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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2018-0920; Product Identifier 2016-NE-09-AD; Amendment 39-19605; AD 2019-06-07]**

**RIN 2120-AA64**

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

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

**ACTION:** Final rule.

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**SUMMARY:** We are superseding Airworthiness Directive (AD) 2016-22-05 for certain Pratt & Whitney Division (PW) PW4164, PW4164-1D, PW4168, PW4168-1D, PW4168A, PW4168A-1D, and PW4170 model turbofan engines. AD 2016-22-05 required initial and repetitive inspections of the affected fuel nozzles and their replacement with parts eligible for installation. This AD requires initial and repetitive inspections of the affected fuel nozzles and fuel nozzle supply manifold assemblies, replacement of the affected fuel nozzles with parts eligible for installation, and the installation of new brackets and clamps on the fuel nozzle supply manifold assemblies. This AD was prompted by several instances of fuel leaks on PW engines with the Talon IIB combustion chamber configuration installed. We are issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective May 2, 2019.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of May 2, 2019.

The Director of the Federal Register approved the incorporation by reference of a certain other publication listed in this AD as of December 6, 2016 (81 FR 75686, November 1, 2016).

**ADDRESSES:** For service information identified in this final rule, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06108; phone: 860-565-8770; fax: 860-565-4503. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759. It is also available on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2018-0920.

## **Examining the AD Docket**

You may examine the AD docket on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2018-0920; 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 regulatory evaluation, any comments received, and other information. The address for Docket Operations (phone: 800-647-5527) 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.

**FOR FURTHER INFORMATION CONTACT:** Scott Hopper, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7154; fax: 781-238-7199; email: [scott.hopper@faa.gov](mailto:scott.hopper@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2016-22-05, Amendment 39-18694 (81 FR 75686, November 1, 2016), (“AD 2016-22-05”). AD 2016-22-05 applied to certain PW PW4164, PW4164-1D, PW4168, PW4168-1D, PW4168A, PW4168A-1D, and PW4170 model turbofan engines. The NPRM published in the Federal Register on November 19, 2018 (83 FR 58194). The NPRM was prompted by several instances of fuel leaks on PW engines with the Talon IIB combustion chamber configuration installed. The fuel leaks were the result of cracks in the fuel nozzle braze joint and cracks in the fuel manifold tube adjacent to the elbow fitting. The NPRM proposed to require initial and repetitive inspections of the affected fuel nozzles and fuel nozzle supply manifold assemblies, replacement of the affected fuel nozzles with parts eligible for installation, and the installation of new brackets and clamps on the fuel nozzle supply manifold assemblies. We are issuing this AD to address the unsafe condition on these products.

### **Comments**

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

#### **Request To Identify Causes of Fuel Leaks**

PW requested that we identify the two potential causes of the fuel leaks, cracks in the fuel nozzle braze joint and cracks in the fuel manifold tube adjacent to the elbow fitting, in the “Actions Since 2016-22-05 Was Issued” paragraph of the NPRM.

We agree that updating the “Actions Since 2016-22-05 Was Issued” paragraph based on the request would better identify the two potential causes of the fuel leaks. We did not update the “Actions Since AD 2017-20-01 Was Issued” paragraph, however, because this language is not included in this final rule. Instead, we updated the Discussion paragraph to identify the two potential causes of the leaks.

#### **Request To Correct Acronym Typographical Error**

PW and Delta Air Lines (Delta) requested that we correct the acronym for the ring case compressor from “RRC” to “RCC” in the Applicability paragraph of this AD.

We agree and corrected the acronym in this AD.

## **Request To Update the Labor Work Hours**

Delta requested that we update the 16 labor work-hours identified in the “Estimated costs” table of this AD to match the 40 man-hours identified in the Manpower paragraph of Pratt & Whitney Service Bulletin (SB) PW4G-100-73-48, Revision No. 1, dated April 24, 2018.

We disagree. Like the service information, the “Estimated costs” table of this AD separates the cost of the actions. The 16 work-hours of this AD reflects only replacing the fuel nozzle supply manifold assemblies and installing the new clamps and brackets. These work hours do not reflect any additional actions, such as opening and closing the cowl doors or using the Aircraft Maintenance Manual (AMM). We did not change this AD.

