DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2018–1034; Project Identifier 2018–NE–38–AD; Amendment 39–21109; AD 2020–08–03]

RIN 2120–AA64

Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG (Type Certificate Previously Held by Rolls-Royce plc) Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is superseding Airworthiness Directive (AD) 2008–22–24 for certain Rolls-Royce Deutschland Ltd. & Co KG (RRD) RB211–535E4–37, RB211–535E4–B–37, and RB211–535E4–B–75 model turbofan engines. AD 2008–22–24 required initial and repetitive ultrasonic inspections (USIs), both on-wing and during overhaul, to detect cracks on the installed low-pressure compressor (LPC) fan blade roots. AD 2008–22–24 also required re-lubrication of the fan blade roots according to accumulated life cycles. This AD retains the requirements of AD 2008–22–24 and extends these requirements to engines operating under additional flight profiles and adds the RB211–535E4–C–37 model turbofan engines to the applicability of this AD. This AD requires initial and repetitive USIs to detect cracks on the installed LPC fan blade roots, both on-wing and at engine overhaul, and replacement of certain blades that exceed the criteria established by the manufacturer. This AD was prompted by small cracks found in the LPC fan blade roots on the concave root flank during an engine overhaul. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective May 18, 2020.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of May 18, 2020.

ADDRESSES: For service information identified in this final rule, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011–44–1332–242424; fax: 011–44–1332–249936; email: *https://www.rolls-royce.com/contact/civil_team.jsp;* internet: *https://www.aeromanager.com.* You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA, 01803. For information on the availability of this material at the FAA, call 781–238–7759. It is also available on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2018–1034.

Examining the AD Docket

You may examine the AD docket on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2018–1034; 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 AD, the mandatory continuing airworthiness information (MCAI), 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: Scott Stevenson, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA, 01803; phone: 781–238–7132; fax: 781–238–7199; email: scott.m.stevenson@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2008–22–24, Amendment 39–15721 (73 FR 65511, November 4, 2008), (''AD 2008–22–24''). AD 2008–22–24 applied to certain RRD RB211–535E4–37, RB211–535E4–B–37, and RB211–535E4–B–75 model turbofan engines. The NPRM published in the **Federal Register** on May 20, 2019 (84 FR 22738). The NPRM was prompted by small cracks found in the LPC fan blade roots on the concave root flank during an engine overhaul. The NPRM proposed to require retaining the requirements of AD 2008–22–24. The NPRM proposed to extend the requirements to engines operating under additional flight profiles and add the RB211–535E4–C–37 model turbofan engines to the applicability of this AD. The NPRM proposed to require initial and repetitive USIs of LPC fan blade roots on-wing or at engine overhaul to detect cracks, and replacement of blades that exceed the criteria in Rolls-Royce (RR) Alert Non-Modification Service Bulletin (NMSB) RB211–72–AC879, Revision 9, dated April 23, 2018. The FAA is issuing this AD to address the unsafe condition on these products.

The European Union Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Community, has issued EASA AD 2018–0202R1, dated September 25, 2018 (referred to after this as ''the MCAI''), to address the unsafe condition on these products. The MCAI states:

> During engine overhaul, inspection of a high life set of low pressure compressor (LPC) fan blades revealed small cracks in the blade roots on the concave root flank. These cracks had originated at the edge of bedding from multiple origins. Root cause analysis indicated the cause of the crack initiation to be the absence of the anti-frettage coating.
>
> This condition, if not detected and corrected, could lead to fan blade failure, possibly resulting in release of high energy non-contained debris from the engine, with consequent damage to the aeroplane.
>
> To address this condition, RR issued NMSB RB.211–72–AC879 (original issue, later revised), providing instructions to inspect high life blades, either on-wing or during engine overhaul. Depending on flight profile flown, different inspection intervals were introduced. Consequently, the UK CAA classified that NMSB as mandatory and issued AD 002–01–2000 accordingly, requiring those repetitive inspections.
>
> Since that [UK CAA] AD was issued, it was reported that some engines were operated outside the profiles initially specified, and new flight profiles were introduced to mitigate the risk of overflying the recommended flight profiles. Consequently, the inspection intervals were extended for engines operating within RB211–535E4–B–37 flight profiles C, D and E, and RR issued the NMSB accordingly. Additionally, RR introduced inspection instructions for engines operating within RB211–535E4–C–37 flight profile F and RB211–535E4–37 flight profile G in the NMSB. For the reasons described above, EASA issued AD 2018–0202, retaining the requirements of UK CAA AD 002–01–2000, which was superseded, amending the compliance times and adding repetitive inspections for RB211–535E4–37, RB211–535E4–B–37 and RB211–535E4–C–37 engines operating within flight profiles C, D, E, F and G. That [EASA] AD also provided a modification as optional terminating action for the repetitive inspections.
>
> This [EASA] AD is revised to correct paragraph (1), indicating that only affected fan blades must be inspected.

