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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2023–2401; Project Identifier AD–2023–01278–E; Amendment 39–22703; AD 2024–05–11]

RIN 2120–AA64

Airworthiness Directives; International Aero Engines, LLC Engines

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is superseding Airworthiness Directive (AD) 2022–19–15 for certain International Aero Engines, LLC (IAE LLC) Model PW1100G series engines; and AD 2023–16–07 for certain IAE LLC Model PW1100G series engines and PW1400G series engines. AD 2022–19–15 required an angled ultrasonic inspection (AUSI) of the high-pressure turbine (HPT) 1st-stage disk and HPT 2nd-stage disk, and replacement, if necessary. AD 2023–16–07 required an AUSI of the HPT 1st-stage hub (also known as the HPT 1st-stage disk) and HPT 2nd-stage hub (also known as the HPT 2nd-stage disk) for cracks, and replacement, if necessary, which is terminating action for AD 2022–19–15. This AD was prompted by an investigation that determined an increased risk of powdered metal anomalies for all powdered metal parts in certain powdered metal production campaigns, which are susceptible to failure significantly earlier than previously determined. This AD retains the AUSI requirement for certain HPT 1st-stage and HPT 2nd-stage hubs from AD 2023–16–07. This AD requires performing an AUSI of the HPT 1st-stage hub, HPT 2nd-stage hub, high-pressure compressor (HPC) 7th-stage integrally bladed rotor (IBR–7), and HPC 8th-stage integrally bladed rotor (IBR–8) for cracks, and replacing if necessary. This AD also requires accelerated replacement of the HPC IBR–7, HPC IBR–8, HPC rear hub, HPT 1st-stage hub, and HPT 2nd-stage hub. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective April 11, 2024.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of April 11, 2024.

The Director of the Federal Register approved the incorporation by reference of a certain other publication listed in this AD as of August 28, 2023 (88 FR 56999, August 22, 2023).

The Director of the Federal Register approved the incorporation by reference of a certain other publication listed in this AD as of November 7, 2022 (87 FR 59660, October 3, 2022; corrected October 24, 2022 (87 FR 64156)).

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA–2023–2401; 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 Pratt & Whitney (PW) service information that is incorporated by reference, contact International Aero Engines, LLC, 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 that is incorporated by reference 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. It is also available at *regulations.gov* under Docket No. FAA–2023–2401.

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 (referred to herein as the NPRM) to amend 14 CFR part 39 to supersede AD 2022–19–15, Amendment 39–22184 (87 FR 59660, October 3, 2022; corrected October 24, 2022 (87 FR 64156)) (AD 2022–19–15); and AD 2023–16–07, Amendment 39–22526 (88 FR 56999, August 22, 2023) (AD 2023–16–07). AD 2022–19–15 applied to certain IAE LLC Model PW1122G–JM, PW1124G1–JM, PW1124G–JM, PW1127G1–JM, PW1127GA–JM, PW1127G–JM, PW1129G–JM, PW1130G–JM, PW1133GA–JM, and PW1133G–JM engines. AD 2023–16–07 applied to certain IAE LLC Model PW1122G–JM, PW1124G1–JM, PW1124G–JM, PW1127G–JM,

PW1127G1–JM, PW1127GA–JM, PW1129G–JM, PW1130G–JM, PW1133G–JM, PW1133GA–JM, PW1428G–JM, PW1428GA–JM, PW1428GH–JM, PW1431G–JM, PW1431GA–JM, and PW1431GH–JM engines. The NPRM published in the **Federal Register** on December 28, 2023 (88 FR 89627). The NPRM was prompted by manufacturer analysis of an HPC IBR–7 failure that determined it was caused by a powdered metal anomaly that is similar in nature to the anomalies outlined in AD 2022–19–15. The analysis concluded that there is an increased risk of failure for additional powdered metal parts in certain powdered metal production campaigns, including the HPC IBR–7 and HPC IBR–8, and that all affected parts are susceptible to failure significantly earlier than previously determined. The 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.

To address the unsafe condition, the FAA issued an NPRM (Docket No. FAA–2023–2237; Project Identifier AD–2023–01057–E) (referred to herein as the previous NPRM) to supersede AD 2022–19–15 and AD 2023–16–07, which was published in the **Federal Register** on December 12, 2023 (88 FR 86088). However, after the previous NPRM was issued, the FAA received information from PW that an error was inadvertently included in the previous NPRM's compliance times for some of the HPT 1st-stage and 2nd-stage hubs, which would have required removal significantly later than necessary. Due to the need to shorten the removal timeframe, the FAA determined it was necessary to withdraw the previous NPRM and issue the NPRM for the unsafe condition with the correct compliance times.

In the NPRM, the FAA proposed to continue to require performing an AUSI of the HPT 1st-stage hub and HPT 2nd-stage hub and replacing as necessary. The NPRM proposed to require performing an AUSI of the HPC IBR–7 and HPC IBR–8 for cracks and replacing as necessary. The NPRM also proposed to require accelerated replacement of the HPC IBR–7, HPC IBR–8, HPC rear hub, HPT 1st-stage hub, HPT 1st-stage air seal, HPT 1st-stage blade retaining plate, HPT 2nd-stage hub, HPT 2nd-stage blade retaining plate, and HPT 2nd-stage rear seal. 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); Air New Zealand; All Nippon Airways CO., LTD. (ANA); Delta Air Lines, Inc. (DAL); Hawaiian Airlines; Hong Kong Express Airways Limited (HK Express); InterGlobe Aviation Limited (IndiGo); JetBlue Airways (JetBlue); Lufthansa Group PW1100G–JM Operators: Lufthansa, SWISS International, Austrian, Lufthansa Cityline (Lufthansa Group); Lufthansa Technik AG; MTU Maintenance Hannover GmbH; PW; United Airlines; and Vietnam Airlines JSC. ALPA urged the manufacturer to develop measures to minimize the operational impact these inspections will have on operators but supported the proposed AD without change. Thirteen 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 Update Service Information

Three commenters, Delta, JetBlue, and Lufthansa Technik AG requested that the FAA revise paragraphs (h)(2), (h)(6), and (m)(3)(ii) of the proposed AD to refer to PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue 002, dated December 12, 2023, rather than PW ASB PW1000G–C–

72–00–0225–00A–930A–D, Issue 001, dated November 3, 2023. Lufthansa Technik AG noted that it would be beneficial to use the latest SB revision in sections (h), (i), and (j) of the proposed AD.

