

[Federal Register: October 17, 2005 (Volume 70, Number 199)]  
[Rules and Regulations]  
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[DOCID:fr17oc05-4]

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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. 96-ANE-35-AD; Amendment 39-14339; AD 2005-21-01]**

**RIN 2120-AA64**

### **Airworthiness Directives; Pratt & Whitney JT8D-200 Series Turbofan Engines**

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

**ACTION:** Final rule.

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**SUMMARY:** This amendment supersedes an existing airworthiness directive (AD) that applies to Pratt & Whitney (PW) JT8D-200 series turbofan engines. That AD currently requires installing and periodically inspecting individual or sets of certain part number (P/N) temperature indicators on the No. 4 and 5 bearing compartment scavenge oil tube and performance of any necessary corrective action. This AD requires installing and periodically inspecting two temperature indicators on all PW JT8D-200 series turbofan engines, including those incorporating high pressure turbine (HPT) containment hardware. This AD results from five uncontained HPT shaft failures. We are issuing this AD to prevent oil fires and the resulting fracture of the HPT shaft which can result in uncontained release of engine fragments; engine fire; in-flight engine shutdown; and possible airplane damage.

**DATES:** This AD becomes effective November 21, 2005. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of November 21, 2005.

**ADDRESSES:** You can get the service information identified in this AD from Pratt & Whitney, 400 Main St., East Hartford, CT 06108; telephone (860) 565-7700, fax (860) 565-1605.

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.

**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 by superseding AD 97-19-13, Amendment 39-10134 (62 FR 49135, September 19, 1997). The proposed AD applies to PW JT8D-200 series turbofan engines. We published the proposed AD in the Federal Register on September 29, 2004 (69 FR 58099). That action proposed to require installing and periodically inspecting two P/N 810486 temperature indicators on all PW JT8D-200 series turbofan engines, including those incorporating HPT containment hardware. Thirteen HPT shaft fractures resulted in five uncontained HPT shaft failures. The HPT shafts fractured through the No. 4\1/2\ oil return holes due to oil fires within the No. 4 and 5 bearing compartment.

### **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.

### **Concerns Over Considering the Engine Unserviceable**

Four commenters state that an engine should not be considered unserviceable and the engine removed from service if both temperature indicators are missing. The commenters state that we should allow installing new temperature indicators followed by a ground diagnostic test before further flight.

One of those commenters states that considering the engine unserviceable imposes an undue hardship on operators. If one of the indicators is missing, PW Alert Service Bulletin (ASB) No. JT8D A5944 requires that the engine be tested using specific instructions to determine its serviceability and the engine be dispositioned accordingly. The theory used for one indicator missing is that the serviceability of the engine is now questionable and the engine must be proven serviceable before it can be returned to service. The commenter further states that any time engine serviceability is in question, it must be proven and cannot be assumed. Requiring operators to remove the engine from service, simply because both of the indicators are missing, forces operators into a position without recourse. The commenter further states that this is the same condition already covered when one indicator is missing. The procedure to determine serviceability for both indicators missing should follow the procedure for one indicator missing but with minor changes.

We agree. We have changed the compliance section of the AD to allow a ground diagnostic test before further flight if both temperature indicators are missing.

### **AD Instructions Not Clear**

One commenter states that the AD instructions for a missing indicator are not clear. The instructions for one indicator missing assume that the missing indicator has a red window that has turned black. The commenter asks if the yellow window of the missing indicator should be assumed to be normal color or black. The condition of the remaining indicator would make a difference as to whether a diagnostic test may be run or if the engine must be removed.

We agree. PW supplied better instructions in Revision 5 to PW ASB No. JT8D A5944, which we incorporated by reference. For troubleshooting purposes, any missing temperature indicator is assumed to have the same indication as the remaining temperature indicator. Therefore, the results of

the visual inspection of the one remaining temperature indicator should be doubled. This should minimize operator impact due to false indications.

### **Follow-Up Inspection Requirements Too Restrictive**

One commenter states the follow-up inspection requirements for certain conditions are too restrictive. In the cases where the proposed requirements state to check the temperature indicators following every flight should be eased to require a check of the temperature indicators once a day. The commenter feels that the economic burden of checking the indicators following every flight outweighs the risk.

We disagree. An indicator with a black window probably is a sign of an impending problem with the engine. The typical progression for the indicator windows to change from normal tan color to black is as follows: One yellow, two yellow, or two yellow with one or two red windows. Any combination other than this progression is not expected and would signal that the reliability of the engine is in question. For example, if both red windows, which are rated about 50 degrees Fahrenheit hotter than the yellow windows, have turned black, but none of the yellow windows have turned black, a problem may exist with the indicator installation, or hot air might be impinging from a stuck carbon seal. A ground diagnostic test cannot accurately reproduce the symptom of a stuck carbon seal. In one case following an indication of one yellow window and one red window turned black, a shaft fracture occurred only two cycles after a visual inspection, despite engine diagnostic test and other troubleshooting. This type of failure will occur quickly, which is why intensive inspections are required.

