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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 98-ANE-61-AD; Amendment 39-14243; AD 2005-18-03]

RIN 2120-AA64

Airworthiness Directives; Pratt & Whitney PW2000 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is superseding an existing airworthiness directive (AD) for Pratt & Whitney (PW) PW2000 series turbofan engines. That AD currently requires revisions to the engine manufacturer's time limits section (TLS) to include enhanced inspection of selected critical life-limited parts at each piece-part opportunity. This AD requires modifying the airworthiness limitations section of the manufacturer's manual and an air carrier's approved continuous airworthiness maintenance program to incorporate additional inspection requirements. This AD results from an FAA study of in-service events involving uncontained failures of critical rotating engine parts that indicates the need for mandatory inspections. The mandatory inspections are needed to identify those critical rotating parts with conditions, which if allowed to continue in service, could result in uncontained failures. We are issuing this AD to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

DATES: This AD becomes effective February 28, 2006.

ADDRESSES: You may examine the AD docket at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA.

FOR FURTHER INFORMATION CONTACT: Mark Riley, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7758, fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 with a proposed airworthiness directive (AD). The proposed AD applies to PW PW2000 series turbofan engines. We published the proposed AD in the Federal Register on August 18, 2004 (69 FR 51198). That action proposed to require modifying the TLS of the manufacturer's manual and an air carrier's approved continuous airworthiness maintenance program to incorporate the additional inspection requirements.

Examining the AD Docket

You may examine the AD Docket (including any comments and service information), by appointment, between 8 a.m. and 4:30 p.m., Monday through Friday, except Federal holidays. See ADDRESSES for the location.

Comments

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

Request To Increase the Costs of Compliance

Several commenters express concern about the capital investment required to eddy-current inspect the bolt holes of the HPT stage 2 hub. They suggest the NPRM fails to recognize the substantial up-front investment to get the equipment needed for the eddy current inspection. In addition, one commenter states we should increase the Costs of Compliance because the complex inspections will require several full-time, specially trained operators. We don't agree. The AD doesn't require air carriers to invest in tooling and equipment or hire more personnel to comply with the proposed AD. The AD requires adding the new eddy current inspection to the TLS of the engine manufacturer's manual, and to the air carriers' approved maintenance manuals. Operators can choose to buy equipment to perform the inspection, or they may send the disk to an approved service provider.

Request for an Annual Cost for the Recurring Inspections

One commenter states that the NPRM implies a onetime cost for the inspection, but that it is actually a recurring cost. We don't agree. The Costs of Compliance section of the NPRM states the estimated cost for each inspection on each engine. We used the current shop visit rate for the PW2000 engine to calculate the recurring cost for each engine on a yearly basis. The air carriers can use their own specific costs for their individual PW2000 fleet to calculate their inspection cost.

Question About the Actual Cost for the Inspection

One commenter states that the actual costs for the inspections are significantly different from the costs we specified in the NPRM. We don't agree. We based our cost estimate on actual inspection times provided by the engine manufacturer. We understand that cost estimates can vary depending on the service provider. However, we consider basing our estimate on inspection times provided by the engine manufacturer to be the most accurate approach to estimating the cost to comply with the AD.

Concern About Increased Inventory Levels for Parts Not Reflected in the Cost Estimate

One commenter suggests that quoted turnaround time for the inspection will make air carriers increase inventory levels for the affected parts. The commenter also feels the cost estimate doesn't reflect the cost of the increased inventory. We don't agree. The proposed AD requires adding the new eddy current inspection for the bolt holes in the HPT stage 2 hub to the TLS of the engine manufacturer's manual, and to the air carrier's approved maintenance manuals. The AD doesn't require air carriers to increase spare parts inventory levels or specify the logistics of performing the inspections.