The FAA agrees. PW Alert Service Bulletin (ASB) PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002, dated December 12, 2023, adds alternative methods of AUSI compliance to the Compliance section, adds service information to the References section, and removes unnecessary steps from the Accomplishment Instructions. The FAA revised this AD to refer to PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002, dated December 12, 2023. The FAA also revised paragraph (j), Credit for Previous Actions, of this AD to allow credit for certain actions performed in accordance with PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 001, dated November 3, 2023.

Request To Add Service Information

One commenter, Lufthansa Technik AG, requested the addition of the following documents to the Related Service Information Under 1 CFR part 51 paragraph of the NPRM:

- Special Instruction (SI) 46F–23A, dated April 4, 2023, which provides instructions to inspect IBR–7 parts;
- SI 47F–23A, dated April 4, 2023, which provides instructions to inspect IBR–8 parts; and
- SI 169F–23B, dated October 11, 2023, and previous, which provides a procedure to inspect all affected hardware in-shop.

Lufthansa Technik AG noted that SI 169F–23B should be added to the proposed AD to ensure that credit can be taken from last accomplishment of this SI.

The FAA disagrees. The Related Service Information Under 1 CFR part 51 paragraph contains service information that is incorporated by reference in this AD, and the above-referenced service information is not incorporated by reference. The FAA did not change this final rule as a result of this comment.

Request To Allow Future Revisions of Service Information

Three commenters, ANA, Hawaiian Airlines, and HK Express Airways requested the FAA add "or later" to SI No. 222F–23 in the AD or to consider not requiring a specific SI No. 222F–23 revision. The commenters noted that this SI will be revised periodically and suggested that the later revisions should also be exempt from the proposed AD. One commenter, ANA, also requested that the FAA add the phrase "or later revision" to each service information (Service Bulletin and PW Special Instruction) stated in paragraph (m) of the proposed AD.

The FAA disagrees with adding "or later" or "or later revision" for service information incorporated by reference in this AD. Future revisions of the service information have not yet been published by the manufacturer or reviewed by the FAA, and therefore cannot be approved as required service information. A request for an alternative method of compliance (AMOC) can be submitted to the FAA in accordance with the requirements of paragraph (k) of this AD if future revisions of the service information referenced in this AD are published. Additionally, if future revisions of the service information are published by the manufacturer and approved by the FAA, the FAA may consider further rulemaking. The FAA did not change this AD as a result of these comments.

Request To Exclude Unaffected Parts

Eleven commenters, ANA, DAL, Hawaiian Airlines, HK Express Airways, IndiGo, JetBlue, Lufthansa Group, Lufthansa Technik AG, MTU Maintenance Hannover GmbH, PW, and United Airlines, recommended the FAA exempt the HPC IBR–7, HPC IBR–8, HPC Rear Hub, HPT 1st stage hub, and HPT 2nd stage hub serial numbers listed in Tables 1, 2, and 3 of PW SI No. 222F–23 from the requirements set forth in the proposed AD. PW explained that SI No. 222F–23 identifies specific part numbers and serial numbers that were manufactured outside the affected population of material manufactured from powdered metal addressed by the proposed AD. PW requested modifying the "Applicability" section of the proposed AD to exclude parts which are not in the affected population.

The FAA agrees. The FAA will revise paragraph (c), Applicability, of this AD to reference Tables 1, 2, and 3 of PW SI No. 222F–23, Revision A, dated February 13, 2024, which specifies part numbers and serial numbers verified as manufactured from powdered metal campaigns produced prior to November 1, 2015, or after September 1, 2021, and which are therefore outside the population of material manufactured from powdered metal addressed by this AD. This change in the applicability reduces the affected part numbers and serial numbers.

Request Clarification on IBR–8 Part Numbers

Lufthansa Technik AG commented that two IBR–8 P/Ns, 30G3808 and 30G6308, are listed in the Illustrated Parts Catalog and in the airworthiness limitations, but not in the proposed AD. The commenter asked for clarification that these part numbers do not require AUSI and have no additional part replacement but are not allowed for reinstallation in accordance with paragraph (i)(5) of the proposed AD. The commenter suggested this could be due to low life-limited part life.

For clarity, the FAA did not address HPC IBR–8 having P/N 30G3808 and 30G6308 in this AD because the FAA has determined that those parts are either retired, out of service, or have airworthiness limitations that are more restrictive than the requirements of this AD. The FAA did not change this AD as a result of this comment.

Request To Modify Paragraph (g) of the Proposed AD To Include Certain Part Numbers

Lufthansa Technik AG requested that the FAA review the inclusion of all four affected HPT Stg 1 and Stg 2 part numbers in paragraphs (g)(1) and (2) of the proposed AD for completeness of retaining the requirements of AD 2023–16–07 with no change.

The FAA disagrees. Paragraph (g), Retained Inspections from AD 2023–16–07, With No Changes, of this AD applies to certain part and serial numbers as specified. The FAA did not change this AD as a result of this comment.

Request To Modify the Compliance Language in Paragraph (g) of the Proposed AD

One commenter, ANA, requested to change the required action specified in paragraph (g) of the proposed AD from "perform an AUSI of the affected parts within 30 days," to "remove the affected engine from service within 30 days, and thereafter perform an AUSI of the affected part before release to service."

The FAA disagrees. The commenter provided no justification for the request, and the FAA has determined that this AD as written accomplishes the same result requested by the commenter. The

FAA did not change this AD as a result of this comment.

Request To Remove References to Certain Parts

Two commenters, Air New Zealand and PW, observed that Table 3 of the proposed AD includes a reference to components that are not affected by the powdered metal issue and are not referenced in PW SB PW1000G–C–72–00–0224 and PW1000G–C–72–00–0225. Air New Zealand suggested that including these in the proposed AD would create confusion and unnecessary complexity when processing and showing compliance. PW noted that the proposed AD would not require accelerated replacement of HPT 1st-stage front air seal, HPT 2nd-stage rear air seal, HPT 1st-stage blade retaining plate, and HPT 2nd-stage blade retaining plate, and further noted that these parts would be automatically replaced with incorporation of the Block D 1st and 2nd stage turbine disks. Air New Zealand requested the removal of the references to the HPT 1&2 air seals and the HPT Stage 1 & 2 retaining plates.

