

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

14 CFR Part 39 [60 FR 15864 No. 59; 03/28/95]

Textron Lycoming

AD 95-07-01

Amendment 39-9183

Effective April 12,  
1995

ATA Code: 85

Recurring: No

[Docket No. 95-ANE-14; Amendment 39-9183; AD 95-07-01]

**Airworthiness Directives; Textron Lycoming O-360, LO-360, HO-360, HIO-360, TIO-360, LIO-360, AEIO-360, O-540, IO-540, TIO-540, LTIO-540, IVO-540, AEIO-540, TIO-541, and IO-720 Series Reciprocating Engines**

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

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

**SUMMARY:** This document publishes in the Federal Register an amendment adopting Airworthiness Directive (AD) 95-07-01 that was sent previously to all known U.S. owners and operators of Textron Lycoming O-360, LO-360, HO-360, HIO-360, TIO-360, LIO-360, AEIO-360, O-540, IO-540, TIO-540, LTIO-540, IVO-540, AEIO-540, TIO-541, and IO-720 series reciprocating engines by individual letters. This AD requires removal prior to further flight of suspect unapproved connecting rod bolts and replacement with serviceable connecting rod bolts. This amendment is prompted by reports of connecting rod bolt failures. The actions specified by this AD are intended to prevent engine failure due to connecting rod bolt failure, which could result in damage to or loss of the aircraft.

**DATES:** Effective April 12, 1995, to all persons except those persons to whom it was made immediately effective by priority letter AD 95-07-01, issued on March 17, 1995, which contained the requirements of this amendment.

Comments for inclusion in the Rules Docket must be received on or before May 30, 1995.

**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-14, 12 New England Executive Park, Burlington, MA 01803-5299.

**FOR FURTHER INFORMATION CONTACT:** Richard D. Karanian, Aerospace Engineer, Special Certification Office, FAA, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, TX 76137-4298; telephone (817) 222-5195, fax (817) 222-5959; or Locke Easton, Aerospace Engineer, Engine and Propeller Standards Staff, FAA, Engine and Propeller

Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (617) 238-7113, fax (617) 238-7199.

**SUPPLEMENTARY INFORMATION:** On March 17, 1995, the Federal Aviation Administration (FAA) issued priority letter airworthiness directive (AD) 95-07-01, applicable to Textron Lycoming O-360, LO-360, HO-360, HIO-360, TIO-360, LIO-360, AEIO-360, O-540, IO-540, TIO-540, LTIO-540, IVO-540, AEIO-540, TIO-541, and IO-720 series reciprocating engines. That priority letter AD was prompted by reports of connecting rod bolt failures. These connecting rod bolts failed with no particular pattern. The head of the bolt sheared off on some, while others failed at the threads and some at the shank. Examination of test specimens indicate that these connecting rod bolts were fabricated by machining bar stock material, including the head region, thus exposing end-grains in the head-to-shank radius. These connecting rod bolts exhibit extremely small fillet radii, numerous deep machining grooves, and inadequate material selection.

In a letter dated December 15, 1994, Superior Air Parts, Inc., advised the FAA that several connecting rod bolts had fractured in service on a Cessna 177RG on December 9, 1994. The pilot completed a power-off landing with no injuries. In a letter dated January 24, 1995, Textron Lycoming advised the FAA that their laboratory analysis indicated that the failed connecting rod bolts appeared to be suspected unapproved parts. A Superior Air Parts, Inc., report of their own laboratory analysis, dated January 3, 1995, was presented to the FAA in mid-February. Another connecting rod bolt failure was identified during maintenance on a Piper PA-60 on February 21, 1995. Superior Air Parts, Inc. advised the FAA of the second failure on the following day. The FAA had already initiated an independent laboratory analysis of a sample of suspect unapproved connecting rod bolts and received a report on February 23, 1995, which concluded that the connecting rod bolts did not meet material or design specifications. That report corroborated Superior Air Parts, Inc.'s and Textron Lycoming's earlier findings. Subsequent investigation revealed that of the 3,382 connecting rod bolts in the original Superior Air Parts, Inc. inventory, 2,473 had been shipped. The FAA considered all possible actions and concluded that the only prudent course of action was to issue priority letter AD 95-07-01.

