



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2021-0577; Project Identifier AD-2021-00470-E]

RIN 2120-AA64

Airworthiness Directives; Pratt & Whitney Division Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to supersede Airworthiness Directive (AD) 2021-05-16, which applies to certain Pratt & Whitney Division (PW) PW4164, PW4164-1D, PW4168, PW4168-1D, PW4168A, PW4168A-1D, and PW4170 model turbofan engines. AD 2021-05-16 requires initial and repetitive replacements of the low-pressure turbine (LPT) 4th-stage air sealing ring segment assemblies with parts eligible for installation. AD 2021-05-16 also requires initial and repetitive dimensional inspections of the LPT case for bulging and, depending on the results of the dimensional inspections, repair or replacement of the LPT case. Since the FAA issued AD 2021-05-16, the FAA was notified of an inadvertent omission in the LPT 4th-stage air sealing ring segment assembly part numbers. This proposed AD would correct this omission. The FAA is proposing this AD to address the unsafe condition on these products.

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

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

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.

- Fax: (202) 493-2251.

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

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

For service information identified in this NPRM, contact Pratt & Whitney, 400 Main Street, East Hartford, CT 06118; phone: (800) 565-0140; email: help24@prattwhitney.com; website: <https://prattwhitney.com>. You may view this service information at the Airworthiness Products Section, Operational Safety Branch, FAA, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0577; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT: Carol Nguyen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7655; fax: (781) 238-7199; email: carol.nguyen@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2021-0577; Project Identifier AD-2021-00470-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, 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 the proposal 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 <https://www.regulations.gov>, including any

personal information you provide. The agency will also post a report summarizing each substantive verbal contact the FAA receives about this proposed AD.

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 NPRM 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 NPRM, 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 NPRM. Submissions containing CBI should be sent to Carol Nguyen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA issued AD 2021-05-16, Amendment 39-21459 (86 FR 17287, April 2, 2021), (AD 2021-05-16), for certain PW PW4164, PW4164-1D, PW4168, PW4168-1D, PW4168A, PW4168A-1D, and PW4170 model turbofan engines with LPT 4th-stage air sealing ring segment assemblies, part number (P/N) 50N463-01 or P/N 50N526-01, installed. AD 2021-05-16 was prompted by six reports from the manufacturer concerning LPT 4th-stage vane cluster assemblies leaning back and notching into rotating LPT 4th-stage blades, causing some blades to fracture and release. These incidents resulted in an aborted takeoff, air turnbacks, engine surges, high vibrations, and unplanned engine removals. The incidents were attributed to the LPT 4th-stage air sealing ring segment assemblies moving into the LPT 4th-stage blades knife edge seals, resulting in damage to the ring segment assemblies. AD 2021-05-16 requires initial and repetitive replacements of the LPT 4th-stage air sealing ring segment assemblies with parts eligible for installation. AD 2021-05-16 also requires initial and repetitive dimensional inspections of the LPT case for bulging and, depending on the results of the dimensional inspections,

repair or replacement of the LPT case. The agency issued AD 2021-05-16 to prevent damage to the LPT 4th-stage air sealing ring segment assemblies, the LPT case, and the LPT 4th-stage blades. The unsafe condition, if not addressed, could result in uncontained release of the LPT 4th-stage blades, damage to the engine, and damage to the airplane.

Actions Since AD 2021-05-16 Was Issued

Since the FAA issued AD 2021-05-16, the FAA was notified by a manufacturer of parts manufacturer approval (PMA) parts and that paragraphs (c), (g), and (h) of the AD should include affected PMA part numbers because the unsafe condition also applies to those parts. The FAA added FAA-approved equivalent part numbers to paragraphs (c), (g), and (h) of this AD to include PMA part numbers.

FAA's Determination

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

Related Service Information under 1 CFR Part 51

The FAA reviewed Pratt & Whitney Alert Service Bulletin No. PW4G-100-A72-262, Revision No. 1, dated September 3, 2020 (the ASB). The ASB specifies procedures for replacing the LPT 4th-stage air sealing ring segment assemblies and inspecting the LPT case for bulging. The Director of the Federal Register approved the ASB for incorporation by reference as of May 7, 2021 (86 FR 17287, April 2, 2021). 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 ADDRESSES.

Proposed AD Requirements in this NPRM

This proposed AD would retain all the requirements of AD 2021-05-16. This proposed AD would add "or FAA-approved equivalent part numbers" to paragraph (c), Applicability; paragraph (g), Required Actions; and paragraph (h), Definitions, of this AD. This proposed AD would also add paragraph (i), Credit for Previous Actions, allowing operators to take credit for the required actions in paragraph (g)(4) of this AD if, prior to the effective date of this AD, operators performed dimensional inspections of the LPT case for bulging using Pratt & Whitney ASB No. PW4G-100-A72-262, Original

Issue, dated October 22, 2019.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 99 engines installed on airplanes of U.S. registry.

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

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
Inspect the LPT case for bulging	2 work-hours x \$85 per hour = \$170	\$0	\$170	\$16,830
Replace the LPT 4th-stage air sealing ring segment assemblies	50 work-hours x \$85 per hour = \$4,250	\$64,592	\$68,842	\$6,815,358

The FAA estimates the following costs to do any necessary repair or replacement that would be required based on the results of the proposed inspection. The agency has no way of determining the number of aircraft that might need these repairs or replacements.

