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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2013-0072; Directorate Identifier 2013-NE-04-AD; Amendment 39-18017; AD 2014-23-01]

RIN 2120-AA64

Airworthiness Directives; Pratt & Whitney Division Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are superseding airworthiness directive (AD) 2013-15-09 for all Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engine models with certain second-stage high-pressure turbine (HPT) air seals installed. AD 2013-15-09 required initial and repetitive inspections for cracks in second-stage HPT air seals. This new AD expands the applicability of AD 2013-15-09 to include additional part numbers (P/Ns), requires removal of the mating hardware if the second-stage HPT air seal is found with a through-crack, and adds a mandatory terminating action. This AD was prompted by reports of cracking in the original location on two additional P/Ns and reports of through-cracks in a new location in the second-stage HPT air seal. We are issuing this AD to prevent failure of the second-stage HPT air seal, which could lead to uncontained engine failure and damage to the airplane.

DATES: This AD is effective December 26, 2014.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of September 17, 2013 (78 FR 49111, August 13, 2013).

ADDRESSES: For service information identified in this AD, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06108; phone: (860) 565-8770; fax: (860) 565-4503. 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-2013-0072; 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: Jo-Ann Theriault, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7105; fax: 781-238-7199; email: jo-ann.theriault@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2013-15-09, Amendment 39-17525 (78 FR 49111, August 13, 2013), ("AD 2013-15-09"). AD 2013-15-09 applied to all PW PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engine models with certain second-stage HPT air seals installed. The NPRM published in the Federal Register on June 5, 2014 (79 FR 32500). The NPRM was prompted by reports of through-cracks in a different location on a second-stage HPT air seal, and reports of cracking in the original location in two additional second-stage HPT air seals. Pratt & Whitney developed a redesigned second-stage HPT air seal that corrects the cracking condition in both locations.

The NPRM proposed to require initial and repetitive inspections for cracks in an expanded population of second-stage HPT air seals, and removal of air seals that fail inspection. The NPRM also proposed to require removal of the mating hardware if the second-stage HPT air seal is found with a through-crack, and a mandatory terminating action to the repetitive inspection requirements. We are issuing this AD to correct the unsafe condition on these products.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM (79 FR 32500, June 5, 2014) and the FAA's response to each comment.

Request To Correct P/N

All Nippon Airways (ANA), Japan Airlines, United Airlines (UA), and PW requested that we correct the reference in the NPRM (79 FR 32500, June 5, 2014) to the P/N for the second-stage HPT air seal from 50L041 to 54L041.

We agree. We corrected the reference to the second-stage HPT air seal P/N in this AD.

Request To Include Air Seal Detail P/N

UA requested that we include the P/N for the air seal detail in this AD. UA has observed instances where the air seal detail, P/N 54L043, is shown as the P/N for the second-stage HPT air seal.

We disagree. The second-stage HPT air seal is identified as P/N 54L041. It includes air seal detail, P/N 54L043. This AD applies to the entire second-stage HPT air seal, including all of its details. We did not change this AD.

Request To Change Compliance Time

ANA, PW, and UA requested that the compliance interval in paragraph (e)(2)(i) of the NPRM (79 FR 32500, June 5, 2014) be increased from 100 cycles-in-service (CIS) to 1,000 CIS. The commenters indicated that this AD should be consistent with AD 2013-15-09, which specifies that the eddy current inspection (ECI) or initial fluorescent-penetrant inspection (FPI) should be performed within 1,000 cycles after the effective date of the AD.

We agree. Performing an ECI or initial FPI within 1,000 cycles of September 17, 2013, the effective date of AD 2013-15-09, maintains an acceptable level of safety. We changed paragraph (e)(2)(i) of this AD to read: "Perform an initial eddy current inspection (ECI) for cracks within 1,000 cycles-in-service after September 17, 2013, or before further flight, whichever occurs later."

Request To Update Service Information

ANA and PW asked that we update the reference to the service information from PW Service Bulletin (SB) No. PW4G-112-A72-332, Revision 2, dated April 9, 2014, to PW SB No. PW4G-112-A72-332, Revision 3, dated June 25, 2014.

We agree. We updated the service information reference in the Related Information paragraph in this AD to reflect the most current revision of SB No. PW4G-112-A72-332.

Request To Include First-Stage HPT Air Seals

ANA requested that first-stage HPT air seals be added to the list of parts that must be removed in paragraph (e)(1)(iii) of this AD. ANA indicated that first-stage HPT air seals are included in the Table of Parts in PW SB No. PW4G-112-72-332. This SB lists parts that must be removed from service if a circumferential crack of any length is found propagated through the web of the forward flange outer diameter of the second-stage HPT air seal.

