



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2009-1100; Directorate Identifier 2009-NE-37-AD]**

**RIN 2120-AA64**

**Airworthiness Directives; International Aero Engines AG Turbofan Engines**

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

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

**SUMMARY:** We propose to supersede airworthiness directive (AD) 2012-09-09 that applies to all International Aero Engines AG (IAE) V2500-A1, V2525-D5, and V2528-D5 turbofan engines, and certain serial numbers (S/Ns) of IAE V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, and V2533-A5 turbofan engines. AD 2012-09-09 currently requires cleaning, eddy current inspection (ECI) or fluorescent penetrant inspection (FPI), and initial and repetitive ultrasonic inspections (USIs) of certain high-pressure compressor (HPC) stage 3 to 8 drums, as well as replacement of the drum attachment nuts. Since we issued AD 2012-09-09, we discovered that additional attachment nuts for certain HPC stage 3 to 8 drums are affected. This proposed AD would expand the affected population for initial and repetitive USIs of the HPC stage 3 to 8 drum, revise the inspection intervals, require removal of the affected attachment nuts and any HPC stage 3 to 8 drum found cracked, and require a mandatory terminating action. We are proposing this AD to prevent failure of the HPC stage 3 to 8 drum, which could result in uncontained drum failure, damage to the engine, and damage to the airplane.

**DATES:** We must receive comments on this proposed AD by [INSERT DATE 60 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 International Aero Engines AG, 400 Main Street, East Hartford, CT 06118; phone: 860-368-3700; fax: 860-368-4600; email: [iaeinfo@iae2500.com](mailto:iaeinfo@iae2500.com); Internet: <https://www.iaeworld.com>. 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-2009-1100; 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 NPRM, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Martin Adler, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England

Executive Park, Burlington, MA 01803; phone: 781-238-7157; fax: 781-238-7199; email: martin.adler@faa.gov.

## **SUPPLEMENTARY INFORMATION:**

### **Comments Invited**

We invite you to send any written relevant data, views, or arguments about this NPRM. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2009-1100; Directorate Identifier 2009-NE-37-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 NPRM.

### **Discussion**

On May 2, 2012, we issued AD 2012-09-09, Amendment 39-17044 (77 FR 30371, May 23, 2012), (“AD 2012-09-09”), for all IAE V2500-A1, V2525-D5, and V2528-D5 turbofan engines, and certain S/Ns of IAE V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, and V2533-A5 turbofan engines. AD 2012-09-09 requires cleaning, ECI or FPI, and initial and repetitive USIs of certain HPC stage 3 to 8 drums, as well as replacement of the drum attachment nuts. AD 2012-09-09 resulted from inspections that found 50 HPC drums with cracks and reports that indicated that the required inspection intervals were not adequate. We issued AD 2012-09-09 to prevent uncontained failure of the HPC stage 3 to 8 drum, which could result in damage to the airplane.

### **Actions Since AD 2012-09-09 Was Issued**

Since we issued AD 2012-09-09, we discovered that partially silver-plated nuts for certain HPC stage 3 to 8 drums cause the drum to corrode and crack. IAE has also developed a new nut design without silver plating.

### **Relevant Service Information**

We reviewed IAE Alert Non-Modification Service Bulletin (NMSB) No. V2500-ENG-72-0615, Revision 6, dated September 4, 2014; IAE NMSB No. V2500-ENG-72-0625, dated September 20, 2011; and IAE NMSB No. V2500-ENG-72-0637, dated May 2, 2013. IAE Alert NMSB No. V2500-ENG-72-0615 describes procedures for performing a USI of the HPC stage 3 to 8 drum. IAE NMSB No. V2500-ENG-72-0625 provides guidance on performing an ECI that will improve the ability to detect cracked HPC stage 3 to 8 drums. IAE NMSB No. V2500-ENG-72-0637 describes procedures for performing an FPI of the HPC stage 3 to 8 drum.

### **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 expand the affected population for initial and repetitive USIs of the HPC stage 3 to 8 drum, revise the inspection intervals, require removal of affected attachment nuts, and require removal of any HPC stage 3 to 8 drums found cracked. As mandatory terminating action, this proposed AD would require installation of an HPC stage 3 to 8 drum that has never operated with silver-plated nuts using silver-free nuts to attach the HPC stage 3 to 8 drum to the HPC stage 9 to 12 drum.