The FAA agrees. The FAA will remove the references to HPT 1st-stage front air seal, HPT 2nd-stage rear air seal, HPT 1st-stage blade retaining plate, and HPT 2nd-stage blade retaining plate from this AD.

Request To Include Calculation for Mixed Model Management

Three commenters, ANA, Lufthansa Group, and Lufthansa Technik AG, observed that a mixed model management calculation as defined in PW ASB PW1000G–C–72–00–0224–00A–930A–D and PW ASB PW1000G–C–72–00–0225–00A–930A–D is not mentioned in the proposed AD. Lufthansa Technik AG suggested that this calculation is also referenced in SIL 17. Lufthansa Group noted that, without a stated reference to the mixed model management calculation, it is possible that engines operated at any time at the higher thrust rating must be treated as such. The commenters requested that the FAA state in the proposed AD that mixed model management calculation can be applied to address parts that have operated in both Group 1 and Group 2 engines.

The FAA agrees. The FAA will revise paragraph (h), New Required Actions, of this AD to address the calculation of cyclic limits for part replacement and AUSI compliance times for parts that have been installed in a Group 1 and Group 2 configuration as defined in the note to Table 3 of the compliance paragraph of PW ASB PW1000G–C–72–00–0224–00A–930A–D, Issue No: 001 and PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002. The FAA has not reviewed SIL 17 and will not reference this service information in this AD.

Request To Add a Cyclic Limit to Paragraph (h)(1) of the Proposed AD

One commenter, Lufthansa Technik AG, requested the FAA add a cyclic limit to paragraph (h)(1) of the proposed AD. The commenter noted that all affected hardware is covered by the 100-flight cycle (FC) timeframe in paragraph (h)(9) of the proposed AD. The commenter suggested that, since there are other unrelated issues in the HPC, and as there is no cyclic limitation planned for the AUSI of the HPC parts, the FAA exclude the requirement to perform an AUSI in accordance with paragraph (h)(1) of the proposed AD below 500 FCs since the last AUSI or since new, unless the HPC rotor is disassembled. The commenter explained that this would remove the need to inspect parts that were recently installed but removed for access.

The FAA disagrees. The FAA cannot account for all circumstances that would require an engine shop visit. Unusual engine shop visit circumstances may be considered through the provisions of paragraph (k), Alternative Methods of Compliance, of this AD. The FAA did not change this AD as a result of this comment.

Request To Clarify Discrepancy in Compliance Times Between the Proposed AD and the PW ASB

Two commenters, DAL and IndiGo, noted a discrepancy between the compliance times in the proposed AD and those in the PW ASBs. IndiGo requested that the FAA clarify if the compliance timeline in the proposed AD supersedes the compliance timeline in the PW ASBs, and if the operators can wait for the proposed AD to be issued and follow the effective date stated in the proposed AD. DAL requested that the FAA add a paragraph or revise paragraph (h)(2) to address the 100–FC drawdown periods in the proposed AD and the discrepancy between the compliance times of the AD and the PW ASBs.

The FAA disagrees with adding a paragraph. Operators are required to comply within the compliance times specified in this AD. However, how an operator reacts to recommended actions from the design approval holder (DAH) should be spelled out in their approved maintenance program and is not governed by this AD. The FAA did not change this AD as a result of this comment.

Request To Adjust Compliance Time To Account for Cycle Count

One commenter, Vietnam Airlines, observed that the drawdown cycles for mandated actions (such as part replacement or inspection) shall be contingent upon the cycle count surpassing the compliance threshold outlined in Table 1 to Paragraph (h)(2) and Table 2 to Paragraph (h)(3) of the proposed AD. The commenter suggested that there should be distinctions in treatment between an engine exceeding the threshold by 1,000 cycles and one exceeding the threshold by 200 cycles. Should the former exhibit a drawdown period of 100 cycles, the commenter recommended that the latter be allocated a longer period for compliance.

The FAA disagrees. The FAA determined that a tiered drawdown is not necessary because all parts exceeding the compliance time or cycle limit stated in Table 1 to paragraph (h)(2) and Table 2 to paragraph (h)(3) of this AD must be removed within 100 FCs after the effective date of this AD. The FAA did not change this AD as a result of this comment.

Request To Include Life Reduction for Certain HPC Rear Hub

One commenter, ANA, noted that the compliance times for HPC rear hub having P/N 30G4008 are specified in ASB PW1000G–C–72–00–0224–00A–930A–D, but they are not included in Table 3 of the proposed AD. Therefore, the commenter observed, an engine may be used beyond the compliance times specified in ASB PW1000G–C–72–00–0224–00A–930A–D. ANA requested that the proposed AD be revised to include the compliance times for P/N 30G4008 specified in ASB PW1000G–C–72–00–0224–00A–930A–D.

The FAA disagrees. This AD requires the removal of HPC rear hub having P/N 30G4008 at either the next HPC engine shop visit or the next HPT engine shop visit, whichever occurs first. The FAA determined that it is not necessary to specify a compliance time for HPC rear hub having P/N

30G4008 due to the cycle limits for the associated HPC and HPT parts. The FAA did not change this AD as a result of this comment.

Request To Change “Crack” to “Defect” in Paragraph (h)(8) of the Proposed AD

One commenter, Lufthansa Technik AG, observed that paragraph (h)(8) of the proposed AD requires to remove only parts found with a crack. The commenter stated that due to AUSI procedure, it cannot be determined if it is a crack or just an anomaly. Therefore, the commenter requested that the FAA change the wording so that all parts with defects will be removed from service.

The FAA partially agrees. The FAA does not agree with the wording proposed by the commenter. The FAA agrees to meet the commenter's intent by changing the wording of paragraph (h)(9) of this AD from “if any crack is found,” to “if any crack indication is found.”

