

[Federal Register: May 20, 2004 (Volume 69, Number 98)]
[Rules and Regulations]
[Page 29055-29058]
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[DOCID:fr20my04-5]
[[Page 29055]]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2002-NE-26-AD; Amendment 39-13643; AD 2004-10-13]

RIN 2120-AA64

Airworthiness Directives; CFM International, S.A. CFM56-2-C, -3 Series, and -5 Series Turbofan Engines

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), that applies to CFM International, S.A., CFM56-2-C, -3 series, and -5 series turbofan engines. This amendment requires removing from service main fuel pumps with bronze gear-stage bearings and installing main fuel pumps with bi-metal, aluminum/bronze bearings. This amendment results from several reports of main fuel pump bronze bearing failures. We are issuing this AD to prevent main fuel pump bearing failures resulting in fuel nozzle clogging, low pressure turbine (LPT) case burn-through, and damage to the airplane.

DATES: Effective June 24, 2004.

ADDRESSES: The service information referenced in this AD may be obtained from CFM International, Technical Publications Department, 1 Neumann Way, Cincinnati, OH 45215; telephone (513) 552-2800; fax (513) 552-2816. This information may be examined, by appointment, at the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA.

FOR FURTHER INFORMATION CONTACT: Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7754; fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an AD that applies to CFM International, S.A., CFM56-2-C, -3 series, and -5 series turbofan engines was published in the Federal Register on May 16, 2003, (68 FR 26553). That action proposed to require removing from service main fuel pumps with bronze bearings and installing main fuel pumps with aluminum/bronze bearings.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

Request To Update Service Bulletins to the Latest Revisions

Two commenters request that the proposed terminating action reference main fuel pump configurations introduced in conjunction with FAA AD 2000-15-01. CFM56-3 Service Bulletin (SB) 73-0120, Revision 4, dated July 27, 2000, and CFM56-5 SB 73-0126, Revision 3, dated September 25, 2000, did not include the part configurations introduced by CFM56-3/3B/3C SB 73-A129 or CFM56-5 SB 73-A143. Comments were specifically related to CFM56-3/3B/3C SB 73-0120, Revision 4, and SB 73-A129.

The FAA agrees. Since the issuance of the proposed rule, CFM56-3 SB 73-0120, Revision 4, dated July 27, 2000, and CFM56-5 SB 73-0126, Revision 3, dated September 25, 2000, have been revised to include hardware defined by CFM56-3/3B/3C SB 73-A129 and CFM56-5 SB 73-A143. The latest revisions of CFM56-2 SB 73-0104, CFM56-3 SB 73-0120, and CFM56-5 SB 73-0126 are referenced in the final rule.

Request for Additional Replacement Parts as Alternative Method of Compliance (AMOC)

Three commenters request that additional replacement parts be specified as AMOCs. The commenters believe that dual-sourced parts can be less costly.

The FAA does not agree. The AD does not make specific hardware replacement recommendations. The AD mandates that unserviceable parts be replaced with serviceable parts. The AD did not change as a result of this comment.

Main Fuel Pump Failure Mode Clarification

One commenter provided additional information on the documented failure modes and requests that the Summary and Discussion statements be modified. The modification would note that the bi-metal bearing was introduced to prevent main fuel pump failures that result in a fuel flow degradation. This degradation could lead to diminished engine start or in-flight restart capability.

The FAA agrees. The initial introduction of the bi-metal bearing was intended to address a specific failure mode that is not the subject of this AD. A further benefit of the bi-metal, aluminum/bronze bearings is that they are less likely to generate debris and create the unsafe condition that this AD addresses. The Summary paragraph in the AD has been modified to better describe the debris-related failure mode. We have noted the commenter's request to clarify the Discussion section of the NPRM; however, the Discussion section does not carry over to the final rule.

Request To Modify the Economic Analysis

One commenter believes that the number of engines affected is incorrect. The commenter has provided additional information on the quantity of engines affected and the cost of incorporating bi-metal aluminum/bronze bearings. The commenter believes that there would be no additional labor or material costs for converting affected main fuel pumps because the conversion should occur within the scheduled refurbishment of the pump.

