

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](mailto: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](mailto:help24@pw.utc.com); website: [connect.prattwhitney.com](http://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](http://www.archives.gov/federal-register/cfr/ibr-locations) or email [fr.inspection@nara.gov](mailto: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]

**BILLING CODE 4910-13-P**

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. FAA-2023-2523; Project Identifier AD-2023-01086-E; Amendment 39-22709; AD 2024-06-04]

RIN 2120-AA64

#### Airworthiness Directives; Pratt & Whitney Turbofan Engines

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

**ACTION:** Final rule.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for certain Pratt & Whitney (PW) Model PW1519G, PW1521G, PW1521GA, PW1521G-3, PW1524G, PW1524G-3, PW1525G, PW1525G-3, PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A engines. This AD was prompted by an updated 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 engine shutdown and aborted takeoff. This AD requires performing an angled ultrasonic inspection (AUSI) of certain high-pressure turbine (HPT) 1st-stage hubs, HPT 2nd-stage hubs, and HPC 8th-stage disks for cracks and, depending on the results of the inspections, replacing the HPT 1st-stage hubs, HPT 2nd-stage hubs, or HPC 8th-stage disks. This AD also requires accelerated replacement of certain HPC 7th-stage rotors, HPC 8th-stage disks, HPC rear hubs, HPT 1st-stage hubs, HPT 2nd-stage hubs, HPT 1st-stage air seals, HPT 2nd-stage air seals, HPT 1st-stage blade retaining plates, and HPT 2nd-stage blade retaining plates. 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.

#### ADDRESSES:

*AD Docket:* You may examine the AD docket at [regulations.gov](http://regulations.gov) under Docket No. FAA-2023-2523; 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 service information identified in this AD, contact International Aero Engines, LLC, 400 Main Street, East Hartford, CT 06118; phone: (860) 565-0140; email: [help24@pw.utc.com](mailto:help24@pw.utc.com); website: [connect.prattwhitney.com](http://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. It is also available at [regulations.gov](http://regulations.gov) under Docket No. FAA-2023-2523.

**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](mailto: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 PW Model PW1519G, PW1521G, PW1521GA, PW1521G-3, PW1524G, PW1524G-3, PW1525G, PW1525G-3, PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A engines. The NPRM published in the *Federal Register* on January 9, 2024 (89 FR 1038). The NPRM was prompted by an incident involving an Airbus Model A320neo airplane powered by IAE LLC Model PW1127GA-JM engines that experienced a failure of the HPC IBR-7 resulting 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. The analysis also concluded that there is an increased risk of failure for additional nickel powdered metal parts in certain nickel powdered metal production campaigns, and these parts 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, HPT 2nd-stage hubs, and HPC 8th-stage disks for cracks and, depending on the results of the inspections, replacing the HPT 1st-stage hubs, HPT 2nd-stage hubs, or HPC 8th-stage disks. The FAA

also proposed to require accelerated replacement of certain HPC 7th-stage rotors, HPC 8th-stage disks, HPC rear hubs, HPT 1st-stage air seals, HPT 2nd-stage air seals, HPT 1st-stage hubs, HPT 2nd-stage hubs, HPT 1st-stage blade retaining plates, and HPT 2nd-stage blade retaining plates. 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 five commenters. The commenters were the Air Line Pilots Association, International (ALPA), Delta Air Lines, Inc. (DAL), Lufthansa Technik AG (Lufthansa), PW, and Transport Canada Civil Aviation (TCCA). ALPA supported the NPRM without change. DAL, Lufthansa, PW, and TCCA 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 Unsafe Condition**

DAL requested that the FAA update paragraph (e) of the proposed AD or create a new paragraph to clarify why the HPC IBR-7 does not require repetitive AUSIs. Delta noted that the HPC IBR-7 was the part that originally separated during an event outlined in the proposed AD, leading to engine shutdown and aborted takeoff, which prompted this AD.

