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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2007-28058; Directorate Identifier 2007-NE-08-AD; Amendment 39-15610; AD 2008-14-15]**

**RIN 2120-AA64**

#### **Airworthiness Directives; International Aero Engines AG (IAE) V2500 Series Turbofan Engines**

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

**ACTION:** Final rule.

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**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for IAE V2500-A1, V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, and V2528-D5 turbofan engines. This AD requires removing certain No. 4 bearing oil system components from service at the next shop visit or by an end date determined by the engine model. This AD results from instances of oil loss from the No. 4 bearing compartment. We are issuing this AD to prevent heat damage to high-pressure turbine (HPT) and low-pressure turbine (LPT) critical life limited hardware such as the HPT stage 1-2 airseal. Damage to the HPT stage 1-2 airseal could cause uncontained engine failure and damage to the airplane.

**DATES:** This AD becomes effective August 20, 2008.

**ADDRESSES:** The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

**FOR FURTHER INFORMATION CONTACT:** Mark Riley, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238-7758; fax (781) 238-7199.

**SUPPLEMENTARY INFORMATION:** The FAA proposed to amend 14 CFR part 39 with a proposed AD. The proposed AD applies to IAE V2500-A1, V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, and V2528-D5 turbofan engines. We published the proposed AD in the Federal Register on July 9, 2007 (72 FR 37126). That action

proposed to require removing certain No. 4 bearing oil system components from service at the next shop visit or by an end date determined by the engine model.

## **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office 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 street address for the Docket Operations office (telephone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

## **Comments**

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

## **Requests To Change Compliance Schedule**

Three commenters, Air Transport Association, United Airlines, and Jet Blue Airways ask that we change the compliance:

- To require removing the parts only when they access the No. 4 bearing compartment, or
- For engines that don't require access to the No. 4 bearing compartment at the next shop visit, to permit them to defer removing the parts to the subsequent shop visit, but not later than June 30, 2011.

The commenters state that changing the compliance times will avoid an undue burden of forcing every engine visit to access the No. 4 bearing compartment and will avoid aircraft-on-ground situations due to lack of spare parts.

We don't agree. We developed the compliance requirements to maintain an acceptable level of safety for the entire V2500 fleet. Revising the compliance requirements will result in having to accelerate the program in order to maintain the same level of safety. That will most likely have an adverse impact on the fleet, due to forcing additional engine removals. The engine manufacturer, IAE, has also stated that a sufficient supply of spare parts exists to handle incorporation within the compliance requirements of the AD, including unexpected shop visit situations. However, operators who have special conditions may propose alternate compliance schedules, if they can show that the alternate compliance schedules provide an acceptable level of safety. We didn't change the AD.

## **Request To Address Design Deficiencies in the HPT Stage 1-2 Airseal**

One commenter, Jet Blue Airways, asks us to revise the AD to address design deficiencies in the HPT Stage 1-2 airseal as a contributor to HPT distress, rather than attributing the root cause of all HPT Stage 1-2 airseal distress to oil in the turbine. The commenter states that one of the reported "confirmed instances of oil loss" in the turbine is inaccurate. One investigation, which was categorized as an "oil in turbine" event, revealed no substantive evidence of oil loss in the turbine, or thermal oil ignition that could have caused the dimensional defects in the HPT Stage 1-2 airseal. It is not beyond reasonable speculation that, of the remaining 23 events, some percentage was incorrectly stated as related to "No. 4 bearing compartment oil loss."

We don't agree. We have been involved in the manufacturer's Engineering Investigations for each of the subject "oil in turbine" (OIT) events, and agree with the manufacturer's conclusions. Due to the operating conditions surrounding the No. 4 bearing compartment, it can be extremely difficult, following engine operation, to detect either evidence of oil loss, or thermo oil ignition. The investigation concluded that the HPT Stage 1-2 airseal distress experienced is a result of thermo oil

ignition and not due to design deficiencies in the HPT Stage 1-2 airseal. The investigation also concluded that measurement of specific HPT Stage 1-2 airseal dimensions is a reliable method of determining if oil ignition has occurred. We did not change the AD.

### **Request To Eliminate the Requirement To Incorporate "OIT Package 2"**

The same commenter, Jet Blue, asks us to revise the AD to eliminate the requirement to incorporate the "OIT Package 2" for compliance. The "OIT Package 2" includes mainly external hardware revisions to eliminate "oil traps" in the oil scavenge tubes for the No. 4 bearing compartment that may adversely impact oil scavenge capability. The commenter states "To our knowledge, no V2527-A5 engine incorporating the modification standards of 'OIT Package' have been found with the reported defects or suspected of No. 4 bearing compartment loss."