The FAA partially agrees. We agree that the initial estimate of the number of engines affected was too high and that the assumption that an affected main fuel pump would be replaced with a new, zero-time part was unrealistic. However, we do not agree that all of the material costs associated with the conversion of a main fuel pump to a serviceable part would be achieved during regularly

scheduled maintenance. The number of affected engines and total cost of incorporating the bi-metal bearings have been adjusted based on the estimated hardware consumption to date. The corrective action cost was also adjusted to reflect bearing incorporation by refurbishment. The bearing hardware has been treated as an incremental cost as there will be unscheduled conversions either because of forced main fuel pump removals or differing workscope practices. The Economic Analysis has been revised in the final rule.

Request To Clarify Part Number Effectivity for CFM56-2-C Engines

One commenter requests that compliance paragraph (a)(2) end with the phrase "if SB 73-081 is accomplished." The commenter believes that by adding this phrase the part numbers to be removed from service will be clarified.

The FAA does not agree. Compliance paragraph (a)(2) states the following: "For all CFM56-2-C series engines that have incorporated CFM International Service Bulletin (SB) (CFM56-2) 73-081 * * *". The final rule did not change as a result of this comment.

Request To Clarify Part Number Effectivity for CFM56-3 Engines

One commenter requests that compliance paragraph (b)(3) end with the phrase "if SB 73-087 is accomplished." The commenter believes that by adding this phrase, the part numbers to be removed from service will be clarified.

The FAA does not agree. Compliance paragraph (b)(3) states the following: "For all CFM56-3 series engines that have incorporated SB (CFM56-3) 73-087 * * *". The final rule did not change as a result of this comment.

One commenter requests that compliance paragraph (b)(3) include a phrase to reference the lack of compliance with CFM56-3 SB 73-120. The commenter believes that by adding the phrase "but have not incorporated SB 73-120," as a qualification for Compliance paragraph (b)(3), the part numbers to be removed from service will be clarified.

The FAA does not agree. The referenced part numbers in paragraph (b)(3) reflect the lack of compliance with CFM56-3 SB 73-120. The final rule did not change as a result of this comment.

Request To Modify the Compliance Statement

One commenter requests that the compliance statement in the Regulatory section of the AD be changed from "required at the next engine removal, engine module removal, or main fuel pump removal" to "required at the next shop visit, or main fuel pump replacement." The commenter suggests that the next shop visit should be defined as removal from the aircraft for the purposes of maintenance and inspection except when removed for the purpose of performing field maintenance type activities at a maintenance facility in lieu of performing them on wing. The commenter suggests that a main fuel pump shop visit would be defined as removal of the pump for the purpose of sending it to a shop capable of performing the specified modification regardless of other planned pump maintenance. The commenter suggests that an engine module would be clarified as the fan, core, or low-pressure turbine to avoid confusion with any other parts of the engine that might be referred to as a module. The commenter feels that these changes would allow easier scheduling of the required corrective actions.

The FAA partially agrees. We agree that next engine shop visit or main fuel pump replacement is a better description of the intended threshold. However we do not agree with the proposed qualifications for each action. For simplification and to assure expedient incorporation at the first opportunity, we have revised the compliance statement to "next engine shop visit or main fuel pump replacement, whichever comes earlier." We have added a definitions paragraph (e) to the Regulatory Section that defines "engine shop visit" as any maintenance that includes the separation of an engine casing flange.

Request To Extend the Compliance Terminating Action Date

Two commenters state that the compliance terminating action date will result in premature main fuel pump removals. One of the commenters requests that the compliance terminating action date of January 1, 2007, be extended.

The FAA disagrees. The corrective action compliance period allows for sufficient planning for main fuel pump replacement during regularly scheduled maintenance. The projected incorporation rate does not allow an extension of the terminating action date.

Request To Include Downstream Fuel Filter as an AMOC

One commenter requests the corrective action requirement be revised to include the incorporation of a downstream fuel filter as an AMOC to preclude fuel nozzle clogging and related LPT overtemperature damages. The commenter referenced CFM56-3 SB 73-0134. The commenter states that together with the main fuel pump interstage filter, the addition of a downstream fuel filter will provide greater engine protection. The commenter also states that a downstream fuel filter is more economical than the proposed main fuel pump modification.