The FAA disagrees with the request to update paragraph (e) or add a paragraph to the AD that clarifies why there are no repetitive AUSIs for the HPC IBR-7. The AUSI for the HPC IBR-7 was not available when the NPRM was written and to address the unsafe condition quickly, the FAA did not want to delay the issuance of this AD in order to add the AUSI for the HPC IBR-7. Since this AD is considered an interim action, the FAA will consider adding the AUSI for the HPC IBR-7 or other actions in the future. The FAA did not change this AD as a result of this comment.

**Request To Update Definition for Parts Eligible for Installation**

DAL requested that the FAA update paragraph (i)(3) of the proposed AD to clarify installation eligibility for new/not service run HPC/HPT hardware that is not currently installed on an engine. Delta stated that HPC/HPT hardware scanned at production are scanned per the non-destructive inspection procedure (NDIP) and may not list service bulletin status so clarification is needed to determine hardware

eligibility based off service bulletin status as well as NDIP status.

The FAA disagrees with the request to update the definition of parts eligible for installation to include new/not service run parts because new parts inspected at production would not have the NDIP listed in their paperwork. The service documents require the AUSI of new parts prior to installation with no allowance for parts inspected at production. The FAA did not change this AD as a result of this comment.

**Request To Update Definition of Engine Shop Visit and HPC Engine Shop Visit**

DAL requested that the FAA update the definitions for "engine shop visit" and "HPC engine shop visit" in paragraph (i)(5) and (6) of the proposed AD to provide clarity and avoid ambiguity. Delta noted that the definition for "engine shop visit" includes the term "pairs" when defining separation of major mating engine flanges. Delta stated that this does not clearly define what constitutes an "engine shop visit," as the term "pairs" may be interpreted as separation of two or more different lettered flanges. Delta also stated that the phrase "when the HPC rotor assembly is removed from the engine" used in the definition for an "HPC engine shop visit" does not clearly describe the different scenarios that may constitute HPC engine shop visits since the HPC rotor assembly can be at different levels of exposure depending on the shop visit type.

The FAA partially agrees with the request. The FAA agrees to update the definition of an "HPC shop visit" in paragraph (i)(6) of this AD to: "For the purposes of this AD, an 'HPC engine shop visit' is when the HPC rotor assembly is removed from the HPC module." The FAA disagrees with the request to update the definition for an "engine shop visit" because the definition used in this AD is standard and taken from the World Airlines Technical Operations Glossary. The FAA notes that the term "pairs" of major mating engine flanges refers to the mating surfaces on each individual part of the bolted joint.

**Request To Include Alert Service Bulletin (ASB) Issue Numbers in Tables**

DAL requested that the FAA update Table 1 to Paragraph (g)(3) and Table 2 to Paragraph (g)(7) of the proposed AD to include the issue numbers of the ASBs that are listed in the Applicable (serial number) S/N listing, Applicable service bulletin and the Table S/N is listed in columns. DAL noted that certain ASBs, such as 72-00-0196 Issue 002, were revised to include additional

serial numbers in the effectivity, so different ASB issue numbers contain different serial number effectivity.

The FAA agrees with the request and has updated Table 1 to paragraph (g)(3) and Table 2 to paragraph (g)(7) of this AD to include the issue numbers of the applicable ASBs.

#### **Request To Edit Service Bulletin References**

Lufthansa requested that the FAA merge paragraph (g)(1) of the proposed AD with paragraph (g)(4)(i) of the proposed AD and paragraph (g)(2) of the proposed AD with paragraph (g)(4)(ii) of the proposed AD and refer to ASBs PW1000G-A-72-00-0204 and PW1000G-A-72-00-0205, as applicable. Lufthansa noted that all of the ASBs referenced in these paragraphs refer to NDIP-1260 for 8th-stage discs, NDIP-1254 for 1st-stage hubs, and NDIP-1257 for 2nd-stage hubs. Lufthansa also noted that this aligns with the PW ASB set-up, which requires inspections during shop visits in accordance with ASBs PW1000G-A-72-00-0204 and PW1000G-A-72-00-0205 for all less affected hardware and stricter inspections for parts more affected and listed in ASBs PW1000G-A-72-00-0196 and PW1000G-A-72-00-0197 only.

