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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2024-0041; Project Identifier AD-2024-00032-E; Amendment 39-22764; AD 2024-11-03]

RIN 2120-AA64

Airworthiness Directives; International Aero Engines, AG Engines

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for certain International Aero Engines, AG (IAE AG) Model V2500 engines. This AD was prompted by an analysis of an event involving an International Aero Engines, LLC (IAE LLC) Model PW1127GA-JM engine, which experienced a high-pressure compressor (HPC) 7th-stage integrally bladed rotor (IBR-7) separation that resulted in an aborted takeoff. This AD requires performing an angled ultrasonic inspection (AUSI) of certain high-pressure turbine (HPT) 1st-stage hubs and HPT 2nd-stage hubs for cracks and replacing if necessary. This AD also requires accelerated replacement of certain HPT 1st-stage hubs and HPT 2nd-stage hubs. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective June 26, 2024.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of June 26, 2024.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA-2024-0041; 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, any comments received, and other information. The address for Docket Operations 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.

Material Incorporated by Reference:

- For service information, contact International Aero Engines, AG, 400 Main Street, East Hartford, CT 06118; phone: (860) 565-0140; email: help24@pw.utc.com; website: connect.prattwhitney.com.
- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

FOR FURTHER INFORMATION CONTACT:

Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7655; email: carol.nguyen@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend [14 CFR part 39](#) by adding an AD that would apply to certain IAE AG Model V2500 engines. The NPRM published in the **Federal Register** on February 5, 2024 ([89 FR 7636](#)). The NPRM was prompted by an event on December 24, 2022, when an Airbus Model A320neo airplane, powered by IAE LLC Model PW1127GA-JM engines, experienced a failure of the HPC IBR-7 that resulted in an engine shutdown and aborted take-off. Following this event, the manufacturer conducted a records review of production and field-returned parts and re-evaluated their engineering analysis methodology. The new analysis found that the failure of the HPC IBR-7 was caused by a nickel powdered metal anomaly, similar in nature to an anomaly previously observed on March 18, 2020, when an Airbus Model A321-231 airplane, powered by IAE AG Model V2533-A5 engines, experienced an uncontained HPT 1st-stage hub failure that resulted in high-energy debris penetrating the engine cowling. The analysis also concluded that there is an increased risk of failure for a subpopulation of HPT 1st-stage hubs and HPT 2nd-stage hubs that were manufactured from the same production campaign (a batch of nickel powdered metal) as the HPT 1st-stage hub that failed on March 18, 2020; these parts have a higher likelihood of containing the nickel powdered metal anomaly and are susceptible to failure much earlier than previously determined. In the NPRM, the FAA proposed to require performing an AUSI of certain HPT 1st-stage hubs and HPT 2nd-stage hubs and, depending on the results of the inspections, replacing the HPT 1st-stage hubs or HPT 2nd-stage hubs. The FAA also proposed to require accelerated replacement of certain HPT 1st-stage hubs and HPT 2nd-stage hubs. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from 14 commenters, including the Air Line Pilots Association, International (ALPA); JetBlue Airways (JetBlue); Lufthansa Technik AG (Lufthansa); MTU Maintenance Hannover GmbH; MTU Maintenance Zhuhai Co. Ltd; Pratt & Whitney (PW); Turkish Engine Center (TEC); United Airlines; five anonymous commenters; and an individual commenter. ALPA, United Airlines, the individual commenter, and one anonymous commenter supported the proposed AD without change. Ten commenters requested changes to the proposed AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Clarify Affected Parts

Two anonymous commenters requested that the FAA clarify if HPT hubs that were produced before 2020 are part of the affected subpopulation if they were installed in January of 2019 or February of 2019 and had not accumulated more than 1,200 flight cycles (FCs).

The FAA clarifies that the affected population was manufactured from the same production campaign (a batch of nickel powdered metal) as the HPT 1st-stage hub that failed on March 18, 2020. The FAA notes that those affected parts are defined by serial number within the service information documents that are incorporated by reference in this AD. The FAA did not change this AD as a result of these comments.

