



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2018-0216; Product Identifier 1988-ANE-18-AD;]**

**RIN 2120-AA64**

**Airworthiness Directives; Honeywell International Inc. Turboprop Engines**

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

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to supersede Airworthiness Directive (AD) 88-12-10, which applies to certain Honeywell International Inc. (Honeywell) TPE331 turboprop engines. AD 88-12-10 requires reducing the life limit for certain second stage turbine rotors. Since we issued AD 88-12-10, we received a report that a TPE331-11U engine experienced an uncontained rotor separation. In addition, cracks were discovered through eddy current inspection (ECI) in the bore of the second stage turbine rotor assembly after publication of AD 88-12-10. This proposed AD would require removing certain second stage turbine rotors from service at a reduced life limit. We are proposing this AD to address the unsafe condition on these products.

**DATES:** We must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Honeywell International Inc., 111 S 34<sup>th</sup> Street, Phoenix, AZ 85034-2802; phone: 800-601-3099; Internet: <https://myaerospace.honeywell.com/wps/portal>. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7759.

### **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-2018-0216; 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 NPRM, the regulatory evaluation, any comments received, and other information. The street address for Docket Operations (phone: 800-647-5527) is listed above. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Joseph Costa, Aerospace Engineer, Los Angeles ACO Branch, FAA, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: [joseph.costa@faa.gov](mailto:joseph.costa@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposed AD. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2018-0216; Product Identifier 1988-ANE-18-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory,

economic, environmental, and energy aspects of this NPRM. We will consider all comments received by the closing date and may amend this NPRM because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

### **Discussion**

We issued AD 88-12-10, Amendment 39-5910 (53 FR 19766, May 31, 1988), (“AD 88-12-10”), for certain Honeywell TPE331 turboprop engines. AD 88-12-10 requires reducing the life limit for certain second stage turbine rotors. AD 88-12-10 resulted from the failure of a second stage turbine rotor due to crack growth from a bore initiation site induced by low cycle fatigue. We issued AD 88-12-10 to prevent failure of the second stage turbine rotor, leading to uncontained failure of the second stage turbine rotor.

### **Actions Since AD 88-12-10 Was Issued**

Since we issued AD 88-12-10, a TPE331-11U engine installed on an M7 Aerospace LP SA227 airplane experienced an uncontained tri-hub rotor separation during climb on April 7, 2015. One of the three fragments from the second stage turbine rotor assembly, part number 3102106-6, came to rest inside the fuselage wall of the twin-engine airplane. In addition, second stage turbine rotor assembly cracks in the bore were discovered by ECI after publication of AD 88-12-10. This evidence supports higher stresses than originally calculated and supports the inability of the normal rotor inspection method, fluorescent penetrant inspection, to detect small cracks in the bore. In addition, we are adding the TPE331-8 and -10N model engines to the applicability of this AD because the design and material of its second stage turbine rotor are similar to those

in the TPE331-10, -10R, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, and -11U model engines.

### **Related Service Information**

We reviewed Honeywell Service Bulletin (SB) TPE331-72-A2319, Revision 0, dated April 25, 2018 and TPE331-72-A2310, Revision 0, dated January 26, 2018. These SBs describe procedures for replacement of the second stage turbine rotor assembly installed on TPE331-8, -10, -10N, -10R, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, and -11U model engines.

### **FAA's Determination**

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

### **Proposed AD Requirements**

This proposed AD would retain certain requirements of AD 88-12-10. This proposed AD would require removing certain second stage turbine rotors from service at a reduced life limit.

### **Differences Between this Proposed AD and the Service Information**

This NPRM proposes to allow certain rotors more time in service before their removal than is allowed by Honeywell SBs TPE331-72-A2310, Revision 0, dated January 26, 2018, and TPE331-72-A2319, Revision 0, dated April 25, 2018. The FAA finds that allowing an additional 100 cycles in service before their removal provides a sufficient level of safety for applicable second stage turbine rotors that have been in service for 30 years after the publication of AD 88-12-10. In addition, the SB includes a calendar deadline of 5 years for removal of the applicable second stage turbine rotors that have exceeded their life-limit of 3,000 cycles. The FAA is instead proposing a requirement to remove applicable rotors at the next access and prohibiting the installation

of applicable rotors. We find that the calendar deadline is inconsistent with our compliance requirements.

**Costs of Compliance**

We estimate that this proposed AD affects 100 engines installed on airplanes of U.S. registry.

We estimate that 20 commercial engines and 80 general aviation engines will need this turbine rotor replacement to comply with this proposed 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>
Scheduled rotor replacement	1 work-hour x \$85 per hour = \$85	\$7,500	\$7,585	\$379,250.
Unscheduled rotor replacement	41 work-hours x \$85 per hour = \$3,485	\$7,500	\$10,985	\$549,250

**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 proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would 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 the proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under the 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.

### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 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) 88-12-10, Amendment 39-5910 (53 FR 19766, May 31, 1988), and adding the following new AD:

**Honeywell International Inc. (Type Certificate previously held by AlliedSignal Inc., Garrett Engine Division; Garrett Turbine Engine Company; and AiResearch Manufacturing Company of Arizona):** Docket No. FAA-2018-0216; Product Identifier 1988-ANE-18-AD.

#### **(a) Comments Due Date**

The FAA must receive comments on this AD action by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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

This AD replaces AD 88-12-10, Amendment 39-5910 (53 FR 19766, May 31, 1988) (“AD 88-12-10”).

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

This AD applies to Honeywell International Inc. (Honeywell) TPE331-8, -10, -10N, -10R, -10U, -10UA, -10UF, -10UG, -10UGR, -10UR, and -11U turboprop engines with second stage turbine rotor assemblies, part number (P/Ns) 3102106-1, -6, and -8 or P/N 3101514-1, -10 and -12, installed.

#### **(d) Subject**

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

**(e) Unsafe Condition**

This AD was prompted by a report that a TPE331-11U engine installed on an M7 SA227 airplane experienced an uncontained rotor separation and the discovery of cracks in the bore of the second stage turbine rotor assembly after publication of AD 88-12-10. We are issuing this AD to prevent failure of the second stage turbine rotor. The unsafe condition, if not addressed, could result in uncontained release of the second stage turbine rotor, 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) Remove from service the applicable second stage turbine rotor assembly, P/Ns 3102106-1, -6 and -8, according to the schedule in Table 1 to Paragraph (g)(1) of this AD:

**Table 1 to Paragraph (g)(1) of this AD – Removal of Second Stage Rotor, P/Ns 3102106-1, -6 and -8**

<b>Second Stage Turbine Rotor Cycles Since New (CSN) on the effective date of the AD</b>	<b>Removal Schedule</b>
0 to 2,600	Prior to 3,000 CSN
2,601 to 3,300	Within 400 cycles-in-service (CIS) after the effective date of this AD or 3,600 CSN, or at next access, whichever occurs first
3,301 to 4,000	Within 200 cycles-in-service after the effective date of this AD or 4,100 CSN, or at next access, whichever occurs first
4,001 to 4,800	Within 100 cycles-in-service after the effective date of this AD or 4,800 CSN, or at next access, whichever occurs first

(2) Remove from service the applicable second stage turbine rotor assembly, P/Ns 3101514-1, -10 and -12, per the schedule in Table 2 to Paragraph (g)(2) of this AD:

**Table 2 to Paragraph (g)(2) of this AD – Removal of Second Stage Rotors, P/Ns 3101514-1, -10 and -12**

<b>Second Stage Turbine Rotor CSN on the effective date of the AD</b>	<b>Removal Schedule</b>
0 to 2,600	Prior to 3,000 CSN
2,601 to 3,200	Within 400 CIS after the effective date of this AD or 3,600 CSN, or at next access, whichever occurs first.
3,201 to 3,800	Within 200 CIS after the effective date of this AD or 4,100 CSN, or at next access, whichever occurs first.
3,801 to 4,400	Within 100 CIS after the effective date of this AD or 4,400 CSN, or at next access, whichever occurs first.

**(h) Definition**

For the purpose of this AD, “next access” is defined as when the applicable second stage turbine rotor assembly is removed from the engine.

**(i) Installation Prohibition**

As of the effective date of this AD, do not install second stage turbine rotor assemblies, P/Ns 3102106-1, -6, and -8 and P/Ns 3101514-1, -10, and -12 on any engine.

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

(1) The Manager, Los Angeles ACO, 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)(1) of this AD.

(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.

**(k) Related Information**

(1) For more information about this AD, contact Joseph Costa, Aerospace Engineer, Los Angeles ACO Branch, FAA, 3960 Paramount Blvd., Lakewood, CA 90712-4137; phone: 562-627-5246; fax: 562-627-5210; email: joseph.costa@faa.gov.

(2) For service information identified in this AD, contact Honeywell International Inc., 111 S 34<sup>th</sup> Street, Phoenix, AZ 85034-2802; phone: 800-601-3099; Internet: <https://myaerospace.honeywell.com/wps/portal>. You may view this referenced service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7759.

Issued in Burlington, Massachusetts, on June 14, 2018.

Robert J. Ganley,  
Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.

[FR Doc. 2018-13211 Filed: 6/19/2018 8:45 am; Publication Date: 6/20/2018]