The FAA disagrees with the request to merge steps within paragraph (g) of this AD. The FAA notes that several service information documents are referenced within paragraph (g) of this AD in order to account for both initial AUSI and repetitive AUSIs. The FAA did not change this AD as a result of this comment.

#### **Request To Clarify 100 Flight Cycle Threshold**

TCCA requested that the FAA clarify the intention of the condition “or within 100 FCs after the effective date of this AD” that is proposed in paragraph (g)(3) of the proposed AD and to clarify if it is related to the intent of paragraph (g)(13) of the proposed AD.

For clarification, the intention of the condition “or within 100 FCs after the effective date of this AD” is to provide a grace period for affected parts that are over the cycle limits listed in Table 1 to Paragraph (g)(3) of this AD, and the condition is not related to paragraph (g)(13) of this AD. The FAA did not change this AD as a result of this comment.

#### **Request To Add Definition for Affected Part**

TCCA requested that the FAA update the proposed AD by adding a definition for “affected part” in order to avoid

misinterpretation since there are multiple parts with different part numbers and a subpopulation of part SNs and inspection thresholds involved.

The FAA disagrees with the request to add a definition for “affected part” to this AD because the affected parts and part numbers are already specified within paragraph (g) of this AD. The FAA did not change this AD as a result of this comment.

#### **Request To Update Number of Affected U.S. Products**

PW requested that the FAA update the NPRM by changing the number of engines installed on airplanes of U.S. registry from 430 to 121.

The FAA agrees and has updated the number of engines installed on airplanes of U.S. registry from 430 to 121 in the Cost of Compliance paragraph of this final rule and updated the estimated costs accordingly.

#### **Request To Incorporate Updated Service Information**

PW requested that the FAA incorporate PW Special Instruction (SI) No. 240F-23A, dated February 7, 2024, into the final rule. PW noted that they have refined this SI, which lists a limited number of affected HPT hubs by S/N, and this information has already been provided to affected operators.

The FAA agrees with the request and has updated this final rule to reference PW SI No. 240F-23A, dated February 7, 2024, in paragraphs (h) and (m)(2)(ix) of this AD.

#### **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 the following service information:

- PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002, dated November 30, 2023, and PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002, dated November 30, 2023. This service information specifies a list of affected HPT 1st-stage hubs and HPT 2nd-stage hubs that are identified by serial number (S/N) and installed on certain PW engines; and instructions for

performing an AUSI on affected HPT 1st-stage hubs and HPT 2nd-stage hubs.

- PW ASB PW1000G-A-72-00-0197-00A-930A-D, Issue No: 004, dated November 30, 2023, and PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 004, dated November 30, 2023. This service information specifies a list of affected HPC 8th-stage disks that are identified by S/N and installed on certain PW engines; and instructions for performing an AUSI on affected HPC 8th-stage disks.

- PW ASB PW1000G-A-72-00-0204-00A-930A-D, Issue No: 001, dated November 30, 2023, and PW ASB PW1000G-A-72-00-0150-00B-930A-D, Issue No: 001, dated November 30, 2023, which specifies procedures for performing repetitive AUSIs on affected HPC 8th-stage disks.

- PW ASB PW1000G-A-72-00-0205-00A-930A-D, Issue No: 001, dated November 30, 2023, and PW ASB PW1000G-A-72-00-0151-00B-930A-D, Issue No: 001, dated November 30, 2023, which specify procedures for performing repetitive AUSIs on affected HPT 1st-stage hubs and HPT 2nd-stage hubs.

