

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2018-0404; Product Identifier 2018-NE-15-AD; Amendment 39-19468; AD 2018-21-10]**

**RIN 2120-AA64**

#### **Airworthiness Directives; International Aero Engines (IAE) Turbofan Engines**

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

**ACTION:** Final rule.

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**SUMMARY:** We are adopting a new airworthiness directive (AD) for all International Aero Engines (IAE) PW1133G-JM, PW1133GA-JM, PW1130G-JM, PW1127G-JM, PW1127GA-JM, PW1127G1-JM, PW1124G-JM, PW1124G1-JM, and PW1122G-JM turbofan engines. This AD was prompted by reports of in-flight engine shutdowns and aborted take-offs as the result of certain parts affecting the durability of the rear high-pressure compressor (HPC) rotor hub knife edge seal. This AD requires replacing the diffuser case air seal assembly, the high-pressure turbine (HPT) 2nd-stage vane assembly, and the HPT 2nd-stage borescope stator vane assembly with parts eligible for installation. We are issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective December 12, 2018.

**ADDRESSES:** For service information identified in this final rule, contact International Aero Engines, 400 Main Street, East Hartford, CT, 06118; phone: 800-565-0140; email: help24@pw.utc.com; internet: <http://fleetcare.pw.utc.com>. You may view this service information at the 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. It is also available on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2018-0404.

#### **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-2018-0404; 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 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.

## **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 all IAE PW1133G-JM, PW1133GA-JM, PW1130G-JM, PW1127G-JM, PW1127GA-JM, PW1127G1-JM, PW1124G-JM, PW1124G1-JM, and PW1122G-JM turbofan engines. The NPRM published in the Federal Register on June 11, 2018 (83 FR 26887). The NPRM was prompted by reports of in-flight engine shutdowns and aborted take-offs as the result of certain parts affecting the durability of the rear HPC rotor hub knife edge seal. The NPRM proposed to require replacing the diffuser case air seal assembly, the HPT 2nd-stage vane assembly, and the HPT 2nd-stage borescope stator vane assembly with parts eligible for installation. 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 final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

### **Request To Change Compliance Time**

Air Line Pilots Association, International (ALPA) requested that paragraph (g) of this AD be changed to indicate by which cycle, hour, or date the “engine shop visit” and associated actions must be accomplished. ALPA stated that “at the next engine shop visit” is not prescriptive enough to ensure that affected parts are identified and removed from service within a timely manner.

We disagree. We determined that removal of the affected parts at the next engine shop visit resolves the unsafe condition within our risk guidelines. Therefore, we did not change this AD.

### **Request To Clarify Applicability**

ALPA requested that we clarify whether engines repaired per paragraph (g) of this AD would be considered “affected engines” as described in AD 2018-04-01 (83 FR 6791, February 15, 2018), and what operational restrictions, if any, would exist on the engines repaired.

We partially agree. We agree that engines repaired per paragraph (g) of this AD are not “affected engines” as described in AD 2018-04-01. We disagree that adding clarification in paragraph (g) of this AD is necessary, because we released a Global Alternative Method of Compliance (AMOC) to paragraph (h) of AD 2018-04-01 (83 FR 6791, February 15, 2018). The Global AMOC removed the operational restrictions on an affected engine if Pratt & Whitney (PW) Alert Service Bulletin (ASB) PW1000G-C-72-00-0099-00A-930A-D, Issue No. 002, dated March 15, 2018 procedures were performed and the affected parts removed. Therefore, we did not change the AD.

### **Request To Clarify Affected Engine Serial Numbers (ESNs)**

European Aviation Safety Agency (EASA) requested that we explain why paragraph (c) of this AD is limited to affected engines with ESNs P770450 to P770614, inclusive. EASA noted that PW

ASB PW1000G-C-72-00-0099-00A-930A-D, Issue No. 002, dated March 15, 2018 identifies a substantially larger population, P770101 to P770614 inclusive, of affected engines.

We limited this AD to ESNs P770450 to P770614 because the affected part numbers are not known to be installed in earlier engine models. Therefore, we did not change this AD.

### **Request To Limit Applicability**

All Nippon Airways requested that we limit the paragraph (c) of this AD to affected engines with diffuser case air seal assembly, part number (P/N) 30G4993-01, the HPT 2nd-stage vane assembly, P/N 30G7572, and HPT 2nd-stage borescope stator vane assembly, P/N 30G7672, installed.

We agree. We revised the paragraph (c) of this AD to list only those engines with ESNs P770450 through P770614 with diffuser case air seal assembly, P/N 30G4993-01; HPT 2nd-stage vane assembly, P/N 30G7572; and HPT 2nd-stage borescope stator vane assembly, P/N 30G7672, installed.

### **Request To Clarify Method of Compliance**

Hawaiian Airlines stated engines that have incorporated PW ASB PW1000G-C-72-00-0099-00A-930A-D, Issue No. 002, dated March 15, 2018, or later revisions, should be shown as having complied with this AD.