We don't agree. We have reviewed the results of the Engineering Investigation of the No. 4 bearing compartment oil loss events, and agree with the manufacturer's conclusions that all hardware identified in Tables 1, 2, and 3 of this AD contribute to the root cause of insufficient oil scavenging from the No. 4 bearing compartment. We didn't change the AD.

### **Request To Revise the NPRM To State a Significant Economic Impact**

The same commenter, Jet Blue, asks us to revise the AD to state that the proposed rule would have a significant economic impact. The commenter states that the modification would cost more than \$8,000,000 for its fleet.

We don't agree. In order for us to categorize an AD as a "significant economic impact" to operators, the total cost of the AD must exceed \$100,000,000 per year. We based our economic assessment for this AD on actual hardware replacement cost (using the manufacturer's spare parts pricing), the estimated number of work-hours (at \$80 per hour) required to comply with the AD, and the estimated number of shop visits per year. Based on those figures, we estimate the cost of the proposed AD to U.S. operators to be \$45,037,165 per year, which is below the \$100,000,000 threshold criterion. We didn't change the AD.

### **Request To Incorporate IAE Service Bulletin V2500-ENG-72-0541 Into the AD**

The same commenter, Jet Blue Airways, requests that we revise the AD to incorporate IAE Service Bulletin (SB) V2500-ENG-72-0541 into the AD. The commenter states that tracking all of the individual parts listed in the AD, especially from parts that are not serialized, is cumbersome and beyond reasonable and customary standards.

We don't agree. Due to the complexity of the various IAE SBs, we determined that it would be clearer to list in the AD, only the parts that operators must remove from service. We list IAE SB V2500-ENG-72-0541 in the Related Information section of the AD. That SB provides specific instructions and the current replacement part information. Listing only the parts that the operators must remove from service also provides operators with increased flexibility for installing other approved parts not listed in the IAE SB. However, we have added a statement in the Compliance section of the AD that states "If you have accomplished IAE Service Bulletin V2500-ENG-72-0541, Revision 4, dated March 12, 2008, you have complied with this AD."

### **Request To Correct Certain Information in the AD**

One commenter, IAE, asks us to correct certain information in the Compliance section of the AD.

We agree. We have:

- Corrected the part number (P/N) for the Seal Assembly, No. 4 Bearing, Front, in Table 2 of the AD, from P/N 2A0853 to P/N 2A2055.

- Deleted P/N 2A0830-01, Tube, Scavenge, No. 4 Bearing Assy, from Table 2 of the AD.
- Deleted P/N 2A1949-01, Tube, Scavenge, No. 4 Bearing Assy, from Table 2 of the AD.
- Deleted P/N 5R8111, Tube A/O Oil, No. 4 Bearing Scav Dif Case to Bif Panel, from Table 2 of the AD.
- Added paragraph (j) for V2525-D5 and V2528-D5 engines stating that with HPT stage 1 rotor assembly, P/Ns 2A9521-002 and 2A9621-002, the stage 1 HPT hub metering plug, P/N 2A3182, does not need to be removed.
- Replaced IAE Service Bulletin V2500-ENG-72-0541, Revision 1, dated February 26, 2007, in the Related Information paragraph, with IAE Service Bulletin V2500-ENG-72-0541, Revision 4, dated March 12, 2008.

**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**

We estimate that this AD will affect 686 engines installed on airplanes of U.S. registry. Of those 686 engines, the operators of nineteen V2500-A1 engines, thirty -A5 engines and twenty-one -D5 engines have already complied with the requirements in this AD.

**Costs of Compliance per Year by Engine Model**

<b>Engine model</b>	<b>Number of engines per year</b>	<b>Total labor cost per year</b>	<b>Total parts cost per year</b>	<b>Total cost per year</b>
V2500-A1	33	\$355,080	\$7,230,564	\$7,585,644
V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5	142	1,368,880	35,790,816	37,159,696
V2525-D5, V2528-D5	5	15,400	276,425	291,825

Based on these figures, we estimate the total cost of this AD to U.S. operators to be \$45,037,165 per year.

**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 at the address listed under ADDRESSES.

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

Air transportation, Aircraft, Aviation safety, 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 adding the following new airworthiness directive:



**2008-14-15 International Aero Engines AG (IAE):** Amendment 39-15610. Docket No. FAA-2007-28058; Directorate Identifier 2007-NE-08-AD.

**Effective Date**

(a) This airworthiness directive (AD) becomes effective August 20, 2008.