## **Request To Clarify the Applicability Paragraph**

SR Technics Switzerland Ltd. (SR Technics) requested that we update paragraphs (c)(1) to (4) of this AD to include the phrase “that have SB PW4G-100-73-48 Rev. 1 not fully introduced.” SR Technics expressed concern that operators who have replaced the fuel nozzle with an eligible part may not comply with the additional requirement to replace fuel nozzle supply manifold assemblies and install new brackets and clamps.

PW and Delta requested that we clarify that engines that have already replaced fuel nozzle part number (P/N) 51J345 per Pratt & Whitney Alert Service Bulletin (ASB) PW4G-100-A73-47, dated March 10, 2017, only have to complete the replacement of the fuel nozzle supply manifold assemblies, and the installation of new brackets and clamps on the fuel nozzle supply manifold assemblies per Pratt & Whitney SB PW4G-100-73-48, Revision No. 1, dated April 24, 2018.

We partially agree. We disagree with including the phrase suggested by SR Technics in the Applicability of this AD because we found it clearer to move the requirement to a separate paragraph. We agree with clarifying that engines with the new fuel nozzles installed only require the installation of the new fuel nozzle supply manifold assemblies, brackets, and clamps. We revised this AD by moving the requirement to replace the fuel nozzle supply manifold assemblies and to install new brackets and clamps from paragraph (g)(2)(ii) in the NPRM into a separate paragraph (g)(3) in this AD.

## **Request To Publish a Separate AD**

Delta requested that we publish a separate AD for the replacement of the fuel nozzle supply manifold assemblies, and the installation of new brackets and clamps on the fuel nozzle supply manifold assemblies per Pratt & Whitney SB PW4G-100-73-48, Revision No. 1, dated April 24, 2018. Delta indicated that per the Applicability paragraph of this proposed rule, engines that have already met the intent of PW ASB PW4G-100-A73-47 and therefore do not have fuel nozzle P/N 51J345 installed are not applicable.

We disagree that it is necessary to publish a separate AD to mandate replacement of the fuel nozzle supply manifold assemblies and installation of new brackets and clamps. As noted above, however, we have revised this AD by creating a separate paragraph (g)(3) to clarify the requirement for replacement of the fuel nozzle supply manifold assemblies, and the installation of new brackets and clamps.

## **Request To Revise the Compliance Time**

PW commented that it disagreed with the compliance time proposed in the NPRM. For replacement of the fuel nozzles, PW requested that we revise the compliance time from 24 months after the effective date of this AD, as proposed in the NPRM, to April 1, 2019. This revised compliance time would match the compliance time in Pratt & Whitney ASB PW4G-100-A73-47,

dated March 10, 2017. PW reasoned that the majority of the fleet is adhering to the April 1, 2019, compliance time and extending the compliance to 24 months is too lenient.

We disagree. The PW safety risk assessment for this AD supports a compliance time of 24-months after the effective date of this AD for replacement of the fuel nozzles. Although certain operators may comply by April 1, 2019, the 24-months compliance time meets the safety intent of this AD. We did not change this AD.

PW also requested that we revise the compliance time to install the fuel nozzle supply manifold assembly, brackets, and clamps to the next shop visit, not to exceed September 30, 2024, whichever occurs first. This compliance time would also be consistent with Pratt & Whitney SB PW4G-100-73-48, Revision No. 1, dated April 24, 2018. PW reasoned that after further analysis, including reassessment of the risk associated with the vibratory stress cracking of the manifolds, they will publish a revision to their service information.

We agree. PW's analysis and updated safety risk support extending the compliance time to replace the fuel nozzle supply manifold assembly, brackets, and clamps. We revised this requirement from "At the next shop visit or within 24 months after the effective date of this AD, whichever comes first. . . ." to "At the next shop visit or within 60 months after the effective date of this AD, whichever comes first. . . ."

### **Request To Remove Wording From Terminating Action Paragraph**

PW and Delta requested that we update the Terminating Action paragraph of this AD to remove the replacement of the manifold supply assemblies and installation of the brackets and clamps. Delta noted that the fuel nozzle and fuel nozzle supply manifold assembly failure modes as described by their respective Pratt & Whitney SBs PW4G-100-A73-47 and PW4G-100-73-48 are not the same. The commenters further reasoned that the repetitive inspections specified in paragraph (g)(1) of the NPRM apply only to the fuel nozzle.

We agree. We removed the replacement of the manifold supply assemblies and installation of the brackets and clamps as terminating actions for this AD.

