

[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [65 FR 70654 11/27/2000]

[Docket No. 2000-NE-16-AD; Amendment 39-11994; AD 2000-23-21]

RIN 2120-AA64

**Airworthiness Directives;** Teledyne Continental Motors IO-360, TSIO-360, LTSIO-360, O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550, and TSIOL-550 Series Reciprocating Engines

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

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

**SUMMARY:** This amendment supersedes emergency airworthiness directive (AD) 2000-08-51. Emergency AD 2000-08-51 was sent to all known U.S. owners and operators of Teledyne Continental Motors (TCM) IO-360, TSIO-360, LTSIO-360, O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550, and TSIOL-550 series reciprocating engines by individual letters. This amendment requires removing a core sample of material from the propeller mounting flange of certain crankshafts, and sending the core sample to TCM for evaluation. This amendment is prompted by reports of crankshaft failures, and by the addition of additional crankshaft serial numbers (SN) that have been added to the suspect population. The actions specified by this AD are intended to prevent fracture of the crankshaft connecting rod journal, which could result in total engine power loss, in-flight engine failure and possible forced landing.

**DATES:** Effective December 12, 2000. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of December 12, 2000. Comments for inclusion in the Rules Docket must be received on or before January 26, 2001.

**ADDRESSES:** Submit comments in triplicate to the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, Attention: Rules Docket No. 2000-NE-16-AD, 12 New England Executive Park, Burlington, MA 01803-5299. Comments may also be sent via the Internet using the following address: "9-ane-adcomment@faa.gov." Comments sent via the Internet must contain the docket number in the subject line.

The service information referenced in this AD may be obtained from Teledyne Continental Motors, PO Box 90, Mobile, AL 36601; telephone toll free 1-888-200-7565, or on the TCM internet site "www.tcmlink.com." This information may be examined at the FAA, New England Region, Office of the Regional 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:** Jerry Robinette, Senior Engineer, Propulsion, Atlanta Aircraft Certification Office, FAA, Small Airplane Directorate, One Crown Center, 1895 Phoenix Blvd., Suite 450, Atlanta, GA 30349; telephone: (770) 703-6096, fax: (770) 703-6097.

**SUPPLEMENTARY INFORMATION:**

On April 28, 2000, the Federal Aviation Administration (FAA) issued emergency airworthiness directive (AD) 2000-08-51 that is applicable to Teledyne Continental Motors IO-360, TSIO-360, LTSIO-360, O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550, and TSIOL-550 series reciprocating engines. That AD requires removing a core sample of material from the propeller mounting flange and sending the core sample to TCM for evaluation. That action was

prompted by reports of crankshafts on which the connecting rod journals had fractured. On November 24, 1999, the FAA was notified of a crankshaft failure on a TCM engine. Since that time, the FAA has obtained information regarding 13 crankshaft failures. The investigation revealed that the crankshafts failed due to subsurface defects in the number one crankshaft connecting rod journal. The FAA has determined that all of the defects were due to unique material composition characteristics combined with process control variations that occurred during the material melt process. This occurred during several discrete periods, i.e. certain lots, of steel production or forming operations. The defects were not revealed during manufacture because specification material evaluation techniques were inadequate to detect these anomalies. Continued evaluation of crankshafts lots with serial numbers (SN's) other than those that were listed in AD 2000-08-51, has detected the same condition in those crankshaft lots. TCM mandatory service bulletin (MSB)005B, dated May 25, 2000, and MSB 005C, dated October 10, 2000, were issued to include the SN's of those additional suspect crankshafts. The specification material evaluation techniques have been improved to preclude a reoccurrence of this condition. Crankshafts with this type of subsurface defect will fail. All of the fractures have been grouped around certain manufacturing dates between April 1, 1998, and March 31, 2000, inclusive. This condition, if not corrected, could result in crankshaft connecting rod journal fracture, which could result in total engine power loss, in-flight engine failure and possible forced landing.

#### **Manufacturer's Service Information**

The FAA has reviewed and approved the technical contents of TCM Mandatory Service Bulletin (MSB) 00-5C, dated October 10, 2000. MSB 00-5C lists additional serial numbers (SN's) of affected engines and suspect crankshafts that were manufactured between April 1, 1998, and March 31, 2000, inclusive. The MSB also describes procedures for removing a core sample of material from the propeller mounting flange of the crankshaft and for cleaning, chamfering, dye checking, and painting the core sample holes.

#### **Requirements of This AD**

Since an unsafe condition has been identified that is likely to exist or develop on other engines of this same type design, this airworthiness directive (AD) requires removing a core sample of material from the propeller mounting flange and sending the core sample to TCM for evaluation. TCM has informed the FAA that it intends to maintain a 24 to 48 hour turn-around time for notification of the crankshaft airworthiness. All crankshafts that are found to be unserviceable must be replaced with a serviceable crankshaft prior to further flight. The actions are required to be accomplished in accordance with the service bulletin described previously.

#### **Immediate Adoption**

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 2000-NE-16-AD." The postcard will be date stamped and returned to the commenter.

### **Regulatory Impact**

This proposed rule does not have federalism implications, as defined in Executive Order No. 13132, because it would 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. Accordingly, the FAA has not consulted with state authorities prior to publication of this proposed rule.

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 No. 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 Code of Federal 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), 40113, 44701.