Request To Include Reference to New Parts

One commenter, Lufthansa Technik AG, requested that the FAA change paragraph (h)(9) of the proposed AD to read “[. . .] 100 FCs or less since the last AUSI OR NEW, (re-)inspection [. . .].” The commenter explained that this would allow also counting from reinstallation of new hardware (where it cannot be determined if the AUSI was performed during production at OEM).

The FAA disagrees. Paragraph (h)(10) of this AD applies to repetitive inspections of affected parts installed within the last 100 FCs. Parts that are not included in paragraph (c), Applicability, of this AD are not subject to the repetitive AUSI requirement. The FAA did not change this AD as a result of this comment.

Request To Revise Heading of Table 1 to Paragraph (h)(2) of the Proposed AD

One commenter, Lufthansa Technik AG, noted that it would avoid confusion to reference HPT hub stage 1 and 2 only in the heading of Table 1 to (h)(2). The commenter requested that the FAA include the part names in the header of the table.

The FAA disagrees. The FAA has determined that including the part names in the header is not necessary because paragraph (h)(2) specifies the parts and part numbers subject to the compliance time specified in Table 1 to Paragraph (h)(2) of this AD. The FAA did not change this AD as a result of this comment.

Request To Reference AUSI Performed in Service in Table 1 to (h)(2) of the Proposed AD

One commenter, Lufthansa Technik AG, suggested that the new production parts inspection regime was updated and that Table 1 to (h)(2) of the proposed AD is not covering this AUSI inspection at production. The commenter requested that the second column of Table 1 to (h)(2) of the proposed AD be revised to state that this reflects only “AUSI performed in service prior to the effective date of this AD.”

The FAA disagrees. However, the FAA has updated paragraph (c), Applicability, of this AD to exempt serial numbers listed in Tables 1, 2, and 3 of SI 222F–23, Revision A, which includes parts subject to AUSI at production.

Request To Add Airworthiness Limitation to Table 2 to Paragraph (h)(3) of the Proposed AD

One commenter, Lufthansa Technik AG, noted that in Table 2 to paragraph (h)(3) of the proposed AD, for Group 1 engines, the 1st-Stage Hub P/N 30G4201 or 30G6201 with AUSI performed refers to 3,800 FCs since the last AUSI. The commenter also noted that for Group 2 engines, the 1st-Stage Hub P/N 30G4201 or 30G6201 with AUSI performed refers to 2,800 FCs since the last AUSI. The commenter observed that the part needs removal within the airworthiness limitation. The commenter requested that the FAA add a statement similar to the 2nd-stage hubs.

The FAA disagrees. The FAA has determined that adding such a statement is unnecessary because the existing airworthiness limitations are more restrictive. The FAA did not change this AD as a result of this comment.

Request To Make Changes to Tables

Three commenters, HK Express Airways, JetBlue, and Lufthansa Technik AG, expressed that the lack of borderlines in Table 2 for paragraph (h)(3) and Table 3 for paragraph (h)(4) of the proposed AD is confusing. Lufthansa Technik AG notes that on the first look, it seems that the compliance time for part removal at next HPT shop visit is applicable to one row only, but in fact should be applicable for all parts listed below. The commenters requested that the FAA complete the engine group and compliance time boxes for each line item listed in Table 2 and Table 3 of the proposed AD.

The FAA agrees. The FAA has revised Table 2 to paragraph (h)(3) and Table 3 to paragraph (h)(4) of this AD to complete the engine group and compliance time columns for each line item.

Request To Provide Additional Cycles for Alternate Climb Operations

One commenter, JetBlue, stated that JetBlue has been operating with the Alternate Climb modification on the fleet. The commenter explained that the Alternate Climb modification is performed pre-delivery and decreases work/stress on the engine during the entire climb duration, which effectively alleviates stress/fatigue. The commenter requested that the FAA analyze the data to check the feasibility of providing additional cycles for the Alternate Climb modification to meet the proposed AD timelines.

The FAA disagrees. Operators can submit a request for an AMOC to the FAA in accordance with the requirements of paragraph (k) of this AD with the data that shows the modification provides an acceptable level of safety. The FAA did not change this AD in response to this comment.

Request To Modify Definition for Part Eligible for Installation

One commenter, HK Express Airways, noted that PW SI 222F–23 identifies parts exempted from repetitive AUSI and early retirement carrying the same part number, and the commenter observed that the proposed AD did not mention this SI in paragraph (i). HK Express Airways requested adding reference to SI 222F–23 to the definition of "part eligible for installation," so the parts listed in the SI are deemed to be eligible for installation. The commenter also noted that SI 222F–23 will be updated quarterly by PW, therefore the AD should not fix the SI version.

The FAA agrees to revise the definition of "part eligible for installation" in paragraph (i) of this AD to reference part serial numbers identified in Tables 1, 2, and 3 of SI 222F–23, Revision A. The FAA does not agree to include an undated reference to SI 222F–23. Future revisions of service information have

not yet been published by the manufacturer or reviewed by the FAA, and therefore cannot be approved as required service information. A request for an AMOC can be submitted to the FAA in accordance with paragraph (k) of this AD if future revisions of the service information referenced in this AD are published. Additionally, if future revisions of the service information are published by the manufacturer and approved by the FAA, the FAA may consider further rulemaking.

Request To Clarify if Newly Produced Parts Are Eligible for Installation

Three commenters, DAL, HK Express Airways, and Lufthansa Technik AG, observed that the proposed AD did not address newly produced parts carrying the same part number in the definition of "part eligible for installation" in paragraph (i)(5) of the proposed AD. Therefore, the commenters reasoned, the proposed AD does not define installation eligibility for any new/not service run HPC/HPT hardware that is not currently installed on a Group 1 or Group 2 engine. The commenters requested that paragraph (i)(5) of the proposed AD be revised to add installation eligibility for new production parts.

The FAA agrees. If the newly produced parts are manufactured from powdered metal material produced prior to November 1, 2015, or after September 1, 2021, as identified in the original manufacturing records or in Tables 1, 2, and 3 of SI No. 222F–23, Revision A, those parts are not affected by this AD. The FAA revised the definition of "part eligible for installation" in paragraph (i)(5) of this AD to reference parts identified as not affected by this AD in paragraph (c)(2) of this AD. Therefore, parts identified in Tables 1, 2, and 3 of SI No. 222F–23, Revision A, will meet the definition of "part eligible for installation." To meet the updated definition of "part eligible for installation," affected parts need to be inspected in accordance with this AD. Unaffected parts can be installed without performing the requirements of this AD.

