



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2015-4474; Directorate Identifier 2015-NE-34-AD; Amendment 39-18485; AD 2016-08-09]**

**RIN 2120-AA64**

**Airworthiness Directives; Pratt & Whitney Division Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** We are adopting a new airworthiness directive (AD) for certain Pratt & Whitney Division (PW) PW4000-94 inch and PW4000-100 inch model turbofan engines. This AD was prompted by a report of a crack found in the high-pressure compressor (HPC) 10<sup>th</sup> stage disk. This AD requires performing an ultrasonic inspection (USI) or an eddy current inspection (ECI) of the HPC 10<sup>th</sup> stage disk. We are issuing this AD to prevent failure of the HPC 10<sup>th</sup> stage disk, uncontained disk release, damage to the engine, and damage to the airplane.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** For service information identified in this final rule, 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, 1200 District Avenue, Burlington, MA. For information on the availability of

this material at the FAA, call (781) 238-7125. It is also available on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2015-4474.

### **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-2015-4474; 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:** Katheryn Malatek, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7747; fax: 781-238-7199; email: [katheryn.malatek@faa.gov](mailto:katheryn.malatek@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain PW PW4000-94 inch turbofan engines with HPC 10<sup>th</sup> stage disk, part number (P/N) 51H710 or 53H976-06, installed and certain PW4000-100 inch turbofan engines with HPC 10<sup>th</sup> stage disk, P/N 53H976-06, installed. The NPRM published in the Federal Register on December 9, 2015 (80 FR 76400). The NPRM was prompted by a report of a crack found in the HPC 10<sup>th</sup> stage disk. The root cause of the crack was a manual polishing procedure, previously used during manufacture, that caused surface scratches on the disk. The NPRM proposed to require a USI or ECI of the HPC 10<sup>th</sup> stage disk. We are issuing this AD to prevent failure of the

HPC 10<sup>th</sup> stage disk, which could lead to an uncontained disk release, 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 NPRM (80 FR 76400, December 9, 2015) and the FAA's response to each comment.

### **Support for the NPRM**

The Boeing Company and United Airlines expressed support for the NPRM (80 FR 76400, December 9, 2015).

### **Request to Use ECI as Follow-on to USI**

American Airlines requested that we revise Compliance paragraph (e) of this AD to add a statement that the ECI can be used to confirm the presence of a crack if a USI is initially performed and the ECI is the final authority on whether or not a crack is present on the disk.

We agree. We revised Compliance paragraph (e) of this AD to allow a follow-on ECI.

### **Request to Allow Disk Replacement Repairs**

Atlas Air requested that we revise the Compliance paragraph (e) of this AD to allow use of disk replacement repairs per the PW PW4000-94/100 Clean, Inspect, Repair (CIR) Manual Part No. 51A357, Section 72-35-10, Repair 07.

We disagree. This AD requires removal of the 10<sup>th</sup> stage disk if it fails inspection. There are no FAA-approved repairs allowed on the 10<sup>th</sup> stage disk. The previously approved PW4000-94/100 CIR Manual Part No. 51A357, Section 72-35-07, Repair 04 to the drum rotor, replaces the disk, resulting in a part eligible for installation. We did not change this AD.

### **Request to Allow ECI at Overhaul**

Air India Limited requested that Compliance paragraph (e) of this AD allow an ECI when the HPC is “overhauled” rather than when it is “removed from the engine.” Air India Limited indicated that “overhauled” is clearer than “removed from the engine”.

We disagree. The intent of this AD is to inspect the 10<sup>th</sup> stage disk at exposure. The phrase, “Whenever the HPC front drum rotor is removed from the engine...” clearly describes the appropriate level of exposure for performing the ECI. We did not change this AD.

### **Request to Waive Repeat USI**

Air India Limited requested that we revise Compliance paragraph (e) of this AD to indicate that a repeat USI should be waived to reduce the maintenance burden if the low-pressure turbine (LPT) is removed in less than 100 hours since the last USI.

We disagree. Our safety risk assessment assumed that a USI is performed whenever the high-pressure turbine (HPT) or LPT is removed from the engine and an ECI is performed whenever the HPC front drum rotor disk assembly is removed from the engine. We determined the inspection interval in the Compliance paragraph (e) of this AD provides an acceptable level of safety. We did not change this AD.

### **Request to Remove Compliance Statement**

FedEx requested that we revise Compliance paragraph (e) of this AD to remove the statement, “Comply with this AD within the compliance times specified, unless already done.” FedEx stated that there are no compliance times specified and the compliance requires a repetitive inspection, so the statement does not apply.