- PW SI No. 240F-23A, dated February 7, 2024, which specifies a list of affected HPT 1st-stage hubs and HPT 2nd-stage hubs that are identified by S/N and installed on certain PW 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. This 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, 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. 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 121 engines installed on

airplanes of U.S. registry. The FAA estimates that 121 engines will need the AUSI of the HPT 1st-stage hub, HPT 2nd-stage hub, and HPC 8th-stage disk; 121 engines will need replacement of the HPT 1st-stage hub; 121 engines will need replacement of the HPT 2nd-stage hub; 121 engines will need replacement of the HPC 7th-stage rotor; 121 engines will need replacement of the HPC 8th-stage disk; 121 engines would need

replacement of the HPC rear hub; 121 engines will need replacement of the HPT 1st-stage air seal; 121 engines will need replacement of the HPT 2nd-stage air seal; 121 engines will need replacement of the HPT 1st-stage blade retaining plate; and 121 engines will need replacement of the HPT 2nd-stage blade retaining plate.

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
Perform AUSI of HPT 1st-stage hub, HPT 2nd-stage hub, and HPC 8th-stage disk.	60 work-hours × \$85 per hour = \$5,100 ..	\$0	\$5,100	\$617,100
Replace HPT 1st-stage hub .....	10 work-hours × 85 per hour = 850 .....	49,500	50,350	6,092,350
Replace HPT 2nd-stage hub .....	10 work-hours × 85 per hour = 850 .....	25,500	26,350	3,188,350
Replace HPC 7th-stage rotor .....	10 work-hours × 85 per hour = 850 .....	48,000	48,850	5,910,850
Replace HPC 8th-stage disk .....	10 work-hours × 85 per hour = 850 .....	35,500	36,350	4,398,350
Replace HPC rear hub .....	10 work-hours × 85 per hour = 850 .....	83,000	83,850	10,145,850
Replace HPT 1st-stage air seal .....	10 work-hours × 85 per hour = 850 .....	21,000	21,850	2,643,850
Replace HPT 2nd-stage air seal .....	10 work-hours × 85 per hour = 850 .....	36,000	36,850	4,458,850
Replace HPT 1st-stage blade retaining plate .....	10 work-hours × 85 per hour = 850 .....	34,000	34,850	4,216,850
Replace HPT 2nd-stage blade retaining plate .....	10 work-hours × 85 per hour = 850 .....	13,000	13,850	1,675,850

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.

**§ 39.13 [Amended]**

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

**2024-06-04 Pratt & Whitney:** Amendment 39-22709; Docket No. FAA-2023-2523; Project Identifier AD-2023-01086-E.

**(a) Effective Date**

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

**(b) Affected ADs**

None.

**(c) Applicability**

Pratt & Whitney (PW) Model PW1519G, PW1521G, PW1521GA, PW1521G-3, PW1524G, PW1524G-3, PW1525G, PW1525G-3, PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A engines.

**(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 updated analysis of an event involving an International Aero Engines, LLC Model PW1127GA-JM engine, which experienced a high-pressure compressor (HPC) 7th-stage integrally bladed rotor separation 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, HPT 2nd-stage hub, and HPC 8th-stage disk. 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 possible loss of the airplane.

**(f) Compliance**

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

**(g) Required Actions**

(1) For PW1500G engines with an installed HPC 8th-stage disk having part number (P/N) 30G7208, at the next HPC engine shop visit, except as required by paragraph (g)(3) of this AD, perform an angled ultrasonic inspection (AUSI) of the affected HPC 8th-stage disk for cracks in accordance with the Accomplishment Instructions, paragraph 8., of PW Alert Service Bulletin (ASB) PW1000G-A-72-00-0197-00A-930A-D, Issue No: 004, dated November 30, 2023 (PW1000G-A-72-00-0197-00A-930A-D, Issue No: 004).

(2) For PW1500G engines with an installed HPT 1st-stage hub having P/N 30G8501 or an installed HPT 2nd-stage hub having P/N 30G7202, at the next engine shop visit, except as required by paragraph (g)(3) 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 8.A. or 8.B., of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002, dated November 30, 2023 (PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002).

