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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2018-0624; Product Identifier 2013-NE-24-AD; Amendment 39-19583; AD 2019-05-01]**

**RIN 2120-AA64**

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

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

**ACTION:** Final rule.

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**SUMMARY:** We are superseding Airworthiness Directive (AD) 2017-11-06, for all Pratt & Whitney (PW) PW2037, PW2037D, PW2037M, PW2040, PW2040D, PW2043, PW2143, PW2643, and F117-PW-100 turbofan engine models. AD 2017-11-06 required initial and repetitive on-wing eddy current inspections (ECIs) of affected engines with certain diffuser and high-pressure turbine (HPT) cases installed. AD 2017-11-06 also required a fluorescent-penetrant inspection (FPI) of the diffuser case rear flange and the HPT case front flange. This AD requires an on-wing ECI of all diffuser case M-flange replacement repairs. This AD was prompted by a rupture of the diffuser-to-HPT case flange. We are issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective April 16, 2019.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of April 16, 2019.

The Director of the Federal Register approved the incorporation by reference of a certain other publication listed in this AD as of July 18, 2017 (82 FR 26979, June 13, 2017).

**ADDRESSES:** For service information identified in this final rule, contact Pratt & Whitney, 400 Main St., East Hartford, CT 06118; phone: 860-565-0140; fax: 860-565-5442; email: help24@pw.utc.com; internet: <http://fleetcare.pw.utc.com>. You may view this service information at the FAA, Engine & Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759. It is also available on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2018-0624.

## **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-2018-0624; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received and other information. The address for Docket Operations (phone: 800-647-5527) is Document Operations, 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:** Kevin M. Clark, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7199; email: [kevin.m.clark@faa.gov](mailto:kevin.m.clark@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2017-11-06, Amendment 39-18905 (82 FR 26979, June 13, 2017), (“AD 2017-11-06”). AD 2017-11-06 applied to all Pratt & Whitney (PW) PW2037, PW2037D, PW2037M, PW2040, PW2040D, PW2043, PW2143, PW2643, and F117-PW-100 turbofan engine models. The NPRM published in the Federal Register on October 10, 2018 (83 FR 50860). The NPRM was prompted by a rupture of the diffuser-to-HPT case flange. The NPRM proposed to require an on-wing ECI of all diffuser case M-flange replacement repairs. We are issuing this AD to address 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 and the FAA's response to each comment.

### **Request To Allow FPI for Small Crack Indications**

United Airlines requested that we allow FPI for small indication conditions as shown in Table 3 of Pratt & Whitney Alert Service Bulletin (ASB) No. PW2000 A72-765, Revision No. 4, dated January 25, 2018.

We partially agree. While we agree that FPI may be an acceptable method to detect these smaller indication cracks, we disagree with requiring FPI because we have not reviewed the desired FPI method or were not informed how well FPI indicates these small cracks versus ECI. We will consider requests for Alternative Methods of Compliance (AMOCs) for FPI. We did not change this AD.

### **Request To Focus on Wrought Diffuser Case M-Flanges**

Delta Air Lines (Delta) requested that we update the Summary and the Required Actions paragraphs of this AD to include “that result in a wrought diffuser case M-flange” language to focus on repairs that resulted in a wrought material.

We disagree. We disagree with focusing only on wrought repairs because all known diffuser case M-flange replacement repairs use wrought material. We will consider further rulemaking action if future diffuser case M-flange replacement repairs use another material. We did not change this AD.

## **Request To Specify Wrought M-Flange Repairs Do Not Change Part Number**

Delta requested that we update the Discussion paragraph to include “by part number” in the statement: “repaired wrought flanges cannot be distinguished from other wrought flanges or from non-repaired flanges on diffuser cases installed on the affected engines.” While the M-flange replacement repair displays a weld line around the circumference of the diffuser case, Delta reasoned that wrought M-flange repairs introduced by the diffuser case M-flange replacement repair do not change the part number (P/N) and, therefore, pose challenges for tracking the repaired diffuser cases.

