

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

14 CFR Part 39 [61 FR 627 No. 6; 01/09/96]

[Docket No. 95-ANE-67; Amendment 39-9460; AD 95-26-02]

Textron Lycoming

[AD 95-26-02](#)

Amendment 39-9460

Effective Jan. 24, 1996

[Supersedes AD 94-14-13](#)

[L](#)

ATA Code: 73

Recurring: No

### Airworthiness Directives; Textron Lycoming Reciprocating Engines

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final rule; request for comments.

**SUMMARY:** This amendment adopts a new airworthiness directive (AD) that is applicable to certain Textron Lycoming reciprocating engines installed on certain aircraft identified by registration numbers. **This action supersedes priority letter AD 94-14-13** that currently requires engines certified to operate on 91 octane or higher aviation gasoline (avgas) to undergo a teardown and analytical inspection for detonation damage, and engines certified to operate on 80 octane avgas to undergo inspection for evidence of possible internal engine damage. This action revises incorrect engine model numbers and aircraft registration numbers listed in the priority letter AD. This amendment is prompted by the Federal Aviation Administration (FAA) receiving more accurate information concerning which aircraft were fueled with the contaminated mixture at the affected airports. The actions specified by this AD are intended to prevent detonation due to low octane, which can result in severe engine damage and subsequent failure.

**DATES:** Effective January 24, 1996.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of January 24, 1996.

Comments for inclusion in the Rules Docket must be received on or before March 11, 1996.

**ADDRESSES:** Submit comments in triplicate to the Federal Aviation Administration (FAA), New England Region, Office of the Assistant Chief Counsel, Attention: Rules Docket No. 95-ANE-67,

12 New England Executive Park, Burlington, MA 01803-5299.

The service information referenced in this AD may be obtained from Textron Lycoming, Reciprocating Engine Division, 652 Oliver St., Williamsport, PA 17701; telephone (717) 327-7278, fax (717) 327-7022. This information may be examined at the FAA, New England Region, Office of the Assistant Chief Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite

700, Washington, DC.

**FOR FURTHER INFORMATION CONTACT:** Locke Easton, Aerospace Engineer, Engine and Propeller Standards Staff, FAA, Engine and Propeller Directorate, 12 New England Executive Park; telephone (617) 238-7113, fax (617) 238-7199.

**SUPPLEMENTARY INFORMATION:** On June 23, 1994, the Federal Aviation Administration (FAA) issued priority letter airworthiness directive (AD) 94-14-13, applicable to Textron Lycoming (formerly Avco Lycoming) O-235-12C, O-235-L, O-320-A, O-320-B2C, O-320-E, O-320-E2A, O-320-E2D, O-320-E20, O-320-D2J, O-320-D3G, O-320-H2AD, IO-320-B, IO-320-B, IO-320-C, LO-320-A4K, LO-320-D1D, O-360-A, O-360-A4M, O-360-F, IO-360-A, IO-360-BIB, IO-360-C, LO-360-A1A, LO-360-A1D, LIO-360-A1A, LIO-360-A3B6D, TIO-360-C, TVO-435-AIA, O-540-E, O-540-C, O-540-J, IO-540-C, IO-540-D, IO-540 E 290, IO-540-K, TIO-540-F, TIO-540-J, TIO-540-S, 165D-540-B 380, and R-680 series reciprocating engines, installed on the following U.S. registered aircraft: N1010F, N106RE, N1068M, N110MP, N1285X, N1317P, N1344V, N14006, N15851, N1666C, N177DT, N1920F, N1928Q, N20HT, N20NC, N20ND, N207X, N2040Q, N2128W, N2165M, N2185K, N2232Z, N22874, N2300R, N2346G, N2394Q, N24395, N24627, N24860, N250M, N2555V, N25562, N2578L, N2603Y, N26602, N28FG, N2811R, N2815F, N2817Q, N2819A, N2848Q, N28683, N2927M, N2964K, N3060M, N32388, N33696, N34242, N36358, N3737U, N37500, N3945K, N40ES, N40VF, N400JM, N4222J, N4293Y, N4316T, N4320F, N4497U, N4515P, N4602S, N4674S, N4687P, N47SG, N4796V, N47964, N48ES, N494FL, N5199U, N52015, N5217L, N5254K, N5344K, N5418W, N54228, N54661, N5547Q, N55521, N56GS, N56884, N59850, N6005Z, N6045M, N61569, N6239H, N62801, N6286W, N6297V, N63R, N6370P, N6412D, N64120, N6480D, N6483Q, N6493Q, N65425, N671A, N67615, N67975, N68SC, N68937, N6905V, N7ZX, N70416, N71RJ, N711PG, N714ZU, N7157V, N7195G, N7213P, N7230F, N7230Q, N7248H, N73064, N733WH, N734TA, N7361R, N737CM, N737NV, N738GX, N738KC, N738KF, N738KK, N738RC, N738ZL, N739RF, N75381, N755GA, N756RV, N757SK, N757SX, N757TU, N7724M, N777EE, N78887, N78901, N7894V, N792BW, N804EH, N8070P, N8094Q, N81RP, N81203, N8144G, N8149E, N8184X, N8201B, N82182, N8223W, N8264W, N8286W, N8306D, N8372L, N8494E, N8537J, N8579H, N8691Y, N8810P, N8961P, N9114H, N9140J, N9157S, N9296P, N9407K, N9444R, N9451B, N95WT, N9574L, N96TB, N96134, N9666V, N9673L, N9728U, N9783L, N9808J and N9864C.