Requests To Allow Operators To Use Equivalent Equipment To Perform the Inspections

Two commenters ask that we allow them to use equipment that is equivalent to the inspection equipment specified by the engine manufacturer. The commenters ask us to allow them to use equipment they already use for other mandated inspections. The commenters suggest that using the single-source equipment specified by the manufacturer will cause an undue burden. We don't agree. We don't intend that this proposed AD specify only one method, or limit the inspection to one method of inspection. This AD requires the operators to revise the ALS to include a mandatory opportunistic inspection. The engine manufacturer developed a validated inspection procedure using specific tooling and equipment that provides an acceptable inspection technique. However, operators may still seek approval from the manufacturer to use alternative tools or methods of inspections other than those specified in the engine manual. Providing flexibility for the engine manufacturers to revise their engine manuals as they fine-tuned their inspection methods and developed alternatives is part of the outcome of working with the Air Transportation Association, operators, and manufacturers.

Request To Extend the Compliance Time of the Final Rule

Two commenters ask that we extend the compliance of the AD to allow an additional six to eight months to procure the eddy current inspection equipment and train personnel. We agree. We changed the effective date from 30 days after publication in the Federal Register to 180 days after publication in the Federal Register.

Request To Provide Special Eddy Current Inspection Instructions

Two commenters ask that we provide clear instructions regarding special handling of the parts and the complexity and sensitivity of the eddy current inspection equipment. We partially agree. We agree that eddy current inspections of aircraft engine parts require special inspection procedures to perform the inspections. However, this AD only requires the operators add eddy current inspection of the bolt holes of HPT stage 2 hub bolt holes to the ALS of the manufacturer's engine manual as a mandatory inspection. The engine manufacturer and the suppliers of the eddy current inspection equipment will provide the special procedures and requirements for the actual inspections.

Removed PW2240 Series and PW2337 Series Engine Models From the Applicability

On January 6, 2005, we removed PW engine models PW2240 and PW2337 from the type certificate data sheet for the PW2000 series engine type certificate. We removed reference to them from paragraph (c) of this AD.

Corrected a Typographical Error

One commenter found a typographical error in paragraph (f)(1)(b). We specified inspection 72-52-00. The inspection should be 72-52-16. We corrected paragraph (f)(1)(b) in the final rule.

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

There are about 938 Pratt & Whitney PW2000 series turbofan engines of the affected design in the worldwide fleet. We estimate that this AD will affect 777 engines installed on airplanes of U.S. registry. We also estimate that it will take about 4 work hours per engine to perform the inspections, and that the average labor rate is \$65 per work hour. Since this is an added inspection requirement, included as part of the normal maintenance cycle, no additional part costs are involved. Based on these figures, we estimate the total additional cost per engine per shop visit to be \$260. Based on the current PW2000 engine shop visit rate, we estimate the total additional cost for the PW2000 fleet to be \$80,860 per year.

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 by sending a request to us at the address listed under ADDRESSES. Include "AD Docket No. 98-ANE-61-AD" in your request.

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 removing Amendment 39-12778, (67 FR 40143, June 4, 2002) and by adding a new airworthiness directive, Amendment 39-14243, 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).

2005-18-03 Pratt & Whitney: Amendment 39-14243. Docket No. 98-ANE-61-AD.

Effective Date

- (a) This AD becomes effective February 28, 2006.

Affected ADs

- (b) This AD supersedes AD 2002-12-06.

Applicability

(c) This AD applies to Pratt & Whitney (PW) PW2037, PW2040, PW2043, PW2143, PW2643, PW2037D, PW2037M, and PW2040D series turbofan engines. These engines are installed on, but not limited to Boeing 757 series and Ilyushin IL-96T series airplanes.