Request To Clarify AUSI for Parts Removed From Service

An anonymous commenter requested that the FAA change the proposed AD to clarify if removal of the affected part from service and replacement with a part eligible for installation is an acceptable alternative to performing the AUSI required by paragraph (g)(1) of the proposed AD. The commenter noted that affected parts may be proactively replaced or found unserviceable before the AUSI is required.

The FAA disagrees with the request to change the AD because the AUSI required by paragraph (g)(1) of the proposed AD only applies to “affected parts.” If the part has been replaced with a part “eligible for installation,” then it is not an “affected part” and the AUSI is not required. The FAA did not change this AD as a result of this comment.

Request To Clarify Start Date for FC Accumulation

An anonymous commenter requested that the FAA clarify the point or date from which FCs should be counted in order to remain compliant with the proposed AD. The commenter noted that in Table 1 to Paragraph (g)(1) of the proposed AD, the AUSI compliance times are specified in terms of FCs, and for the HPT 1st-stage hub with Part Number (P/N) 2A5001, the compliance requirement is based on 100 FCs from a specific reference point.

The FAA clarifies that the FC count for AUSI compliance times begins on the effective date of this AD. The FAA has also changed the fourth column header of Table 1 to Paragraph (g)(1), Table 2 to Paragraph (g)(4), and Table 3 to Paragraph (g)(5) of this AD to read as follows: “Flight cycle (FC) limit from the effective date of this AD.”

Request To Account for Inability To Obtain Special Instruction

JetBlue requested that the FAA do one of the following:

- (1) remove the reference to PW Special Instruction No. 189F-23, dated November 20, 2023 (PW SI No. 189F-23), from the effectivity of the affected parts listed in Table 1 to Paragraph (g)(1) and Table 2 to Paragraph (g)(4) of this AD; or
- (2) have IAE LLC revise IAE AG Non-Modification Service Bulletin (NMSB) V2500-ENG-72-0720, dated November 20, 2023 (V2500-ENG-72-0720) to provide the list of the affected P/Ns and serial numbers of the hubs mentioned in PW SI No. 189F-23; or
- (3) list all affected hubs within the AD.

JetBlue noted that they were unable to obtain PW SI No. 189F-23 from IAE LLC because it relates to a military program and there are concerns about the inadvertent release of data.

The FAA disagrees with the request because PW SI No. 189F-23 applies to the V2531-E5 engine model only, and therefore IAE only provides PW SI No. 189F-23 to those owning or operating the product. The FAA notes that material that is incorporated by reference in airworthiness directives can be accessed by the means identified in the **ADDRESSES** section. For clarity, the FAA added the phrase “which only applies to the IAE AG V2531-E5 Model engine” at the end of each reference to the service bulletin, except for paragraph (l), Material Incorporated by Reference, of the final rule.

Request To Adjust Compliance Times

JetBlue requested that the FAA adjust the compliance times for Table 1 to Paragraph (g)(1), Table 2 to Paragraph (g)(4), and Table 3 to Paragraph (g)(5) of this AD to match the drawdown period of IAE AG NMSB V2500-ENG-72-0720. JetBlue noted that IAE AG NMSB V2500-ENG-72-0720 provides an additional 200 FCs and is based on an effective date of January 1, 2024, while the proposed AD provides 200 FCs less and is based on the effective date of the AD. JetBlue also noted that it planned the engine removal schedule based on the drawdown of IAE AG NMSB V2500-ENG-72-0720, including working with the engine shops for induction slots and spare engines (including obtaining lease engines).

The FAA disagrees with the request because the drawdown times for IAE AG NMSB V2500-ENG-72-0720 started on January 1, 2024, and the FAA reduced the compliance time for the AUSIs required by this AD in order to better align with the control program. The FAA did not change this AD as a result of this comment.

Comment Regarding Low Cost Estimate

JetBlue commented that the estimated cost of compliance provided in the proposed AD is not realistic and would be only achievable for a new engine or engine just returning to the shop. JetBlue also noted that the estimated cost would have great financial impact on operators, and the manufacturer is not providing a support program to address this.

The FAA disagrees that the estimated cost in the AD is unrealistic. The FAA based its estimated cost of compliance on the work-hours and parts costs from the manufacturer to perform the required actions.

