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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 98-ANE-80-AD; Amendment 39-13948; AD 2005-02-03]

RIN 2120-AA64

Airworthiness Directives; Pratt & Whitney JT8D-209, -217, -217A, -217C, and -219 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is superseding an existing airworthiness directive (AD) for Pratt & Whitney (PW) JT8D-209, -217, -217A, -217C, and -219 series turbofan engines. That AD currently requires torque inspection of the 3rd stage and 4th stage low pressure turbine (LPT) blades for shroud notch wear and replacement of the blade if wear limits are exceeded. This AD continues to require those torque inspections at shorter inspection intervals of the refurbished 3rd stage and 4th stage LPT blades, but the same or longer inspection intervals of the new 3rd stage and 4th stage LPT blades, for shroud notch wear and replacement of the blade if wear limits are exceeded. This AD also requires replacing LPT-to-exhaust case bolts and nuts with bolts and nuts made of Tinidur material. This AD results from reports of 194 blade fractures since 1991, with 37 of those blade fractures resulting in LPT case separation, and three reports of uncontained 3rd stage and 4th stage LPT blade failures with cowl penetration. We are issuing this AD to prevent an uncontained blade failure that could result in damage to the airplane.

DATES: This AD becomes effective March 3, 2005. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of March 3, 2005.

ADDRESSES: You can get the service information identified in this AD from Pratt & Whitney, 400 Main St., East Hartford, CT 06108; telephone (860) 565-8770, fax (860) 565-4503.

You may examine the AD docket at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA. You may examine the service information, at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or 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/code_of_federal_regulations/ibr_locations.html*.

FOR FURTHER INFORMATION CONTACT: Keith Lardie, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7189, fax (781) 238-7199.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 with a proposed airworthiness directive (AD). The proposed AD applies to Pratt & Whitney (PW) JT8D-209, -217, -217A, -217C, and -219 series turbofan engines. We published the proposed AD in the Federal Register on August 16, 2004 (69 FR 50346). That action proposed to require torque inspections of the 3rd stage and 4th stage LPT blades for shroud notch wear and replacement of the blade if wear limits are exceeded. That action also proposed to require replacing the LPT-to-exhaust case bolts and nuts with bolts and nuts made of Tinidur material.

Examining the AD Docket

You may examine the AD Docket (including any comments and service information), by appointment, between 8 a.m. and 4:30 p.m., Monday through Friday, except Federal holidays. See ADDRESSES for the location.

Comments

We provided the public the opportunity to participate in the development of this AD. We have considered the comments received.

Use of Radioisotope Inspection Procedure

One commenter proposes to use a radioisotope inspection procedure, which they have developed and was approved as an alternative method of compliance (AMOC) for a previously issued AD. The commenter states that this inspection method is more reliable than the torque inspections mandated in this AD and provides an equivalent level of safety. The FAA does not agree. The commenter did not provide data to substantiate the claim of an equivalent level of safety as it relates to the revised inspection intervals. The commenter's proposal is also operator-specific and does not provide literature for the rest of the fleet. The FAA will evaluate a request for an AMOC that includes data substantiating that an acceptable level of safety is maintained using this procedure.

Costs of Compliance Underestimated

Another commenter states that the costs of compliance are underestimated. The commenter requests that we consider the costs of numerous parts removed when complying with this AD. The FAA does not agree. The indirect costs associated with this AD are not directly related to the required actions, and therefore, are not addressed in the economic analysis for this AD. A finding that an AD is warranted means that the original engine design no longer achieves the level of safety specified by related airworthiness requirements and that other required actions are necessary.

Another commenter states that the costs of compliance are underestimated. The commenter states that the cost of turbine blades and cost of labor to replace the blades when complying with this AD should be considered. The FAA agrees. We estimate that 10% of the blade sets will fail the inspection per year and will require replacement. Therefore, the estimated cost of turbine blades and labor to replace the blades is added to the total cost of the AD to U.S. operators to perform initial torque inspection and bolt and nut replacement.