The FAA does not agree. Analysis based on fleet experience indicates safety margins are maintained with the conversion of the bi-metal, gear-stage bearings. Vendor data shows that the main fuel pump gear-stage bearings would normally be replaced during pump refurbishment. Recommending incorporation of the downstream fuel filter is not justified at this time. The AD did not change as a result of this comment.

Typographical Error Corrected for CFM56-2-C Engine

After the issuance of the NPRM, we discovered that the CFM56-2-C engine had been incorrectly listed as CFM56-2C. We have corrected the engine model in the AD.

Regulatory Text Corrections

Paragraph (a)(2) of the NPRM Regulatory text for the CFM56-2-C included pump part numbers (P/Ns) 301-778-801-0, 301-778-802-0, 301-778-804-0, and 301-778-805-0 with pumps that had incorporated CFM56-2 SB 73-081. Further review revealed these parts were originally CFM56-3 hardware that could incorporate bronze bearings following CFM56-3 SB 73-087. CFM56-2 SB 73-0070 subsequently released these parts for use on the CFM56-2-C engine. We have added a new Regulatory text paragraph (a)(3) in the AD to highlight that these pumps could incorporate bronze bearings by a CFM56-3 SB. The codification of paragraph (a) is changed from (a)(1), (2), (3), (4) to (a)(1), (2), (3), (4), and (5) in the AD as a result of this comment.

The addition of Regulatory text paragraph (a)(3) in the AD results in the addition of Regulatory text paragraph (d)(3) in the AD. The codification of paragraph (d) is changed from (d)(1), (2), and (3) to (d)(1), (2), (3), and (4) in the AD.

Paragraph (a)(3) of the NPRM Regulatory text for the CFM56-2-C inadvertently referenced CFM56-2-C SB 73-078 as defining P/N 301-779-006-0. That SB is incorrect. The correct SB that defines P/N 301-779-006-0 is CFM56-2 SB 73-A113. We have corrected the SB reference in the newly recodified paragraph (a)(4) of the AD.

Paragraph (b)(2) of the NPRM Regulatory text for the CFM56-3 inadvertently referenced CFM56-3 SB 73-082 as defining pump P/N 301-779-006-0. That SB is incorrect. The correct SB that defines pump P/N 301-779-006-0 is CFM56-3 SB 73-A129. We have corrected the SB reference in paragraph (b)(2) of the AD.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Economic Analysis

There are approximately 6,160 CFM56-2-C, -3 series, and -5 series turbofan engines of the affected design in the worldwide fleet. The FAA estimates that 975 engines installed on airplanes of U.S. registry would be affected by this AD. Assuming an average incorporation rate of 325 pumps per year and an incremental material cost of \$8,000, the cost for U.S. operators to replace the bronze bearings is estimated to be \$2,600,000 per year.

Regulatory Analysis

This final rule does not have federalism implications, as defined in Executive Order 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 final rule.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) 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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, 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), 40113, 44701.

§ 39.13 [Amended]

2. Section 39.13 is amended by adding a new airworthiness directive to read as follows:

AIRWORTHINESS DIRECTIVE



Aircraft Certification Service
Washington, DC

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

We post ADs on the internet at "www.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).

2004-10-13 CFM International, S.A.: Amendment 39-13643. Docket No. 2002-NE-26-AD.

Applicability

This airworthiness directive (AD) applies to CFM International, S.A. CFM56-2-C, -3 series, and -5 series turbofan engines. These engines are installed on, but not limited to, Airbus Industrie A319 and A320, Boeing 737, and McDonnell Douglas DC-8 airplanes.

Note 1: 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 request approval for an alternative method of compliance in accordance with paragraph (f) 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 this AD is required at the next engine shop visit, or main fuel pump replacement, whichever is earlier, after the effective date of this AD, but no later than January 1, 2007, unless already done.

To prevent main fuel pump bearing failures resulting in fuel nozzle clogging, low pressure turbine (LPT) case burn-through, and damage to the airplane, do the following:

Main Fuel Pumps Installed on CFM56-2-C Engines

(a) For CFM56-2-C engines, do the following:

(1) Remove from service main fuel pumps part number (P/N) 301-779-002-0.