That action requires teardown and analytical inspection for engines certified to operate on 91 or higher octane aviation gasoline (avgas), and differential compression test and examination of the oil filter for engines certified to operate on 80 octane avgas. That action was prompted by reports of reports of aviation gasoline (avgas) being contaminated by Jet A fuel. After investigation, the source of the contamination has been determined to be the refiner of the avgas. Through its distribution system, the refiner inadvertently caused Jet A fuel to be loaded into distribution tanks intended for avgas. Contaminated avgas from these distribution tanks was then shipped to local fuel distributors. The FAA has determined that aircraft with certain

Textron Lycoming engines installed were fueled with this contaminated mixture between May 22 and June 2, 1994, at Sacramento Executive (SAC) airport, or between May 18 and June 2, 1994, at Sacramento Metro (SMF) airport. The list of U.S. registered aircraft specified in the applicability paragraph of this AD is based on investigation of fueling records secured from the two affected airports, which the FAA has determined to represent the population of affected engines. That condition, if not corrected, could result in detonation due to low octane, which can result in severe engine damage and subsequent failure.

This AD requires engines certified to operate on 91 octane or higher avgas to undergo a teardown and analytical inspection for detonation damage, and engines certified to operate on 80 octane avgas to undergo inspection for evidence of possible internal engine damage. Engineering analysis of operating these engines with avgas contaminated with Jet A fuel indicates that actual damage to the engine may range from unnoticeable to very severe, according to the duration of run, engine power level, and level of contamination. Damage may be characterized by increased operating temperatures resulting in damaged intake valves and burned pistons, and excessive loads imposed by detonation. Since internal damage may not be assessed by any other method, engines certified to operate on 91 octane or higher avgas must undergo a teardown and analytical inspection and any parts showing signs of detonation damage must be replaced. Investigation revealed the lowest octane level of the contaminated fuel to be 83 octane, therefore engines certified to operate on 80 octane avgas need not undergo a teardown and analytical inspection unless evidence of internal engine damage is present by the required differential compression test and examination of the oil filter for metal particles. The refiner has advised the FAA that it may pay for any reasonable expense associated with the inspection and/or disassembly in accordance with the mechanic's and manufacturer's recommendations.

Since the issuance of that priority letter AD, the FAA has received more accurate information concerning which aircraft were fueled with the contaminated mixture at the affected airports. This AD therefore corrects certain engine model numbers and aircraft registration numbers for aircraft that were fueled with the contaminated mixture.

The FAA has reviewed and approved the technical contents of: **Avco Lycoming Service Bulletin (SB) No. 398**, dated April 30, 1976, that specifies that reciprocating engines operated with lower octane than that approved for the engine or contaminated with Jet A fuel should undergo a teardown and analytical inspection as the engine could sustain damage that cannot be assessed by any other method; and **Avco Lycoming Service Instruction (SI) No. 1191**, dated March 31, 1972, that describes procedures for differential compression tests.

