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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2025-2555; Project Identifier AD-2025-00433-E; Amendment 39-23446; AD 2026-17-03]

RIN 2120-AA64

Airworthiness Directives; International Aero Engines AG Engines

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for certain International Aero Engines AG (IAE AG) Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines. This AD was prompted by a manufacturer investigation that revealed that certain 3rd stage high pressure compressor (HPC) rotor blades were susceptible to shroud wear and blade failure. This AD requires replacement of affected 3rd stage HPC rotor blades with parts eligible for installation. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective September 24, 2026.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA-2025-2555; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The

address for Docket Operations is 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:

Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7655; email: *carol.nguyen@faa.gov*.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain IAE AG Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines. The NPRM was published in the **Federal Register** on November 18, 2025 (90 FR 51600). The NPRM was prompted by multiple reports of failed 3rd stage HPC rotor blades that resulted in engine fires, unplanned engine removals, aborted takeoffs, and in-flight shutdowns (IFSD). A manufacturer investigation revealed that 3rd stage HPC rotor blade part numbers (P/Ns) 6A8353 and 6A8688, installed on IAE AG Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines were susceptible to shroud wear and blade fractures. As a result, the manufacturer has developed an improved coating process that increases the durability of the shroud coating, mitigating wear, and reducing the risk of blade fractures. In the NPRM, the FAA proposed to require a full set replacement of affected 3rd stage HPC rotor blades with parts eligible for installation. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from seven commenters. Commenters included the Air Line Pilots Association, International (ALPA), American Airlines, Citizens Rulemaking Alliance, InterGlobe Aviation Limited (IndiGo), Lufthansa Technik, SIA Engineering Company (SIAEC), and United Airlines. ALPA supported the NPRM without change. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request Regarding Withdrawing the NPRM

Lufthansa Technik commented that a change of category code may be sufficient to address the unsafe condition rather than an NPRM because the current failure mode for 3rd stage HPC rotor blades having P/N 6A8353 is not as serious as it was with older blades. Lufthansa Technik stated that IAE AG issued Service Bulletin (SB) V2500-ENG-72-0487, which introduced the current blade standard, and no corresponding AD was published at that time. Lufthansa Technik also stated that prior to the issuance of SB V2500-ENG-72-0487, 3rd stage HPC rotor blades fractured below platform but currently, either the clapper breaks off or the blade fracture occurs above platform, making the unsafe condition less severe and the necessity of an NPRM doubtful.

The FAA infers that the commenter is requesting that the NPRM be withdrawn. The FAA disagrees with the request. The FAA has identified airworthiness limitations and maintenance requirements as mandatory for an airplane's continued airworthiness. An operator's failure to accomplish these instructions could result in a variety of unsafe conditions, including rotor blade failure, which could result in engine fire, reduced control of the airplane, and engine IFSD.

In addition, the FAA may issue ADs to require actions to address unsafe conditions that are not otherwise being addressed (or are not addressed adequately) by normal maintenance procedures. The FAA may address such unsafe conditions by requiring revisions to maintenance or inspection programs, as applicable, as a condition under which airplanes may continue to be operated. The FAA has therefore determined that it is necessary to issue this final rule. The FAA did not change this AD as a result of this comment.

Request To Issue an NPRM or Justify Forgoing Notice and Comment

The Citizens Rulemaking Alliance requested that the FAA either convert this action to an NPRM with an expedited comment period and adopt an immediately effective interim AD only for tasks with compliance times that would lapse before the NPRM could be finalized or provide its justification for finding good cause to bypass notice and comment procedures. Additionally, the commenter requested that the FAA provide the standard 30-day delayed effective date for non-urgent provisions. The commenter asserted the FAA has not adequately justified use of the good cause exemption to bypass notice and comment and the 30-day delayed effective date.

