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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-0051; Directorate Identifier 2007-NE-37-AD; Amendment 39-17801; AD 2014-05-29]

RIN 2120-AA64

Airworthiness Directives; Continental Motors, Inc. Reciprocating Engines With Superior Air Parts, Inc. (SAP) Cylinder Assemblies Installed

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are superseding airworthiness directive (AD) 2009-16-03 for certain Continental Motors, Inc. (CMI) IO-520, TSIO-520, and IO-550 series reciprocating engines, with certain SAP replacement parts manufacturer approval (PMA) investment cast cylinder assemblies installed. AD 2009-16-03 required initial and repetitive inspections and compression tests to detect cracks in those cylinders. This new AD requires that additional engines be added to the applicability. This AD was prompted by the need to add to the applicability all other engine models approved for the use of CMI 520 and 550 cylinder assemblies, such as the CMI 470 series engines when modified by supplemental type certificate (STC), with affected SAP investment cast cylinder assemblies installed. We are issuing this AD to prevent the separation of the cylinder head, damage to the engine, and damage to the airplane.

DATES: This AD is effective April 25, 2014.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of April 25, 2014.

ADDRESSES: For service information identified in this AD, contact Continental Motors, Inc., 2039 Broad St., Mobile, AL 36615; phone: 251-438-3411; Web site: http://www.continentalmotors.aero/Support_Materials/Publications/Service_Bulletins/. 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.

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-2007-0051; 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: Peter W. Hakala, Aerospace Engineer, Special Certification Office, FAA, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, TX 76137; phone: 817-222-5145; fax: 817-222-5785; email: peter.w.hakala@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2009-16-03, Amendment 39-15986 (74 FR 38896, August 5, 2009), ("AD 2009-16-03"). AD 2009-16-03 applied to the specified products. The NPRM published in the Federal Register on September 13, 2013 (78 FR 56622). The NPRM proposed to continue to require initial and repetitive inspections and compression tests to detect cracks in certain replacement SAP PMA investment cast cylinder assemblies. The NPRM also proposed to require that additional engines be added to the applicability. We are issuing this AD to prevent the separation of the cylinder head, damage to the engine, and damage to the airplane.

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 Delete Requirement To Remove Cylinders After 12 Years

SAP requested that we delete paragraph (i)(2), which requires the removal of cylinders after 12 years, stating that removal is not necessary if the required periodic 50-hour inspections show that the cylinders have no defects and are still airworthy.

We disagree. The 12-year calendar requirement is due to the increased risk of environmental corrosion, a corresponding increase in potential for metal fatigue cracks, and the subsequent separation of the cylinder assemblies. The type certificate holder recommends removal and replacement of the cylinders no later than 12 years from date placed in service. We did not change this AD.

Request To Delete From Applicability the Additional Engines Identified by This Supersedure AD, and To Cancel This AD

SAP requested that we delete from the applicability of this AD the Continental Motors, Inc. model CMI 470 series engines that are added to the applicability of this supersedure AD, and that we cancel this supersedure AD. SAP is not aware of any problems with the investment cast SAP cylinders installed on CMI model 470 series engines modified by STC to install SAP 520 cylinder assemblies.

We disagree. We are not aware of data that would indicate that the failure mode of SAP 520 cylinder assemblies identified in this AD would not also exist in the comparatively small population of CMI model 470 series engines modified by STC. We did not change this AD.

Request To Allow Reinstallation of Removed Cylinders

SAP requested that we change paragraph (j) to allow reinstallation of cylinders that have been removed for maintenance because the removal and reinstallation of a cylinder does not impact cylinder head fatigue.

We disagree. The purpose of this AD is to correct an unsafe condition by removing from service SAP investment cast cylinder assemblies. We did not change this AD.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD as proposed.

Costs of Compliance

We estimate that this AD affects 6,000 engines installed on airplanes of U.S. registry. We also estimate that it will take about 5 hours to replace a cylinder, and 15 hours per engine to inspect the cylinders. The average labor rate is \$85 per hour. Required parts will cost about \$1,200 per cylinder. We anticipate that 4,000 cylinders will require replacement. Based on these figures, we estimate the total cost of this AD to U.S. operators to be \$14,150,000.

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),
- (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 removing airworthiness directive (AD) 2009-16-03, Amendment 39-15986 (74 FR 38896, August 5, 2009), and adding the following new AD:



2014-05-29 Continental Motors, Inc. (formerly Teledyne Continental Motors, Continental):
Amendment 39-17801; Docket No. FAA-2007-0051; Directorate Identifier 2007-NE-37-AD.

(a) Effective Date

This AD is effective April 25, 2014.

(b) Affected ADs

This AD supersedes AD 2009-16-03, Amendment 39-15986 (74 FR 38896, August 5, 2009).

(c) Applicability

This AD applies to:

(1) Continental Motors, Inc. (CMI) IO-520, TSIO-520, and IO-550 series reciprocating engines with replacement Superior Air Parts, Inc. (SAP) parts manufacturer approval (PMA) investment cast cylinder assemblies, part numbers (P/Ns) SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P, installed.