We disagree. If a crack is found in the second-stage HPT air seal, then the life of mating hardware is adversely affected to the point that the mating hardware must be removed. The first-stage HPT air seal is not a life-limited part like the mating hardware we require to be removed if a crack is found. The first-stage HPT air seal, therefore, may be retained unless it is found damaged in the course of removing the rest of the mating hardware. We did not change this AD.

Request To Develop Tracking Process for Parts Being Removed From Service

UA requested that this AD consider record-keeping for the results of the FPI for second-stage HPT air seals that are being removed from service. UA commented that inspecting parts being removed from service is not common practice and that the burden of showing compliance to this AD rests with the operator and appropriate paper records need to be maintained. While the commenter did not request a specific change to this AD, we regard the comment as a reference to the lack of a standard industry practice for inspecting parts that are being removed from service. This refers to the second-stage HPT air seals, P/N 54L041, which are subject to an FPI after removal from service.

We partially agree. We agree that inspecting parts removed from service for their impact on other parts is not common practice. However, operators must maintain adequate records of the maintenance they perform to show that the product has been properly maintained and is eligible for return to service as airworthy. We disagree that we need to impose additional record keeping requirements on operators to ensure that they comply with their obligation to perform maintenance properly. It is up to each operator to establish its own record-keeping process. We did not change this AD.

Request To Develop Reporting and Tracking Processes for Spare Parts

UA indicated the need for a procedure for determining the serviceability of spare parts, i.e., first-stage HPT hubs, second-stage HPT hubs, and second-stage HPT blade retaining plates, that may have been mated previously to a cracked second-stage HPT air seal. UA noted that the continued serviceability of these spare parts depends on the result of the inspection of the second-stage HPT air seal that the parts were mated to while in service. UA would like procedures established to identify, tag, and mark these spare parts. UA noted that such procedures are not standardized within industry. UA also suggested that PW SB No. PW4G-112-A72-330 be revised to add some kind of marking to notate serviceable spare parts.

We partially agree. We do not find the need to mandate a procedure to track these spare parts. Each operator should establish its own process for tracking its spare parts. We did not change this AD.

We agree, however, that mating hardware previously installed with cracked second-stage HPT air seals is not eligible for installation as airworthy. We changed this AD to establish an installation prohibition to clarify that life-limited parts previously mated to a cracked second-stage HPT air seal, P/N 54L041, cannot be reinstalled. We added Installation Prohibition paragraph (f)(2) to this AD, which states: "After the effective date of this AD, do not install any spare first-stage HPT hub, second-stage HPT hub, or second-stage HPT blade retaining plate that was previously mated in service to a second-stage HPT air seal, P/N 54L041, that was found to have a through-crack in the front forward fillet radius, into any engine."

Request To Clarify ECI Requirement

ANA asked that we clarify the requirement for an on-wing ECI of second-stage HPT air seals, P/Ns 50L960 and 50L976. The NPRM (79 FR 32500, June 5, 2014) proposed an on-wing ECI for second-stage HPT air seal, P/N 54L041, only.

We disagree. We are not requiring an ECI for second-stage HPT air seals, P/Ns 50L960 and 50L976, because the ECI probe is not compatible with the geometry of those P/Ns. Also, removal of these parts at the next piece-part exposure without interim inspections maintains an acceptable level of safety. We did not change this AD.

Agreement With This AD

The Boeing Company expressed support for the NPRM (79 FR 32500, June 5, 2014) as proposed.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously. We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

Costs of Compliance

We estimate that this AD affects 116 engines installed on airplanes of U.S. registry. We also estimate that it will take about 5 hours to perform the inspection required by this AD. The average labor rate is \$85 per hour. We estimate that two engines will also require removal of the first-stage HPT hub, second-stage HPT hub, and second-stage HPT blade retaining plate. We estimate that parts will cost about \$698,920 per engine. Based on these figures, we estimate the total cost of this AD on U.S. operators to be \$23,420,020.

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) 2013-15-09, Amendment 39-17525 (78 FR 49111, August 13, 2013), and adding the following new AD:



2014-23-01 Pratt & Whitney Division: Amendment 39-18017; Docket No. FAA-2013-0072; Directorate Identifier 2013-NE-04-AD.

(a) Effective Date

This AD is effective December 26, 2014.

