

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. 98-ANE-47-AD; Amendment 39-12719; AD 2002-08-11]**

**RIN 2120-AA64**

### **Airworthiness Directives; Pratt & Whitney JT9D Series Turbofan Engines**

**AGENCY:** Federal Aviation Administration, DOT.

**ACTION:** Final rule.

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**SUMMARY:** This amendment supersedes an existing airworthiness directive (AD), that is applicable to certain Pratt & Whitney JT9D series turbofan engines. That AD currently requires revisions to the Airworthiness Limitations Section (ALS) of the manufacturer's Instructions for Continued Airworthiness (ICA) to include required enhanced inspection of selected critical life-limited parts at each piece-part exposure. This action adds additional critical life-limited parts for enhanced inspection. This amendment is prompted by an FAA study of in-service events involving uncontained failures of critical rotating engine parts. The actions specified by this AD are intended to prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane.

**DATES:** Effective date May 28, 2002.

**ADDRESSES:** The information referenced in this AD may be examined, by appointment, at the Federal Aviation Administration (FAA), New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC.

**FOR FURTHER INFORMATION CONTACT:** Tara Goodman, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803-5299; telephone (781) 238-7130, fax (781) 238-7199.

**SUPPLEMENTARY INFORMATION:** A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 2000-01-13, Amendment 39-11511 (65 FR 2864, January 19, 2000), which is applicable to Pratt & Whitney (PW) JT9D series turbofan engines, was published in the Federal Register on November 20, 2001, (66 FR 58075). That action proposed to require revisions to the Airworthiness Limitations Section (ALS) of the manufacturer's Instructions for Continued Airworthiness (ICA) to include required enhanced inspection of selected critical life-limited parts at each piece-part exposure.

## **Comments**

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

### **Add the -20 Model**

One commenter requests that the JT9D-20 engine model be added to the applicability paragraph.

The FAA agrees. Although the JT9D-20 engine model was included in the Mandatory Inspections Table of the proposed rule, it was inadvertently omitted from the applicability paragraph of the proposed rule, and is now included in this final rule.

### **Modify Part Nomenclature**

One commenter requests that in the Mandatory Inspections Table, under the Part Nomenclature column, the words "and Hubs" be added to all four references to "All LPT Stage 3-6 Disks" to be consistent with manufacturer nomenclature.

The FAA agrees. The four references in the Mandatory Inspections Table now read "All LPT Stage 3-6 Disks and Hubs" in this final rule.

### **Difference Between Existing AD and Proposal Paragraph (a)**

One commenter states that paragraph (a) of AD 2000-01-13 differs from the proposal paragraph (a). The AD paragraph (a) directs the revision to the Engine Time Limit Section (TLS) of the manufacturer's Engine Manuals by specifically listed Engine Manual part numbers, while the proposal states the necessity to revise the manufacturer's Airworthiness Limitation Section (ALS) of the Instructions for Continued Airworthiness (ICA). The commenter requests clarification.

The FAA agrees with adding clarification. The wording in paragraph (a) of AD 2000-01-13 was changed in the proposal to be consistent with other engine models, however, the JT9D engine manuals are not consistent with the manuals of the other PW engine models. Also, the proposal included the engine manual part numbers in the table. Therefore, the FAA changes the wording of paragraph (a) in this final rule to read: "Within the next 30 days after the effective date of this AD, revise the Engine-Time Limits-Airworthiness Limitations Section of the manufacturer's Engine Manual (EM) (JT9D manual part numbers provided in the Table of this AD) and for air carrier operations revise the approved continuous airworthiness maintenance program, by adding the following:"

## Expand Cycles-In-Service Inspection Waiver

One commenter states that there are circumstances where the part inspection would not normally be done. An example of this would be during the rotor balancing process; the inspection would be called out where the rotors may require removal and reinstallation of all blades at rearranged locations to meet balance requirements. The commenter proposes that paragraph (2)(ii) of the proposed change to the Engine Time Limits Section be reworded to allow 2,500 cycles-in-service since the last piece-part opportunity inspection for parts not damaged or related to the removal cause. This would ensure at least one mid-life inspection opportunity for the disk and hub, and would prevent unnecessary inspections due to rotor balance and other work requirements.