Since an unsafe condition has been identified that is likely to exist or develop on other engines of this same type design, **this AD supersedes priority letter AD 94-14-13** to revise incorrect engine model numbers and aircraft registration numbers listed in the priority letter AD. The actions are required to be accomplished in accordance with the service documents described previously.

Since a situation exists that requires the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

## Comments Invited

Although this action is in the form of a final rule that involves requirements affecting flight safety and, thus, was not preceded by notice and an opportunity for public comment, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified under the caption ADDRESSES. All communications received on or before the closing date for comments will be considered, and this rule may be amended in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket Number 95-ANE-67." The postcard will be date stamped and returned to the commenter.

The regulations adopted herein will not have substantial direct effects 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. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

The FAA has determined that this regulation is an emergency regulation that must be issued immediately to correct an unsafe condition in aircraft, and is not a "significant regulatory action" under Executive Order 12866. It has been determined further that this action involves an emergency regulation under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). If it is determined that this emergency regulation otherwise would be significant under DOT Regulatory Policies and Procedures, a final regulatory evaluation will be prepared and placed in the Rules Docket. A copy of it, if filed, may be obtained from the Rules Docket at the location provided under the caption ADDRESSES.

### **List of Subjects in 14 CFR Part 39**

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

### **Adoption of the Amendment**

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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), 40101, 40113, 44701.

Sec. 39.13 [Amended]

2. Section 39.13 is amended by adding the following new airworthiness directive:

**95-26-02** **TEXTRON LYCOMING:** Amendment 39-9460. Docket No. 95-ANE-67.  
**Supersedes AD 94-14-13.**

**Applicability:** Textron Lycoming (formerly Avco Lycoming) O-235-12C, O-235-L, O-320-A, O-320-B2C, O-320-E, O-320-E2A, O-320-E2D, O-320-E20, O-320-D2J, O-320-D3G, O-320-H2AD, IO-320-B, IO-320-B, IO-320-C, LO-320-A4K, LO-320-D1D, O-360-A, O-360-A4M, O-360-F, IO-360-A, IO-360-BIB, IO-360-C, LO-360-A1A, LO-360-A1D, LIO-360-A1A, LIO-360-A3B6D, TIO-360-C, TVO-435-AIA, O-540-E, O-540-C, O-540-J, IO-540-C, IO-540-D, IO-540 E 290, IO-540-K, TIO-540-F, TIO-540-J, TIO-540-S, and R-680 series reciprocating engines, installed on the following U.S. registered aircraft: N1004V, N1010F, N106RE, N1068M, N110MP, N1285X, N1317P, N1344V, N14006, N15851, N1666C, N177DT, N1920F, N1928Q, N20HT, N20NC, N20ND, N207X, N2040Q, N2128W, N2165M, N2185K, N2232Z, N22874, N2300R, N2346G, N2394Q, N24395, N24627, N24860, N250M, N2555V, N25562, N2578L, N2603Y, N26602, N28FG, N2811R, N2815F, N2817Q, N2819A, N2848Q, N28683, N2927M, N2964K, N3060M, N32388, N33696, N34242, N36358, N3737U, N37500, N3945K, N40ES, N40VF, N400JM, N4222J, N4293Y, N4316T, N4320F, N4497U, N4515P, N46GS, N4602S, N4674S, N4687P, N47SG, N4796V, N47964, N48ES, N494FL, N5199U, N52015, N5217L, N5254K, N5344K, N5418W, N54228, N54661, N5547Q, N55521, N56884, N59850, N6005Z, N6045M, N61569, N6239H, N62801, N6286W, N6297V, N63R, N6370P, N6412D, N6480D, N6483Q, N6493Q, N65425, N671A, N67615, N67975, N68SC, N68937, N6905V, N7ZX, N70416, N71RJ, N711PG, N714ZU, N7157V, N7195G, N7213P, N7230F, N7230Q, N7248H, N73064, N733WH, N734TA, N7361R, N737CM, N737NV, N738GX, N738KC, N738KF, N738RC, N738ZL, N739RF, N75381, N755GA, N756RV, N757SK, N757SX, N757TU, N7724M, N777EE, N78887, N78901, N7894V, N792BW, N804EH, N8070P, N8094Q, N81RP, N81203, N8144G, N8149E, N8184X, N8201B, N82182, N8223W, N8264W, N8306D, N8372L, N8494E, N8537J, N8579H, N8691Y, N8810P, N8961P, N9140J, N9157S, N9296P, N9407K, N9444R, N9451B, N95WT, N9574L, N96TB, N96134, N9666V, N9673L, N9728U, N9783L, N9808J and N9864C.