Request To Clarify Meaning of Induction as Used in Paragraph (i), Definitions, of the Proposed AD

One commenter, ANA, asked the FAA to clarify that the definition of "induction" in paragraph (i) of the proposed AD is the timing when the engine disassembly is started. ANA asked the FAA to clarify a particular situation to have a correct understanding. ANA noted that, in terms of paragraph (h)(1) and (2) of the proposed AD, if an engine is already in shop for maintenance involving the separation H-flange or M-flange, then assembly has already been started at the effective date of this AD. The commenter asked if an angled ultrasonic scan inspection should therefore not be performed in this shop visit.

The FAA agrees to clarify. The FAA does not have a set definition for induction. Reference your approved maintenance program to determine what ADs apply to your engines during an engine shop visit. In the example provided, if the engine were already at an engine shop visit on the effective date of this AD, the requirements of paragraphs (h)(1) and (2) would apply at the next engine shop visit after the effective date of this AD. The FAA did not change this AD in response to this comment.

Request To Include 2nd-Stage HPT Retaining Plates in Paragraph (i), Definitions, of the Proposed AD

One commenter, Lufthansa Technik AG, requested that the FAA include 2nd-stage HPT retaining

plates in the definition of parts eligible for installation.

The FAA disagrees. The FAA revised this final rule to remove references to HPT retaining plates in response to another comment. The FAA did not change this AD in response to this comment.

Request To Identify Previous AUSI Service Information in Paragraph (j), Credit for Previous Actions, of the Proposed AD

One commenter, Lufthansa Technik AG, observed that, in addition to the credit for paragraphs (g)(1) and (2) of the proposed AD, it should be required to note down which procedures qualify as "AUSI performed" for cyclic requirements under paragraphs (h)(2) with table 1 and (h)(8) of the proposed AD to correctly determine the remaining life and if the AUSI was performed prior to AD effectivity. The commenter listed the following service information: For HPT hubs in accordance with (h)(2) and (8) of the proposed AD:

- SI 169F–23;
- SB PW1000G–C–72–00–0188–00A–930A–D, Issue 1 dated September 13, 2021; and
- PW1000G–C–72–00–0188–00A–930A–D, Issue 2 dated July 8, 2022.

For HPC parts in accordance with paragraph (h)(8) of the proposed AD:

- SI 46F–23; and
- SI 47F–23.

The FAA infers that the commenter requested that the FAA add the service information identified to paragraph (j), Credit for Previous Actions, of this AD. The FAA disagrees. PW SB PW1000G–C–72–00–0188–00A–930A–D, Issue No: 001, dated September 13, 2021, is referenced in paragraph (j), Credit for Previous Actions, of this AD. The FAA revised paragraph (j), Credit for Previous Actions, of this AD to include PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No. 001, dated November 3, 2023, which provides methods for AUSI that may have been previously used, in response to a separate comment. The FAA did not change this AD in response to this comment.

Request To Add Special Flights Permit Paragraph

One commenter, HK Express Airways, noted that according to PW, non-revenue maintenance or check flights are permitted if the aircraft is required to re-locate to base maintenance facilities for storage or engine removal after the compliance time. The commenter requested that the FAA add a paragraph to the proposed AD to clearly state that non-revenue maintenance flights are permitted within the proposed AD.

The FAA disagrees because 14 CFR 39.23 allows for special flight permits unless specified as limited or prohibited in the AD. The FAA did not change this AD in response to this comment.

Additional Change Made to the Applicability

Since the NPRM published, the FAA determined the need to add IAE LLC Models PW1127G1A–JM and PW1127G1B–JM to paragraph (c), Applicability, in this AD. These engine models were recently certificated but are not in production yet. The FAA revised the applicability of this AD to include these additional engine models. None of the engines added to the applicability of this AD are on the U.S.

Register. Additional notice and opportunity for public comment before issuing this AD are therefore unnecessary. Since there are no additional engines on the U.S. registry, no changes have been made to the Costs of Compliance paragraph in this final rule.

Updated Service Information for Paragraph (c)(2) of the Applicability

Since the NPRM comment period closed, PW updated SI 222F–23, Revision A, to add additional part numbers and serial numbers verified as manufactured from powdered metal campaigns produced prior to November 1, 2015, or after September 1, 2021, and which are therefore outside the population of material manufactured from powdered metal addressed by this AD. For this reason, the FAA updated paragraph (c)(2) of the Applicability to reference Tables 1, 2, and 3 of PW SI No. 222F–23, Revision B, dated March 1, 2024. This change to the applicability of this AD reduces the affected part numbers and serial numbers.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting the 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 the following service information:

- PW ASB PW1000G–C–72–00–0224–00A–930A–D, Issue No: 001, dated November 3, 2023, which specifies procedures for performing an AUSI for cracks on affected HPC IBR–7 and HPC IBR–8;
- PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002, dated December 12, 2023, which specifies procedures for performing an AUSI for cracks on affected HPT 1st-stage hubs and HPT 2nd-stage hubs;
- PW SI No. 198F–23, dated November 3, 2023, which 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 LLC engines;
- PW SI No. 222F–23, Revision B, dated March 1, 2024, which specifies the list of part numbers and serial numbers that were manufactured outside of the affected population of material manufactured from powdered metal;
- PW Service Bulletin PW1000G–C–72–00–0188–00A–930A–D, Issue No: 002, dated July 8, 2022, which was previously approved for incorporation by reference on November 7, 2022 (87 FR 59660, October 3, 2022; corrected October 24, 2022 (87 FR 64156)). This service information specifies procedures for performing an AUSI for cracks on affected HPT 1st-stage hubs and HPT 2nd-stage hubs; and
- PW SI No. 149F–23, dated August 4, 2023, which was previously approved for incorporation by reference on August 28, 2023 (88 FR 56999, August 22, 2023). This service information 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 LLC 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 hub, HPT 2nd-stage hub, HPC IBR–7, and HPC IBR–8 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 compliance time for replacement of certain parts is within 100 flight cycles after the effective date of this AD, which is on average one calendar month of operation. The longer these parts remain in service, the higher the probability of failure. Additionally, the FAA did not receive any adverse comments or useful information about this AD from U.S. operators that necessitates waiting 30 days for this AD to become effective. 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 430 engines installed on airplanes of U.S. registry. The FAA estimates that 366 engines will need replacement of the HPT 1st-stage hub; 351 engines will need replacement of the HPT 2nd-stage hub; 408 engines will need replacement of the HPC IBR–7; 368 engines will need replacement of the HPC IBR–8; and 283 engines will need replacement of the HPC rear hub.