The commenter did not provide specifics on which cost estimates were incorrect and what would be considered realistic. The FAA did not change this AD as a result of this comment.

Comment Regarding Parts Eligible for Installation

Lufthansa commented that parts considered eligible for installation should not be limited to the disk S/Ns that are not listed in V2500-ENG-72-0720 or PW SI No. 189F-23. Lufthansa noted that disk S/Ns listed in those documents that have passed AUSI are also eligible for installation and need to be removed within 4,000 FCs from accomplishment of the AUSI or at the next HPT module removal after the AUSI.

The FAA agrees to change paragraph (h)(1) of this AD to include parts that were not removed from service as a result of the required actions of this AD as “parts eligible for installation.”

Request To Redefine AUSI Inspected Part Installation Date

TEC requested that the FAA change the definition of the date that an AUSI inspected part was installed in paragraph (h)(5) of the proposed AD from “the date of the authorized release certification for the shop visit at which the part was first installed after the AUSI was performed” to “the HPT hub release certificate date.” TEC noted that it is possible for two HPT hubs to be inspected on the same date and be installed on different engines. Since release dates of these engines can differ, it is possible for different replacement compliance times to apply to parts that were inspected on the same day.

The FAA disagrees with the request to change the definition of the date that an AUSI inspected part was installed. The FAA acknowledges that AUSI compliance times will vary depending on when the AUSI inspected part was installed, and this was taken into consideration in order to manage shop visit capacity. The FAA did not change this AD as a result of this comment.

Request To Revise Paragraph (g)(1) of the Proposed AD

MTU Maintenance Hannover GmbH and PW requested that the FAA revise paragraph (g)(1) of the proposed AD to remove mention of AUSI inspected parts installed on or after November 1, 2023. MTU Maintenance Hannover GmbH requested that the phrase “or the AUSI inspected part was installed on or after November 1, 2023” be removed from paragraph (g)(1) of the proposed AD entirely, and PW requested that the FAA change the language from “or the AUSI inspected part was installed on or after November 1, 2023” to “before November 1, 2023.” JetBlue, MTU Maintenance Hannover GmbH, and PW all noted that the current language in paragraph (g)(1) of the proposed AD could cause an early engine removal by requiring a second AUSI inspection on hubs that had been previously AUSI inspected.

The FAA agrees to revise paragraph (g)(1) of this AD to prevent the potential requirement of performing a second AUSI on hubs that had an AUSI performed on or after November 1, 2023.

Request To Revise Paragraph (g)(2) of the AD

MTU Maintenance Hannover GmbH and PW requested that the FAA revise paragraph (g)(2) of the proposed AD to clarify the required actions for engines with AUSI inspected parts that were installed on or after November 1, 2023. MTU Maintenance Hannover GmbH requested that the FAA revise

paragraph (g)(2) to read as follows: “For engines with an AUSI inspected part installed on or after November 1, 2023 or for parts inspected in accordance with paragraph (g)(1) of this AD, within 4,000 FCs from accomplishment of the AUSI required by paragraph (g)(1) of this AD or at the next HPT module removal after the AUSI required by paragraph (g)(1) of this AD, whichever occurs first, remove the part from service and replace with a part eligible for installation.” PW requested that the FAA revise paragraph (g)(2) of the proposed AD to read as follows: “For parts inspected in accordance with paragraph (g)(1) of this AD, or for parts previously AUSI inspected and installed on or after November 1, 2023, within 4,000 FCs from accomplishment of the AUSI required by paragraph (g)(1) of this AD or at the next HPT module removal after the AUSI required by paragraph (g)(1) of this AD, whichever occurs first, remove the part from service and replace with a part eligible for installation.” PW noted that the intent is to inspect everything, and any part inspected after November 1, 2023 will be removed at 4,000 FCs.

The FAA agrees to revise paragraph (g)(2) of this AD to clarify the required actions for engines with AUSI inspected parts that were installed on or after November 1, 2023.

Request To Clarify Compliance Time for High-Thrust Engines

MTU Maintenance Zhuhai Co. Ltd requested that the FAA clarify the part replacement compliance time in Table 2 to Paragraph (g)(4) of the proposed AD for a part not previously operated in a high-thrust engine model that has its engine rating changed to a high-thrust rating without any disassembly or removal of the HPT module.