The FAA notes the comment was submitted in response to an NPRM for which the FAA provided a 45-day comment period. This final rule is effective 35 days after its publication in the **Federal Register** . Therefore, the FAA did not change this AD as a result of this comment.

Requests To Reference Service Material and Clarify Compliance

American Airlines, IndiGo, and Lufthansa Technik requested that the FAA revise the NPRM to reference IAE AG SB V2500-ENG-72-0716, dated October 4, 2024. SIAEC also requested that the FAA clarify if accomplishing the 3rd stage HPC rotor blades replacement in accordance with IAE AG SB V2500-ENG-72-0716, dated October 4, 2024, demonstrates compliance with the NPRM. American Airlines stated that the terminating action for the requirements of the NPRM is replacement of the 3rd stage HPC rotor blades using IAE AG SB V2500-ENG-72-0716, dated October 4, 2024, but that material is not referenced anywhere in the NPRM. IndiGo specifically recommended revising paragraph (g) of the proposed AD to require replacing the 3rd stage HPC rotor blades in accordance with IAE AG SB V2500-ENG-72-0716, dated October 4, 2024.

The FAA agrees to clarify that replacing the 3rd stage HPC rotor blades in accordance with IAE AG SB V2500-ENG-72-0716, dated October 4, 2024, demonstrates compliance with the requirements of this AD because doing so changes the part numbers to those listed in the definition of “part eligible for installation” in paragraph (h) of this AD. The FAA disagrees with the request to reference IAE AG SB V2500-ENG-72-0716, dated October 4, 2024, in this AD because this AD already provides the necessary compliance procedures. The FAA did not change this AD as a result of this comment.

Request To Make Incorporation by Reference (IBR) Materials Reasonably Available

The Citizens Rulemaking Alliance requested that the FAA confirm that IBR materials are properly identified and reasonably available as required by 1 CFR 51.5 and 51.9. The commenter stated that if the preamble of the rule lacks the identification of the specific documents and revision levels, and reasonable availability for free inspection via the docket, the FAA office, and the National Archives and Records Administration, IBR should not be approved until this is corrected.

The FAA notes that this AD does not IBR any material. Additionally, paragraph (k) of this AD specifies that there is no IBR in this AD. Therefore, the FAA did not change this AD as a result of this comment.

Request To Comply With the Paperwork Reduction Act (PRA)

The Citizens Rulemaking Alliance requested that the FAA revise the proposed AD to comply with the PRA if reporting is required or remove any mandatory reporting provisions or suspend enforcement until PRA requirements are satisfied. If reporting is not required, the commenter requested the FAA clarify that in the AD.

The FAA notes that this AD does not require reporting. If an AD were to require reporting, the preamble of the AD would include a paragraph titled "Paperwork Reduction Act" that would provide the applicable OMB control number, required PRA statements, and the estimated time to collect the required information (burden). Any costs associated with the reporting requirement would be included in the Costs of Compliance section in the preamble of the AD. Therefore, the FAA did not change this AD as a result of this comment.

Request To Add Cost Estimate for New Blades

Lufthansa Technik requested that the FAA revise the estimated costs table of the NPRM to include the costs for a set of new blades. Lufthansa Technik stated that the table only includes costs for replacement with reworked blades, and this does not reflect actual modification costs because the blade rework is not an established alternative and new blades are more than five times the cost of reworked blades.

The FAA partially agrees. The FAA disagrees with revising the Estimated Costs table in this final rule because the FAA predicts that most operators will choose the most cost-effective option of replacement with reworked blades. However, the FAA agrees that the cost of a full set of new blades should be mentioned in the Costs of Compliance section of this final rule because replacement with new blades is an acceptable option for compliance with this AD. Therefore, the FAA has revised the Costs of Compliance section of this final rule to include this estimate.

