

Rules and Regulations

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-27229; Directorate Identifier 2007-NE-03-AD; Amendment 39-15359; AD 2008-03-09]

RIN 2120-AA64

Airworthiness Directives; CFM International, S.A. CFM56-7B Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), Department of Transportation.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for CFM International, S.A. CFM56-7B series turbofan engines. This AD requires revising the Airworthiness Limitations Section (ALS) in the Engine Shop Manual (ESM) and the air carrier's approved continuous airworthiness maintenance program (CAMP) to add mandatory inspections of certain low pressure turbine rear frames (TRFs) to the ALS or CAMP. This AD results from a refined lifting analysis by the engine manufacturer that shows the need to identify an initial threshold for inspecting certain TRFs. We are issuing this AD to prevent failure of the TRF from low-cycle fatigue cracks. Failure of the TRF could result in engine separation from the airplane, which could lead to loss of control of the airplane.

DATES: This AD becomes effective March 10, 2008.

ADDRESSES: The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

FOR FURTHER INFORMATION CONTACT:

Antonio Cancelliere, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238-7751; fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 with a proposed AD. The proposed AD applies to CFM International, S.A. CFM56-7B series turbofan engines. We published the proposed AD in the **Federal Register** on April 23, 2007 (72 FR 20075). That action proposed to require revising the ALS in the Engine Shop Manual and the air carrier's approved continuous airworthiness maintenance program (CAMP) to add mandatory inspections of certain low pressure turbine rear frames (TRFs) to the ALS or CAMP.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office 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 street address for the Docket Operations office (telephone (800) 647-5527) is provided in the **ADDRESSES** section. Comments will be available in the AD docket shortly after receipt.

Comments

We provided the public the opportunity to participate in the development of this AD. We have considered the comments received.

Update Table for Figure 805

Delta Airlines requests that we change the wording in the table for Figure 805 because CFM International updated CFM56-7B Engine Shop Manual section 05-21-03, with Temporary Revision 05-0080, dated December 5, 2006. We agree and have reworded the table for Figure 805 to reflect wording used by the original equipment manufacturer (OEM). For clarification, we also moved the titles for Figures 806 and 807 to the beginning of the figures.

Guidance on Future Revisions

Delta Airlines also suggests that we provide guidance on making future OEM revisions to ESM section 05-21-03

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while maintaining compliance with the AD. We disagree. The information contained within sections (j) and (k) of the AD is adequate. Any future OEM changes to the ALS that affect compliance with this AD will require an AD revision or supersedure, depending on the specific situation. Airlines should make changes to items outside of this specific area and incorporate them into their ESM or CAMP per their normal procedures.

Add Part Numbers (P/Ns) to Applicability

Finally, Delta Airlines requests that we add P/Ns 340-166-251-0, 340-166-252-0 and 340-166-253-0 to the Applicability section and clarify whether these P/Ns will be applicable to the business jet application as well as the commercial application. We disagree. The intent of this AD is to make operators aware of the life limit/mandatory inspections recently introduced by CFM International in the Airworthiness Limitations Section of the CFM56-7B Engine Shop Manual that affect P/Ns that were not previously limited. Ignoring these new limitations could create a potentially unsafe condition. The P/Ns listed above were subject to a life limit and mandatory inspection when first introduced to the ESM, therefore, there is no potential unsafe condition. Business jet and commercial engine model applicability of the new P/Ns is as listed in the ESM.

Conclusion

We have carefully reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We have determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Costs of Compliance

We estimate that this AD will affect 1,228 engines installed on airplanes of U.S. registry. While the cost of making the manual change is negligible, the resulting inspections must be discussed. Since life extensions are possible on condition, the cost of the AD is limited to performing TRF inspections. We estimate that it will take about 3.0 work-hours per engine to perform the actions, including the TRF inspections, and that the average labor rate is \$80 per work-

hour. No parts are required. Based on these figures, we estimate the total cost of the AD to U.S. operators to be \$294,720.

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); 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.

We prepared a summary of the costs to comply with this AD and placed it in the AD Docket. You may get a copy of this summary at the address listed under **ADDRESSES**.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

- Accordingly, under the authority delegated to me by the Administrator, the Federal Aviation Administration 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 adding the following new airworthiness directive:

2008-03-09 CFM International, S.A.:

Amendment 39-15359. Docket No. FAA-2007-27229; Directorate Identifier 2007-NE-03-AD.

Effective Date

(a) This airworthiness directive (AD) becomes effective March 10, 2008.

Affected ADs

(b) None.

Applicability

(c) This AD applies to CFM International, S.A. CFM56-7B18, -7B20, -7B22, -7B24, -7B26, -7B27, -7B22/B1, -7B24/B1, -7B26/B1, -7B27/B1, -7B22/B2, -7B26/B2, -7B27/B3 turbofan engines with turbine rear frame (TRF), part numbers 340-166-205-0, 340-166-206-0, 340-166-207-0, 340-166-208-0, 340-166-209-0, and 340-166-210-0, installed. These engines are installed on, but not limited to, Boeing 737 series airplanes.