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

Estimated Costs

Action	Labor cost	Parts cost (average pro-rated cost)	Cost per product	Cost on U.S. operators
AUSI of HPT 1st-stage hub, HPT 2nd-stage hub, HPC IBR–7, and HPC IBR–8 for cracks	80 work-hours ×$85 per hour = $6,800	$0	$6,800	$2,924,000
Replace HPT 1st-stage hub	10 work-hours ×$85 per hour = $850	56,000	56,850	20,807,100

Action	Labor cost	Parts cost (average pro-rated cost)	Cost per product	Cost on U.S. operators
Replace HPT 2nd-stage hub	10 work-hours ×$85 per hour = $850	62,000	62,850	$22,060,350
Replace HPC IBR–7	10 work-hours ×$85 per hour = $850	82,000	82,850	33,802,800
Replace HPC IBR–8	10 work-hours ×$85 per hour = $850	93,000	93,850	34,536,800
Replace HPC rear hub	10 work-hours ×$85 per hour = $850	132,000	132,850	37,596,550

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

The FAA has 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) 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.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by:

a. Removing Airworthiness Directive 2022–19–15, Amendment 39–22184 (87 FR 59660, October 3, 2022; corrected October 24, 2022 (87 FR 64156)); and Airworthiness Directive 2023–16–07, Amendment 39–22526 (88 FR 56999, August 22, 2023); and

b. Adding the following new airworthiness directive:

2024–05–11 International Aero Engines, LLC: Amendment 39–22703; Docket No. FAA–2023–2401; Project Identifier AD–2023–01278–E.

(a) Effective Date

This airworthiness directive (AD) is effective April 11, 2024.

(b) Affected ADs

(1) This AD replaces AD 2022–19–15, Amendment 39–22184 (87 FR 59660, October 3, 2022; corrected October 24, 2022 (87 FR 64156)).

(2) This AD replaces AD 2023–16–07, Amendment 39–22526 (88 FR 56999, August 22, 2023) (AD 2023–16–07).

(c) Applicability

(1) This AD applies to International Aero Engines, LLC (IAE LLC) Model PW1122G–JM, PW1124G1–JM, PW1124G–JM, PW1127G–JM, PW1127G1–JM, PW1127G1A–JM, PW1127G1B–JM, PW1127GA–JM, PW1129G–JM, PW1130G–JM, PW1133G–JM, PW1133GA–JM, PW1428G–JM, PW1428GA–JM, PW1428GH–JM, PW1431G–JM, PW1431GA–JM, and PW1431GH–JM engines with an installed:

(i) High-pressure compressor (HPC) 7th-stage integrally bladed rotor (IBR–7) having part number (P/N) 30G2307 or 30G4407;

(ii) HPC 8th-stage integrally bladed rotor (IBR–8) having P/N 30G5608, 30G5908, or 30G8908;

(iii) HPC rear hub having P/N 30G4008 or 30G8208;

(iv) High-pressure turbine (HPT) 1st-stage hub having P/N 30G4201, 30G6201, or 30G7301; or

(v) HPT 2nd-stage hub having P/N 30G3902, 30G5502, or 30G6602.

(2) This AD does not apply to parts identified in paragraphs (c)(1)(i) through (v) of this AD if those parts were manufactured from powdered metal material produced prior to November 1, 2015, or after September 1, 2021, as identified by part serial number in Tables 1, 2, and 3 of PW Special Instruction (SI) No. 222F–23, Revision B, dated March 1, 2024 (PW SI No. 222F–23, Revision B) or in the original manufacturing records for the part.

(3) If the original manufacturing records do not identify the production date of the powdered metal used to make the parts identified in paragraphs (c)(1)(i) through (v) of this AD, and the part serial number is not listed in Tables 1, 2, and 3 of PW SI No. 222F–23, Revision B, then the part is subject to the requirements of this AD.

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section; 7250, Turbine Section.

(e) Unsafe Condition

This AD was prompted by an analysis of an event involving an IAE LLC Model PW1127GA–JM engine, which experienced failure of an HPC IBR–7 that resulted in an engine shutdown and aborted takeoff. The FAA is issuing this AD to prevent failure of the HPT 1st-stage hub, HPT 2nd-stage hub, HPC IBR–7, and HPC IBR–8. 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) Retained Inspections From AD 2023–16–07, With No Changes

(1) This paragraph restates the requirements of paragraph (g)(1) of AD 2023–16–07. For Group 1 and Group 2 engines with an installed HPT 1st-stage hub having part number (P/N) 30G7301 and a serial number (S/N) listed in Tables 1, 2, 3, or 4 of PW Special Instruction (SI) No. 149F–23, dated August 4,

2023 (PW SI No. 149F–23), within 30 days after August 28, 2023 (the effective date of AD 2023–16–07), perform an AUSI of the HPT 1st-stage hubs for cracks in accordance with the Accomplishment Instructions, paragraph 9.A. or 9.B., as applicable, of Pratt & Whitney (PW) Service Bulletin PW1000G–C–72–00–0188–00A–930A–D, Issue No: 002, dated July 8, 2022 (PW1000G–C–72–00–0188–00A–930A–D, Issue No: 002).

(2) This paragraph restates the requirements of paragraph (g)(2) of AD 2023–16–07. For Group 1 and Group 2 engines with an installed HPT 2nd-stage hub having P/N 30G6602 and an S/N listed in Tables 1, 2, 3, or 4 of PW SI No. 149F–23, within 30 days after August 28, 2023 (the effective date of AD 2023–16–07), perform an AUSI of the HPT 2nd-stage hubs for cracks in accordance with the Accomplishment Instructions, paragraph 9.C. or 9.D., as applicable, of PW1000G–C–72–00–0188–00A–930A–D, Issue No: 002.