(3) For PW1500G engines with an installed part, P/N and serial number (S/N) listed in Table 1 to paragraph (g)(3) of this AD with no AUSI performed prior to the effective date of this AD, within the applicable compliance time listed in Table 1 to paragraph (g)(3) of this AD or within 100 flight cycles (FCs) after the effective date of this AD, whichever occurs later, perform an AUSI of the affected part for cracks in accordance with the applicable service bulletin listed in Table 1 to paragraph (g)(3) of this AD.

**TABLE 1 TO PARAGRAPH (g)(3)—AUSI COMPLIANCE TIMES**

Part	Applicable S/N listing	Compliance time	Applicable service bulletin (see paragraph (m)(2) of this AD)
HPC 8th-stage disk P/N 30G7208.	Table 1 of PW ASB PW1000G-A-72-00-0197-00A-930A-D, Issue No: 004.	Next HPC engine shop visit not to exceed 10,000 part cycles since new (CSN).	Accomplishment Instructions, paragraph 8., of PW ASB PW1000G-A-72-00-0197-00A-930A-D, Issue No: 004.
HPT 1st-stage hub P/N 30G8501.	Table 2 of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.	Next engine shop visit not to exceed 5,000 part CSN.	Accomplishment Instructions, paragraph 8.A. of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.
HPT 2nd-stage hub P/N 30G7202.	Table 3 of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.	Next engine shop visit not to exceed 5,000 part CSN.	Accomplishment Instructions, paragraph 8.B. of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.
HPT 1st-stage hub P/N 30G8501.	Table 4 of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.	Next engine shop visit not to exceed 4,000 part CSN.	Accomplishment Instructions, paragraph 8.A. of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.
HPT 2nd-stage hub P/N 30G7202.	Table 5 of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.	Next engine shop visit not to exceed 4,000 part CSN.	Accomplishment Instructions, paragraph 8.B., of PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002.

(4) Thereafter at each piece-part exposure of the affected part for PW1500G engines with an installed HPC 8th-stage disk having P/N 30G7208, an installed HPT 1st-stage hub having P/N 30G8501, or an installed HPT 2nd-stage hub having P/N 30G7202, do the following:

(i) Perform an AUSI of the affected HPC 8th-stage disk for cracks in accordance with the Accomplishment Instructions, paragraph 5.B., PW ASB PW1000G-A-72-00-0204-00A-930A-D, Issue No: 001, dated November 30, 2023.

(ii) Perform an AUSI of the affected HPT 1st-stage hub and HPT 2nd-stage hub, as applicable, for cracks in accordance with the Accomplishment Instructions, paragraph 7.A. or 7.B., of PW ASB PW1000G-A-72-00-

0205-00A-930A-D, Issue No: 001, dated November 30, 2023.

(5) For PW1900G engines with an installed HPC 8th-stage disk having P/N 30G7208, at the next HPC engine shop visit, except as required by paragraph (g)(7) of this AD, perform an AUSI of the affected HPC 8th-stage disk for cracks in accordance with the Accomplishment Instructions, paragraph 8., of Pratt & Whitney PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 004, dated November 30, 2023 (PW1000G-A-72-00-0142-00B-930A-D, Issue No: 004).

(6) For PW1900G engines with an installed HPT 1st-stage hub having P/N 30G8501 or an installed HPT 2nd-stage hub having P/N 30G7202, at the next engine shop visit, except as required by paragraph (g)(7) of this AD, perform an AUSI of the affected HPT 1st-

stage hub and HPT 2nd-stage hub, as applicable, for cracks in accordance with the Accomplishment Instructions, paragraph 8.A. or 8.B., of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002, dated November 30, 2023 (PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002).

(7) For PW1900G engines with an installed part, P/N and S/N listed in Table 2 to paragraph (g)(7) of this AD, with no AUSI performed prior to the effective date of this AD, within the compliance time listed in Table 2 to paragraph (g)(7) of this AD or within 100 FCs after the effective date of this AD, whichever occurs later, perform an AUSI of the affected parts for cracks in accordance with the applicable service bulletin listed in Table 2 to paragraph (g)(7) of this AD.