We partially agree. We agree that the lack of a P/N for the wrought M-flange repair poses challenges for tracking the engines with an M-flange replacement repair. We disagree with modifying the Discussion paragraph because this discussion is not included in this final rule.

## **Request To Update the Service Information Description**

Delta requested that we update the service information description in the Related Service Information Under 1 CFR part 51 paragraph to “The [Pratt & Whitney] ASB describes procedures for repetitive ECIs of the diffuser case M-flange.” Delta reasoned that the ASB also provides procedures for off-wing ECIs and that the inspection is for the diffuser case M-flange, and not the diffuser case assembly.

We agree. We updated the service information description in the Related Service Information under 1 CFR part 51 paragraph in this AD.

## **Request To Revise Previous Credit Paragraph**

Delta requested that we update the service information in the Credit for Previous Actions paragraph of this AD to include “Pratt & Whitney Service Bulletin (SB) No. PW2000 72-763, Revision No. 1, dated August 30, 2013, or an earlier version.” and “Pratt & Whitney ASB No. PW2000 A72-765, Revision No. 4, dated January 25, 2018, or an earlier version.” Delta reasoned that the language of the NPRM would void inspections completed using the most recent service information.

We disagree. Inspections already completed using the version of the service information specified in this AD are considered “already done” per paragraph (f) of this AD. We did not change this AD.

## **Support for the AD**

The Air Line Pilots Association International and FedEx Express expressed support for the NPRM as written. The Boeing Company reviewed the NPRM and had no comments.

## **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 and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

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 Pratt & Whitney SB No. PW2000 72-763, Revision No. 1, dated August 30, 2013. The SB describes procedures for a one-time ECI inspection of the engine diffuser case. We also reviewed Pratt & Whitney ASB No. PW2000 A72-765, Revision No. 4, dated January 25, 2018. The ASB describes procedures for repetitive ECIs of the diffuser case M-flange. 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 910 engines installed on airplanes of U.S. registry. Based on the diffuser case identified in paragraph (g)(1) of this AD, we estimate that 339 engines will be required to perform the on-wing ECI inspection. We estimate that all 910 engines will be required to perform the FPI inspection.

We estimate the following costs to comply with this AD:

#### Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
On-wing/module ECI Inspection	8 work-hours × \$85 per hour = \$680	\$0	\$680	\$230,520 per inspection cycle.
FPI Inspection	3 work-hours × \$85 per hour = \$255	20	275 per inspection cycle	250,250 per inspection cycle.

### 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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

### 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, 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) 2017-11-06, Amendment 39-18905 (82 FR 26979, June 13, 2017), and adding the following new AD:



**2019-05-01 Pratt & Whitney Division:** Amendment 39-19583; Docket No. FAA-2018-0624; Product Identifier 2013-NE-24-AD.

**(a) Effective Date**

This AD is effective April 16, 2019.

**(b) Affected ADs**

This AD replaces AD 2017-11-06, Amendment 39-18905 (82 FR 26979, June 13, 2017).

**(c) Applicability**

This AD applies to all Pratt & Whitney (PW) PW2037, PW2037D, PW2037M, PW2040, PW2040D, PW2043, PW2143, PW2643, and F117-PW-100 turbofan engines.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7200, Turbine/Turboprop Engine.

**(e) Unsafe Condition**

This AD was prompted by a rupture of the diffuser-to-high-pressure turbine (HPT) case flange. We are issuing this AD to prevent failure of the diffuser-to-HPT case flange. The unsafe condition, if not addressed, could result in uncontained diffuser-to-HPT case flange release, damage to the engine, and damage to the airplane.

**(f) Compliance**

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

**(g) Required Actions**

(1) For diffuser case, part number (P/N) 1B7461, serial numbers (S/Ns) DGGUAK1306 and DGGUAK1308, and HPT case, P/N 1B2440, S/N DKLBCS1032:

(i) Within 100 flight cycles after the effective date of this AD, perform an eddy current inspection (ECI) of the diffuser case and the HPT case M-flange in accordance with PW Service Bulletin (SB) No. PW2000 72-763, Revision No. 1, dated August 30, 2013.