Request To Consider Impact on Small Entities

The Citizens Rulemaking Alliance requested that the FAA either provide the factual basis for its Regulatory Flexibility Act (RFA) certification that the AD will not have a significant economic impact on a substantial number of small entities or prepare an initial regulatory flexibility analysis and solicit comment. The commenter stated that the FAA should disclose how many small U.S. carriers operate the affected engines, projected per-entity compliance costs (including labor and parts), and downtime or scheduling impacts caused by the proposed AD.

The FAA has considered the AD's impact on small entities and provides the following factual basis for its RFA certification.

The Regulatory Flexibility Act of 1980, Public Law 96-354, 94 Stat. 1164 (5 U.S.C. 601-612), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104-121, 110 Stat. 857, Mar. 29, 1996) and the Small Business Jobs Act of 2010 (Pub. L. 111-240, 124 Stat. 2504 Sept. 27, 2010), requires Federal agencies to consider the effects of the regulatory action on small business and other small entities and to minimize any significant economic impact. The term “small entities” comprises small businesses and not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations of less than 50,000.

Small Entities to Which This AD Applies

The FAA used the definition of small entities in the RFA for this analysis. The RFA defines small entities as small businesses, small governmental jurisdictions, or small organizations. In 5 U.S.C. 601(3), the RFA defines “small business” to have the same meaning as “small business concern” under section 3 of the Small Business Act. The Small Business Act authorizes the Small Business Administration (SBA) to define “small business” by issuing regulations.

The SBA has established size standards for various types of economic activities, or industries, under the North American Industry Classification System (NAICS). These size standards generally define small businesses based on the number of employees or annual receipts. The following table shows the SBA size standards for all industries with at least 1 impacted entity. Note that the SBA definition of a small business applies to the parent company and all affiliates as a single entity.

Small Business Size Standards

NAICS code	Description	Size standard
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	1,250 employees.
481111	Scheduled Passenger Air Transportation	1,500 employees.
532411	Commercial Air Transportation Equipment Rental and Leasing	$47,000,000.

To identify small entities, the FAA first identified the primary NAICS of the entity or parent company, and then used data from different sources (*e.g.,* company annual reports, Bureau of Transportation Statistics) to determine whether the entity meets the applicable size standard. The following table provides a summary of the results.

Estimated Number of Small Entities

Category	Number of entities	Engines	Number of small entities	Percent small entities

Category	Number of entities	Engines	Number of small entities	Percent small entities
Aircraft Manufacturing	1	6	0	0
Other Aircraft Parts and Auxiliary Equipment Manufacturing	2	4	2	100
Scheduled Passenger Air Transportation	8	1,398	1	13
Commercial Air Transportation Equipment Rental and Leasing	12	54	5	42
Total	23	1,462	8	35

Projected Reporting, Recordkeeping, and Other Compliance Requirements

The FAA estimates affected entities will incur a cost of $30,085 to replace a full set of 3rd stage HPC rotor blades with reworked blades. If the blades are unserviceable and cannot be reworked, the cost of a full set of new blades is estimated to be $225,000. The following table provides the estimated low-case cost and high-case cost by each NAICS industry.

Average Cost of Compliance per Small Entity

Category	Annual revenue	Low-case cost		High-case cost	
		Average cost	Percent of revenue	Average cost	Percent of revenue
Other Aircraft Parts and Auxiliary Equipment Manufacturing	$2,750,000	$60,170	2.2	$450,000	16.4
Scheduled Passenger Air Transportation	246,300,000	481,360	0.2	3,600,000	1.5
Commercial Air Transportation Equipment Rental and Leasing	5,400,000	132,374	2.5	990,000	18.3

Significant Alternatives Considered

The FAA evaluated the alternative of not promulgating this AD but ultimately deemed that this alternative would create a significant safety hazard. The FAA is issuing this AD to address the unsafe condition for certain IAE AG Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines, ensuring a level of safety that the alternative of no action could not provide.