We agree. PW ASB PW1000G-C-72-00-0099-00A-930A-D, Issue No. 002, dated March 15, 2018 can be used as a method to comply with paragraph (g) of this AD, because it requires removing and replacing the affected part numbers.

### **Request To Clarify How To Demonstrate Compliance**

Hawaiian Airlines stated that complying with this AD would require removal of the diffuser case air seal assembly, P/N 30G4993-01; the HPT 2nd-stage vane assembly, P/N 30G7572; and the HPT 2nd-stage borescope stator vane assembly, P/N 30G7672 at the next engine shop visit. However, none of these P/Ns are individually documented by IAE or PW, either upon delivery or on maintenance, repair, and overhaul (MRO) documentation. Therefore, it would be difficult to demonstrate compliance with paragraph (g) of this AD.

We disagree. The operator must verify that their products comply with paragraph (g) of this AD. If overhaul facilities are used to perform maintenance, then documentation of the work completed must be provided to the operator to verify compliance with paragraph (g) of this AD. Therefore, we did not change this AD.

### **Request To Explain Differences in Applicability Between AD and Service Information**

EASA requested that we explain why this AD applies to more engine models than PW ASB PW1000G-C-72-00-0099-00A-930A-D, Issue No. 002, dated March 15, 2018.

We disagree. This AD applies to all IAE PW1133G-JM, PW1133GA-JM, PW1130G-JM, PW1127G-JM, PW1127GA-JM, PW1127G1-JM, PW1124G-JM, PW1124G1-JM, and PW1122G-JM turbofan engines, because they are approved under type certificate, E00087EN. The PW ASB PW1000G-C-72-00-0099-00A-930A-D, Issue No. 002, dated March 15, 2018 only applies to PW1100G-JM engine models that are currently in service. Therefore, 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 final rule with the changes described previously. 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 final rule.

### **Related Service Information**

We reviewed PW ASB PW1000G-C-72-00-0099-00A-930A-D, Issue No. 002, dated March 15, 2018. This ASB describes procedures for the disassembly, removal, and replacement of the diffuser case air seal assembly, P/N 30G4993-01; the HPT 2nd-stage vane assembly, P/N 30G7572; and the HPT 2nd-stage borescope stator vane assembly, P/N 30G7672.

### **Interim Action**

We consider this AD interim action. The manufacturer is currently developing a modification that will address the unsafe condition identified in this AD. Once this modification is developed, approved, and available, we might consider additional rulemaking.

### **Costs of Compliance**

We estimate that this AD affects 16 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

#### **Estimated Costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Removing and replacing parts	0 work-hours × \$85 per hour = \$0	\$44,000	\$44,000	\$704,000

### **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**

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 adding the following new airworthiness directive (AD):



**FAA**  
**Aviation Safety**

## **AIRWORTHINESS DIRECTIVE**

[www.faa.gov/aircraft/safety/alerts/](http://www.faa.gov/aircraft/safety/alerts/)  
[www.gpoaccess.gov/fr/advanced.html](http://www.gpoaccess.gov/fr/advanced.html)

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**2018-21-10 International Aero Engines:** Amendment 39-19468; Docket No. FAA-2018-0404; Product Identifier 2018-NE-15-AD.

**(a) Effective Date**

This AD is effective December 12, 2018.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to International Aero Engines (IAE) PW1133G-JM, PW1133GA-JM, PW1130G-JM, PW1127G-JM, PW1127GA-JM, PW1127G1-JM, PW1124G-JM, PW1124G1-JM, and PW1122G-JM turbofan engines with engine serial numbers (ESNs) P770450 through P770614, and with diffuser case air seal assembly part number (P/Ns) 30G4993-01, high-pressure turbine (HPT) 2nd-stage vane assembly, P/N 30G7572, or HPT 2nd-stage borescope stator vane assembly, P/N 30G7672, installed.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

**(e) Unsafe Condition**

This AD was prompted by reports of in-flight engine shutdowns and aborted take-offs that were the result of a failed knife edge seal on affected engines with ESNs P770450 through P770614. We are issuing this AD to prevent failure of the rear high-pressure compressor rotor hub knife edge seal. The unsafe condition, if not addressed, could result in failure of one or more engines, loss of thrust control, and loss of the airplane.

**(f) Compliance**

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

**(g) Required Actions**

At the next engine shop visit after the effective date of this AD, do the following:

- (1) Remove from service the diffuser case air seal assembly, P/N 30G4993-01, and replace with a part eligible for installation.
- (2) Remove from service the HPT 2nd-stage vane assembly, P/N 30G7572, and replace with a part eligible for installation.

(3) Remove from service HPT 2nd-stage borescope stator vane assembly, P/N 30G7672, and replace with a part eligible for installation.

**(h) Definition**

For the purpose of this AD, an “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine flanges (lettered flanges). The separation of engine flanges solely for the purpose of transportation of the engine without subsequent engine maintenance does not constitute an engine shop visit.

**(i) 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 (j) 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.

**(j) 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.

**(k) Material Incorporated by Reference**

None.

Issued in Burlington, Massachusetts, on October 31, 2018.  
Robert J. Ganley,  
Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.