These connecting rod bolts were shipped from Superior Air Parts, Inc., between February 15, 1994, and December 20, 1994, as replacements for Textron Lycoming connecting rod bolts, Part Number (P/N) 75060, or Superior Air Parts, Inc., connecting rod bolts, P/N SL75060, or Aircraft Technologies, Inc. P/N AL75060. However, the failed parts have no markings to identify them. The traceability of these bolts is extremely difficult, and the FAA has determined that the vast majority of the bolts distributed cannot be recovered, nor can they be identified by a routine records search of engines which have been overhauled since February 15, 1994. The FAA has concluded that all engines which may have been overhauled using these connecting rod bolts must be visually inspected for the installation of unmarked connecting rod bolts. Further, since it is impossible to analytically determine how long these connecting rod bolts as installed may remain intact, this AD must be complied with before further flight. Therefore, all connecting rod bolts with no markings must be considered suspect unapproved parts. This condition, if not corrected, could result in engine failure due to

connecting rod bolt failure, which could result in damage to or loss of the aircraft.

Also, during the investigation the FAA determined that only unmarked 75060 connecting rod bolts shipped from Superior Air Parts, Inc., between February 15, 1994, and December 20, 1994, are considered suspect unapproved parts. Approved serviceable parts can be readily identified by raised letters SPS, S, C, or FC, identifying them as Textron Lycoming parts, or SL75060 etched on the head, identifying them as PMA parts manufactured by Superior Air Parts, Inc., or AL75060 forged into the head, identifying them as PMA parts manufactured by Aircraft Technologies, Inc.

Since the unsafe condition described is likely to exist or develop on other engines of the same type design, the FAA issued priority letter AD 95-07-01 to prevent engine failure due to connecting rod bolt failure, which could result in damage to or loss of the aircraft. The AD requires removal prior to further flight of suspect unapproved connecting rod bolts and replacement with serviceable connecting rod bolts.

Suspect unapproved connecting rod bolts may be identified as those bolts that are not clearly marked on the head by raised letters SPS, S, C, or FC, identifying them as Textron Lycoming parts, or not clearly marked with SL75060 etched on the head, identifying them as PMA parts manufactured by Superior Air Parts, Inc., or not clearly forged into the head with AL75060, identifying them as PMA parts manufactured by Aircraft Technologies, Inc.

Since it was found that immediate corrective action was required, notice and opportunity for prior public comment thereon were impracticable and contrary to the public interest, and good cause existed to make the AD effective immediately by individual letters issued on March 17, 1995, to all known U.S. owners and operators of Textron Lycoming O-360, LO-360, HO-360, HIO-360, TIO-360, LIO-360, AEIO-360, O-540, IO-540, TIO-540, LTIO-540, IVO-540, AEIO-540, TIO-541, and IO-720 series reciprocating engines. These conditions still exist, and the AD is hereby published in the Federal Register as an amendment to Section 39.13 of part 39 of the Federal Aviation Regulations (14 CFR part 39) to make it effective to all persons.

### **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-14.” 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. App. 1354(a), 1421 and 1423; 49 U.S.C. 106(g); and 14 CFR 11.89.

Section 39.13 - [AMENDED]

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

**95-07-01 Textron Lycoming:** Amendment 39-9183. Docket 95-ANE-14.

**Applicability:** The following Textron Lycoming reciprocating engine models, assembled on or after February 15, 1994, and that contain connecting rod bolts shipped directly or indirectly from Superior Air Parts, Inc., on or after February 15, 1994:

O-360-A1A, -A1AD, -A1C, -A1D, -A1F6, -A1F6D, -A1G6, -A1G6D, -A1LD, -A2A, -A2D, -A2E, -A2F, -A2G, -A3A, -A3AD, -A4A, -A4G, -A4J, -A4K, -A4M, -A4N, -A5AD, -B2A, -C1A, -C1C, -C1E, -C1F, -C1G, -C2A, -C2C, -C2D, -C2E, -D2A, -D2B, -F1A6; IO-360-A1A, -A1B, -A1B6, -A1B6D, -A1C, -A1D, -A1D6, -A2A, -A2B, -A3B6D, -B1A, -B1B, -B1D, -B1E, -B1F, -B2F, -B2F6, -B4A, -C1A, -C1B, -C1C6, -C1D6, -C1E6, -C1F, -J1A6D; AIO-360-A1A, -A1B, -B1B; LO-360-A1G6D; HO-360-B1A, -B1B; HIO-360-A1A, -B1A, -C1A, -C1B, -E1AD, -E1BD; LIO-360-C1E6; TIO-360-A1B; AEIO-360-A1E, -B1G6, -H1A; O-540-A1A, -A1A5, -A1B5, -A1C5, -A1D, -A1D5, -A2B, -A3D5, -B1A5, -B1B5, -B2B5, -B2C5, -B4B5, -E4A5, -E4B5, -E4C5, -F1A5, -F1B5, -G1A5, -G2A5, -H1B5D, -H2B5D, -J1A5D, -J3A5D, -J3C5D, -L3C5D; IO-540-A1A5, -B1A5, -B1C5, -C1B5, -C4B5, -C4C5, -C4D5D, -D4A5, -E1A5, -E1B5, -G1A5, -G1B5, -G1C5, -G1D5, -G1E5, -G1F5, -J4A5, -K1A5, -K1A5D, -K1B5, -K1C5, -K1D5, -K1E5, K1K5, -M1A5, -N1A5, -P1A5, -R1A5, -T4C5D, -K1F5, -K1F5D, -K1G5, -K1G5D, -K1J5D, -K1K5, -M1QA5, -M1B5D, -N1A5, -P1A5, -R1A5, -S1A5, -T4A5D, -T4B5D, -T4CTD, -V4A5D, -W1A5D, -W3A5D, -AA1A5; TIO-540-A1A, -A1B, -A2A, -A2B, -A2C, -C1A, -E1A, -G1A, -H1A, -J2B, -F2BD, -J2BD, -N2BD, -R2AD, -S1AD, -AA1AD, -AB1AD; LTIO-540-J2B, -F2BD, -J2BD, -N2BD, -R2AD; IVO-540-A1A; AEIO-540-D4B5; TIO-541-A1A, -E1A4, -E1B4, -E1C4; IO-720-A1A, -A1B, -B1B, -B1BD, -C1B, and -D1B.

These engines are installed on but not limited to the following aircraft: Beech series 95, 23, 76, 60; Piper series PA-24, PA-44, PA-28, PA-34, PA-23, PA-25, PA-32, PA-60, PA-31; Aero Commander (Intermountain, Callair, Aeronautical Agricola Mexicana, Twin Commander Aircraft Corp.) series A-6, A-9, 100, 500; Lake Aircraft Corporation (Consolidated Aero., Inc., REVO) series C-2, LA-4; Mooney Aircraft Corp. series M-20, M-22; Sud Aviation GY-180; Partenavia series P-68; Siai-Marchetti (Agusta S.p.A) series S. 205, S.210, F.260, S.208; Procaer series F 15; SOCATTA series TB10, MS-893, 235, TB20, TB21; Cessna series 172, 177, 177RG, 182, TR182, 182RG; Teal Aircraft Corporation (Bohica) TWC-1; Avions Mudry et Cie CAP 10; Augustair (Montanair, Inc.) 2150; Grumman American (American General Aircraft Holding Co., Inc.) AA-5 series; Fuji Heavy Industries, Ltd. FA-200 series; Bellanca (American Champion Aircraft Corp.) Aircraft 8GCBC, 8KCAB; Maule Aerospace Technology Corp. series MX-7, M5, M-6; Christen A-1, (Pitts) S1T; Schweizer Aircraft Corp.(Hughes, McDonnell Douglas) 269A series; Rockwell (Commander Aircraft Company) series 112, 114; Moravan ZLIN Z 242L; Slingsby Aviation Limited T67M; Enstrom F-28 series; Found Brothers Aviation Ltd. FBA-2C, FBA Centennial "100"; Dornier Luftfahrt GmbH DO-28 series; Spinks Industries, M.H. Spinks, Sr. Rawdon T-1; Pilatus Britten-Norman BN-2 series; Omega Aircraft Corporation BS-12D1; Robinson R-44 series; Aerostar Aircraft Corp. (Piper, Ted Smith); Brantly Helicopters Industries U.S.A. Co., Ltd. 305; Pacific Aerospace Corp., Ltd. FU-24-954 series.