The FAA clarifies that after the initial flight in the newly rated high-thrust engine, the part is considered to have previously operated in a high-thrust engine and it will be required to use the lower cycle limits. For example, the HPT 1st-stage hub will need to be removed at 1,800 FCs after the effective date of the AD because it is now operating in a high-thrust engine. The FAA notes that the removal or non-removal of the HPT module at shop visit would not have an effect on this scenario as these are considered the new replacement cycle limits for the affected parts on the effective date of the AD. The FAA has revised paragraph (h)(3) of this AD by removing the second instance of the word “previously” from the definition in order to avoid potential misinterpretation.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information Under [1 CFR Part 51](#)

The FAA reviewed IAE AG NMSB V2500-ENG-72-0720, dated November 20, 2023; and PW Special Instruction No. 189F-23, dated November 20, 2023, which only applies to the IAE AG V2531-E5 Model engine. This service information specifies procedures for performing an AUSI for cracks on affected HPT 1st-stage hubs and HPT 2nd-stage hubs. This service information also specifies the list of affected HPT 1st-stage hubs and HPT 2nd-stage hubs, identified by part number and serial number, installed on certain IAE AG engines. 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.

Interim Action

The FAA considers this AD to be an interim action. The unsafe condition is still under investigation by the manufacturer and, depending on the results of that investigation, the FAA may consider further rulemaking action.

Justification for Determination of the Effective Date

Section 553(d) of the Administrative Procedure Act (APA) ([5 U.S.C. 551 et seq.](#)) authorizes agencies to make rules effective in less than thirty days, upon a finding of “good cause.” The FAA has found that the risk to the flying public justifies a shortened effective date for this rule due to powdered metal anomalies in HPT 1st-stage hubs and HPT 2nd-stage hubs that could lead to premature fracture and uncontained failure, which could lead to the release of high-energy debris, damage to the engine, damage to the airplane, and loss of the airplane. The longer these parts remain in service, the higher the probability of failure. Accordingly, the FAA finds that good cause exists pursuant to [5 U.S.C. 553\(d\)](#) for making this amendment effective in less than 30 days.

Costs of Compliance

The FAA estimates that this AD affects 116 engines installed on airplanes of U.S. registry. The FAA estimates that 40 engines need an AUSI of the HPT 1st-stage hub; 40 engines need an AUSI of the HPT 2nd-stage hub; 67 engines need replacement of the HPT 1st-stage hub; and 49 engines need replacement of the HPT 2nd-stage hub.

The FAA estimates the following costs to comply with this AD:

Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
AUSI of HPT 1st-stage hub	5 work-hours × \$85 per hour = \$425	\$0	\$425	\$17,000
AUSI of HPT 2nd-stage hub	5 work-hours × \$85 per hour = \$8,500	0	425	17,000
Replace HPT 1st-stage hub	100 work-hours × \$85 per hour = \$8,500	460,000	468,500	31,389,500
Replace HPT 2nd-stage hub	100 work-hours × \$85 per hour = \$8,500	360,000	368,500	18,056,500

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some of the costs of this AD may be covered under warranty, thereby reducing the cost impact on

affected operators.

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.

The FAA is 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) Will not affect intrastate aviation in Alaska, and
- (3) 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 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](#).

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2024-11-03 International Aero Engines, AG: Amendment 39-22764; Docket No. FAA-2024-0041; Project Identifier AD-2024-00032-E.

(a) Effective Date

This airworthiness directive (AD) is effective June 26, 2024.

(b) Affected ADs

This AD is related to AD 2022-02-09, Amendment 39-21906 ([87 FR 7029](#), February 8, 2022) (AD 2022-02-09).

(c) Applicability

This AD applies to International Aero Engines, AG (IAE AG) Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines.