### **Use of Dual-Window Temperature Indicators**

One commenter agrees with the proposed AD that dual-window temperature indicators should be used and sealed to minimize false indications. The commenter further states that in a situation where hot air impingement or indicator contamination is determined to cause a false indication, a ground diagnostic test should be allowed to return the engine to service.

We partially agree. In most cases, operators will be unable to show that the source of black windows seen during a visual inspection is indicator contamination or hot air impingement. Operators must follow all of the manufacturer's instructions for installation of temperature indicators to minimize false indications.

### **Troubleshooting On-Wing**

Two commenters disagree with the last two dispositions in the table for Visual Inspection of Dual Window Indications, in Alert Service Bulletin (ASB) No. A5944, Revision 4, dated April 8, 2004. Those dispositions state to remove the engine, whereas the other dispositions in the table allow for troubleshooting the engine on-wing. The commenter states that troubleshooting for false indications should be also allowed for these two dispositions. Hot air impingement could be more likely due to close proximity to sources of contamination and would lead to false indications. The commenter did not supply any data or field experience to support the concern.

We disagree. The new mandatory sealing instructions for the temperature indicators will prevent most false indications. An indicator combination of two yellow windows turned black with at least one red window turned black is not more likely a result of contamination due to hot air impingement than any other situation involving indicators showing at least one black window. If one properly installs the temperature indicators, the last two dispositions involving temperature indicators with black windows probably are a sign of a significant engine problem. Since uncontained HPT shaft fractures continue to occur, a more conservative approach is necessary to prevent their future occurrence.

## **Use of an Immersion Thermocouple**

One commenter feels that an immersion thermocouple should be allowed for all situations in which a window of a temperature indicator has turned black.

We disagree. An immersion thermocouple provides a more accurate reading of temperature. However, an immersion thermocouple can only be used during ground diagnostic tests and may not help detect in-flight issues that cannot be reproduced on the ground, such as a stuck carbon seal. We did not change the AD.

## **Alert Service Bulletin Is Too Precise**

One commenter states that paragraph 1.B of the Accomplishment Instructions of PW ASB No. A5944, Revision 4, dated April 8, 2004, is too precise for otherwise inaccurate temperature indicator measurements. The commenter states that the ASB requires diagnostic tests in intervals from before further flight to 10, 20, or 25 hours or cycles.

We disagree. We used past failure event field data to establish diagnostic testing intervals. Temperature indicators, although they do not provide an absolute temperature indication, are an effective method of determining the health of the scavenge system. Requiring a full ground diagnostic test every 65 hours would be an unnecessary economic burden for the operators. Therefore, for different indicator conditions, depending on the severity of the indications, different follow-on testing requirements are appropriate.

## **Concerns With ASB Instructions**

One commenter states that the ASB instructions for manufacture of the thermocouple are inaccurate and incomplete in some areas, and too detailed in other areas. The instructions specify too long a thermocouple and provide no sealing instructions to prevent oil from leaking past the thermocouple. The instructions also are so detailed for drilling the chip detector, that the operator is left few other options. The commenter further states that PW should not mandate the brand of thermocouple. The commenter feels that operators should be given the intent of the design specifications for installing a thermocouple, and be given flexibility to choose their own installation based on these requirements.

We agree. PW has revised the instructions for the thermocouple, which are in ASB No. JT8D A5944, Revision 5, dated October 3, 2005.

## **Equivalent Parts**

One commenter states that the use of equivalent parts to temperature indicator, PW P/N 810486, should be permitted. A parts manufacturer approval (PMA)-equivalent, P/N 3641, is available. The commenter also requests that the AD wording be changed so that it does not imply that the OEM is the only supplier of an approved temperature indicator for this AD.

We partially agree. PMA parts are acceptable. But presently only one, PMA P/N 3641, is available as a substitute for PW P/N 810486. We changed the AD to include this PMA-equivalent.

## **Other Changes to the Compliance Section for Clarification**

Several commenters suggest that the Compliance section is unclear. We agree that it could be clearer. We changed the Compliance section to clarify the procedures.

## **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 would be affected by this AD. We also estimate that it would take about 1 work hour per engine to perform the actions, and that the average labor rate is \$65 per work hour. Required parts would cost about \$37 per engine. Based on these figures, we estimate the total cost of the AD to U.S. operators to be \$116,586.