### **Request To Correct the Part Terminology for Consistency**

Delta noted that we used the term "fuel nozzle manifold supply assemblies" and "fuel supply manifolds" in the NPRM and requested that the term "fuel nozzle supply manifold assembly" be used to be consistent with the service information.

We agree. We revised this AD to refer to "fuel nozzle supply manifold assembly."

### **Request To Separate Required Actions To Allow Alternate Tool**

Delta requested that we separate the actions identified in paragraph (g)(2)(ii) of the NPRM (paragraph (g)(3) of this AD), into two steps: 1. Replace the fuel nozzle supply manifold assemblies, and 2. Install the new brackets and clamps on the fuel nozzle supply manifold assemblies. Delta reasoned that this AD specifies using service information that will only allow the use of a backup wrench to install the fuel nozzle supply manifold assemblies. Delta and PW, however, have developed an alternate tool to install the fuel nozzle supply manifold assemblies to reduce the risk of over-torqueing.

We disagree. While the service information references a backup wrench, it does not specify the P/N of the tool to use. Therefore, 14 CFR part 43 allows for the use of alternate, FAA-approved, tools. We did not change this AD.

## **Request To Allow Use of Later Revisions of Service Information**

Delta requested that we add the phrase “or later per subsequent SBs” to paragraph (h)(2) of this AD to remove the need to submit alternative methods of compliance requests in response to future redesigns of the fuel nozzles.

We disagree. We are authorized to require the use of service information that we have reviewed and which are published. Since later revisions of the service information are not yet published, we are not authorized to require their use. We did not change this AD.

## **Support for the AD**

The Air Line Pilots Association expressed support for the NPRM as written.

## **Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

## **Related Service Information Under 1 CFR Part 51**

We reviewed Pratt & Whitney ASB PW4G-100-A73-45, dated February 16, 2016; Pratt & Whitney ASB PW4G-100-A73-47, dated March 10, 2017; and Pratt & Whitney SB PW4G-100-73-48, Revision No. 1, dated April 24, 2018. Pratt & Whitney ASB PW4G-100-A73-45 describes procedures for inspecting and replacing the fuel nozzles. Pratt & Whitney ASB PW4G-100-A73-47 describes procedures for replacing the fuel nozzle and support assembly. Pratt & Whitney SB PW4G-100-73-48 describes procedures for replacing the fuel nozzle supply manifold assemblies and installing new brackets and clamps on the manifolds. 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.

## **Costs of Compliance**

We estimate that this AD affects 72 engines installed on airplanes of U.S. registry. We estimate the following costs to comply with this AD:

### Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspect fuel nozzles	2.2 work-hours × \$85 per hour = \$187	\$0	\$187	\$13,464
Open and close cowl doors (on-wing)	1 work-hour × \$85 per hour = \$85	0	85	6,120
Remove and replace (24) fuel nozzles	48 work-hours × \$85 per hour = \$4,080	423,471	427,551	30,783,672
Remove and re-install necessary hardware according to AMM	23 work-hours × \$85 per hour = \$1,955	0	1,955	140,760
Replace Fuel Nozzle Supply Manifold Assemblies and install new clamps/brackets	16 work-hours × \$85 per hour = \$1,360	77,159	78,519	5,653,36

### Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, “General requirements.” Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

### Regulatory Findings

We have 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) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),

(3) Will not affect intrastate aviation in Alaska, and

(4) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

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

### **Adoption of 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 removing Airworthiness Directive (AD) 2016-22-05, Amendment 39-18694 (81 FR 75686, November 1, 2016), and adding the following new AD:



**2019-06-07 Pratt & Whitney Division:** Amendment 39-19605; Docket No. FAA-2018-0920; Product Identifier 2016-NE-09-AD.

**(a) Effective Date**

This AD is effective May 2, 2019.

**(b) Affected ADs**

This AD replaces AD 2016-22-05, Amendment 39-18694 (81 FR 75686, November 1, 2016).