(h) New Required Actions

(1) For Group 1 and Group 2 engines with an affected HPC IBR–7 having P/N 30G2307 or 30G4407, or an affected HPC IBR–8 having P/N 30G5608, 30G5908, or 30G8908, at the next HPC engine shop visit and thereafter at every HPC engine shop visit, perform an angled ultrasonic scan inspection (AUSI) of the affected HPC IBR–7 or HPC IBR–8, as applicable, for cracks in accordance with the Accomplishment Instructions, paragraph 4.E.(1) or 4.E.(2), of PW Alert Service Bulletin (ASB) PW1000G–C–72–00–0224–00A–930A–D, Issue No: 001, dated November 3, 2023 (PW ASB PW1000G–C–72–00–0224–00A–930A–D, Issue No: 001).

(2) For Group 1 and Group 2 engines with an affected HPT 1st-stage hub having P/N 30G7301 or an HPT 2nd-stage hub having P/N 30G6602, before exceeding the applicable compliance time in Table 1 to paragraph (h)(2) of this AD, except as required by paragraphs (g)(1) and (2) and paragraph (h)(7) of this AD, perform an AUSI of the affected HPT 1st-stage hub or HPT 2nd-stage hub, as applicable, for cracks in accordance with the Accomplishment Instructions, paragraph 1.D.(7)(a) or 1.D.(7)(b) of PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002, dated December 12, 2023 (PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002). Thereafter, repeat the AUSI at the applicable interval in Table 1 to paragraph (h)(2) of this AD.

Table 1 to Paragraph (h)(2) —AUSI Compliance Times

Engine group	AUSI performed prior to effective date of this AD	Compliance time	Repetitive interval
1	No	Before accumulating 3,800 cycles since new (CSN) or within 100 flight cycles (FCs) after the effective date of this AD, whichever occurs later	Thereafter at each HPT engine shop visit or before exceeding 3,800 FCs from the last AUSI of the affected hub, whichever occurs first.
1	Yes	At the next HPT engine shop visit, not to exceed 3,800 FCs since the previous AUSI, or within 100 FCs	Thereafter at each HPT engine shop visit or before exceeding 3,800 FCs from the

Engine group	AUSI performed prior to effective date of this AD	Compliance time	Repetitive interval
		after the effective date of this AD, whichever occurs later	last AUSI of the affected hub, whichever occurs first.
2	No	Before accumulating 2,800 CSN or within 100 FCs after the effective date of this AD, whichever occurs later	Thereafter at each HPT engine shop visit or before exceeding 2,800 FCs from the last angled AUSI of the affected hub, whichever occurs first.
2	Yes	At the next HPT engine shop visit, not to exceed 2,800 FCs since the previous AUSI, or within 100 FCs after the effective date of this AD, whichever occurs later	Thereafter at each HPT engine shop visit or before exceeding 2,800 FCs from the last AUSI of the affected hub, whichever occurs first.

(3) For Group 1 and Group 2 engines with an affected part listed in Table 2 to paragraph (h)(3) of this AD, at the next HPT engine shop visit not to exceed the applicable cyclic limit specified in Table 2 to paragraph (h)(3) of this AD, or 100 FCs after the effective date of the AD, whichever occurs later, except as required by paragraphs (h)(6) and (8) of this AD, remove the affected part from service and replace with a part eligible for installation.

Table 2 to Paragraph (h)(3) —Part Replacement Compliance Times

Engine group	AUSI performed prior to effective date of this AD	Part name	Part No.	Cyclic limit
1	Yes	HPT 1st-stage hub	30G4201 or 30G6201	3,800 FCs since last AUSI.
1	No	HPT 1st-stage hub	30G4201 or 30G6201	3,800 CSN.
1	Yes	HPT 2nd-stage hub	30G3902 or 30G5502	3,800 FCs since last AUSI or 7,000 CSN, whichever comes first.
1	No	HPT 2nd-stage hub	30G3902 or 30G5502	3,800 CSN.
2	Yes	HPT 1st-stage hub	30G4201 or 30G6201	2,800 FCs since last AUSI.
2	No	HPT 1st-stage hub	30G4201 or 30G6201	2,800 CSN.

Engine group	AUSI performed prior to effective date of this AD	Part name	Part No.	Cyclic limit
2	Yes	HPT 2nd-stage hub	30G3902 or 30G5502	2,800 FCs since last AUSI or 5,000 CSN, whichever comes first.
2	No	HPT 2nd-stage hub	30G3902 or 30G5502	2,800 CSN.

(4) For Group 1 and Group 2 engines with an affected part listed in Table 3 to paragraph (h)(4) of this AD, before exceeding the applicable compliance times specified in Table 3 to paragraph (h)(4) of this AD, remove the affected part from service and replace with a part eligible for installation.

Table 3 to Paragraph (h)(4) —Part Replacement Compliance Times

Engine group	Part name	Part No.	Compliance time
1 and 2	HPC rear hub	30G4008	At the next HPC shop visit or HPT shop visit, whichever occurs first after the effective date of this AD.
1	HPC rear hub	30G8208	Before accumulating 7,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
1	HPC IBR–7	30G2307 or 30G4407	Before accumulating 7,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
1	HPC IBR–8	30G5608 or 30G5908 or 30G8908	Before accumulating 7,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
1	HPT 1st-stage hub	30G7301	Before accumulating 7,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
1	HPT 2nd-stage hub	30G6602	Before accumulating 7,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
2	HPC rear hub	30G8208	Before accumulating 5,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
2	HPC IBR–7	30G2307 or 30G4407	Before accumulating 5,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.

Engine group	Part name	Part No.	Compliance time
2	HPC IBR–8	30G5608 or 30G5908 or 30G8908	Before accumulating 5,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
2	HPT 1st-stage hub	30G7301	Before accumulating 5,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.
2	HPT 2nd-stage hub	30G6602	Before accumulating 5,000 CSN or within 100 FCs after the effective date of this AD, whichever occurs later.