**TABLE 2 TO PARAGRAPH (g)(7)—AUSI COMPLIANCE TIMES**

Part	Table S/N is listed in	Compliance time	Applicable service bulletin (see paragraph (m)(2) of this AD)
HPC 8th-stage disk having P/N 30G7208.	Table 1 of PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 004.	Next HPC engine shop visit not to exceed 10,000 part CSN.	Accomplishment Instructions, paragraph 8., of PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 004.
HPT 1st-stage hub having P/N 30G8501.	Table 2 of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.	Next engine shop visit not to exceed 5,000 part CSN.	Accomplishment Instructions, paragraph 8.A., of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.
HPT 2nd-stage hub having P/N 30G7202.	Table 3 of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.	Next engine shop visit not to exceed 5,000 part CSN.	Accomplishment Instructions, paragraph 8.B. of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.
HPT 1st-stage hub having P/N 30G8501.	Table 4 of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.	Next engine shop visit not to exceed 4,000 part CSN.	Accomplishment Instructions, paragraph 8.A., of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.
HPT 2nd-stage hub having P/N 30G7202.	Table 5 of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.	Next engine shop visit not to exceed 4,000 part CSN.	Accomplishment Instructions, paragraph 8.B., of PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002.

(8) Thereafter at each piece-part exposure of the affected part for PW1900G engines with an installed HPC 8th-stage disk having P/N 30G7208, or an installed HPT 1st-stage hub having P/N 30G8501, or an installed HPT 2nd-stage hub having P/N 30G7202, do the following:

(i) Perform an AUSI of the affected HPC 8th-stage disk for cracks in accordance with the Accomplishment Instructions, paragraph 5.B., of PW ASB PW1000G-A-72-00-0150-00B-930A-D, Issue No: 001, dated November 30, 2023.

(ii) Perform an AUSI of the affected HPT 1st-stage hub and HPT 2nd-stage hub, as applicable, for cracks in accordance with the Accomplishment Instructions, paragraph 7.A. or 7.B., of PW ASB PW1000G-A-72-00-0151-00B-930A-D, Issue No: 001, dated November 30, 2023.

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

(10) For engines with an installed part and P/N listed in Table 3 to paragraph (g)(10) of this AD having 3,300 CSN or less on the effective date of this AD, before the part accumulates 4,000 CSN or at the next engine shop visit after the effective date of this AD, whichever occurs first, remove the part from service and replace with a part eligible for installation.

TABLE 3 TO PARAGRAPH (g)(10)—PART NUMBERS

Part name	P/N
HPC 7th-stage rotor .....	30G3307
HPC 8th-stage disk .....	30G3248
HPC rear hub .....	30G2902
HPT 1st-stage hub .....	30G5701
HPT 2nd-stage hub .....	30G5002
HPT 1st-stage air seal .....	30G3132
HPT 2nd-stage air seal .....	30G3451
HPT 1st-stage blade retaining plate .....	30G1692
HPT 2nd-stage blade retaining plate .....	30G1698

(11) For engines with an installed part and P/N listed in Table 3 to paragraph (g)(10) of this AD having more than 3,300 CSN on the effective date of this AD, at the next engine shop visit or within 700 FCs after the effective date of this AD, whichever occurs first, remove the part from service and replace it with a part eligible for installation.

(12) For engines with an installed HPT 1st-stage hub having P/N 30G8501 or an installed HPT 2nd-stage hub having P/N 30G7202 and an S/N listed in Table 1 of PW Special Instruction (SI) No. 240F-23A, dated February 7, 2024, within 100 FCs from the effective date of this AD, remove the hub from service and replace it with a part eligible for installation.

(13) 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.

**(h) Installation Prohibition**

After the effective date of this AD, do not install an HPT 1st-stage hub having P/N 30G8501 or an HPT 2nd-stage hub having P/

N 30G7202 and an S/N listed in Table 1 of PW SI No. 240F-23A, dated February 7, 2024, in any engine.