### **Costs of Compliance**

We estimate that this proposed AD affects 956 engines installed on airplanes of U.S. registry. We estimate that it would take about 3 hours per engine to perform the USI and about 2 hours per engine to perform the FPI or ECI of the HPC stage 3 to 8 drum. We also estimate that removing silver residue from the HPC stage 3 to 8 drum would cost about \$2,600 per engine, and required parts would cost about \$1,060 per engine. We estimate the pro-rated replacement cost to replace an HPC stage 3 to 8 drum to be \$52,014. Based on these figures, we estimate the cost of this proposed AD on U.S. operators to be \$53,630,644.

### **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 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 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.

**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) 2012-09-09, Amendment 39-17044 (77 FR 30371, May 23, 2012), and adding the following new AD:

**International Aero Engines AG:** Docket No. FAA-2009-1100; Directorate Identifier 2009-NE-37-AD.

**(a) Comments Due Date**

The FAA must receive comments on this AD action by [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

This AD replaces AD 2012-09-09, Amendment 39-17044 (77 FR 30371, May 23, 2012).

**(c) Applicability**

This AD applies to:

- (1) All International Aero Engines AG (IAE) V2500-A1 turbofan engines; and
- (2) All IAE V2525-D5 and V2528-D5 turbofan engines; and
- (3) IAE V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, and V2533-A5 turbofan engines with serial numbers (S/Ns) V10001 through V13190, and V15001 through V16728, excluding V16707.

**(d) Unsafe Condition**

This AD was prompted by the discovery that additional attachment nuts for certain HPC stage 3 to 8 drums cause the drum to corrode and crack. We are issuing this AD to prevent failure of the HPC stage 3 to 8 drum, which could result in uncontained drum failure, damage to the engine, and damage to the airplane.

**(e) Compliance**

Comply with this AD within the compliance times specified, unless already done. Use paragraph 3.A. of IAE Alert Non-Modification Service Bulletin (NMSB) No. V2500-ENG-72-A0615, Revision 6, dated September 4, 2014, to do the ultrasonic inspection (USI) required by this AD. You may use the inspections listed in paragraph (g)(3) of this AD instead of a USI for the initial inspection required by paragraphs (e)(1) through (e)(5) of this AD. If cracks are found during any of the inspections required by this AD, remove the drum from service before further flight.

**(1) Initial USI of the HPC stage 3 to 8 drum – Group “A” and Group “B”:**

For IAE V2500-A1 turbofan engines with S/Ns listed in “Group A” or “Group B” in paragraph 1.E. in IAE Alert NMSB No. V2500-ENG-72-A0615, Revision 6, dated

September 4, 2014, perform an initial USI of the HPC stage 3 to 8 drum within 200 cycles of accumulating 8,000 cycles-since-new (CSN) or within 200 cycles from the effective date of this AD, whichever occurs later.

**(2) Initial USI of the HPC stage 3 to 8 drum – Group “C”:**

For IAE V2500-A5 turbofan engines with S/Ns listed in “Group C” in paragraph 1.E. in IAE Alert NMSB No. V2500-ENG-72-A0615, Revision 6, dated September 4, 2014, perform an initial USI of the HPC stage 3 to 8 drum within 200 cycles of accumulating 6,250 CSN or within 200 cycles from the effective date of this AD, whichever occurs later.

**(3) Initial USI of the HPC stage 3 to 8 drum – Group “D”:**

For IAE V2500-A5 turbofan engines with S/Ns listed in “Group D” in paragraph 1.E. in IAE Alert NMSB No. V2500-ENG-72-A0615, Revision 6, dated September 4, 2014, perform an initial USI of the HPC stage 3 to 8 drum within 200 cycles of accumulating 3,750 CSN or within 200 cycles from the effective date of this AD, whichever occurs later.

**(4) Initial USI of the HPC stage 3 to 8 drum – Group “E”:**

For IAE V2500-A1, -A5, and –D5 turbofan engines not listed in “Group A,” “Group B,” “Group C,” or “Group D,” and with drum assembly part numbers (P/Ns) listed in “Group E” in paragraph 1.E. in IAE Alert NMSB No. V2500-ENG-72-A0615, Revision 6, dated September 4, 2014, perform an initial USI of the HPC stage 3 to 8 drum within 200 cycles of accumulating 12,500 CSN or within 200 cycles from the effective date of this AD, whichever occurs later.

**(5) Initial USI of the HPC stage 3 to 8 drum – Group “F”:**

For IAE V2500-A1, -A5, and –D5 turbofan engines not listed in “Group A,” “Group B,” “Group C,” or “Group D,” and with drum assembly P/Ns listed in “Group F” in paragraph 1.E. in IAE Alert NMSB No. V2500-ENG-72-A0615, Revision 6, dated

September 4, 2014, perform an initial USI of the HPC stage 3 to 8 drum within 200 cycles of accumulating 9,000 CSN or within 200 cycles from the effective date of this AD, whichever occurs later.

