[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2016-9405; Directorate Identifier 2016-NE-22-AD; Amendment 39-18918; AD 2017-12-03]

RIN 2120-AA64

Airworthiness Directives; Pratt & Whitney Division Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain Pratt & Whitney Division (PW) PW2037, PW2037M, and PW2040 turbofan engines. This AD was prompted by an unrecoverable engine in-flight shutdown (IFSD) after an ice crystal icing event. This AD requires installing a software standard eligible for installation and precludes the use of electronic engine control (EEC) software standards earlier than SCN 5B/I. We are issuing this AD to correct the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06118; phone: 800-565-0140; fax: 860-565-5442. You may view this service information at the FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125. It is also available on the internet at http://www.regulations.gov by searching for and locating Docket No. FAA-2016-9405.

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-2016-9405; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, 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: Kevin Clark, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7199; email: kevin.m.clark@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain PW PW2037, PW2037M, and PW2040 turbofan engines. The NPRM published in the Federal Register on January 5, 2017 (82 FR 1265). The NPRM was prompted by an unrecoverable engine IFSD after an ice crystal icing event. An attempt to rapidly restart the engine was made while the EEC had the Active Clearance Control (ACC) turned on, which caused contraction of the high-pressure turbine (HPT) case and reduced clearances in the HPT, with subsequent HPT damage and rotor seizure. A change to the EEC software can force the ACC to activate at a higher rotor speed to prevent active ACC during engine restart. The NPRM proposed to preclude the use of EEC software standards earlier than SCN 5B/I. We are issuing this

AD to prevent failure of the HPT, rotor seizure, failure of one or more engines, loss of thrust control, and loss of the airplane.

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. The Airline Pilots Association and United Airlines support the NPRM.

Request to Change Compliance

The Boeing Company, PW, Delta Air Lines, Inc., FedEx, and Rudy Pueschel requested removing the engine serial number requirement for earlier compliance time and use the Asia Pacific regional requirement for earlier compliance time. The change would properly capture the risk of icing events in the Asia Pacific region. This change would also match the referenced alert service bulletin (ASB).

We disagree. There are difficulties in compliance and enforcement for regulations based on regions. Using engines serial numbers (S/Ns) that are currently known to operate in the area was our approach to best capture the higher risk engines while easing compliance. The unsafe condition is addressed by upgrading at least one engine per airplane on all known engines currently operating in the Asia Pacific region within the shorter compliance period. Finally, this AD requires all engines with EEC model numbers EEC104-40 and EEC104-60 to upgrade software earlier than software standard SCN 5B/I by 2024. We did not change this AD.

Request to Change Method to Identify Engines Affected by Earlier Compliance Time

Delta Air Lines, Inc. and FedEx requested removing the engine serial number requirement for earlier compliance time and use extended range twin-engine operations (ETOPs) or Aircraft Tail Number requirements for earlier compliance time. The change

was requested to ease with compliance and help properly capture the safety risk of operating in the Asia Pacific region.

We disagree. Operators may have ETOPs flights that do not operate in the Asia Pacific region and would then be mandated to the earlier compliance time unnecessarily. Typically the EEC remains with the engine instead of the aircraft so tracking engines would be more appropriate than aircraft. However, we will review any Alternative Methods of Compliance (AMOCs) submitted to cover the regional risk to any operator's specific fleet instead of tracking through engine S/Ns. We did not change this AD.

Request to Change Compliance Time

Delta Air Lines, Inc. and FedEx requested using EEC S/Ns instead of engine S/Ns to track the earlier compliance times because, as the software is removed and upgraded on the EEC that the EEC should be tracked to properly follow the software upgrades.

We partially agree. We agree that tracking EEC serial numbers would assist in tracking software because EECs are removed or replaced more often than engines. We disagree with this approach because our available Asia Pacific region information only includes engine S/Ns. We did not change this AD.

Request to Clarify Engine S/Ns

Rudy Pueschel and PW requested clarification that the affected engine S/Ns are those engines currently operating in the Asia Pacific region, to assist operators in knowing why specific engines require earlier compliance.