Unsafe Condition

(d) This AD results from a refined lifting analysis by the engine manufacturer that shows the need to identify an initial

threshold for inspecting certain TRFs. We are issuing this AD to prevent failure of the TRF from low-cycle fatigue cracks. Failure of the TRF could result in engine separation from the airplane, which could lead to loss of control of the airplane.

Compliance

- (e) You are responsible for having the actions required by this AD performed within 30 days after the effective date of this AD, unless the actions have already been done.

Mandatory Inspections

(f) Within the next 30 days after the effective date of this AD, revise the applicable inspection program for the Business Jet and Air Carrier engine models by adding the Mandatory Inspection Intervals as specified in this AD, and revise the Airworthiness Limitations Section (ALS) (chapter 05-21-03) of the CFM56-7B Engine Shop Manual, CFMI-TP-SM.10 by adding the following:

TURBINE REAR FRAME WITH TANGENTIAL STRUTS—MANDATORY INSPECTIONS—LIFE LIMITS

TASK 05-21-03-200-001

1. General

A. This section contains the FAA and EASA mandatory Eddy Current inspection intervals for the turbine rear frame with tangential struts. The inspection uses:

—A threshold limit, specified in flight cycles
—Inspection intervals, specified in flight cycles

B. The threshold limit is the timing of the first required inspection. First inspection must be done before that part has reached the threshold number of flight cycles.

C. The inspection intervals specify the timing of inspections to be done after the threshold inspection has been reached. Inspections are repetitive without any limit.

2. Mandatory Inspection Intervals for the Critical Areas of the Turbine Rear Frame with Tangential Struts (4 Mount Struts, No. 1, 2, 15, and 16).

C. Turbine Rear Frame Part Numbers 340-166-205-0, 340-166-206-0, 340-166-207-0, 340-166-208-0, 340-166-209-0, 340-166-210-0, for all CFM56-7B SAC engine models (except -7B27A engine models). Refer to figure 805.

Figure index No.	Inspection location	Inspection threshold (cycles since new)	Inspection intervals (cycles)	Inspection reference
805	Strut/outer ring fillet radius on trailing edge (A). Strut/hub fillet radius on leading edge (B). Strut/outer ring fillet radius on trailing edge (C1 below outer ring). Strut/outer ring fillet radius on trailing edge (C2 above outer ring).	25,000* for -7B SAC (except business jet) engine models. 19,000* for -7B SAC business jet engine models.	Refer to Figure 806* for -7B SAC (except business jet) engine models. Refer to Figure 807* for -7B SAC business jet engine models.	Refer to SB 72-0579.*

Note: * Applicable to all inspection locations. If inspection is not performed, part must be removed.

Figure 805

**Turbine Rear Frame with Tangential Struts P/N 340-166-205-0,
340-166-206-0, 340-166-207-0, 340-166-208-0, 340-166-209-0, 340-166-210-0 –
Areas to Be Inspected**

