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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 39-18269; AD 2015-19-07]**

**RIN 2120-AA64**

### **Airworthiness Directives; Lycoming Engines Fuel Injected Reciprocating Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** We are superseding airworthiness directive (AD) 2011-26-04 for certain fuel injected reciprocating engines manufactured by Lycoming Engines. AD 2011-26-04 required inspection, replacement if necessary, and proper clamping of externally mounted fuel injector fuel lines. This new AD retains the requirements of AD 2011-26-04, and expands the list of affected engine models. This AD was prompted by revised service information that added engine models to the applicability. We are issuing this AD to prevent failure of the fuel injector fuel lines, which could lead to uncontrolled engine fire, engine damage, and damage to the airplane.

**DATES:** This AD is effective November 3, 2015.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of November 3, 2015.

**ADDRESSES:** For service information identified in this AD, contact Lycoming Engines, 652 Oliver Street, Williamsport, PA 17701; phone: 800-258-3279; fax: 570-327-7101; Internet: [www.lycoming.com/Lycoming/SUPPORT/TechnicalPublications/ServiceBulletins.aspx](http://www.lycoming.com/Lycoming/SUPPORT/TechnicalPublications/ServiceBulletins.aspx). You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call (781) 238-7125. It is also available on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2007-0218.

### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2007-0218; or in person at the Docket Management Facility 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 address for the Docket Office (phone: 800-647-5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

**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; phone: 516-228-7337; fax: 516-794-5531; email: norman.perenson@faa.gov.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2011-26-04, Amendment 39-16894 (76 FR 79051, December 21, 2011), ("AD 2011-26-04"). AD 2011-26-04 applied to certain fuel injected reciprocating engines manufactured by Lycoming Engines. The NPRM published in the Federal Register on November 25, 2013 (78 FR 70240). The NPRM was prompted by revised service information that added engine models to the applicability. The NPRM proposed to expand the scope by adding the IO-540-C1C5 and IO-540-D4B5 engine models and requiring inspection, replacement if necessary, and proper clamping of externally mounted fuel injector fuel lines. We are issuing this AD to prevent failure of the fuel injector fuel lines, which could lead to uncontrolled engine fire, engine damage, and damage to the airplane.

### **Related Service Information Under 1 CFR Part 51**

We reviewed Lycoming Engines Mandatory Service Bulletin (MSB) No. 342G, dated July 16, 2013; Supplement No. 1 to MSB No. 342G, dated August 29, 2013; and Supplement No. 2 to MSB No. 342G, dated January 23, 2014. The service information describes procedures for fuel line and support clamp inspection and installation. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section of this AD.

### **Comments**

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the proposal and the FAA's response to each comment.

### **Request To Add an Engine Model**

Aerotech Publications and an individual commenter requested that the Lycoming LIO-360-M1A be added to the AD. The justification given was that the type certificate data sheet, 1E10, shows the LIO-360-M1A to be identical to the IO-360-M1A except with counter rotation. Additionally, unless specific engine models are listed in the AD, exempting those engines with maintenance manuals would prevent the maintenance technician from knowing which engines are exempt.

We disagree. The engine certification basis determines if an engine model's mandatory maintenance will be managed by a dedicated engine maintenance manual (EMM) with an airworthiness limitations section (ALS) or by manufacturer's service bulletins (SBs). Engines certified to 14 CFR 33, as was LIO-360-M1A, have a dedicated EMM with an ALS that includes the fuel tube inspection in Section 05-00-00. We did not change this AD.

## **Request To Add Service Information**

Lycoming Engines requested that Lycoming SB 342G, Supplement No. 2, dated January 23, 2014 be added to this AD. Lycoming said that SB 342G, Supplement No. 2 removes the eight inch spacing dimension between clamps and corrects Diagram No. 30 for the IO-540-M1C5 engine model.

We agree. We changed this AD to include Lycoming SB 342G, Supplement No. 2.