On-condition costs

Action	Labor Cost	Parts Cost	Cost per product
Repair LPT case to restore dimensions	250 work-hours x \$85 per hour = \$21,250	\$0	\$21,250
Replace the LPT case	0 work-hours x \$85 per hour = \$0	\$1,300,000	\$1,300,000

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 determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by:

- a. Removing Airworthiness Directive AD 2021-05-16, Amendment 39-21459 (86 FR 17287, April 2, 2021); and

- b. Adding the following new airworthiness directive:

Pratt & Whitney Division: Docket No. FAA-2021-0577; Project Identifier AD-2021-00470-E.

(a) Comments Due Date

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

(b) Affected ADs

This AD replaces AD 2021-05-16, Amendment 39-21459 (86 FR 17287, April 2, 2021).

(c) Applicability

This AD applies to Pratt & Whitney Division (PW) PW4164, PW4164-1D, PW4168, PW4168-1D, PW4168A, PW4168A-1D, and PW4170 model turbofan engines with low-pressure turbine (LPT) 4th-stage air sealing ring segment assemblies, part number (P/N) 50N463-01, P/N 50N526-01, or FAA-approved equivalent part numbers, installed.

(d) Subject

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

(e) Unsafe Condition

This AD was prompted by several reports from the manufacturer concerning LPT 4th-stage vane cluster assemblies leaning back and notching into the rotating LPT 4th-stage blades, causing some blades to fracture and release. A manufacturer investigation into those reports determined that the leaning back of the LPT 4th-stage vane cluster assemblies was caused by damage to the LPT 4th-stage air sealing ring segment assemblies. The FAA is issuing this AD to prevent damage to the LPT 4th-stage air sealing ring segment assemblies, the LPT case, and the LPT 4th-stage blades. The unsafe condition, if not addressed, could result in uncontained release of the LPT 4th-stage blades, damage to the engine, and damage to the airplane.

(f) Compliance

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

(g) Required Actions

(1) For affected engines that have either the Talon IIA outer combustion chamber assembly, P/N 51J100 or P/N 51J382, or the Talon IIB outer combustion chamber

assembly, P/N 51J381 or P/N 51J500, installed, at the next engine shop visit after the effective date of this AD, remove from service the LPT 4th-stage air sealing ring segment assemblies, P/N 50N463-01, P/N 50N526-01, or FAA-approved equivalent part numbers, and replace with parts eligible for installation.

(2) For affected engines not referenced in paragraph (g)(1) of this AD, at the next LPT overhaul after the effective date of this AD, remove from service the LPT 4th-stage air sealing ring segment assemblies, P/N 50N463-01, P/N 50N526-01, or FAA-approved equivalent part numbers, and replace with parts eligible for installation.

(3) For all affected engines, at each LPT overhaul after compliance with the required actions in paragraphs (g)(1) or (2) of this AD, remove from service the LPT 4th-stage air sealing ring segment assemblies, P/N 50N526-01 or FAA-approved equivalent part numbers, and replace with parts eligible for installation.

(4) During each replacement of the LPT 4th-stage air sealing ring segment assemblies required by paragraphs (g)(1) through (3) of this AD, perform a dimensional inspection of the LPT case for bulging in accordance with the Accomplishment Instructions, paragraph 2, of PW Alert Service Bulletin No. PW4G-100-A72-262 Revision No. 1, dated September 3, 2020 (the ASB).

(5) If, during the dimensional inspection of the LPT case required by paragraph (g)(4) of this AD, any LPT case found to be outside the serviceable limits specified in Table 1: Serviceable Limits and Repairs of the ASB, repair or replace the LPT case before further flight.

(h) Definitions

For the purpose of this AD:

(1) An “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine flanges H through P. The separation of engine flanges solely for the purpose of transportation without subsequent engine maintenance does not constitute an engine shop visit.

(2) An “LPT overhaul” is when the LPT rotor is removed from the engine, all four disks are removed from the LPT rotor, and all blades are removed from the disks.

(3) “Parts eligible for installation” are LPT 4th-stage air sealing ring segment assemblies, P/N 50N526-01, or FAA-approved equivalent part numbers, with zero flight cycles since new or with a P/N not mentioned in this AD.

(i) Credit for Previous Actions

You may take credit for the dimensional inspection of the LPT case for bulging required by paragraph (g)(4) of this AD if the inspection was performed before the effective date of this AD using PW ASB No. PW4G-100-A72-262 Original Issue, dated October 22, 2019.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO 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 certification office, send it to the attention of the person identified in Related Information. Information may be emailed to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(k) Related Information

(1) For more information about this AD, contact Carol Nguyen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7655; fax: (781) 238-7199; email: carol.nguyen@faa.gov.

(2) For service information identified in this AD, contact Pratt & Whitney, 400 Main Street, East Hartford, CT 06118; phone: (800) 565-0140; email: help24@prattwhitney.com; website: <https://prattwhitney.com>. You may view this referenced 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 (781) 238-7759.

Issued on July 16, 2021.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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