**Affected ADs**

(b) None.

**Applicability**

(c) This AD applies to IAE V2500-A1, V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, and V2528-D5 turbofan engines with a part listed by part number (P/N) in this AD installed. These engines are installed on, but not limited to, Airbus A319, A320, A321, and McDonnell Douglas MD-90 airplanes.

**Unsafe Condition**

(d) This AD results from instances of oil loss from the No. 4 bearing compartment. We are issuing this AD to prevent heat damage to high-pressure turbine (HPT) and low-pressure turbine (LPT) critical life limited hardware such as the HPT stage 1-2 airseal. Damage to the HPT stage 1-2 airseal could cause uncontained engine failure and 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.

**V2500-A1 Engines**

(f) For V2500-A1 engines, remove the parts listed by P/N in the following Table 1 of this AD at the next shop visit after the effective date of this AD but not later than November 30, 2008. The ATA chapter reference of the IAE V2500-A1 engine manual (E-V2500-IIA) contains information on removing the parts.

**Table 1.—V2500-A1 Parts To Be Removed**

<b>ATA chapter reference</b>	<b>P/N</b>	<b>Nomenclature</b>
72-42-20	2A0367-01	Tube Assy of, Weep, No. 4 Bearing Outer.
72-42-20	2A2873-01	Tube Assy of, Weep, No. 4 Bearing Outer.
72-42-20	2A0830-01	Tube, Scavenge, No. 4 Bearing Assy.
72-42-20	2A1949-01	Tube, Scavenge, No. 4 Bearing Assy.

72-42-20	2A2028-01	Tube, Scavenge, No. 4 Bearing Assy.
72-42-20	2A0830-001	Tube, Scavenge, No. 4 Bearing Assy.
72-42-20	2A2274-01	Tube, Scavenge, No. 4 Bearing Assy.
72-42-33	2A0853	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A2055	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A2834	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A2930	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A3525	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A3538	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A0851	Support Assy, No. 4 Bearing Seal.
72-42-33	2A2833	Support, No. 4 Bearing, Seal Assy.
72-42-33	2A3537	Support, No. 4 Bearing Seal Assy.
72-42-35	2A0892-01	Duct Assy, Cooling Air, No. 4 Bearing, Front.
72-42-35	2A2257-01	Duct Assy, Cooling Air, No. 4 Bearing, Front.
72-43-20	2A2056	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A2931	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A3526	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A0847	Seal Ring Holder.
72-43-20	2A0891-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-43-20	2A1205-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-43-20	2A3078-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-45-11	2A0594	Metering Plug, HPT Hub, Stage 1.
72-45-11	2A1040	Metering Plug, HPT Hub, Stage 1.
72-45-11	2A2181	Metering Plug, HPT Hub, Stage 1.
72-45-13	2A0884	Seal Air, HPT Stage 1.
72-45-13	2A1203	Seal Air, HPT Stage 1.
72-45-13	2A0884-001	Seal Air, HPT Stage 1.
79-22-49	5R8111	Tube A/O Oil—No. 4 Brg Scav Dif Case to Bif Panel.
79-22-49	5R8138	Tube A/O Oil—No. 4 Brg Scav Dif Case to Bif Panel.
79-22-49	6A5367	Tube A/O Oil—No. 4 Brg Scav Dif Case to Bif Panel.
79-22-49	5A9083	Tube A/O Oil—No. 4 Brg Discon to Discon.
79-22-49	5A9084	Tube A/O Oil—No. 4 Brg Discon to Scav Valve.
79-22-49	5A8573	Tube A/O Oil—Press 'T' To Pressure Transducer.
79-23-51	1648MK2	Scavenge Valve.

**V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, and V2533-A5 Engines**

(g) For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, and V2533-A5 engines, remove the parts listed by P/N in the following Table 2 of this AD at the next shop visit after the effective date of this AD but not later than June 30, 2011. The ATA chapter reference of the IAE V2500-A5 engine manual (E-V2500-11A) contains information on removing the parts.