(2) For all CFM56-2-C series engines that have incorporated CFM International Service Bulletin (SB) (CFM56-2) 73-081, remove from service main fuel pumps P/N 301-776-101-0, P/N 301-776-102-0, P/N 301-776-103-0, P/N 301-776-104-0, P/N 301-776-105-0, P/N 301-776-106-0, P/N 301-776-108-0, P/N 301-776-109-0, P/N 301-776-110-0, P/N 301-776-111-0, P/N 301-776-112-0, and P/N 301-776-113-0.

(3) For all CFM56-2-C series engines that have incorporated SB (CFM56-3) 73-087, remove from service main fuel pumps P/N 301-778-801-0, P/N 301-778-802-0, P/N 301-778-804-0, and P/N 301-778-805-0.

(4) For all CFM56-2-C engines that have incorporated SB (CFM56-2-C) 73-A113, remove from service main fuel pumps P/N 301-779-006-0.

(5) Install a serviceable main fuel pump. Information on converting removed pumps into serviceable pumps can be found in SB (CFM56-2) 73-0104, Revision 3, dated December 17, 2003.

Main Fuel Pumps Installed on CFM56-3 Series Engines

(b) For CFM56-3 series engines, do the following:

(1) Remove main fuel pumps P/N 301-779-002-0.

(2) For all CFM56-3 series engines that have incorporated SB (CFM56-3) 73-A129, remove from service main fuel pumps P/N 301-779-006-0.

(3) For all CFM56-3 series engines that have incorporated SB (CFM56-3) 73-087, remove from service main fuel pumps P/N 301-778-801-0, P/N 301-778-802-0, P/N 301-778-804-0, and P/N 301-778-805-0.

(4) Install a serviceable main fuel pump. Information on converting removed pumps into serviceable pumps can be found in SB (CFM56-3) 73-0120, Revision 5, dated December 17, 2003.

Main Fuel Pumps Installed on CFM56-5 Series Engines

(c) For CFM56-5 series engines, do the following:

(1) Remove main fuel pumps P/N 301-785-502-0.

(2) For all CFM56-5 series engines that have incorporated SB (CFM56-5A) 73-A143, remove from service main fuel pumps P/N 301-785-504-0.

(3) Install a serviceable main fuel pump. Information on converting removed pumps into serviceable pumps can be found in SB (CFM56-5A) 73-0126, Revision 4, dated December 17, 2003.

Do Not Install Main Fuel Pumps

(d) After the effective date of this AD, do not install the following P/N main fuel pumps onto any engine:

(1) For all engines: P/N 301-779-002-0, P/N 301-779-006-0, P/N 301-785-502-0, and P/N 301-785-504-0.

(2) For CFM56-2-C engines that have incorporated SB (CFM56-2-C) 73-081 but have not incorporated SB (CFM56-2-C) 73-0104: P/N 301-776-101-0, P/N 301-776-102-0, P/N 301-776-103-0, P/N 301-776-104-0, P/N 301-776-105-0, P/N 301-776-106-0, P/N 301-776-108-0, P/N 301-776-109-0, P/N 301-776-110-0, P/N 301-776-111-0, P/N 301-776-112-0, and P/N 301-776-113-0.

(3) For CFM56-2-C engines that have incorporated SB (CFM56-3) 73-087 but have not incorporated SB (CFM56-3) 73-0120: P/N 301-778-801-0, P/N 301-778-802-0, P/N 301-778-804-0, and P/N 301-778-805-0.

(4) For CFM56-3 series engines that have incorporated SB (CFM56-3) 73-087 but have not incorporated SB (CFM56-3) 73-0120: P/N 301-778-801-0, P/N 301-778-802-0, P/N 301-778-804-0, and P/N 301-778-805-0.

Definition

(e) An engine shop visit is defined as any maintenance that includes the separation of an engine casing flange.

Alternative Methods of Compliance (AMOC)

(f) An AMOC or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine Certification Office (ECO). Operators must submit their request through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, ECO.

Note 2: Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the ECO.

Special Flight Permits

(g) Special flight permits may be issued in accordance with §§ 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 done.

Documents That Have Been Incorporated by Reference

(h) None.

Effective Date

(i) This amendment becomes effective on June 24, 2004.

Issued in Burlington, Massachusetts, on May 13, 2004.

Peter A. White,

Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.

[FR Doc. 04-11405 Filed 5-19-04; 8:45 am]

BILLING CODE 4910-13-P