Request To Provide Additional Cost Information

The Citizens Rulemaking Alliance requested that the FAA provide an explicit Unfunded Mandates Reform Act (UMRA) determination and a more complete cost analysis. The commenter requested that the FAA provide the number of engines affected, inspection intervals, labor assumptions, expected finding rates, parts costs if findings occur, and the on-year aggregation method. Further, if the revised calculations approach or exceed the $100 million threshold under reasonable assumptions, the FAA should treat the action accordingly or separate non-urgent elements for standard rulemaking.

The FAA notes that in the preamble of the proposed AD, the FAA certified that this regulation is not a "significant regulatory action" under Executive Order 12866 and will not have an annual effect on the economy of $100 million or more. Further, in the Costs of Compliance section of the NPRM, the FAA disclosed the number of affected engines on the U.S. registry and the number of work hours per affected engine to estimate the cost of the AD on all U.S. operators. The FAA also disclosed an estimated parts cost. Additionally, the FAA considered the impact that this AD will have on affected operators and determined this AD will not trigger any downtime costs or scheduling disruptions because the requirements of this AD can be performed during regularly scheduled maintenance. However, as previously discussed, the FAA has revised this final rule to include the cost of a full set of new blades. Since the FAA has assessed and disclosed the total known costs of the AD requirements in the Costs of Compliance section of the proposed AD with the addition of the replacement cost using a full set of new blades in this final rule, and because the commenter did not provide additional cost data for the FAA to consider in its cost analysis, it is not necessary to provide additional information in the AD docket. The FAA did not change this AD as a result of this comment.

Request To Revise Compliance Language

United Airlines requested that the FAA clarify the timeline for required actions by revising paragraph (g) of the proposed AD to state, "For any engine inducted into a shop visit after the effective date of this AD where 3rd stage rotor blade is exposed, replace the full set of 3rd stage HPC rotor blades with parts eligible for installation." United Airlines noted that the exact exposure date can be difficult to track for engines inducted for a shop visit prior to the AD effective date, and revising the language would allow for easier tracking of when the AD would apply to a specific engine.

The FAA agrees to revise paragraph (g) of this AD because 3rd stage HPC rotor blade replacement can only be performed at a shop visit and it is not the FAA's intent to require engines that were inducted into an engine shop visit prior to the effective date of this AD to comply with the AD. The FAA has also revised paragraph (h) of this AD by adding paragraph (h)(3) to include a definition for "engine shop visit."

Request for Alternative Method of Compliance Due to Parts Shortage

Lufthansa Technik requested that the FAA revise the proposed AD to allow for repetitive inspections of 3rd stage HPC rotor blades as an alternative method of compliance for the required blade replacement. Lufthansa Technik stated that a shortage of parts eligible for installation is expected due to limited rework options.

The FAA disagrees with the request. The FAA has received assurance from the parts original equipment manufacturer (OEM) that no parts shortages are expected due to limited rework options,

and new hardware production has been increased to meet current demand. The OEM also informed the FAA that there are no inspections currently available for the 3rd stage HPC rotor blades to mitigate this issue. Therefore, the FAA will not mandate any repetitive inspections of the affected 3rd stage HPC rotor blades as an alternative to the blade replacements. If parts may not be available in a timely manner, paragraph (i)(1) of this AD allows operators to request approval of an alternative method of compliance to extend the compliance time, based on a showing that the extension will not adversely affect safety. The FAA did not change this AD as a result of this comment.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM.