Request To Clearly Identify the Superseded AD

Another commenter requests that the identification of the superseded AD be clarified. The FAA does not agree. The fact that this AD supersedes AD 99-27-01 is clearly stated in the compliance section of this AD. Although AD 99-22-14 requires replacement of the LPT-to-exhaust case bolts and nuts, that AD primarily addresses installation of high pressure turbine (HPT) containment hardware. Further, a notice of proposed rulemaking was published in the Federal Register on July 15, 2004 (69 FR 42356), which moves the requirement to replace the LPT-to-exhaust case bolts and nuts from AD 99-22-14 to this AD.

Request To Include Reference to NDIP-662, Revision D

Another commenter requests that this AD include a reference to NDIP-622, Revision D. The FAA does not agree. We assume that the commenter intended to say NDIP-662, Revision D and not NDIP-622, Revision D. This AD already references PW ASB No. JT8D A6224, Revision 5, which specifies the use of NDIP-662, which is included as an Appendix in the ASB. Because all pages of NDIP-662, Revision D, are included in the ASB, a clarification to the reference and a change to this AD are not necessary.

Request To Define ''Accessibility to the LPT-to-Exhaust Case Bolts''

Another commenter requests that this AD include a definition of the statement "accessibility to the LPT-to-exhaust case bolts" and that the definition match the one provided in PW SB 6455. The FAA agrees. A definition of "accessibility to the LPT-to-exhaust case bolts" is included in this AD.

Overlap Between Inspection Torque Readings

Another commenter states that there is an overlap between the inspection torque readings in the tables providing the repetitive torque inspection intervals. For example, one range in Table 3 states "* * * but greater than or equal to 10 LB-IN (1.130 N.m)." Another range in Table 3 states "Less than or equal to 10 LB-IN (1.130 N.m) * * *". A single value cannot have two different requirements. The FAA agrees. The affected tables are corrected in this AD.

Inspect Only Turbine Blades That Fail Inspection

Another commenter proposes to inspect only the turbine blades of the LPT stage that fails the torque check inspection. Also, the commenter proposes that the requirement to inspect the turbine blades of the other LPT stages should be suggested rather than mandated as proposed in the AD. The FAA agrees. This AD clarifies the information about how to return an engine to service. In addition, this AD clarifies the information about how the repetitive inspection intervals may be reset.

Conclusion

We have carefully reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We have determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Costs of Compliance

There are about 2,345 PW JT8D-200 series turbofan engines of the affected design in the worldwide fleet. We estimate that 1,143 engines installed on airplanes of U.S. registry are affected by

this AD. We also estimate that it will take about 1 work hour per engine to perform the torque inspection and 1 work hour per engine to perform the bolt and nut replacements. The average labor rate is $65 per work hour. It is estimated that 10% of the blade sets will fail the inspection per year and will require replacement. The average cost for a new blade set is $72,500. The new blades take about 23 work hours to install. Based on these figures, the annual replacement cost of the AD to U.S. operators is $8,584,020. The required bolts and nuts will cost about $1,734 per engine. Based on these figures, we estimate the total annual cost of this AD to U.S. operators to perform initial torque inspection and bolt and nut replacement to be $10,565,982.

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

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); 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.

We prepared a summary of the costs to comply with this AD and placed it in the AD Docket. You may get a copy of this summary by sending a request to us at the address listed under ADDRESSES. Include "AD Docket No. 98-ANE-80-AD" in your request.

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 Federal Aviation Administration 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 Amendment 39-11482 (64 FR 72916, December 29, 1999) and by adding a new airworthiness directive, Amendment 39-13948, to read as follows:

AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
Federal Aviation
Administration

We post ADs on the internet at "www.faa.gov"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2005-02-03 Pratt & Whitney: Amendment 39-13948. Docket No. 98-ANE-80-AD. Supersedes AD 99-27-01, Amendment 39-11482.

Effective Date

(a) This AD becomes effective March 3, 2005.

Affected ADs

(b) This AD supersedes AD 99-27-01.

