administration amends 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by removing Amendment 39-12986 (67 FR 78965, December 27, 2002), and by adding a new airworthiness directive, Amendment 39-15602, to read as follows:



2008-14-07 Lycoming Engines (formerly Textron Lycoming Division, AVCO Corporation):
Amendment 39-15602. Docket No. FAA-2007-0218; Directorate Identifier 92-ANE-56-AD.

Effective Date

(a) This airworthiness directive (AD) becomes effective August 14, 2008.

Affected ADs

(b) This AD supersedes AD 2002-26-01, Amendment 39-12986.

Applicability

(c) This AD applies to fuel injected reciprocating engines manufactured by Lycoming Engines that incorporate externally mounted fuel injection lines (engines with an "I" in the prefix of the engine model designation) as listed in the following Table 1:

Table 1. Engine Models Affected

Engine	Model
AEIO-320	-D1B, -D2B, -E1B, -E2B
AIO-320	-A1B, -B1B, -C1B
IO-320	-B1A, -B1C, -C1A, -D1A, -D1B, -E1A, -E1B, -E2A, -E2B
LIO-320	-B1A, -C1A
AEIO-360	-A1A, -A1B, -A1B6, -A1D, -A1E, -A1E6, -B1F, -B2F, -B1G6, -B1H, -B4A, -H1A, -H1B
AIO-360	-A1A, -A1B, -B1B
HIO-360	-A1A, -A1B, -B1A, -C1A, -C1B, -D1A, -E1AD, -E1BD, -F1AD, -G1A
IO-360	-A1A, -A1B, -A1B6, -A1B6D, -A1C, -A1D, -A1D6, -A2A, -A2B, -A3B6, -A3B6D, -B1B, -B1D, -B1E, -B1F, -B1G6, -B2F, -B2F6, -B4A, -C1A, -C1B, -C1C, -C1C6, -C1D6, -C1E6, -C1F, -C1G6, -C2G6, -F1A, -J1A6D, -M1B, -L2A, -M1A
IVO-360	-A1A
LIO-360	-C1E6
TIO-360	-A1B, -C1A6D
IGO-480	-A1B6
AEIO-540	-D4A5, -D4B5, -D4D5, -L1B5, -L1B5D, -L1D5
IGO-540	-B1A, -B1C

IO-540	-A1A5, -AA1A5, -AA1B5, -AB1A5, -AC1A5, -AE1A5, -B1A5, -B1C5, -C1B5, -C4B5, -C4D5D, -D4A5, -E1A5, -E1B5, -G1A5, -G1B5, -G1C5, -G1D5, -G1E5, -G1F5, -J4A5, -V4A5D, -K1A5, -K1A5D, -K1B5, -K1C5, -K1D5, -K1E5, -K1E5D, -K1F5, K1H5, -K1J5, -K1F5D, -K1G5, -K1G5D, -K1H5, -K1J5D, -K1K5, -K1E5, -K1E5D, -K1F5, -K1J5, -L1C5, -M1A5, -M1B5D, -M1C5, -N1A5, -P1A5, -R1A5, -S1A5, -T4A5D, -T4B5, -T4B5D, -T4C5D, -V4A5, -V4A5D, -W1A5, -W1A5D, -W3A5D
IVO-540	-A1A
LTIO-540	-F2BD, -J2B, -J2BD, -N2BD, -R2AD, -U2A, -V2AD, -W2A
TIO-540	-A1A, -A1B, -A2A, -A2B, -A2C, AE1A5, -AE2A, -AH1A, -AA1AD, -AF1A, -AF1B, -AG1A, -AB1AD, -AB1BD, -AH1A, -AJ1A, -AK1A, -C1A, -E1A, -G1A, -F2BD, -J2B, -J2BD, -N2BD, -R2AD, -S1AD, -U2A, -V2AD, -W2A
TIVO-540	-A2A
IO-720	-A1A, -A1B, -D1B, -D1BD, -D1C, -D1CD, -B1B, -B1BD, -C1B

Engine models in Table 1 are installed on, but not limited to, Piper PA-24 Comanche, PA-30 and PA-39 Twin Comanche, PA-28 Arrow, and PA-23 Aztec; Beech 23 Musketeer; Mooney 20, and Cessna 177 Cardinal airplanes.