(ii) [Reserved]

(2) For all diffuser and HPT cases, at the next piece-part opportunity after the effective date of this AD and every piece-part opportunity thereafter, perform a high sensitivity fluorescent-penetrant inspection (FPI) of the entire diffuser case rear flange (M-flange) and bolt holes, and the entire HPT case forward flange (M-flange) and bolt holes.

(3) For all diffuser cases installed on any affected engine model except for F117-PW-100 turbofan engines, that have not incorporated PW SB PW2000-72-364, have incorporated PW SB PW2000-72-700, or have had an M-flange replacement, perform initial and repetitive ECIs of the diffuser case M-flange as follows:

(i) Perform an initial ECI in accordance with the “Last Shop Visit Activity” column and before exceeding the maximum cycles since the last shop visit activity in the “Initial Inspection” column of Table 1 of PW Alert Service Bulletin (ASB) No. PW2000 A72-765, Revision No. 4, dated January 25, 2018, or within 1,000 cycles from the effective date of this AD, whichever occurs later.

(ii) Evaluate the inspection results and perform re-inspections as necessary in accordance with Accomplishment Instructions, “For Engines Installed on the Aircraft,” paragraph 5, or the Accomplishment Instructions, “For Engines Removed from the Aircraft,” paragraph 4, of PW ASB No. PW2000 A72-765, Revision No. 4, dated January 25, 2018, as applicable. If given a cycle range, perform the subsequent inspections before exceeding the maximum number of cycles.

(iii) Inspect the diffuser case M-flange using, as applicable, either the Accomplishment Instructions, “For Engines Installed on the Aircraft,” paragraphs 3.I. through 3.J., or the Accomplishment Instructions, “For Engines Removed from the Aircraft,” paragraphs 3.D. through 3.E., of PW ASB No. PW2000 A72-765, Revision No. 4, dated January 25, 2018.

#### **(h) Definition**

For the purpose of this AD, a “piece-part opportunity” is defined as when the part is completely disassembled.

#### **(i) Credit for Previous Actions**

(1) You may take credit for the diffuser case and HPT case inspections required by paragraphs (g)(1) and (3) of this AD if you performed:

(i) An ECI of the diffuser case and the HPT case M-flange using the Accomplishment Instructions of PW SB No. PW2000 72-763, Original Issue, dated March 22, 2013, or

(ii) a high sensitivity FPI of the diffuser case and the HPT case at a piece-part opportunity after January 1, 2010.

(2) You may take credit for only the diffuser case inspections required by paragraphs (g)(1) and (3) of this AD if you performed an ECI of the diffuser case M-flange using the Accomplishment Instructions of PW ASB No. PW2000 A72-765, Revision No. 3, dated December 19, 2017, or an earlier version.

#### **(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (k) of this AD. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) AMOCs approved for AD 2017-11-06 (82 FR 26979, June 13, 2017) are approved as AMOCs for the corresponding provisions of this AD.

## **(k) Related Information**

For more information about this AD, contact Kevin M. Clark, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7199; email: kevin.m.clark@faa.gov.

## **(l) 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 April 16, 2019.

(i) Pratt & Whitney (PW) Alert Service Bulletin No. PW2000 A72-765, Revision No. 4, dated January 25, 2018.

(ii) [Reserved]

(4) The following service information was approved for IBR on July 18, 2017.

(i) PW Service Bulletin No. PW2000 72-763, Revision No. 1, dated August 30, 2013.

(ii) [Reserved]

(5) For PW service information identified in this AD, contact Pratt & Whitney, 400 Main St., East Hartford, CT 06118; phone: 860-565-0140; fax: 860-565-5442; email: help24@pw.utc.com; internet: <http://fleetcare.pw.utc.com>.

(6) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

(7) 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 March 6, 2019.

Karen M. Grant,  
Acting Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.