**Table 2.—V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, and V2533-A5 Parts To Be Removed**

<b>ATA chapter reference</b>	<b>P/N</b>	<b>Nomenclature</b>
72-42-20	2A0367-01	Tube Assy of, Weep, No. 4 Bearing Outer.
72-42-20	2A2873-01	Tube Assy of, Weep, No. 4 Bearing Outer.
72-42-33	2A2055	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A2834	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A2930	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A3525	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A3538	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A0851	Support Assy, No. 4 Bearing Seal.
72-42-33	2A2833	Support, No. 4 Bearing, Seal Assy.
72-42-33	2A3537	Support, No. 4 Bearing Seal Assy.
72-42-35	2A0892-01	Duct Assy, Cooling Air, No. 4 Bearing, Front.
72-42-35	2A2257-01	Duct Assy, Cooling Air, No. 4 Bearing, Front.
72-43-20	2A2056	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A2931	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A3526	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A0847	Seal Ring Holder.
72-43-20	2A0891-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-43-20	2A1205-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-43-20	2A3078-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-45-11	2A0594	Metering Plug, HPT Hub, Stage 1.
72-45-11	2A1040	Metering Plug, HPT Hub, Stage 1.
72-45-11	2A2354	Metering Plug, HPT Hub, Stage 1.
72-45-11	2A3182	Metering Plug, HPT Hub, Stage 1.
72-45-13	2A1352	Seal Air, HPT Stage 1.
72-45-13	2A3032	Seal Air, HPT Stage 1.
79-22-49	5R8138	Tube A/O Oil—No. 4 Brg Scav Dif Case to Bif Panel.
79-22-49	6A5367	Tube A/O Oil—No. 4 Brg Scav Dif Case to Bif Panel.

79-22-49	5A9083	Tube A/O Oil—No. 4 Brg Discon to Discon.
79-22-49	5A9084	Tube A/O Oil—No. 4 Brg Discon to Scav Valve.
79-22-49	5A8573	Tube A/O Oil—Press ‘T’ To Pressure Transducer.

(h) For V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, and V2533-A5 engines with HPT stage 1 rotor assembly, P/Ns 2A9521-002 and 2A9621-002, the stage 1 HPT hub metering plug, P/N 2A3182, does not need to be removed.

### V2525-D5 and V2528-D5 Engines

(i) For V2525-D5 and V2528-D5 engines, remove the parts listed by P/N in the following Table 3 of this AD at the next shop visit after the effective date of this AD but not later than June 30, 2011. The ATA chapter reference of the IAE V2500-D5 engine manual (E-V2500-3IA) contains information on removing the parts.

**Table 3.—V2525-D5 and V2528-D5 Parts To Be Removed**

ATA chapter reference	P/N	Nomenclature
72-42-20	2A0367-01	Tube Assy of, Weep, No. 4 Bearing Outer.
72-42-20	2A2873-01	Tube Assy of, Weep, No. 4 Bearing Outer.
72-42-33	2A0851	Support Assy, No. 4 Bearing Seal.
72-42-33	2A2833	Support, No. 4 Bearing, Seal Assy.
72-42-33	2A3537	Support, No. 4 Bearing Seal Assy.
72-42-33	2A2834	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A2930	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A3525	Seal Assy, No. 4 Bearing, Front.
72-42-33	2A3538	Seal Assy, No. 4 Bearing, Front.
72-42-35	2A2257-01	Duct Assy, Cooling Air, No. 4 Bearing, Front.
72-43-20	2A2056	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A2931	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A3526	Seal Assy, No. 4 Bearing, Rear.
72-43-20	2A0847	Seal Ring Holder.
72-43-20	2A1205-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-43-20	2A3078-01	Duct Assy, Cooling Air, No. 4 Bearing, Rear.
72-45-11	2A3182	Metering Plug, HPT Hub, Stage 1.
72-45-11	2A2354	Metering Plug, HPT Hub, Stage 1.
72-45-13	2A1352	Seal Air, HPT Stage 1.
72-45-13	2A3032	Seal Air, HPT Stage 1.

(j) For V2525-D5 and V2528-D5 engines with HPT stage 1 rotor assembly, P/Ns 2A9521-002 and 2A9621-002, the stage 1 HPT hub metering plug, P/N 2A3182, does not need to be removed.

### **Previous Credit**

(k) If you have accomplished IAE Service Bulletin V2500-ENG-72-0541, Revision 4, dated March 12, 2008, you have complied with this AD.

(l) After the effective date of this AD, do not install any part that has a P/N listed in this AD.

### **Alternative Methods of Compliance**

(m) 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.

### **Related Information**

(n) International Aero Engines Service Bulletin No. V2500-ENG-72-0541, Revision 4, dated March 12, 2008, pertains to the subject of this AD.

(o) Contact Mark Riley, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238-7758; fax (781) 238-7199, for more information about this AD.

### **Material Incorporated by Reference**

(p) None.

Issued in Burlington, Massachusetts, on July 2, 2008.

Peter A. White,

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

[FR Doc. E8-15686 Filed 7-15-08; 8:45 am]