**Note:** This 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 (g) to request approval from the FAA. This approval may address either no action, if the current configuration eliminates the unsafe condition, or different action 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 engine failure due to connecting rod bolt failure, which could result in damage to or loss of the aircraft, accomplish the following:

- (a) Prior to further flight, determine if the engine has been assembled on or after February 15, 1994. This AD does not apply to engines assembled prior to February 15, 1994.
- (b) For the purpose of this AD, assembled is defined as the construction of an engine from its component parts for any purpose, such as, but not limited to, overhaul and inspection.
- (c) For engines assembled on or after February 15, 1994, prior to further flight, determine if any connecting rod bolts were replaced during assembly. This AD applies only to engines that had connecting rod bolts replaced on or after February 15, 1994.
- (d) For engines that contain replacement connecting rod bolts installed on or after February 15, 1994, prior to further flight, determine if any of those replacement connecting rod bolts were purchased directly from Textron Lycoming or Aircraft Technologies, Inc. This AD does not apply to engines with replacement connecting rod bolts purchased directly from Textron Lycoming or Aircraft Technologies, Inc. In addition, this AD does not apply to engines that were manufactured or remanufactured at Textron Lycoming.
- (e) For engines that contain replacement connecting rod bolts installed on or after February 15, 1994, that were not purchased directly from Textron Lycoming or Aircraft Technologies, Inc., prior to further flight, visually inspect to determine if the connecting rod bolts are clearly identified by raised letters SPS, S, C, or FC, identifying them as Textron Lycoming parts, or SL75060 etched on the head, identifying them as PMA parts manufactured by Superior Air Parts, Inc., or AL75060 forged into the head, identifying them as PMA parts manufactured by Aircraft Technologies, Inc. If the connecting rod bolts can be positively identified as provided in this paragraph, no further action is required.
- (f) If the connecting rod bolts can not be positively identified in accordance with paragraph (e) of this AD, prior to further flight remove unapproved connecting rod bolts and replace with serviceable parts.

**Note:** Further information may be found in **Superior Air Parts Service Bulletin No. 95-002**, dated March 3, 1995, or by contacting Superior Air Parts, Inc., 14280 Gillis Rd., Dallas, TX 75244-3792; telephone (800) 487-4884.

- (g) An alternative method of compliance that provides an acceptable level of safety may be

used if approved by the Manager, Special Certification Office. The request should be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Special Certification Office.

**Note:** Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the Special Certification Office.

- (h) Special flight permits shall not be issued.
- (i) This amendment becomes effective April 12, 1995, to all persons except those persons to whom it was made immediately effective by priority letter AD 95-07-01, issued March 17, 1995, which contained the requirements of this amendment.

**FOR FURTHER INFORMATION CONTACT:** Richard D. Karanian, Aerospace Engineer, Special Certification Office, FAA, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, TX 76137-4298; telephone (817) 222-5195, fax (817) 222-5959; or Locke Easton, Aerospace Engineer, Engine and Propeller Standards Staff, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (617) 238-7113, fax (617) 238-7199.

**Manufacturer's Service Information:**

**Superior Air Parts Service Bulletin No. 95-002**

Copies of the service information referenced in this directive are available upon request from Superior Air Parts, Inc., 14280 Gillis Rd., Dallas, TX 75244-3792; telephone (800) 487-4884.