We disagree. The statement “...unless already done” allows an operator who has performed an initial inspection before the effective date of the AD, but has not yet returned the part to service, to take credit for that action. While there is no calendar or

cyclic time given, the requirements of this AD must be met when the HPT, LPT, or HPC front drum rotor disk assembly is removed from the engine. 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 with the changes described previously. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM (80 FR 76400, December 9, 2015) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM (80 FR 76400, December 9, 2015).

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

### **Related Service Information under 1 CFR part 51**

We reviewed PW Alert Service Bulletin (ASB) PW4G-100-A72-255, dated August 31, 2015 and PW ASB PW4ENG A72-833, dated August 20, 2015. The ASBs provide lists of affected HPC disks and describe procedures for USI and ECI of the HPC 10<sup>th</sup> stage disk. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

### **Costs of Compliance**

We estimate that this AD affects 763 engines installed on airplanes of U.S. registry. We also estimate that it would take about 12 hours per engine to do the inspection. The average labor rate is \$85 per hour. Based on these figures, we estimate the cost of this AD on U.S. operators to be \$778,260.

### **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**

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 adding the following new airworthiness directive (AD):

2016-08-09 **Pratt & Whitney Division**: Amendment 39-18485; FAA-2015-4474; Directorate Identifier 2015-NE-34-AD.

#### **(a) Effective Date**

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

#### **(b) Affected ADs**

None.

#### **(c) Applicability**

(1) This AD applies to all Pratt & Whitney Division (PW) PW4050, PW4052, PW4056, PW4060, PW4060A, PW4060C, PW4062, PW4062A, PW4152, PW4156, PW4156A, PW4158, PW4160, PW4460, PW4462, and PW4650 turbofan engines, including models with a “-3” suffix, with one of the following installed:

(i) High-pressure compressor (HPC) 10<sup>th</sup> stage disk, part number (P/N) 51H710, with a serial number (S/N) listed in Table 1 of PW Alert Service Bulletin (ASB) PW4ENG A72-833, dated August 20, 2015; or

(ii) HPC 10<sup>th</sup> stage disk, P/N 53H976-06, with an S/N listed in Table 2 of PW ASB PW4ENG A72-833, dated August 20, 2015.

(2) This AD also applies to all PW PW4164, PW4168, PW4168A, PW4164C, PW4164C/B, PW4170, PW4168A-1D, PW4168-1D, PW4164-1D, PW4164C-1D, and PW4164C/B-1D turbofan engines with an HPC 10<sup>th</sup> stage disk, P/N 53H976-06, with an S/N listed Table 1 of PW ASB PW4G-100-A72-255, dated August 31, 2015, installed.

**(d) Unsafe Condition**

This AD was prompted by a report of a crack found in the HPC 10<sup>th</sup> stage disk. We are issuing this AD to prevent failure of the HPC 10<sup>th</sup> stage disk, uncontained disk release, damage to the engine, and damage to the airplane.

**(e) Compliance**

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

(1) After the effective date of this AD, whenever the high-pressure turbine (HPT) or low-pressure turbine (LPT) is removed from the engine, perform an ultrasonic inspection (USI) of the HPC 10<sup>th</sup> stage disk for cracks. If the HPC 10<sup>th</sup> stage disk fails the USI, perform a follow-on eddy current inspection (ECI) or remove the disk from service and replace with a part eligible for installation.

(2) After the effective date of this AD, whenever the HPC front drum rotor disk assembly is removed from the engine, perform an ECI of the HPC 10<sup>th</sup> stage disk for cracks. Remove from service any HPC 10<sup>th</sup> stage disk that fails inspection and replace with a part eligible for installation. A USI as required by paragraph (e)(1) of this AD is not required if an ECI is performed.

**(f) 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.

**(g) Related Information**

For more information about this AD, contact Katheryn Malatek, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7747; fax: 781-238-7199; email: katheryn.malatek@faa.gov.

**(h) 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) Pratt & Whitney (PW) Alert Service Bulletin (ASB) PW4G-100-A72-255, dated August 31, 2015.

(ii) PW ASB PW4ENG A72-833, dated August 20, 2015.

(3) 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.

(4) You may view this service information at FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

(5) You may view this service information that is incorporated by reference 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 April 7, 2016.

Colleen M. D'Alessandro,  
Manager, Engine & Propeller Directorate,  
Aircraft Certification Service.

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