## **Request To Allow Previously Approved Alternative Methods of Compliance (AMOCs)**

Central Airlines requested that AMOCs previously approved in AD 2008-14-07 and AD 2011-26-04 be allowed for use in this AD.

We agree. We changed the AMOC paragraph in this AD by adding: "AMOCs previously approved for AD 2008-14-07, Amendment 39-15602 (73 FR 39574, July 10, 2008) ("AD 2008-14-07") and AD 2011-26-04, Amendment 39-16894 (76 FR 79051, December 21, 2011) ("AD 2011-26-04") are approved as AMOCs to the corresponding requirements in paragraph (e) of this AD."

## **Request To Change Applicability**

An anonymous commenter requested that Continental and Jacobs R-755 engines, be added to the applicability of this AD. There was no justification provided for the request to add Continental engine(s). The commenter said that the Jacobs R-755 engine uses the same fuel units and Lycoming fuel injector tubes.

We disagree. We have received no data to indicate that any other engines, including Continental engines, have the same problem as the Lycoming engines. We also do not agree with adding the Jacobs R-755 engine to the applicability because the unsafe condition for this AD concerns missing or improperly clamped fuel injector fuel lines. We have received no reports of problems with fuel injector fuel lines for the R-755; therefore, the R-755 engine does not need to be included in this AD. We did not change this AD.

## **Correction to Applicability**

Since we issued the NPRM (78 FR 70240, November 25, 2013) ("the NPRM"), we determined that a discussion of a change to the engine model applicability was omitted from the NPRM. Engine model LIO-360-M1A was removed from the Applicability paragraph in this AD because the fuel tube inspections are documented in the ALS for this engine model.

We also determined that the NPRM incorrectly stated that the proposed AD action would add three engine models to the applicability list of the affected engines. The NPRM added two engine models, the IO-540-C1C5 and IO-540-D4B5, to applicability list of affected engines.

## **Correction to the Costs of Compliance**

Since we issued the NPRM, we determined that the Costs of Compliance paragraph was incorrect. We changed the Costs of Compliance paragraph in this AD to correct that error.

## **Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously. We have determined that these changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

### **Costs of Compliance**

We estimate that this AD will affect about 37,270 engines installed on airplanes of U.S. registry. We also estimate that it will require 1 hour to inspect 19,081 four cylinder engines, 1.5 hours to inspect 18,000 six cylinder engines, and 2 hours to inspect 189 eight cylinder engines. The average labor rate is \$85 per hour. Based on these figures, we estimate the cost of this AD on U.S. operators to be \$3,949,015.

### **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**

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),
- (3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and
- (4) 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.

### **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 FAA 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:

a. Removing airworthiness directive (AD) 2011-26-04 (76 FR 79051, December 21, 2011) ("AD 2011-26-04"); and

b. Adding the following new AD:



**2015-19-07 Lycoming Engines (Type Certificate previously held by Textron Lycoming Division, AVCO Corporation) Fuel Injected Reciprocating Engines:** Amendment 39-18269; Docket No. FAA-2007-0218; Directorate Identifier 92-ANE-56-AD.

**(a) Effective Date**

This AD is effective November 3, 2015.

**(b) Affected ADs**

This AD supersedes AD 2011-26-04, Amendment 39-16894 (76 FR 79051, December 21, 2011).

**(c) Applicability**

This AD applies to Lycoming Engines fuel injected reciprocating engine models identified in Table 1 to paragraph (c) of this AD, with externally mounted fuel injector fuel lines (stainless steel tube assembly), installed.

**Table 1 to Paragraph (c)–Engine Models Affected**

<b>Engine</b>	<b>Model</b>
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, -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, -C1C5, -C4B5, -C4D5D, -D4A5, -D4B5, -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, -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 IO-540-AG1A5, LIO-360-M1A, IO-390-A Series, AEIO-390-A Series, IO-540-AF1A5, IO-580-B1A, and AEIO-580-B1A, are not listed in Table 1. These engine models are accounted for in the Maintenance and Overhaul Manual with an Airworthiness Limitations Section. As Lycoming has more engine models certified they will add them to this list of engines with a Maintenance and Overhaul Manual. To determine if your engine has a Maintenance and Overhaul Manual you can either contact Lycoming, or you can refer to Lycoming's list of maintenance publications for engines that have a Maintenance and Overhaul Manual.