Applicability

(c) This AD applies to Pratt & Whitney (PW) JT8D-209, -217, -217A, -217C, and -219 series turbofan engines. These engines are installed on, but not limited to, Boeing 727 series and McDonnell Douglas MD-80 series airplanes.

Unsafe Condition

(d) This AD results from reports of 194 blade fractures since 1991, with 37 of those blade fractures resulting in low pressure turbine (LPT) case separation, and three reports of uncontained 3rd stage and 4th stage LPT blade failures with cowl penetration. We are issuing this AD to prevent an uncontained blade failure that could result in damage to the airplane.

Compliance

(e) You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

Initial Torque Inspection for JT8D-209, -217, and -217A Engines

(f) For JT8D-209, -217, and -217A engines, perform the initial torque inspection of 3rd and 4th stage LPT blades for shroud notch wear. Use the procedures described in Accomplishment Instructions, part 1, paragraphs 1. through 3. of PW Alert Service Bulletin (ASB) No. JT8D A6224, Revision 5, dated June 11, 2004, at the applicable threshold in the following Table 1:

TABLE 1.—INITIAL TORQUE INSPECTION THRESHOLD FOR JT8D–209, –217, AND –217A ENGINES

Blade type	Hours time-in-service (TIS)	Inspection threshold
(1) New pre-Service Bulletin (SB) No. 5867 (small notch) 3rd stage turbine blades.	Any number	Within 6,000 hours TIS.
(2) Refurbished pre-SB No. 5867 (small notch) 3rd stage turbine blades.	(i) Fewer than 3,000	Within 4,000 hours TIS.
	(ii) 3,000 or more	Within 6,000 hours TIS, or within 1,000 hours TIS after the effective date of this AD, whichever occurs first.
(3) New post-SB No. 5867 (large notch) 3rd stage turbine blades.	Any number	Within 10,000 hours TIS.
(4) Refurbished post-SB No. 5867 (large notch) 3rd stage turbine blades.	(i) Fewer than 6,000	Within 7,000 hours TIS.
	(ii) 6,000 or more	Within 8,000 hours TIS, or within 1,000 hours TIS after the effective date of this AD, whichever occurs first.
(5) New pre-SB No. 6029 (small notch) 4th stage turbine blades.	Any number	Within 6,000 hours TIS.
(6) Refurbished pre-SB No. 6029 (small notch) 4th stage turbine blades.	(i) Fewer than 3,000	Within 4,000 hours TIS.
	(ii) 3,000 or more	Within 6,000 hours TIS, or within 1,000 hours TIS after the effective date of this AD, whichever occurs first.
(7) New post-SB No. 6029 or new post-SB No. 6308 (large notch) 4th stage turbine blades.	Any number	Within 10,000 hours TIS
(8) Refurbished post-SB No. 6029 or refurbished post-SB No. 6308 (large notch) 4th stage turbine blades.	(i) Fewer than 6,000	Within 7,000 hours TIS.
	(ii) 6,000 or more	Within 8,000 hours TIS, or within 1,000 hours TIS after the effective date of this AD, whichever occurs first.

Repetitive Torque Inspections for JT8D-209, -217, and -217A Engines

(g) For JT8D-209, -217, and -217A engines, perform repetitive torque inspections of 3rd and 4th stage LPT blades for shroud notch wear. Use the procedures described in Accomplishment Instructions, Part 1, Paragraph 1. of PW ASB No. JT8D A6224, Revision 5, dated June 11, 2004, at the applicable intervals in the following Table 2 and Table 3:

TABLE 2.—3RD STAGE REPETITIVE TORQUE INSPECTION INTERVALS FOR JT8D–209, –217, AND –217A ENGINES

Inspection torque readings	Number of readings	Disposition
Greater than or equal to 15 LB–IN (1.695 N.m)	All	Repeat torque inspection within 1,000 hours TIS since last inspection.
Less than 15 LB–IN (1.695 N.m) but greater than or equal to 10 LB–IN (1.130 N.m).	One or more	Repeat torque inspection within 500 hours TIS since last inspection.