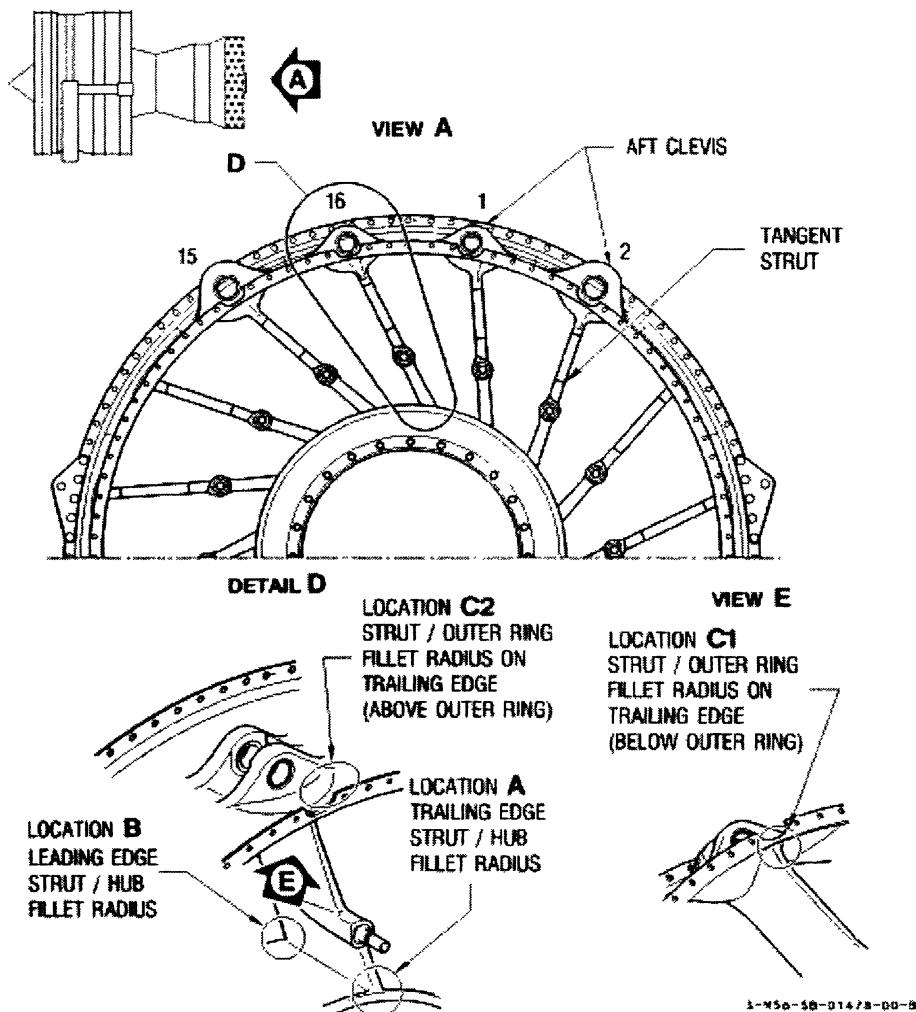


Figure 806
Inspection Intervals for -7B SAC (Except Business Jet) Engine Models

MANDATORY INSPECTION INTERVAL FOR TURBINE REAR FRAME
P/N 340-166-205/206/207/208/209/210-0

If no crack is found on any of the four mount struts, the turbine rear frame is serviceable and must be re-inspected at 4,700 cycle repetitive intervals. If cracks are found on the mount struts, the TRF must be re-inspected according to the following repetitive intervals:

TOTAL CUMULATED CRACK LENGTH AT EACH LOCATION	RE-INSPECT WITHIN
$L < 0.20$ (5)	4,700
0.20 (5) $\leq L < 0.28$ (7)	3,300
0.28 (7) $\leq L < 0.39$ (10)	1,300
0.39 (10) $\leq L < 0.59$ (15)	700
0.59 (15) $\leq L < 0.79$ (20)	120
$L \geq 0.79$ (20)	IMMEDIATELY REMOVE THE TURBINE FRAME

During each inspection, all the locations must be inspected. If cracks are found at different locations, the repetitive inspection interval is the minimum interval corresponding to the max. cumulated crack lengths.

NOTE: Dimensions are in inches with millimeters in parentheses.

Figure 807
Inspection Intervals for -7B SAC Business Jet Engine Models

MANDATORY INSPECTION INTERVAL FOR TURBINE REAR FRAME
P/N 340-166-205/206/207/208/209/210-0

If no crack is found on any of the four mount struts, the turbine rear frame is serviceable and must be re-inspected at 3,300 cycle repetitive intervals. If cracks are found on the mount struts, the TRF must be re-inspected according to the following repetitive intervals:

TOTAL CUMULATED CRACK LENGTH AT EACH LOCATION	RE-INSPECT WITHIN
$L < 0.20$ (5)	3,300
0.20 (5) $\leq L < 0.28$ (7)	2,400
0.28 (7) $\leq L < 0.39$ (10)	900
0.39 (10) $\leq L < 0.59$ (15)	500
0.59 (15) $\leq L < 0.79$ (20)	80
$L \geq 0.79$ (20)	IMMEDIATELY REMOVE THE TURBINE FRAME

During each inspection, all the locations must be inspected. If cracks are found at different locations, the repetitive inspection interval is the minimum interval corresponding to the maximum cumulated crack lengths.

NOTE: Dimensions are in inches with millimeters in parentheses"

(g) After the effective date of this AD, we will not approve any alternative inspection intervals for these parts except as provided for in paragraph (j) of this AD.

TRFs With Unknown Cycles

(h) If you cannot establish the number of cycles accumulated since new, remove or inspect the TRF within 300 cycles-in-service after the effective date of this AD. The CFM56-7B Engine Shop Manual (ESM) or air carrier's approved continuous airworthiness maintenance program (CAMP) contains information for inspecting the TRF.

(i) You may install a TRF removed in paragraph (h) of this AD after the TRF passes an initial inspection for cracks. The CFM56-7B ESM or CAMP contains information on inspecting the TRF.

Alternative Methods of Compliance

(j) The Manager, Engine Certification Office, has the authority to approve alternative methods of compliance for this

AD if requested using the procedures found in 14 CFR 39.19.

Maintaining Records of the Mandatory Inspections

(k) You have met the requirements of this AD by making the changes to the Engine Shop Manual as specified in paragraph (f) of this AD, and, for air carriers operating under part 121 of the Federal Aviation Regulations (14 CFR part 121), by modifying your continuous airworthiness maintenance plan to reflect those changes. You must maintain records of the mandatory inspections that result from those changes to the ALS according to the regulations governing your operation. You do not need to record each inspection as compliance to this AD. For air carriers operating under part 121, you may use the system established to comply with section 121.369.

Related Information

(l) CFM International Service Bulletin CFM56-7B S/B 72-0579, Revision 1, dated

October 27, 2006, contains information about Eddy Current inspection.

(m) Contact Antonio Cancelliere, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238-7751; fax (781) 238-7199, for more information about this AD.

Issued in Burlington, Massachusetts, on January 23, 2008.

Peter A. White,

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