(d) Subject

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

(e) Unsafe Condition

This AD was prompted by an analysis of an event involving an International Aero Engines, LLC Model PW1127GA-JM engine, which experienced failure of a high-pressure compressor 7th-stage integrally bladed rotor that resulted in an engine shutdown and aborted takeoff. The FAA is issuing this AD to prevent failure of the high-pressure turbine (HPT) 1st-stage hub and HPT 2nd-stage hub. The unsafe condition, if not addressed, could result in uncontained hub failure, release of high-energy debris, damage to the engine, damage to the airplane, and loss of the airplane.

(f) Compliance

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

(g) Required Actions

(1) For engines with an installed part, part number (P/N), and serial number (S/N) listed in Table 1 to paragraph (g)(1) of this AD, with no angled ultrasonic inspection (AUSI) performed, at the next engine shop visit after the effective date of this AD before exceeding the applicable cycle limit specified in Table 1 to paragraph (g)(1) of this AD, perform an AUSI of the affected parts for cracks in accordance with the applicable service information listed in Table 1 to paragraph (g)(1) of this AD.

Table 1 to Paragraph (g)(1)—AUSI Compliance Times

Part	Table S/N is listed in	Previously operated in high-thrust model engine	Flight cycle (FC) limit from the effective date of this AD	Applicable service information (see paragraph (1)(2) of this AD)
HPT 1st-stage hub P/N 2A5001	Table 1 of IAE AG Non-Modification Service Bulletin V2500-ENG-72-0720, dated November 20, 2023 (IAE AG NMSB V2500-ENG-72-0720)	Yes	100 FCs	Accomplishment Instructions, paragraph 5., of IAE AG NMSB V2500-ENG-72-0720.
HPT 1st-stage hub P/N 2A5001	Table 1 of Pratt & Whitney (PW) Special Instruction No. 189F-23, dated November 20, 2023 (PW SI No. 189F-23), which only applies to the IAE AG V2531-E5 Model engine	Yes	100 FCs	Accomplishment Instructions, paragraph 5., of PW SI No. 189F-23, which only applies to the IAE AG V2531-E5 Model engine.
HPT 1st-stage hub P/N 2A5001	Table 1 of IAE AG NMSB V2500-ENG-72-0720	No	700 FCs	Accomplishment Instructions, paragraph 5., of IAE AG NMSB V2500-ENG-72-0720.
HPT 2nd-stage hub P/N 2A4802	Table 2 of IAE AG NMSB V2500-ENG-72-0720	Yes	800 FCs	Accomplishment Instructions, paragraph 6., of IAE AG NMSB V2500-ENG-72-0720.
HPT 2nd-stage hub P/N 2A4802	Table 2 PW SI No. 189F-23, which only applies to the IAE AG V2531-E5 Model engine	Yes	800 FCs	Accomplishment Instructions, paragraph 6., of PW SI No. 189F-23, which only applies to the IAE AG V2531-E5 Model engine.
HPT 2nd-stage hub P/N 2A4802	Table 2 of IAE AG NMSB V2500-ENG-72-0720	No	1100 FCs	Accomplishment Instructions, paragraph 6., of IAE AG NMSB V2500-ENG-72-0720.

(2) For parts inspected in accordance with paragraph (g)(1) of this AD, or for AUSI inspected parts installed on or after November 1, 2023, within 4,000 FCs from accomplishment of the AUSI or at the next HPT module removal after the AUSI, whichever occurs first, remove the part from service and replace with a part eligible for installation.

(3) If any crack is found during the inspections required by paragraphs (g)(1) of this AD, before further

flight, remove the affected part from service and replace with a part eligible for installation.

(4) For engines with an AUSI inspected part installed prior to November 1, 2023, having a P/N and S/N listed in Table 2 to paragraph (g)(4) of this AD, at the next HPT module removal after the effective date of this AD, but before exceeding the applicable cycle limit specified in Table 2 to paragraph (g)(4) of this AD, remove the affected part from service and replace with a part eligible for installation.