Less than 10 LB–IN (1.130 N.m) but greater than or equal to 5 LB–IN (0.565 N.m).	One to three	Repeat torque inspection within 125 hours TIS since last inspection.
Less than 10 LB–IN (1.130 N.m) but greater than or equal to 5 LB–IN (0.565 N.m).	Four or more	Remove engine from service within 20 hours TIS since last inspection.
Less than 5 LB–IN (0.565 N.m)	One or more	Remove engine from service within 20 hours TIS since last inspection.

TABLE 3.—4TH STAGE REPETITIVE TORQUE INSPECTION INTERVALS FOR JT8D–209, –217, AND –217A ENGINES

Inspection torque readings	Number of readings	Disposition
Greater than or equal to 15 LB–IN (1.695 N.m)	All	Repeat torque inspection within 1,000 hours TIS since last inspection.
Less than 15 LB–IN (1.695 N.m) but greater than or equal to 10 LB–IN (1.130 N.m).	One or more	Repeat torque inspection within 500 hours TIS since last inspection.
Less than 10 LB–IN (1.130 N.m) but greater than or equal to 5 LB–IN (0.565 N.m).	One to six	Repeat torque inspection within 125 hours TIS since last inspection.
Less than 10 LB–IN (1.130 N.m) but greater than or equal to 5 LB–IN (0.565 N.m).	Seven or more	Remove engine from service within 20 hours TIS since last inspection.
Less than 5 LB–IN (0.565 N.m)	One or more	Remove engine from service within 20 hours TIS since last inspection.

(h) Subsequent repeat inspection intervals must not exceed the previous inspection interval.

JT8D-209, -217, and -217A Engines Removed From Service

(i) JT8D-209, -217, and -217A engines removed from service may be returned to service after a detailed inspection and repair or replacement for all blades, of the failed stage, that exceed Engine Manual limits is done. Information on repairing or replacing turbine blades can be found in Sections 72-53-12 through 72-53-13 of the JT8D-200 Engine Manual, Part No. 773128.

Initial Inspection for JT8D-217C and -219 Engines

(j) For JT8D-217C and -219 engines, perform the initial torque inspection of 4th stage LPT blades for shroud notch wear. Use the procedures described in Accomplishment Instructions, Part 2, Paragraphs 1. through 3. of PW ASB No. JT8D A6224, Revision 5, dated June 11, 2004, at the applicable threshold in the following Table 4:

TABLE 4.—INITIAL TORQUE INSPECTION THRESHOLD FOR JT8D–217C AND –219 ENGINES

Blade Type	TIS	Inspection threshold
(1) New pre-SB No. 6090 (small notch) 4th stage turbine blades.	Any number	Within 5,000 hours TIS.
(2) Refurbished pre-SB No. 6090 (small notch) 4th stage turbine blades.	(i) Fewer than 3,000	Within 4,000 hours TIS.
	(ii) 3,000 or more	Within 5,000 hours TIS, or within 1,000 hours TIS after the effective date of this AD, whichever occurs first.
(3) New post-SB No. 6090, new post-SB No. 6402, or new post-SB No. 6412 (large notch) 4th stage turbine blades.	Any number	Within 10,000 hours TIS.

(4) Refurbished ‘‘As-Cast’’ post-SB No. 6090, post-SB No. 6402, or post-SB No. 6412 (large notch) 4th stage turbine blades.	Any number	Within 7,000 hours TIS.
(5) Refurbished ‘‘Modified’’ post-SB No. 6090, post-SB No. 6402, or post-SB No. 6412 (large notch) 4th stage turbine blades.	(i) Fewer than 3,000	Within 4,000 hours TIS.
	(ii) 3,000 or more	Within 7,000 hours TIS, or within 1,000 hours TIS after the effective date of this AD, whichever occurs first.