(5) For affected parts that have been operated in a Group 1 and Group 2 configuration, calculate part replacement and AUSI times required by paragraphs (h)(2) through (4) using the note to Table 3 of the compliance paragraph of PW ASB PW1000G–C–72–00–0224–00A–930A–D, Issue No: 001 or PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002, as applicable, which addresses calculating mixed model cycles.

(6) For Group 1 and Group 2 engines with an installed HPT 1st-stage hub having P/N 30G6201 or an HPT 2nd-stage hub having P/N 30G5502 and an S/N listed in Tables 1, 2, 3, or 4 of PW SI No. 149F–23 that has not had an AUSI performed before the effective date of this AD, before further flight, remove the affected hub from service.

(7) For Group 1 and Group 2 engines with an installed HPT 1st-stage hub having P/N 30G7301 or an HPT 2nd-stage hub having P/N 30G6602 with an S/N listed in Tables 1, 2, 3, or 4 of PW SI No. 198F–23, dated November 3, 2023 (PW SI No. 198F–23), within 100 FC after the effective date of this AD, perform an AUSI of the affected hub for cracks in accordance with the Accomplishment Instructions, paragraph 1.D.(7)(a) or 1.D.(7)(b) of PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002.

(8) For Group 1 and Group 2 engines with an installed HPT 1st-stage hub having P/N 30G6201 or an HPT 2nd-stage hub having P/N 30G5502 with an S/N listed in Tables 1, 2, 3, or 4 of PW SI No. 198F–23, within 100 FC after the effective date of this AD, remove the hub from service and replace with a part eligible for installation.

(9) If any crack indication is found during any AUSI required by this AD, before further flight, remove the affected part from service and replace with a part eligible for installation.

(10) If an affected part has accumulated 100 FCs or less since the last AUSI, reinspection is not required provided that the part was not damaged during removal from the engine.

(i) Definitions

(1) For the purposes of this AD, “Group 1 engines” are IAE LLC Model PW1122G–JM, PW1124G1–JM, PW1124G–JM, PW1127G–JM, PW1127G1–JM, PW1127G1A–JM, PW1127G1B–JM, and PW1127GA–JM engines.

(2) For the purposes of this AD, “Group 2 engines” are IAE LLC Model PW1129G–JM, PW1130G–JM, PW1133G–JM, PW1133GA–JM, PW1428G–JM, PW1428GA–JM, PW1428GH–JM, PW1431G–JM, PW1431GA–JM, and PW1431GH–JM engines.

(3) For the purposes of this AD, an “HPC engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of the H-flange.

(4) For the purposes of this AD, an “HPT engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of the M-flange.

(5) For the purposes of this AD, a “part eligible for installation” is:

(i) An HPC IBR–7 having P/N 30G2307 or 30G4407 that has passed the AUSI required by paragraph (h)(1) of this AD or is identified as not affected by this AD in paragraph (c)(2) of this AD, or later approved P/N.

(ii) An HPC IBR–8 having P/N 30G5608, 30G5908, or 30G8908 that has passed the AUSI required by paragraph (h)(1) of this AD or is identified as not affected by this AD in paragraph (c)(2) of this AD, or later approved P/N.

(iii) An HPT 1st-stage hub having P/N 30G7301 that has passed the AUSI required by paragraph (h)(2) of this AD or is identified as not affected by this AD in paragraph (c)(2) of this AD, or later approved P/N.

(iv) An HPT 2nd-stage hub having P/N 30G6602 that has passed the AUSI required by paragraph (h)(2) of this AD or is identified as not affected by this AD in paragraph (c)(2) of this AD, or later approved P/N.

(v) An HPC rear hub having P/N 30G8208 and is identified as not affected by this AD in paragraph (c)(2) of this AD, or later approved P/N.

(j) Credit for Previous Actions

(1) This paragraph provides credit for the actions specified in paragraph (g)(1) and (2) of this AD, if those actions were performed before the effective date of this AD using PW Service Bulletin PW1000G–C–72–00–0188–00A–930A–D, Issue No: 001, dated September 13, 2021. This service information is not incorporated by reference in this AD.

(2) This paragraph provides credit for the actions specified in paragraph (h)(2) and (6) of this AD, if those actions were performed before the effective date of this AD using PW Alert Service Bulletin PW ASB PW1000G–C–72–00–0225–00A–930A–D, Issue No: 001, dated November 3, 2023. This service information is not incorporated by reference in this AD.

(k) 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 (l)(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.

(l) Additional Information

(1) 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*.

(2) Service information identified in this AD that is not incorporated by reference is available at the address specified in paragraph (m)(6) of this AD.

(m) 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 11, 2024.

(i) Pratt & Whitney Alert Service Bulletin PW1000G–C–72–00–0224–00A–930A–D, Issue No: 001, dated November 3, 2023.

(ii) Pratt & Whitney Alert Service Bulletin PW1000G–C–72–00–0225–00A–930A–D, Issue No: 002, dated December 12, 2023.

(iii) Pratt & Whitney Special Instruction No. 198F–23, dated November 3, 2023.

(iv) Pratt & Whitney Special Instruction No. 222F–23, Revision B, dated March 1, 2024.

(4) The following service information was approved for IBR on August 28, 2023 (88 FR 56999, August 22, 2023).

(i) Pratt & Whitney Special Instruction No. 149F–23, dated August 4, 2023.

(ii) [Reserved]

(5) The following service information was approved for IBR on November 7, 2022 (87 FR 59660, October 3, 2022; corrected October 24, 2022 (87 FR 64156)).

(i) Pratt & Whitney Service Bulletin PW1000G–C–72–00–0188–00A–930A–D, Issue No: 002, dated July 8, 2022.

(ii) [Reserved]

(6) For Pratt & Whitney service information that is incorporated by reference, contact International Aero Engines, LLC, 400 Main Street, East Hartford, CT 06118; phone: (860) 565–0140; email: *help24@pw.utc.com;* website: *connect.prattwhitney.com*.

(7) You may view this service information that is incorporated by reference 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.

(8) 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*.

Issued on March 8, 2024.

Victor Wicklund,

Deputy Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2024–06419 Filed 3–22–24; 11:15 am]

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