**(c) Applicability**

This AD applies to Pratt & Whitney Division (PW):

(1) PW4164, PW4168, and PW4168A model turbofan engines that have fuel nozzles, part number (P/N) 51J345, installed, and that have any of the following installed: Talon IIB combustion chamber per Pratt & Whitney Service Bulletin (SB) PW4G-100-72-214, dated December 15, 2011; ring case configuration (RCC) high-pressure compressor (HPC) per Pratt & Whitney SB PW4G-100-72-219, Revision No. 1, dated October 5, 2011, or original issue; or the outer combustion chamber assembly waspaloy nuts per Pratt & Whitney SB PW4G-100-72-253, dated November 24, 2014;

(2) PW4168A model engines with Talon IIA outer combustion chamber assembly, P/N 51J100 or 51J382, and fuel nozzles, P/N 51J345, installed;

(3) PW4168A-1D and PW4170 model engines with engine serial numbers P735001 through P735190, inclusive, and fuel nozzles, P/N 51J345, installed;

(4) PW4164-1D, PW4168-1D, PW4168A-1D, and PW4170 model turbofan engines that have installed the RCC HPC per Pratt & Whitney SB PW4G-100-72-220, Revision No. 4, dated September 30, 2011, or earlier revision, and have fuel nozzles, P/N 51J345, installed; and

(5) PW4164, PW4164-1D, PW4168, PW4168-1D, PW4168A, PW4168A-1D, and PW4170 model turbofan engines with fuel nozzle, P/N 51J398, installed, that have not installed the replacement fuel nozzle supply manifold assemblies, and new brackets and clamps on the fuel nozzle supply manifold assemblies per Pratt & Whitney SB PW4G-100-73-48, Revision No. 1, dated April 24, 2018.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7310, Engine Fuel Distribution.

**(e) Unsafe Condition**

This AD was prompted by several instances of fuel leaks on PW engines with the Talon IIB combustion chamber configuration installed. We are issuing this AD to prevent failure of the fuel nozzles. The unsafe condition, if not addressed, could result in engine fire and damage to the airplane.

## **(f) Compliance**

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

## **(g) Required Actions**

(1) Within 800 flight hours (FHs) after December 6, 2016 (the effective date of AD 2016-22-05), or before further flight, whichever occurs later, and after that within every 800 FHs accumulated on the fuel nozzles, perform the following:

(i) Inspect all fuel nozzles, P/N 51J345, in accordance with Part A of Pratt & Whitney Alert Service Bulletin (ASB) PW4G-100-A73-45, dated February 16, 2016.

(ii) For any fuel nozzle that fails the inspection, before further flight, remove and replace with a part that is eligible for installation.

(2) At the next shop visit or within 24 months after the effective date of this AD, whichever occurs first, remove all fuel nozzles, P/N 51J345, in accordance with Part A, of Pratt & Whitney ASB PW4G-100-A73-47, dated March 10, 2017, and replace with parts eligible for installation.

(3) At the next shop visit or within 60 months after the effective date of this AD, whichever comes first, replace the fuel nozzle supply manifold assemblies and install the new brackets and clamps on the fuel nozzle supply manifold assembly in accordance with Accomplishment Instructions, "For Engines Installed on Aircraft" or "For Engines Not Installed on Aircraft," of Pratt & Whitney SB PW4G-100-73-48, Revision No. 1, dated April 24, 2018.

## **(h) Definitions**

(1) For the purpose 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 case flanges, except for the following situations, which do not constitute an engine shop visit:

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

(ii) Separation of engine flanges solely for the purpose of replacing the fan or propulsor without subsequent engine maintenance.

(2) For the purpose of this AD, a part that is "eligible for installation" is a fuel nozzle with a P/N other than 51J345 that is FAA-approved for installation.

## **(i) Terminating Action**

Installation of the eligible fuel nozzles constitutes terminating action for the repetitive inspection requirements of paragraph (g)(1) of this AD.

## **(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 paragraph (k) of this AD. You may email your request 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**

For more information about this AD, contact Scott Hopper, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7154; fax: 781-238-7199; email: scott.hopper@faa.gov.

## **(l) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(3) The following service information was approved for IBR on May 2, 2019.

(i) Pratt & Whitney Alert Service Bulletin (ASB) PW4G-100-A73-47, dated March 10, 2017; and

(ii) Pratt & Whitney Service Bulletin PW4G-100-73-48, Revision No. 1, dated April 24, 2018.

(4) The following service information was approved for IBR on December 6, 2016.

(i) Pratt & Whitney ASB PW4G-100-A73-45, dated February 16, 2016.

(ii) [Reserved]

(5) For Pratt & Whitney service information identified in this AD, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06108; phone: 860-565-8770; fax: 860-565-4503.

(6) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

(7) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on March 22, 2019.

Karen M. Grant,  
Acting Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.