(b) Affected ADs

This AD supersedes AD 2013-15-09, Amendment 39-17525 (78 FR 49111, August 13, 2013).

(c) Applicability

This AD applies to all Pratt & Whitney Division (PW) PW4074, PW4074D, PW4077, PW4077D, PW4084D, PW4090, and PW4090-3 turbofan engine models with second-stage high-pressure turbine (HPT) air seal, part number (P/N) 54L041, 50L960, or 50L976, installed.

(d) Unsafe Condition

This AD was prompted by additional reports of cracking in the second-stage HPT air seal. We are issuing this AD to prevent failure of the second-stage HPT air seal, which could lead to uncontained engine failure and damage to the airplane.

(e) Compliance

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

(1) At the next piece-part exposure after the effective date of this AD, do the following:

(i) Remove from service second-stage HPT air seals, P/Ns 50L960, 50L976, and 54L041.

(ii) Perform a fluorescent-penetrant inspection (FPI) of the second-stage HPT air seal, P/N 54L041, for a through-crack in the front forward fillet radius.

(iii) If a through-crack in the front forward fillet radius is found, remove the first-stage HPT hub, second-stage HPT hub, and second-stage HPT blade retaining plate from service. Do not reinstall the first-stage HPT hub, second-stage HPT hub, or second-stage HPT blade retaining plate into any engine.

(2) For engines with second-stage HPT air seals, P/N 54L041, installed, perform initial and repetitive inspections for cracks on-wing until the part is removed from the engine as follows:

(i) Perform an initial eddy current inspection (ECI) for cracks within 1,000 cycles-in-service after September 17, 2013, or before further flight, whichever occurs later.

(ii) Thereafter, repeat the ECI every 1,200 cycles since last inspection, or fewer, depending on the results of the inspection.

(iii) Use section 4.0 of the appendix of PW Alert Service Bulletin (ASB) No. PW4G-112-A72-330, Revision 2, dated July 11, 2013, to perform the inspection and use paragraph 8 of the Accomplishment Instructions of PW ASB No. PW4G-112-A72-330, Revision 2, dated July 11, 2013, to disposition the results of the inspection.

(f) Installation Prohibition

(1) After the effective date of this AD, do not install any second-stage HPT air seal, P/N 54L041, P/N 50L960, or P/N 50L976, into any engine.

(2) After the effective date of this AD, do not install any spare first-stage HPT hub, second-stage HPT hub, or second-stage HPT blade retaining plate that was previously mated in service to a second-stage HPT air seal, P/N 54L041, that was found to have a through-crack in the front forward fillet radius, into any engine.

(g) Definitions

For the purpose of this AD:

(1) Piece-part exposure is when the second-stage HPT air seal is removed from the engine and fully disassembled.

(2) A through-crack is a crack that has propagated through the thickness of the part and can be seen on both the inner diameter and outer diameter of the front forward fillet radius.

(h) Credit for Previous Actions

(1) If you performed an ECI of the second-stage HPT air seal before the effective date of this AD, using PW ASB No. PW4G-112-A72-330, Revision 1, dated February 14, 2013, or an earlier version, you have met the requirements of paragraph (e)(2)(i) of this AD.

(2) If you performed an in-shop FPI of the second-stage HPT air seal before the effective date of this AD, you have met the requirements of paragraph (e)(2)(i) of this AD.

(i) Alternative Methods of Compliance (AMOCs)

The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request. You may email your request to: ANE-AD-AMOC@faa.gov.

(j) Related Information

(1) For more information about this AD, contact Jo-Ann Theriault, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7105; fax: 781-238-7199; email: jo-ann.theriault@faa.gov.

(2) PW Service Bulletin (SB) No. PW4G-112-72-332, Revision 3, dated June 25, 2014, which is not incorporated by reference in this AD, can be obtained from PW, using the contact information in paragraph (k)(3) of this AD. This SB provides guidance on how to replace the second-stage HPT air seal with an air seal that is more resistant to low cycle fatigue cracks.

(k) 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.

(3) The following service information was approved for IBR on September 17, 2013 (78 FR 49111, August 13, 2013).

(i) Pratt & Whitney (PW) Alert Service Bulletin No. PW4G-112-A72-330, Revision 2, dated July 11, 2013.

(ii) Reserved.

(4) For PW service information identified in this AD, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06108; phone: 860-565-8770; fax: 860-565-4503.

(5) You may view this service information at 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.

(6) 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 October 30, 2014.
Colleen M. D'Alessandro,
Assistant Directorate Manager, Engine & Propeller Directorate,
Aircraft Certification Service.