(d) This AD is not applicable to engines having internally mounted fuel injection lines, which are not accessible.

(e) This AD is not applicable to engines that have a Maintenance and Overhaul Manual with an Airworthiness Limitations Section that requires inspection of externally mounted fuel injector lines. Those engines models are not included in Table 1 of this AD.

Unsafe Condition

(f) This AD results from Lycoming Engines revising their Mandatory Service Bulletin (MSB) to add new engine models requiring inspection, and from the need to clarify a repetitive inspection compliance time. We are issuing this AD to prevent failure of the fuel injector fuel lines that would allow fuel to spray into the engine compartment, resulting in an engine fire.

Compliance

(g) You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

Engines That Have Had Initial Inspections

(h) For engines that have had initial inspections in accordance with Textron Lycoming MSB No. 342, dated March 24, 1972; Textron Lycoming MSB No. 342A, dated May 26, 1992; Textron Lycoming MSB No. 342B, dated October 22, 1993; Supplement No. 1 to MSB No. 342B, dated April 27, 1999; Textron Lycoming MSB No. 342C, dated April 28, 2000; Textron Lycoming MSB No. 342D, dated July 10, 2001; and Lycoming Engines MSB No. 342E, dated May 18, 2004, inspect in accordance with paragraph (j) of this AD.

Engines That Have Not Had Initial Inspections

(i) For engines that have not had initial inspections previously done in accordance with Textron Lycoming MSB No. 342, dated March 24, 1972; Textron Lycoming MSB No. 342A, dated May 26, 1992; Textron Lycoming MSB No. 342B, dated October 22, 1993; Supplement No. 1 to MSB No. 342B, dated April 27, 1999; Textron Lycoming MSB No. 342C, dated April 28, 2000; Textron Lycoming MSB No. 342D, dated July 10, 2001; or Lycoming Engines MSD No. 342E, dated May 18, 2004, inspect as follows:

(1) For engines that have not yet had any fuel line maintenance done, or have not had any fuel line maintenance done since new or since the last overhaul, inspect in accordance with paragraph (k) of this AD within 50 hours time-in-service (TIS) after the effective date of this AD.

(2) For all other engines, inspect in accordance with paragraph (k) of this AD within 10 hours TIS after the effective date of this AD.

Repetitive Inspections

(j) Thereafter, inspect at intervals of 100 hours TIS (not to exceed 110 hours), at each engine overhaul, and after any maintenance has been done on the engine where any clamp (or clamps) on a fuel injector line (or lines) has been disconnected, moved, or loosened, in accordance with paragraph (k) of this AD.

Inspection Criteria

(k) Inspect the fuel injector fuel lines and clamps between the fuel manifold and the fuel injector nozzles, and replace as necessary any fuel injector fuel line and clamp that does not meet all conditions specified in Lycoming Engines MSB No. 342E, dated May 18, 2004.

Alternative Methods of Compliance

(l) The Manager, New York Aircraft Certification Office, FAA, has the authority to approve alternative methods of compliance for this AD if requested using the procedures found in 14 CFR 39.19.

Related Information

(m) FAA Special Airworthiness Information Bulletin No. NE-07-49, dated September 20, 2007, is not mandatory, but has additional information on this subject.

(n) Contact Norm Perenson, Aerospace Engineer, New York Aircraft Certification Office, FAA, Engine & Propeller Directorate, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; e-mail: Norman.perenson@faa.gov; telephone (516) 228-7337; fax (516) 794-5531, for more information about this AD.

Material Incorporated by Reference

(o) You must use Lycoming Engines Mandatory Service Bulletin No. 342E, dated May 18, 2004, to perform the actions required by this AD. The Director of the Federal Register approved the incorporation by reference of this service bulletin in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Contact Lycoming Engines, 652 Oliver Street, Williamsport, PA 17701, or go to <http://www.lycoming.textron.com> for a copy of this service information. You may review copies at the FAA, New England Region, 12 New England Executive Park, Burlington, MA; or at the National

Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on June 24, 2008.

Peter A. White,

Assistant Manager, Engine and Propeller Directorate, Aircraft Certification Service.

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