Costs of Compliance

The FAA estimates that this AD affects 1,462 engines installed on aircraft of U.S. registry.[1] The FAA estimates the following costs to comply with this AD:

Estimated Costs

Action	Labor cost *	Parts cost	Cost per product	Cost on U.S. operators
Replace full set of 3rd stage HPC rotor blades with reworked blades	1 work-hour × $85 per hour = $85	$30,000	$30,085	$43,984,270

** The FAA estimated operators will incur $85 in costs per labor hour, which is the weighted average fiscal year (FY) 2026 fully loaded wage of an aircraft mechanic ($69.85) working 60% of the labor hours and a general and operations manager ($108.15) working 40% of the labor hours. The FAA estimated these wages by taking the average of the FY 2024 Bureau of Labor Statistics (BLS) air transportation industry average wage for aircraft mechanics and general and operations managers (See: Occupational Employment and Wage Statistics Query System, BLS (May 2024), data.bls.gov/oes/); multiplying each wage by a fringe benefit factor of 1.42 (See: Employer Cost for Employee Compensation—December 2024, BLS (2024), bls.gov/news.release/archives/ecec_03142025.pdf); and adjusting these 2024 wages to 2026 dollars using an implicit Gross Domestic Product (GDP) Price Deflator of 2.8% (See: Gross Domestic Product: Implicit Price Deflator, FRED (2026) fred.stlouisfed.org/series/GDPDEF).*

Although this AD provides two options for replacement, with new or reworked blades, the FAA predicts most operators will choose to replace with reworked blades, which is the most cost-effective option. If the blades are unserviceable and cannot be reworked, the cost of a full set of new blades is estimated to be $225,000.

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.

The FAA is 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; and

(2) Will not affect intrastate aviation in Alaska.

List of Subjects in 14 CFR Part 39

- Air transportation
- Aircraft
- Aviation safety
- Incorporation by reference
- Safety

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:

2026-17-03 International Aero Engines AG: Amendment 39-23446; Docket No. FAA-2025-2555; Project Identifier AD-2025-00433-E.

(a) Effective Date

This airworthiness directive (AD) is effective September 24, 2026.

(b) Affected ADs

None.

(c) Applicability

This AD applies to International Aero Engines AG (IAE AG) Model V2522-A5, V2524-A5, V2525-D5, V2527-A5, V2527E-A5, V2527M-A5, V2528-D5, V2530-A5, V2531-E5, and V2533-A5 engines with a 3rd stage high-pressure compressor (HPC) rotor blade having part number (P/N) 6A8353 or P/N 6A8688 installed.

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

(e) Unsafe Condition

This AD was prompted by multiple reports of failed 3rd stage HPC rotor blades that resulted in engine fires, unplanned engine removals, aborted takeoffs, and in-flight shutdowns (IFSD). The FAA is issuing this AD to prevent failure of the 3rd stage HPC rotor blades. The unsafe condition, if not addressed, could result in engine fire, reduced control of the airplane, and engine IFSD.

(f) Compliance

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

(g) Required Actions

At the next engine shop visit after the effective date of this AD where the 3rd stage HPC rotor is exposed, replace the full set of 3rd stage HPC rotor blades with parts eligible for installation.

(h) Definitions

(1) For the purpose of this AD, a “part eligible for installation” is:

(i) A 3rd stage HPC rotor blade having P/N 6C8368, 6C8403, or later approved P/N; or

(ii) A 3rd stage HPC rotor blade modified to P/N 6A8353-001 or P/N 6A8688-001.

(2) For the purpose of this AD, a “3rd stage HPC rotor blade exposure” is when any 3rd stage HPC rotor blade is removed from the HPC stage 3 to 8 drum.

(3) For the purpose of this AD, an “engine shop visit” is the induction of an engine into the shop for maintenance.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR-520 Continued Operational Safety Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the AIR-520 Continued Operational Safety Branch, send it to the attention of the person identified in paragraph (j) of this AD and email to: *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.

(j) Additional Information

For more information about this AD, contact Carol Nguyen, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7655; email: *carol.nguyen@faa.gov*.

(k) Material Incorporated by Reference

None.

Issued on August 17, 2026.

Brian Knaup,

Acting Deputy Director, Integrated Certificate Management Division, Aircraft Certification Service.

Footnotes

1. The affected population may be smaller than indicated as some operators might already have accomplished IAE AG SB V2500-ENG-72-0716, dated October 4, 2024.

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