Unsafe Condition

(d) This AD results from the need to require enhanced inspection of selected critical life-limited parts of PW PW2000 series turbofan engines. We are issuing this AD to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

Compliance

(e) You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

(f) Within 30 days after the effective date of this AD, revise the manufacturer's Time Limits section (TLS) of the manufacturer's engine manual, as appropriate for PW PW2037, PW2040, PW2043, PW2143, PW2643, PW2037D, PW2037M, and PW2040D series turbofan engines, and for air carriers revise the approved continuous airworthiness maintenance program, by adding the following:

"MANDATORY INSPECTIONS

(1) Perform inspections of the following parts at each piece-part opportunity in accordance with the instructions provided in PW2000 Engine Manuals 1A6231 and 1B2412:

| Nomenclature | Part No. | EM Manual section | Inspection/check | Subtask |
|--|-----------------|--------------------------|---|--------------------------------------|
| Hub, LPC Assembly | ALL | 72-31-04 | -06. | |
| Disk, HPT 1st Stage | ALL | 72-52-02 | FPI entire disk per 72-52-00, Inspection/Check-02 .. | 72-52-02-230-007 |
| Hub, HPT 2nd Stage | ALL | 72-52-16 | (a) FPI entire hub per 72-52-00, Inspection/Check-02. (b) Eddy-current inspect hub bolt holes per 72-52-16, Inspection/Check-05. | 72-52-16-230-007 72-52-16-200-005 |
| Hub, HPC Front | ALL | 72-35-02 | -05. | |
| Disk, HPC Drum Rotor Assembly (7-15). | ALL | 72-35-03 | -04. | |
| Disk, HPC Drum Rotor Assembly (16-17). | ALL | 72-35-10 | -05. | |
| Disk, HPC 16th Stage | ALL | 72-35-06 | -04. | |
| Disk, HPC 17th Stage | ALL | 72-35-07 | -04. | |
| HPC Turbine Drive Shaft Assembly | ALL | 72-35-08 | -05. | |
| LPC Drive Turbine Shaft | ALL | 72-32-01 | -06. | |
| Hub, Turbine Rear | ALL | 72-53-81 | -06. | |
| Disk, LPT 3rd Stage | ALL | 72-53-31 | -01. | |
| Disk, LPT 4th Stage | ALL | 72-53-41 | -01. | |
| Disk, LPT 5th Stage | ALL | 72-53-51 | -01. | |
| Disk, LPT 6th Stage | ALL | 72-53-61 | -01. | |
| Disk, LPT 7th Stage | ALL | 72-53-71 | -01. | |

(2) For the purposes of these mandatory inspections, piece-part opportunity means:

(i) The part is considered completely disassembled when done in accordance with the disassembly instructions in the manufacturer's engine manual to either part number level listed in the table above, and

(ii) The part has accumulated more than 100 cycles in service since the last piece-part opportunity inspection, provided that the part was not damaged or related to the cause for its removal from the engine."

Alternative Methods of Compliance

(g) You must perform these mandatory inspections using the TLS and the applicable Engine Manual unless you receive approval to use an alternative method of compliance under paragraph (h) of this AD. Section 43.16 of the Federal Aviation Regulations (14 CFR 43.16) may not be used to approve alternative methods of compliance or adjustments to the times in which these inspections must be performed.

(h) 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

(i) You have met the requirements of this AD by using a TLS of the manufacturer's engine manual changed 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 TLS according to the regulations governing your operation. You do not need to record each piece-part inspection as compliance to this AD. For air carriers operating under part 121, you may use either the system established to comply with section 121.369 or use an alternative system that your principal maintenance inspector has accepted if that alternative system:

(1) Includes a method for preserving and retrieving the records of the inspections resulting from this AD; and

(2) Meets the requirements of section 121.369(c); and

(3) Maintains the records either indefinitely or until the work is repeated.

(j) These record keeping requirements apply only to the records used to document the mandatory inspections required as a result of revising the TLS as specified in paragraph (f) of this AD, and do not alter or amend the record keeping requirements for any other AD or regulatory requirement.

Related Information

(k) None.

Issued in Burlington, Massachusetts, on August 24, 2005.

Jay J. Pardee,

Manager, Engine and Propeller Directorate, Aircraft Certification Service.

[FR Doc. 05-17318 Filed 8-31-05; 8:45 am]

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