**(f) Repetitive USIs of the HPC Stage 3 to 8 Drum**

(1) For engines included in “Group A,” “Group B,” “Group C,” “Group E,” or “Group F,” as defined in paragraph (e) of this AD, perform repetitive USIs of the HPC stage 3 to 8 drum within every 750 cycles of the last USI.

(2) For engines included in “Group D,” as defined in paragraph (e) of this AD, perform repetitive USIs of the HPC stage 3 to 8 drum within every 500 cycles of the last USI.

(3) If you inspect the HPC stage 3 to 8 drum at shop visit, you may delay the next USI as shown in the “Grace Periods Table” for each compliance group listed in paragraph 1.E. in IAE Alert NMSB No. V2500-ENG-72-A0615, Revision 6, dated September 4, 2014.

**(g) Removal of Silver-Plated Nuts**

Unless already done, at the next piece-part exposure of the HPC stage 3 to 8 drum after the effective date of this AD, do the following before returning any HPC stage 3 to 8 drum to service:

(1) Remove from service all silver-plated nuts (fully or partially-plated), P/Ns AS44862 or AS64367, that attach the HPC stage 3 to 8 drum to the HPC stage 9 to 12 drum.

(2) Remove the silver residue from the HPC stage 3 to 8 drum.

(3) Perform an inspection of the HPC stage 3 to 8 drum using at least one of the following methods:

(i) Fluorescent penetrant inspection (FPI) of the HPC stage 3 to 8 drum for cracks,  
or

(ii) Eddy current inspection (ECI) of the HPC stage 3 to 8 drum for cracks.

**(h) Installation Prohibition**

After the effective date of this AD, do not install any silver-plated nuts, P/N AS44862 or AS64367, into any engine.

**(i) Mandatory Terminating Action**

Within 9,450 cycles after the effective date of this AD, install:

(1) an HPC stage 3 to 8 drum that has never operated with silver-plated nuts (fully or partially plated) to attach the HPC stage 3 to 8 drum to the HPC stage 9 to 12 drum, with

(2) silver-free nuts to attach the HPC stage 3 to 8 drum to the HPC stage 9 to 12 drum.

**(j) Definition**

For the purpose of this AD, “piece-part exposure” is removal of the HPC stage 3 to 8 drum from the engine, removal of all blades from the drum, and separation of the HPC stage 3 to 8 drum from the stage 9 to 12 drum.

**(k) Credit for Previous Actions**

If you performed an inspection of the HPC stage 3 to 8 drum before the effective date of this AD using one of the following IAE NMSBs, you met the initial inspection requirement of paragraph (e) of this AD:

(i) IAE NMSB No. V2500-ENG-72-0594, Revision 3, dated August 7, 2009, through Revision 6, dated April 12, 2010.

(ii) IAE NMSB No. V2500-ENG-72-0603, Revision 2, dated March 17, 2010, or earlier revisions.

(iii) IAE NMSB No. V2500-ENG-72-0608, Revision 3, dated September 20, 2011, or earlier revisions.

(iv) IAE NMSB No. V2500-ENG-72-0615, Revision 5, dated August 5, 2014, or earlier revisions.

(v) IAE NMSB No. V2500-ENG-72-0638, Initial Issue, dated April 11, 2013.

**(l) 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.

**(m) Related Information**

(1) For more information about this AD, contact Martin Adler, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7157; fax: 781-238-7199; email: martin.adler@faa.gov.

(2) IAE NMSB No. V2500-ENG-72-0637, dated May 2, 2013; IAE NMSB No. V2500-ENG-72-0625, dated September 20, 2011; IAE Engine Manual Task 72-41-11-200-001; and IAE Engine Manual Task 72-41-11-110-001, which are not incorporated by reference in this AD, can be obtained from IAE, using the contact information in paragraph (m)(3) of this proposed AD. IAE NMSB No. V2500-ENG-72-0637 and IAE Engine Manual Task 72-41-11-200-001 provide guidance on performing the FPI. Guidance on performing the ECI can be found in IAE NMSB No. V2500-ENG-72-0625. IAE Engine Manual Task 72-41-11-110-001 provides guidance on cleaning the HPC stage 3 to 8 drum.

(3) For service information identified in this AD, contact International Aero Engines AG, 400 Main Street, East Hartford, CT 06118; phone: 860-368-3700; fax: 860-368-4600; email: iaefinfo@iaev2500.com; Internet: <https://www.iaeworld.com>.

(4) 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.

Issued in Burlington, Massachusetts, on December 16, 2014.

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

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