## **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. 96-ANE-35-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 39-10134 (62 FR 49135, September 19, 1997) and by adding the following new airworthiness directive:

# 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/aircraft/safety/alerts/](http://www.faa.gov/aircraft/safety/alerts/)*

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).

**2005-21-01 Pratt & Whitney:** Amendment 39-14339. Docket No. 96-ANE-35-AD.

## **Effective Date**

- (a) This airworthiness directive (AD) becomes effective November 21, 2005.

## **Affected ADs**

- (b) This AD supersedes AD 97-19-13, Amendment 39-10134.

## **Applicability**

(c) This AD applies to Pratt & Whitney (PW) JT8D-200 series turbofan engines. These engines are installed on, but not limited to, McDonnell Douglas MD-80 series and Boeing 727 series airplanes.

## **Unsafe Condition**

(d) This AD results from five uncontained high pressure turbine (HPT) shaft failures out of thirteen HPT shaft fractures due to oil fires in the No. 4 and 5 bearing compartments. We are issuing this AD to prevent oil fires; fracture of the HPT shaft which can result in uncontained release of engine fragments; engine fire; in-flight engine shutdown; and possible airplane damage.

## **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.

## **Installation of the Dual-Window Temperature Indicators**

(f) Install two dual-window temperature indicators on the No. 4 bearing compartment scavenge oil tubes of PW JT8D-200 series turbofan engines within 90 days after the effective date of this AD.

(1) Use paragraph 1.A. of the Accomplishment Instructions of PW Alert Service Bulletin (ASB) No. JT8D A5944, Revision 5, dated October 3, 2005, to install the temperature indicators.

(2) The use of part manufacturer approval (PMA)-equivalent temperature indicators, P/N 3641, made by Telatemp Corporation, is acceptable.

## **Initial Visual Inspection of the Dual-Window Temperature Indicators**

(g) Perform initial visual inspection of the dual-window temperature indicators installed in paragraph (f) of this AD within 65 hours time-in-service (TIS) since installation.

(h) If the color of any temperature indicator window has turned black, perform troubleshooting, diagnostic testing, and corrective action as required, using paragraph 1.B. of the Accomplishment Instructions of PW ASB No. JT8D A5944, Revision 5, dated October 3, 2005.

(i) If any temperature indicators are missing:

(1) If one temperature indicator is missing, inspect the remaining temperature indicator and perform troubleshooting, diagnostic testing, and corrective action as required, using Paragraph B.2. of the Accomplishment Instructions of PW ASB No. JT8D A5944, Revision 5, dated October 3, 2005.

(2) If both temperature indicators are missing:

(i) Perform troubleshooting, diagnostic testing, and corrective action as required, using Figure 2 of the Accomplishment Instructions of PW ASB No. JT8D A5944, Revision 5, dated October 3, 2005.

(ii) Perform both engine diagnostic tests as specified in Figure 3 and Figure 4 of the Accomplishment Instructions of PW ASB No. JT8D 5944, Revision 5, dated October 3, 2005.

(iii) If the engine fails the diagnostic tests for red indicators, do not perform the test for yellow indicators. Remove the engine from service.

(3) If the test results show an oil overtemperature condition, remove the engine from service.

(4) If the test results show no oil overtemperature condition:

(i) Replace any temperature indicator that has turned black as specified in paragraph (h) of this AD; and

(ii) Replace any temperature indicator that is missing as specified in paragraph (i) of this AD; and

(iii) Return the engine to service, and inspect as specified in paragraph (g) of this AD.

## **Repetitive Visual Inspection of the Dual-Window Temperature Indicators**

(j) Perform repetitive visual inspections of the dual-window temperature indicators installed in paragraph (f) of this AD within 65 hours TIS since-last-inspection. Use paragraph (h) of this AD to inspect the temperature indicators.

## **Requirements for Thermocouple Installation for On-Wing Diagnostic Test**

(k) The requirements for thermocouple installation are listed in Appendix B of PW ASB No. JT8D A5944, Revision 5, dated October 3, 2005.

## **On-Wing Diagnostic Test Information**

(l) To perform the on-wing diagnostics test, use Appendix C of PW ASB No. JT8D A5944, Revision 5, dated October 3, 2005.

## **Material Incorporated by Reference**

(m) You must use Pratt & Whitney Alert Service Bulletin No. JT8D A5944, Revision 5, dated October 3, 2005, to perform the inspections and tests required by this AD. The Director of the Federal Register approved the incorporation by reference of this service bulletin 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) 565-7700, fax (860) 565-1605. 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/cfr/ibr-locations.html>*.

**Related Information**

(n) None.

Issued in Burlington, Massachusetts, on October 3, 2005.

Francis A. Favara,

Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.

[FR Doc. 05-20501 Filed 10-14-05; 8:45 am]

BILLING CODE 4910-13-P