**Note:** This airworthiness directive (AD) applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been

modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must use the authority provided in paragraph (c) to request approval from the Federal Aviation Administration (FAA). This approval may address either no action, if the current configuration eliminates the unsafe condition, or different actions necessary to address the unsafe condition described in this AD. Such a request should include an assessment of the effect of the changed configuration on the unsafe condition addressed by this AD. In no case does the presence of any modification, alteration, or repair remove any engine from the applicability of this AD.

**Compliance:** Required as indicated, unless accomplished previously.

To prevent detonation due to low octane, which can result in severe engine damage and subsequent failure, accomplish the following:

- (a) For engines that are certified to operate on only 91 or higher octane aviation gasoline (avgas) within the next 2 hours time in service (TIS) after the effective date of this airworthiness directive (AD) perform an engine teardown and analytical inspection, and replace with serviceable parts as necessary in accordance with **Avco Lycoming Service Bulletin (SB) No. 398**, dated April 30, 1976.
- (b) For engines that are certified to operate on 80 octane avgas, within the next 2 hours TIS after the effective date of this AD conduct a differential compression test on all cylinders in accordance with **Avco Lycoming Service Instruction (SI) No. 1191**, dated March 31, 1972, and examine the oil filter by cutting the oil filter apart and spreading the filter paper out to look for metal particles. If metal particles are present, or if one or more cylinders shows unacceptable compression as specified in **Avco Lycoming SI No. 1191**, dated March 31, 1972, perform an engine teardown and analytical inspection, and replace with serviceable parts as necessary in accordance with **Avco Lycoming SB No. 398**, dated April 30, 1976.
- (c) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine and Propeller Standards Staff. The request should be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Engine and Propeller Standards Staff.

**Note:** Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the Engine and Propeller Standards Staff.

- (d) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the aircraft to a location where the requirements of this AD can be accomplished.

The actions required by this AD shall be done in accordance with the following Avco Lycoming service documents:

Document No.	Page	Revision	Date
<b>SB No. 398</b>	1	<b>Original</b>	April 30, 1976
Total Pages: 1.			
<b>SI No. 1191</b>	1-2	<b>Original</b>	March 31, 1972
Total Pages: 2.			

This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from Textron Lycoming, Reciprocating Engine Division, 652 Oliver St., Williamsport, PA 17701; telephone (717) 327-7278, fax (717) 327-7022. Copies may be inspected at the FAA,

New England Region, Office of the Assistant Chief Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

- (f) **This amendment supersedes priority letter AD 94-14-13, issued June 23, 1994.**
- (g) This amendment becomes effective on January 24, 1996.

Issued in Burlington, Massachusetts, on December 5, 1995.

Jay J. Pardee, Manager, Engine and Propeller Directorate, Aircraft Certification Service.

**FOR FURTHER INFORMATION CONTACT:** Locke Easton, Aerospace Engineer, Engine and Propeller Standards Staff, FAA, Engine and Propeller Directorate, 12 New England Executive Park; telephone (617) 238-7113, fax (617) 238-7199.

**Manufacturer's Service Information:**

[Avco Lycoming Service Bulletin \(SB\) No. 398](#)

[Avco Lycoming Service Instruction \(SI\) No. 1191](#)

Copies of the service information referenced in this AD may be obtained upon request from Textron Lycoming, Reciprocating Engine Division, 652 Oliver St., Williamsport, PA 17701; telephone (717) 327-7278, fax (717) 327-7022.