We agree. Knowing the engines with certain S/Ns are currently operating in the Asia Pacific region will help operators understand the risk and unsafe condition. We revised the Differences Between this Proposed AD and the Service Information section.

Request to Change Compliance Time

FedEx and PW requested changing the engine shop visit definition to when the EEC is accessible at a maintenance facility. The EEC is a line replaceable unit (LRU)

which may be replaced outside of a major flange separation shop visit definition. This would also align with the ASB.

We disagree. Our decision to use the separation of pairs of major mating engine flanges for the definition of an "engine shop visit" is based on the average time between shop visits and allows a period of time to operate with an adequate level of safety without unduly burdening operators not flying in the Asia Pacific Region. This is to avoid grounding aircraft that may be at a facility capable of replacing the EEC, but, not having the required parts or equipment to do so at the time. We did not change this AD.

Request to Change Compliance Time

Delta Air Lines, Inc. requested removing the engine shop visit requirement because the EEC is an LRU and may not line up with a major flange separation engine shop visit definition.

We disagree. The risk requires complying at the next engine shop visit. Our decision to use the separation of pairs of major mating engine flanges for the definition of an "engine shop visit" is based on the average time between shop visits and allows a period of time to operate with an adequate level of safety without unduly burdening operators not flying in the Asia Pacific Region. This is to avoid grounding aircraft that may be at a facility capable of replacing the EEC, but, not having the required parts or equipment to do so at the time. We did not change this AD.

Request to Change Service Information

Delta Air Lines, Inc., FedEx, and PW requested changing the required action from removing software earlier than software standard SCN 5B/I to install or upgrade to software standard SCN 5B/I, because there are no instructions for removing software. PW ASB PW2000 A73-170, dated July 14, 2016 is only for upgrading the software.

We partially agree. We disagree with mandating installation of software standard SCN 5B/I because that would prohibit the installation of a newer software standard in the

future. We agree that an alternative to removing EEC software is needed because there are no instructions for removing software. This AD requires upgrading software, or installing an EEC that is eligible for installation. We changed paragraph (g) of this AD from “remove software” to “upgrade software”.

Request to Change Compliance Time

Delta Air Lines, Inc. and PW requested that we specify a date in the compliance paragraphs of this AD to provide clarity on the deadline for compliance.

We agree. We changed the compliance paragraphs of this AD to include specific dates.

Request to Change Applicability

Delta Air Lines, Inc. and PW requested that we specify EEC model numbers EEC104-40 and EEC104-60 in the Installation Prohibition section because the Installation Prohibition section applies only to EEC model numbers EEC104-40 and EEC104-60, not to all EECs.

We agree. We revised paragraph (h) of this AD.

Request to Change Costs of Compliance

PW requested that we change the number of affected engines to 303 because only 303 engines have EEC model numbers EEC104-40 or EEC104-60, installed.

We agree. We changed the Costs of Compliance section.

Request to Change Discussion

Delta Air Lines, Inc. requested that we change the Discussion section to clarify that for the event engine, the attempted engine relight with the ACC turned on caused contraction of the HPT case and reduced clearances in the HPT, with subsequent HPT damage and rotor seizure. Delta also requested that we clarify that the EEC controls ACC activation.

We agree. We revised the Discussion section.

Request to Change Difference Between this Proposed AD and the Service Information Paragraph

Delta Air Lines, Inc. requested clarification in the "Differences Between this Proposed AD and the Service Information" section that the AD appears to apply all engines and not just to PW2000 with EEC model numbers EEC104-40 and EEC104-60. To provide further clarification, Delta also requests stating to which engines the July 2024 date applies.

We agree. This AD is applicable to PW2000 engines with EEC model numbers EEC104-40 and EEC104-60. We added the affected EEC model numbers to the Differences Between this AD and the Service Information section.

Request to Change Compliance

Delta Air Lines, Inc. requested that we remove the ellipses from Figure 1 to paragraph (g) of this AD. Ellipses should not be in the list and may suggest missing information.

We agree. We removed the ellipses from Figure 1 to paragraph (g) of this AD.