**(d) Unsafe Condition**

This AD was prompted by revised service information that added engine models to the applicability. This service information adds engine models requiring inspection and technical updates. We are issuing this AD to prevent failure of the fuel injector fuel lines, which could lead to uncontrolled engine fire, engine damage, and damage to the airplane.

**(e) Compliance**

Comply with this AD within the compliance times specified, unless already done.

(1) Initial Inspections

(i) Within 10 hours time-in-service (TIS) after the effective date of this AD, inspect the fuel injector fuel lines and clamps between the fuel manifold and the fuel injector nozzles. Use Lycoming Engines Mandatory Service Bulletin (MSB) No. 342G, dated July 16, 2013; Supplement No. 1 to MSB No. 342G, dated August 29, 2013; and Supplement No. 2 to MSB No. 342G, dated January 23, 2014 to perform the inspection. Replace any fuel injector fuel line or clamp that fails the inspection required by the Fuel Line Inspection and Installation Checklist in MSB No. 342G.

(ii) Thereafter, re-inspect after any maintenance is done on the engine where any clamp on a fuel injector fuel line was disconnected, moved, or loosened, and within every 110 hours TIS and after each engine overhaul. Use Lycoming Engines MSB No. 342G, dated July 16, 2013; Supplement No. 1 to MSB No. 342G, dated August 29, 2013; and Supplement No. 2 to MSB No. 342G, dated January 23, 2014 to perform the inspection and the Fuel Line Inspection and Installation Checklist in MSB No. 342G to perform the re-inspection.

## **(f) Credit for Previous Actions**

If you inspected your fuel injector fuel lines and clamps using Lycoming Engines MSB No. 342F, dated June 4, 2010, or earlier versions, you met the initial inspection requirements of this AD. However, you must still comply with the repetitive inspection requirements of paragraph (e)(1)(ii) of this AD.

## **(g) Alternative Methods of Compliance (AMOCs)**

The Manager, New York Aircraft Certification Office, FAA, may approve AMOCs to this AD. Use the procedures found in 14 CFR 39.19 to make your request. AMOCs previously approved for AD 2008-14-07, Amendment 39-15602 (73 FR 39574, July 10, 2008) ("AD 2008-14-07") and AD 2011-26-04, Amendment 39-16894 (76 FR 79051, December 21, 2011) ("AD 2011-26-04") are approved as AMOCs to the corresponding requirements in paragraph (e) of this AD.

## **(h) Related Information**

(1) For more information about this AD, contact Norm Perenson, Aerospace Engineer, New York Aircraft Certification Office, FAA, Engine & Propeller Directorate, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; phone: 516-228-7337; fax: 516-794-5531; email: norman.perenson@faa.gov.

(2) FAA Special Airworthiness Information Bulletin NE-07-49R1 contains additional information on this subject.

## **(i) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to the actions required by this AD, unless the AD specifies otherwise.

(i) Lycoming Engines Mandatory Service Bulletin (MSB) No. 342G, dated July 16, 2013.

(ii) Lycoming Engines MSB No. 342G, Supplement No. 1, dated August 29, 2013.

(iii) Lycoming Engines MSB No. 342G, Supplement No. 2, dated January 23, 2014.

(3) For Lycoming Engines service information identified in this AD, contact Lycoming Engines, 652 Oliver Street, Williamsport, PA 17701; phone: 800-258-3279; fax: 570-327-7101; Internet: <http://www.lycoming.com/Lycoming/SUPPORT/TechnicalPublications/ServiceBulletins.aspx>.

(4) You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

(5) You may view this service information 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 September 11, 2015.

Thomas A. Boudreau,  
Acting Directorate Manager, Engine & Propeller Directorate,  
Aircraft Certification Service.