Table 2 to Paragraph (g)(4)—Part Replacement Compliance Times

Part	Table S/N is listed in	Previously operated in high-thrust model engine	Flight cycle limit from the effective date of this AD
HPT 1st-stage hub P/N 2A5001	Table 1 of IAE AG NMSB V2500-ENG-72-0720	Yes	1,800 FCs.
HPT 1st-stage hub P/N 2A5001	Table 1 of PW SI No. 189F-23, which only applies to the IAE AG V2531-E5 Model engine	Yes	1,800 FCs.
HPT 1st-stage hub P/N 2A5001	Table 1 of IAE AG NMSB V2500-ENG-72-0720	No	2,800 FCs.
HPT 2nd-stage hub P/N 2A4802	Table 2 of IAE AG NMSB V2500-ENG-72-0720	Yes	3,400 FCs.
HPT 2nd-stage hub P/N 2A4802	Table 2 of PW SI No. 189F-23, which only applies to the IAE AG V2531-E5 Model engine	Yes	3,400 FCs.
HPT 2nd-stage hub P/N 2A4802	Table 2 of IAE AG NMSB V2500-ENG-72-0720	No	3,800 FCs.

(5) For engines with an installed part that has a P/N and S/N listed in Table 3 to paragraph (g)(5) of this AD, at the next HPT module removal after the effective date of this AD, but before exceeding the applicable cycle limit specified in Table 3 to paragraph (g)(5) of this AD, remove the affected part from service and replace with a part eligible for installation.

Table 3 to Paragraph (g)(5)—Part Replacement Compliance Times

Part	Table S/N is listed in	Previously operated in high-thrust model engine	Flight cycle limit from the effective date of this AD
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Part	Table S/N is listed in	Previously operated in high-thrust model engine	Flight cycle limit from the effective date of this AD
HPT 1st-stage hub P/N 2A5001	Table 3 of IAE AG NMSB V2500-ENG-72-0720	Yes	1,800 FCs.
HPT 1st-stage hub P/N 2A5001	Table 3 of IAE AG NMSB V2500-ENG-72-0720	No	2,800 FCs.
HPT 2nd-stage hub P/N 2A4802	Table 4 of IAE AG NMSB V2500-ENG-72-0720	Yes	3,400 FCs.
HPT 2nd-stage hub P/N 2A4802	Table 4 of IAE AG NMSB V2500-ENG-72-0720	No	3,800 FCs.

(h) Definitions

(1) For the purposes of this AD, a “part eligible for installation” is an HPT 1st-stage disk or HPT 2nd-stage disk having an S/N that is not listed in IAE AG NMSB V2500-ENG-72-0720 or PW SI No. 189F-23, or an HPT 1st-stage disk or HPT 2nd-stage disk that was not removed from service per the requirements of this AD.

(2) For the purposes of this AD, an “HPT module removal” is when the HPT rotor and stator assembly are removed from the engine.

(3) For the purposes of this AD, “Previously operated in high-thrust model engine” refers to HPT 1st-stage hubs or HPT 2nd-stage hubs that have operated in an IAE AG Model V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, or V2533-A5 engine for any duration.

(4) For the purposes 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, H-P, except for the following situations, which do not constitute an engine shop visit:

(i) Separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance.

(ii) Engine removal for the purpose of performing field maintenance activities at a maintenance facility in lieu of performing them on-wing.

(5) For the purposes of this AD, the date that an AUSI inspected part was installed is the date of the authorized release certification for the shop visit at which the part was first installed after the AUSI was performed.

(i) Terminating Action to AD 2022-02-09

Compliance with paragraph (g)(1) of this AD satisfies the requirements of AD 2022-02-09.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR-520 Continued Operational Safety 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 AIR-520 Continued Operational Safety Branch, send it to the attention of the person identified in paragraph (k) 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) Additional Information

For more information about this AD, contact Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7655; email: carol.nguyen@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.

(i) International Aero Engines AG (IAE AG) Non-Modification Service Bulletin V2500-ENG-72-0720, dated November 20, 2023.

(ii) Pratt & Whitney (PW) Special Instruction No. 189F-23, dated November 20, 2023.

(3) For IAE AG and PW service information, contact International Aero Engines, AG, 400 Main Street, East Hartford, CT 06118; phone: (860) 565-0140; email: help24@pw.utc.com; website: connect.prattwhitney.com.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

(5) You may view this material at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, visit www.archives.gov/federal-register/cfr/ibr-locations or email fr.inspection@nara.gov.

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