(2) All other engine models approved for the use of CMI 520 and 550 cylinder assemblies such as the CMI 470 series engines when modified by Supplemental Type Certificate (STC), with SAP investment cast cylinder assemblies, P/Ns SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P, installed.

(3) This AD applies to all serial numbers for the P/Ns listed in paragraphs (c)(1) and (c)(2) of this AD.

(4) If no SAP replacement cylinders were installed during engine maintenance since the CMI engines were new, then this AD does not apply.

(d) Unsafe Condition

This AD was prompted by the need to add to the applicability all other engine models approved for the use of CMI 520 and 550 cylinder assemblies such as the CMI 470 series engines when modified by STC, with affected SAP investment cast cylinder assemblies installed. We are issuing this AD to prevent the separation of the cylinder head, damage to the engine, and damage to the airplane.

(e) Compliance

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

(f) Identification of SAP Cylinder Assemblies

Seeing the SAP cylinder assembly P/Ns referenced in paragraphs (c)(1) and (c)(2) of this AD may be difficult because the assembly P/Ns are stamped on the bottom cylinder flange. Therefore, you may review the engine maintenance records instead of the steps listed in paragraphs (f)(1) and

(f)(2) of this AD, to see if the engine records identify the P/Ns of the cylinders installed. If the records do not identify the P/Ns of the cylinders installed, do the following:

(1) Remove the valve cover from the cylinder assembly.

(2) Look at the top of the cylinder head for the casting markings "AMCAST" or "CP" (note that the cylinder head casting part number, P/N SAC 52001 "I" or P/N SAC 55001 "I", will also be visible). If a cylinder head has these markings, do the steps required by paragraphs (g) through (j) of this AD.

(g) Initial Inspection of SAP Cylinder Assemblies

For engines and cylinders listed in paragraphs (c)(1) and (c)(2) of this AD, with cylinders over 750 flight hours (FH) time-in-service (TIS) on the effective date of this AD, do the following initial inspection within 25 FH TIS.

(1) Inspect each cylinder head around the exhaust valve side for visual cracks or any signs of black combustion leakage.

(2) Replace any cracked or leaking cylinders before further flight.

(3) Perform a standard cylinder compression test. Guidance on standard cylinder compression tests can be found in Teledyne Continental Aircraft Engine Service Bulletin SB03-3, Differential Pressure Test and Borescope Inspection Procedures for Cylinders, dated March 28, 2003.

(i) If the cylinder pressure gauge reads below 60 pounds per square inch, determine if the unacceptable pressure is due to a cracked cylinder.

(ii) To check the cylinder, apply a 2-percent soapy water solution to the side of the leaking cylinder.

(iii) If you see air bubbles, indicating air leakage, on the side of the cylinder head, or near the head-to-cylinder interface, replace the cylinder assembly before further flight.

(h) Repetitive Inspections of SAP Cylinder Assemblies

Thereafter, repeat the cylinder visual inspections and compression tests specified in paragraphs (g)(1) through (g)(3)(iii) of this AD, within every 50 FH time-since-last inspection until the cylinder reaches the TIS as listed in paragraph (i) of this AD.

(i) Replacing SAP Cylinder Assemblies

For installed cylinders, replace the affected SAP cylinders at the earliest of the following:

(1) When the cylinder reaches the operating hours TIS between overhaul limits specified in Table 1, "Engine Time Between Overhaul", in Continental Motors Aircraft Engine Service Information Letter SIL98-9C, Revision C, dated July 17, 2013; or

(2) When the cylinder reaches 12 calendar years-since-installation.

(j) Prohibition Against Installing Certain P/Ns of SAP Cylinder Assemblies

After the effective date of this AD, do not install or reinstall after any removal, any SAP investment cast cylinder assembly, P/Ns SA52000-A1, SA52000-A20P, SA52000-A21P, SA52000-A22P, SA52000-A23P, SA55000-A1, or SA55000-A20P, in any engine.

(k) Alternative Methods of Compliance (AMOCs)

The Manager, Special Certification Office, may approve AMOCs to this AD. Use the procedures found in 14 CFR 39.19 to make your request.

(l) Special Flight Permits

Under 14 CFR Part 39.23, we will not approve special flight permits for this AD for engines that have failed the visual inspection or the 50-hour periodic cylinder assembly compression test required by this AD.

(m) Related Information

For more information about this AD, contact Peter W. Hakala, Aerospace Engineer, Special Certification Office, FAA, Rotorcraft Directorate, 2601 Meacham Blvd., Fort Worth, TX 76137; phone: 817-222-5145; fax: 817-222-5785; email: peter.w.hakala@faa.gov.

(n) 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 do the actions required by this AD, unless the AD specifies otherwise.

(i) Continental Motors Aircraft Engine Service Information Letter SIL98-9C, Revision C, dated July 17, 2013.

(ii) Reserved.

(3) For Continental Motors, Inc. service information identified in this AD, contact Continental Motors, Inc., 2039 Broad St., Mobile, AL 36615; phone: 251-438-3411; Web site: http://www.continentalmotors.aero/Support_Materials/Publications/Service_Bulletins.

(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 March 4, 2014.
Colleen M. D'Alessandro,
Assistant Directorate Manager, Engine & Propeller Directorate,
Aircraft Certification Service.