§39.13 [Amended]

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

# AIRWORTHINESS DIRECTIVE



Aircraft Certification Service  
Washington, DC

U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

*We post ADs on the internet at "av-info.faa.gov"*

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

**2000-23-21 Teledyne Continental Motors:** Amendment 39-11994. Docket 2000-NE-16-AD.  
Supersedes Emergency AD 2000-08-51. Docket 2000-NE-16-AD.

## Applicability

This Airworthiness Directive (AD) is applicable to Teledyne Continental Motors (TCM) IO-360, TSIO-360, LTSIO-360, O-470, IO-470, TSIO-470, IO-520, TSIO-520, LTSIO-520, IO-550, TSIO-550 and TSIOL-550 series reciprocating engines that were assembled, rebuilt, or overhauled using a crankshaft that was manufactured between April 1, 1998, and March 31, 2000, listed by engine and crankshaft serial number (SN) in TCM Mandatory Service Bulletin (MSB) 00-5C, dated October 10, 2000.

**Note 1:** The engines and crankshafts that are the subject of this AD were manufactured by TCM from April 1, 1998 through March 31, 2000. However the dates that the engines and crankshafts were delivered may not coincide with their dates of manufacture. For crankshafts identified in paragraph (a) of this AD, TCM has already determined which engines have a new suspect crankshaft installed and have identified those engines by engine SN. The crankshaft SN is only used to determine the need for taking a core sample for those crankshafts identified in paragraph (a) and (b) of this AD. The engine SN can be found in logbooks or other maintenance records. For those engines that were overhauled in the field with factory new crankshafts, the crankshaft SN should be shown in work orders, log books or other maintenance records. If the engine was assembled new, rebuilt, or overhauled on or before March 31, 1998, or on or after April 1, 2000, no action is required.

**Note 2:** 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 request approval for an alternative method of compliance in accordance with paragraph (d) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

## Compliance

Compliance with the requirements of this AD is required within the next 10 hours time-in-service from the effective date of this AD, unless already done.

To prevent crankshaft connecting rod journal fracture, which could result in total engine power loss, in-flight engine failure and possible forced landing, do the following:

**Note 3:** TCM supplies an instructional video in the tool kit for MSB 00-5C. It is recommended that the technician views and understands “Instructional Video for Compliance with Teledyne Continental Motors Mandatory Service Bulletin MSB 00-5C” before performing these procedures.

### **Crankshaft Material Inspection**

(a) For those engines and crankshafts listed by SN in TCM MSB 00-5C, dated October 10, 2000, do the crankshaft material inspection (crankshaft propeller flange core sample) as follows:

**Note 4:** The engine SN’s listed in TCM MSB 00-5C contain only the numerical portion of the SN. Engines that have been rebuilt by TCM will have a letter “R” at the end of the six digit numerical portion. Disregard the letter “R.”

(1) Do the crankshaft material inspection (crankshaft propeller flange core sample) in accordance with sections A through J of TCM MSB 00-5C, dated October 10, 2000, as follows:

(i) Use the specialized tools and equipment provided by TCM as listed in section A of TCM MSB 00-5C, dated October 10, 2000.

(ii) You may use each rotobroach bit to obtain up to six core samples. Replace the rotobroach after the sixth core sample, or before if the rotobroach does not cut with the maximum torque applied.

(iii) Maintain a record of each core sample obtained with each rotobroach bit used. Contact TCM to obtain additional rotobroach bits.

(iv) Do not exceed the torque limits specified in TCM MSB 00-5C, dated October 10, 2000, when obtaining the core sample.

(2) After obtaining the results of the core sample evaluation, disposition the crankshaft as follows:

(i) If TCM notifies you that the crankshaft is not serviceable, replace the crankshaft with a serviceable crankshaft of the same part number before further flight.

(ii) If TCM notifies you that the crankshaft is serviceable, the propeller assembly may be reinstalled.

### **Installation of Crankshafts**

(b) After the effective date of this AD, do not install a crankshaft with a SN that is listed in MSB 00-5C, dated October 10, 2000, unless core samples have been taken and TCM has approved it for return to service.

(c) Crankshaft material inspections (crankshaft propeller flange core samples) that were done using TCM MSB 00-5, dated April 14, 2000; MSB 00-5A, dated April 28, 2000; or MSB 00-5B, dated May 25, 2000, comply with this AD and must not be repeated.

### **Alternative Methods of Compliance**

(d) 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, Atlanta Aircraft Certification Office (ACO). Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Atlanta ACO.

**Note 5:** Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the Atlanta ACO.

### **Incorporation by Reference Material**

(e) The actions required by this AD shall be performed in accordance with Teledyne Continental Motors MSB 00-5C, dated October 10, 2000. 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 Teledyne Continental Motors, PO Box 90, Mobile, AL 36601; telephone toll free

1-888-200-7565, or on the TCM internet site “[www.tcmlink.com](http://www.tcmlink.com)”. Copies may be inspected at the FAA, New England Region, Office of the Regional 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.

**Effective Date of This AD**

(f) This amendment becomes effective on December 12, 2000.

**FOR FURTHER INFORMATION CONTACT:** Jerry Robinette, Senior Engineer, Propulsion, Atlanta Aircraft Certification Office, FAA, Small Airplane Directorate, One Crown Center, 1895 Phoenix Blvd., Suite 450, Atlanta, GA 30349; telephone: (770) 703-6096, fax: (770) 703-6097.

Issued in Burlington, Massachusetts, on November 13, 2000.

David A. Downey, Assistant Manager, Engine and Propeller Directorate, Aircraft Certification Service.