Request Reopening the Additional Comment Period

Delta Air Lines, Inc. requested reopening the comment period because of expected significant changes to the language of this AD.

We disagree. In response to the public comments we received on the NPRM, we made minor changes to the compliance section of this AD for clarification. However, we did not make any significant changes to this AD. Also we determined that air safety and the public interest require adopting this AD without delay.

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.

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

We reviewed PW ASB PW2000 A73-170, dated July 14, 2016. The ASB describes procedures for modifying or replacing the EEC. 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.

Differences Between this AD and the Service Information

PW ASB PW2000 A73-170, dated July 14, 2016, specifies compliance for any PW2000 engine with EEC model numbers EEC104-40 and EEC104-60, flown, or expected to be flown, in the Asian Pacific latitudes and longitudes, while this AD lists specific engine S/Ns that are currently known to operate in the Asia Pacific region. Also, PW ASB PW2000 A73-170, dated July 14, 2016, provides until 2026 to comply, while this AD provides until July 2024 for all PW2000 engines with EEC104-40 and EEC104-60 to comply.

Costs of Compliance

We estimate that this AD affects 303 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
EEC software installation	1.8 work-hours X $85 per hour = $153.00	$0.00	$153.00	$46,359.00

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.

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) 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 adding the following new airworthiness directive (AD):

2017-12-03 **Pratt & Whitney Division**: Amendment 39-18918; Docket No. FAA-2016-9405; Directorate Identifier 2016-NE-22-AD.

(a) Effective Date

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Pratt & Whitney Division (PW) PW2037, PW2037M, and PW2040 turbofan engines with electronic engine control (EEC), model number EEC104-40 or EEC104-60, installed, with an EEC software standard earlier than SCN 5B/I.

(d) Subject

Joint Aircraft System Component (JASC) of America Code 7321, Fuel Control Turbine Engines.

(e) Unsafe Condition

This AD was prompted by an unrecoverable engine in-flight shutdown (IFSD) after an ice crystal icing event. We are issuing this AD to prevent failure of the high-pressure turbine (HPT), rotor seizure, failure of one or more engines, loss of thrust control, and loss of the airplane.

(f) Compliance

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

(g) Required Action

(1) For an engine with a serial number (S/N) listed in Figure 1 to paragraph (g) of this AD, upgrade any EEC software standards earlier than SCN 5B/I at the next engine shop visit, or before December 1, 2018, whichever occurs first, or, replace the EEC with a part eligible for installation.

(2) For an engine with an S/N not listed in Figure 1 to paragraph (g) of this AD, upgrade any EEC software standards earlier than SCN 5B/I at the next engine shop visit, or before July 1, 2024, whichever occurs first, or replace the EEC with a part eligible for installation.

Figure 1 to paragraph (g) – Engine S/Ns

716402	727272	728741
727103	727280	728743
727134	727281	728748
727152	727282	728779
727158	727286	728785
727189	727287	728795
727202	727288	728806
727204	728709	728811
727231	728715	728812
727239	728716	728820
727240	728719	728824
727251	728720	728826
727252	728725	728827
727253	728726	728840
727257	728729	728864
727269	728730	728870

(h) Installation Prohibition

After the effective date of this AD, do not install any software standard earlier than SCN 5B/I into any EEC model number EEC104-40 or EEC104-60.

(i) Definition

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 flanges, except that the separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance does not constitute an engine shop visit.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request. 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

(1) For more information about this AD, contact Kevin Clark, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7199; email: kevin.m.clark@faa.gov.

(2) PW Alert Service Bulletin PW2000 A73-170, dated July 14, 2016, which is not incorporated by reference in this AD, can be obtained from PW, using the contact information in paragraph (k)(3) of this AD.

(3) For service information identified in this AD, contact Pratt & Whitney Division, 400 Main St., East Hartford, CT 06118; phone: 800-565-0140; fax: 860-565-5442.

(4) You may view this service information at FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

(l) Material Incorporated by Reference

None.

Issued in Burlington, Massachusetts, on June 2, 2017.

Robert J. Ganley,
Acting Manager, Engine & Propeller Directorate,
Aircraft Certification Service.
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