Repetitive Torque Inspections for JT8D-217C and -219 Engines

(k) For JT8D-217C and -219 engines, perform repetitive torque inspections of 4th stage LPT blades for shroud notch wear. Use the procedures described in Accomplishment Instructions, Part 2, Paragraph 1. of PW ASB No. JT8D A6224, Revision 5, dated June 11, 2004, at the applicable intervals in the following Table 5:

TABLE 5.—REPETITIVE TORQUE INSPECTION INTERVALS FOR JT8D–217C AND –219 ENGINES

Inspection torque readings	Number of readings	Disposition
Greater than or equal to 15 LB-IN (1.695 N.m)	All	Repeat torque inspection within 1,000 hours TIS since last inspection.
Less than 15 LB-IN (1.695 N.m) but greater than or equal to 10 LB-IN (1.130 N.m).	One or more	Repeat torque inspection within 500 hours TIS since last inspection.
Less than 10 LB-IN (1.130 N.m) but greater than or equal to 5 LB-IN (0.565 N.m).	One to six	Repeat torque inspection within 125 hours TIS since last inspection.
Less than 10 LB-IN (1.130 N.m) but greater than or equal to 5 LB-IN (0.565 N.m).	Seven or more	Remove engine from service within 20 hours TIS since last inspection.
Less than 5 LB-IN (0.565 N.m).	One or more	Remove engine from service within 20 hours TIS since last inspection.

(l) Subsequent repeat inspection intervals must not exceed the previous inspection interval.

JT8D-217C and -219 Engines Removed From Service

(m) JT8D-217C and -219 engines removed from service may be returned to service after a detailed inspection and repair or replacement for all blades, of the failed stage, that exceed Engine Manual limits is done. Information on repairing or replacing turbine blades can be found in Sections 72-53-12 through 72-53-13 of the JT8D-200 Engine Manual, Part No. 773128.

Other Criteria for All Engine Models Listed in This AD

(n) Whenever a refurbished or used blade is intermixed with new blades in a rotor, use the lowest initial inspection threshold that is applicable.

(o) The initial torque inspection or the repetitive inspection intervals for a particular stage may not be reset unless the blades for that stage are refurbished or replaced.

(p) Whenever a used (service run) blade is reinstalled in a rotor, the previous used time should be subtracted from the initial torque inspection threshold.

LPT-to-Exhaust Case Bolts and Nuts Replacement

(q) At next accessibility to the LPT-to-exhaust case bolts, part number (P/N) ST1315-15, and nuts, P/N 4023466, replace bolts and nuts with bolts and nuts made of Tinidur material. Information on replacing the bolts and nuts can be found in PW SB No. 6455, dated January 15, 2004.

Definitions

(r) For the purpose of this AD, refurbishment is defined as restoration of either the shrouds or blade retwist or both, per the JT8D-200 Engine Manual, Part No. 773128.

(s) For the purpose of this AD, "As-Cast" refers to blades that were machined from new castings and "Modified" refers to blades that were derived from the pre-SB No. 6090 configuration.

(t) For the purpose of this AD, "accessibility to the LPT-to-exhaust case bolts" refers to when the engine is disassembled sufficiently to give access to the LPT-to-exhaust case bolts, which is whenever the inner turbine fan ducts are removed.

Alternative Methods of Compliance

(u) The Manager, Engine Certification Office, has the authority to approve alternative methods of compliance for this AD if requested using the procedures found in 14 CFR 39.19.

Material Incorporated by Reference

(v) You must use Pratt & Whitney (PW) Alert Service Bulletin (ASB) No. JT8D A6224, Revision 5, dated June 11, 2004, to perform the inspections required by this AD. The Director of the Federal Register approved the incorporation by reference of this document in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You can get a copy from Pratt & Whitney, 400 Main St., East Hartford, CT 06108; telephone (860) 565-8770, fax (860) 565-4503. You can review copies at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or 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/code_of_federal_regulations/ibr_locations.html*.

Related Information

(w) None.

Issued in Burlington, Massachusetts, on January 14, 2005.
Francis A. Favara,
Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.
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