The FAA disagrees. The commenter suggests that the 100 cycles-in-service inspection waiver provided in the piece-part opportunity definition is too low and should be expanded to 2,500 cycles. The 100 cycle waiver is intended to allow short-term relief from mandatory inspections for a part recently inspected in accordance with the engine manual requirements. The 100 cycle waiver is specifically aimed at disassembled parts removed from an engine following a test cell reject or some other event that caused the parts removal shortly after successful completion of mandatory inspections. Waiver of mandatory inspections in this instance also requires that the part was not damaged related to the cause for its removal from the engine. Mandatory inspections are required on fully disassembled parts regardless of time-since-new (TSN) or time-since-overhaul (TSO).

The FAA is aware that cracks can be missed during part inspections and that each time a part is processed through an inspection line, the probability of detecting a crack is increased. Typical on-condition maintenance plans make it likely that a given part could be returned to service for thousands of cycles without the need for additional focused inspection. Recognizing two opposing aspects of part removal and inspection, which are the need for a brief exemption period following conduct of mandatory inspections and the benefits of increased frequency of inspection, the FAA established the 100 cycle threshold. No consideration for crack growth time was given in the choice of this number. It is strictly based on keeping the frequency of mandatory inspections as high as practicable and therefore increases the probability of crack detection while providing a brief window of exemption from mandatory inspection if certain conditions are met. Therefore, the 100 cycle limit will remain in paragraph (2)(ii) of the changes to the Engine Time Limits Section of the AD and no exemption will be allowed for infrequent circumstances that create a piece-part opportunity.

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes described previously. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

## Economic Analysis

The FAA estimates that 837 engines installed on airplanes of US registry would be affected by this AD, that it would take approximately 1 work hour per engine to do the proposed actions. The average labor rate is \$60 per work hour. Based on these figures the total cost of the proposed AD on U.S. operators is estimated to be \$954,180.

## Regulatory Analysis

This final rule does not have federalism implications, as defined in Executive Order 13132, because it 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. Accordingly, the FAA has not consulted with state authorities prior to publication of this final rule.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, 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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

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

Air transportation, Aircraft, Aviation safety, Safety.

### **Adoption of the Amendment**

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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.

Sec. 39.13 [Amended]

2. Section 39.13 is amended by removing Amendment 39-11511 (65 FR 2864, January 19, 2000) and by adding a new airworthiness directive, Amendment 39-12719, 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.airweb.faa.gov/rgl](http://www.airweb.faa.gov/rgl)"*

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).

**2002-08-11 Pratt & Whitney:** Amendment 39-12719. Docket No. 98-ANE-47-AD. Supersedes AD 2000-01-13, Amendment 39-11511.

**Applicability:** This airworthiness directive (AD) is applicable to Pratt & Whitney (PW) JT9D-3A, -7, -7A, -7H, -7AH, -7F, -7J, -20, -20J, -59A, -70A, -7Q, -7Q3, -7R4D, -7R4D1, -7R4E, -7R4E1, -7R4E4, -7R4G2, and -7R4H1 series turbofan engines, installed on but not limited to Boeing 747 and 767 series, McDonnell Douglas DC-10 series, and Airbus Industrie A300 and A310 series airplanes.

**Note 1:** This airworthiness directive (AD) applies to each engine identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For engines that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (c) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

**Compliance:** Compliance with this AD is required as indicated, unless already done.

To prevent critical life-limited rotating engine part failure, which could result in an uncontained engine failure and damage to the airplane, do the following:

## Inspections

(a) Within the next 30 days after the effective date of this AD, revise the Engine-Time Limits-Airworthiness Limitations Section of the manufacturer's Engine Manual (EM) (JT9D manual part numbers provided in the Table of this AD) and for air carrier operations revise the approved continuous airworthiness maintenance program, by adding the following:

## Mandatory Inspections

(1) Perform inspections of the following parts at each piece-part opportunity in accordance with the instructions provided in the applicable manual provisions:

| Engine model                  | Engine manual part number  | Part nomenclature  | FPI per manual section | Inspection                 |
|-------------------------------|--|--|------------------------|----------------------------|
| 7/7A/7AH/7F,<br>7H/7J/20/20J. | *646028 (or the equivalent customized versions 770407 and 770408). | All Fan Hubs   | 72-31-04               | 02                         |
|                               |  | All HPC Stage 5-15 Disks and Rear Compressor Drive Turbine Shafts. | 72-35-00               | 03                         |
|                               |  | All HPT Stage 1-2 Disks and Hubs                                   | 72-51-00               | 03                         |
|                               |  | All LPT Stage 3-6 Disks and Hubs                                   | 72-52-00               | 03                         |
|                               |  |  |                        |                            |
| 59A/70A                       | 754459   | All Fan Hubs   | 72-31-00               | Heavy Maintenance Check.   |
|                               |  | All HPC Stage 5-15 Disks and Rear Compressor Drive Turbine Shafts. | 72-35-00               |                            |
|                               |  | All HPT Stage 1-2 Disks and Hubs                                   | 72-51-00               | Heavy Maintenance Check-3. |
|                               |  | All LPT Stage 3-6 Disks and Hubs                                   | 72-52-00               | Heavy Maintenance Check-3. |
|                               |  |  |                        |                            |
| 7Q/7Q3                        | 777210   | All Fan Hubs   | 72-31-00               | 03                         |
|                               |  | All HPC Stage 5-15 disks and Rear Compressor Drive Turbine Shafts. | 72-35-00               | 03                         |
|                               |  | All HPT Stage 1-2 Disks and Hubs                                   | 72-51-00               | 03                         |
|                               |  | All LPT Stage 3-6 Disks and Hubs                                   | 72-52-00               | 03                         |
|                               |  |  |                        |                            |
| 7R4                           | 785058, 785059, and 789328.  | All Fan Hubs   | 72-31-00               | 03                         |
|                               |  | All HPC Stage 5-15 Disks and Rear Compressor Drive Turbine Shafts. | 72-35-00               | 03                         |
|                               |  | All HPT Stage 1-2 Disks and Hubs                                   | 72-51-00               | 03                         |
|                               |  | All LPT Stage 3-6 Disks and Hubs                                   | 72-52-00               | 03                         |
|                               |  |  |                        |                            |

\*P/N 770407 and 770408 are customized versions of P/N 646028 engine manual.

(2) For the purposes of these mandatory inspections, piece-part opportunity means:

- (i) The part is considered completely disassembled when done in accordance with the disassembly instructions in the manufacturer's engine manual; and
- (ii) The part has accumulated more than 100 cycles-in-service since the last piece-part opportunity inspection, provided that the part was not damaged or related to the cause for its removal from the engine."



(b) Except as provided in paragraph (c) of this AD, and notwithstanding contrary provisions in section 43.16 of the Federal Aviation Regulations (14 CFR 43.16), these mandatory inspections must be performed only in accordance with the Engine-Time Limits-Airworthiness Limitations Section of the JT9D Engine Manual.

### **Alternative Method of Compliance**

(c) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Engine Certification Office (ECO). Operators must submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, ECO.

**Note 2:** Information concerning the existence of approved alternative methods of compliance with this airworthiness directive, if any, may be obtained from the ECO.

### **Special Flight Permits**

(d) Special flight permits may be issued in accordance with Secs. 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the aircraft to a location where the requirements of this AD can be done.

### **Continuous Airworthiness Maintenance Program**

(e) FAA-certificated air carriers that have an approved continuous airworthiness maintenance program in accordance with the record keeping requirement of Sec. 121.369(c) of the Federal Aviation Regulations (14 CFR 121.369(c)) of this chapter must maintain records of the mandatory inspections that result from revising the Time Limits section of the Instructions for Continuous Airworthiness (ICA) and the air carrier's continuous airworthiness program. Alternatively, certificated air carriers may establish an approved system of record retention that provides a method for preservation and retrieval of the maintenance records that include the inspections resulting from this AD, and include the policy and procedures for implementing this alternate method in the air carrier's maintenance manual required by Sec. 121.369(c) of the Federal Aviation Regulations (14 CFR 121.369(c)); however, the alternate system must be accepted by the appropriate PMI and require the maintenance records be maintained either indefinitely or until the work is repeated. Records of the piece-part inspections are not required under Sec. 121.380(a)(2)(vi) of the Federal Aviation Regulations (14 CFR 121.380(a)(2)(vi)). All other operators must maintain the records of mandatory inspections required by the applicable regulations governing their operations.

**Note 3:** The requirements of this AD have been met when the engine manual changes are made and air carriers have modified their continuous airworthiness maintenance plans to reflect the requirements in the Engine Manuals.

### **Effective Date**

(f) This amendment becomes effective on May 28, 2002.

Issued in Burlington, Massachusetts, on April 12, 2002.  
Thomas A. Boudreau,  
Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.  
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