**(i) Definitions**

(1) For the purposes of this AD, “PW1500G” engines are PW Model PW1519G, PW1521G, PW1521GA, PW1521G-3, PW1524G, PW1524G-3, PW1525G, and PW1525G-3 engines.

(2) For the purposes of this AD, “PW1900G” engines are PW Model PW1919G, PW1921G, PW1922G, PW1923G, and PW1923G-A engines.

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

(i) Any HPC 7th-stage rotor, P/N 30G5307 or later approved P/N.

(ii) Any HPC 8th-stage disk, P/N 30G7208, that has passed the AUSI required by paragraph (g) of this AD or later approved P/N.

(iii) Any HPC rear hub, P/N 30G7308 or later approved P/N.

(iv) Any HPT 1st-stage hub, P/N 30G8501, that has passed the AUSI required by paragraph (g) of this AD or later approved P/N.

(v) Any HPT 2nd-stage hub, P/N 30G7202, that has passed the AUSI required by paragraph (g) of this AD or later approved P/N.

(vi) Any HPT 1st-stage air seal, P/N 30G5195 or later approved P/N.

(vii) Any HPT 2nd-stage air seal, P/N 30G5196 or later approved P/N.

(viii) Any HPT 1st-stage blade retaining plate, P/N 30G5193 or later approved P/N.

(ix) Any HPT 2nd-stage blade retaining plate, P/N 30G5194 or later approved P/N.

(4) For the purposes of this AD, a “piece-part exposure” is when the part is disassembled from the rotor assembly.

(5) 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, except for the following situations, which do not constitute an engine shop visit.

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

(ii) Fan case maintenance or replacement.

(6) For the purposes of this AD, an “HPC engine shop visit” is when the HPC rotor assembly is removed from the HPC module.

**(j) Credit for Previous Actions**

This paragraph provides credit for the initial AUSI of the HPC 8th-stage disk, HPT 1st-stage hub and HPT 2nd-stage hub specified in paragraph (g)(1), (2), (4) and (5) of this AD, if the initial AUSI was performed before the effective date of this AD using the following service information.

(1) PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 001, dated March 16, 2023; or

(2) PW ASB PW1000G-A-72-00-0197-00A-930A-D, Issue No: 001, dated March 22, 2023; or

(3) PW ASB PW1000G-A-72-00-0197-00A-930A-D, Issue No: 002, dated June 19, 2023; or

(4) PW ASB PW1000G-A-72-00-0197-00A-930A-D, Issue No: 003, dated August 14, 2023; or

(5) PW ASB PW1000G-A-72-00-0141-00B-930A-D, Issue No: 001, dated March 16, 2023; or

(6) PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 001, dated March 22, 2023; or

(7) PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 002, dated June 19, 2023; or

(8) PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 003, dated August 14, 2023.

**(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 AIR-520 Continued Operational Safety Branch, send it to the attention of the person identified in paragraph (l) 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**

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](mailto:carol.nguyen@faa.gov).

**(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.

(i) Pratt & Whitney (PW) Alert Service Bulletin (ASB) PW1000G-A-72-00-0141-00B-930A-D, Issue No: 002, dated November 30, 2023.

(ii) PW ASB PW1000G-A-72-00-0142-00B-930A-D, Issue No: 004, dated November 30, 2023.

(iii) PW ASB PW1000G-A-72-00-0150-00B-930A-D, Issue No: 001, dated November 30, 2023.

(iv) PW ASB PW1000G-A-72-00-0151-00B-930A-D, Issue No: 001, dated November 30, 2023.

(v) PW ASB PW1000G-A-72-00-0196-00A-930A-D, Issue No: 002, dated November 30, 2023.

(vi) PW ASB PW1000G-A-72-00-0197-00A-930A-D, Issue No: 004, dated November 30, 2023.

(vii) PW ASB PW1000G-A-72-00-0204-00A-930A-D, Issue No: 001, dated November 30, 2023.

(viii) PW ASB PW1000G-A-72-00-0205-00A-930A-D, Issue No: 001, dated November 30, 2023.

(ix) PW Special Instruction No. 240F-23A, dated February 7, 2024.

(3) For PW service information identified in this AD, contact International Aero Engines, LLC, 400 Main Street, East Hartford, CT 06118; phone: (860) 565-0140; email: [help24@pw.utc.com](mailto:help24@pw.utc.com); website: [connect.prattwhitney.com](http://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](http://www.archives.gov/federal-register/cfr/ibr-locations) or email [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov).

Issued on March 21, 2024.

**Victor Wicklund,**

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

[FR Doc. 2024-06433 Filed 3-22-24; 4:15 pm]

**BILLING CODE 4910-13-P**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

[Docket No. FAA-2024-0472; Project Identifier MCAI-2024-00095-E; Amendment 39-22707; AD 2024-06-02]

**RIN 2120-AA64**

**Airworthiness Directives; GE Aviation Czech s.r.o. (Type Certificate Previously Held by WALTER Engines a.s., Walter a.s., and MOTORLET a.s.) Engines**

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

**ACTION:** Final rule; request for comments.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for all GE Aviation Czech s.r.o. (GEAC) (type certificate previously held by WALTER Engines a.s., Walter a.s., and MOTORLET a.s.) Model M601D-11, M601E-11, M601E-11A, M601E-11AS, M601E-11S, and M601F engines. This AD was prompted by a report of a crack on the centrifugal compressor case mount pad weld area, caused by a non-conforming welding (lack of welding penetration). This AD requires a one-time detailed visual inspection of the compressor case pad welds for any crack, and replacement of the compressor case if necessary, as specified in a European Union Aviation Safety Agency (EASA) AD, which is incorporated by reference (IBR). 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 a certain publication listed in this AD as of April 11, 2024.

The FAA must receive comments on this AD by May 13, 2024.

**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 [regulations.gov](http://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.

*AD Docket:* You may examine the AD docket at [regulations.gov](http://regulations.gov) under Docket No. FAA-2024-0472; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The street address for Docket Operations is listed above.

*Material Incorporated by Reference:*

- For service information identified in this final rule, contact EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; phone: +49 221 8999 000; email: [ADS@easa.europa.eu](mailto:ADS@easa.europa.eu); website: [easa.europa.eu](http://easa.europa.eu). You may find this material on the EASA website at [ad.easa.europa.eu](http://ad.easa.europa.eu).

- 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. It is also available at [regulations.gov](http://regulations.gov) under Docket No. FAA-2024-0472.

**FOR FURTHER INFORMATION CONTACT:**

Barbara Caufield, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; phone: (781) 238-7146; email: [barbara.caufield@faa.gov](mailto:barbara.caufield@faa.gov).

**SUPPLEMENTARY INFORMATION:**

**Comments Invited**

The FAA invites you to send any written data, views, or arguments about this final rule. Send your comments to an address listed under **ADDRESSES**. Include "Docket No. FAA-2024-0472;

Project Identifier MCAI-2024-00095-E" at the beginning of your comments. The most helpful comments reference a specific portion of the final rule, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this final rule because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to [regulations.gov](http://regulations.gov), including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this final rule.

**Confidential Business Information**

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this AD contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this AD, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as "PROPIN." The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this AD. Submissions containing CBI should be sent to Barbara Caufield, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

**Background**

EASA, which is the Technical Agent for the Member States of the European Union, has issued EASA AD 2024-0040-E, dated February 8, 2024, (EASA AD 2024-0040-E) (also referred to as the MCAI), to correct an unsafe condition on GEAC Model M601D, M601D-1, M601D-2, M601D-11, M601D-11NZ, M601E, M601E-11, M601E-11A, M601E-11AS, M601E-11S, M601E-21, M601F, M601FS, and M601Z engines. The MCAI states that a crack was found on the centrifugal compressor case mount pad weld area of an engine, which led to an unscheduled engine removal. Further investigation identified a non-conforming welding in the location of the failure (lack of