You may obtain further information by examining the MCAI in the AD docket on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2018–1034.

Comments

The FAA gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Correct Typographical Error

RRD requested that the FAA correct the typographical error ''conclave'' to ''concave'' in paragraph (e) of this AD.

The FAA agrees and corrected the typographical error as suggested.

Revised the Name of the Type Certificate (TC) Holder

The FAA determined that the name of the TC design approval used in the NPRM should have been revised to ''Rolls-Royce Deutschland Ltd & Co KG'' to match TCDS Number E12EU, Revision 26, dated April 25, 2019. The FAA has revised references in this AD from ''Rolls-Royce plc'' to ''Rolls-Royce Deutschland Ltd. & Co KG'' when the FAA refers to the name of the TC design approval holder.

Support for the AD

United Airlines agreed with the modified inspection intervals listed in the NPRM.

No Comments on the AD

Boeing Commercial Airplanes commented that it has no comments.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the change described previously and minor editorial changes. The FAA has determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

The FAA also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

Related Service Information Under 1 CFR Part 51

The FAA reviewed RR Alert NMSB No. RB.211–72–AC879, Revision 9, dated April 23, 2018, and RR Service Bulletin (SB) RB.211–72–C946, Revision 4, dated June 22, 2010. RR NMSB RB.211–72–AC879 describes procedures for performing inspections of high cyclic life LPC fan blade roots on-wing or at overhaul, and re-lubrication of the LPC fan blade roots during overhaul. RR SB RB.211–72–C946 introduces a revised LPC fan blade featuring a redefined dry film lubricant application. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the **ADDRESSES** section.

Costs of Compliance

The FAA estimates that this AD affects 512 engines installed on airplanes of U.S. registry.

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
Inspection of LPC fan blade set	7 work-hours × $85 per hour = $595	$0	$595	$304,640

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the required inspections. The FAA has no way of determining the number of aircraft that might need these replacements:

ON-CONDITION COSTS

Action	Labor cost	Parts cost	Cost per product
Replacement of LPC fan blade	4 work-hours × $85 per hour = $340	$77,916	$78,256

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,

(2) Will not affect intrastate aviation in Alaska, 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.

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 FAA 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.

§ 39.13 [Amended]

■ 2. The FAA amends § 39.13 by removing Airworthiness Directive (AD) 2008–22–24, Amendment 39–15721 (73 FR 65511, November 4, 2008), and adding the following new AD:

2020–08–03 Rolls-Royce Deutschland Ltd & Co KG (Type Certificate Previously Held by Rolls-Royce plc): Amendment 39–21109; Docket No. FAA–2018–1034; Project Identifier 2018–NE–38–AD.

(a) Effective Date

This AD is effective May 18, 2020.

(b) Affected ADs

This AD replaces AD 2008–22–24, Amendment 39–15721 (73 FR 65511, November 4, 2008).

(c) Applicability

This AD applies to Rolls-Royce Deutschland Ltd. & Co KG (RRD) (Type Certificate previously held by Rolls-Royce plc) RB211–535E4–37, RB211–535E4–B–37, RB211–535E4–C–37, and RB–211–535E4–B–75 model turbofan engines except those with fan blades that have all incorporated Rolls-Royce (RR) Service Bulletin (SB) RB.211–72–C946, Revision 4, dated June 22, 2010 (or any earlier revision).

(d) Subject

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

(e) Unsafe Condition

This AD was prompted by small cracks found in the low-pressure compressor (LPC) fan blade roots on the concave root flank during an engine overhaul. The FAA is issuing this AD to detect cracks in the LPC fan blade roots. The unsafe condition, if not addressed, could result in uncontained LPC fan blade release, damage to the engine, and damage to the airplane.

(f) Compliance

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

(g) Required Actions

(1) For engine models being used in the flight profiles indicated in Table 1 to paragraph (g)(1) of this AD, perform initial and repetitive ultrasonic inspections (USIs) of the affected fan blades in accordance with the Accomplishment Instructions, paragraphs 3.A., 3.B., and 3.C., of RR Alert Non-Modification Service Bulletin (NMSB) RB211–72–AC879, Revision 9, dated April 23, 2018, as follows:

(i) Perform an initial ultrasonic root or surface wave inspection of each LPC fan blade before exceeding the inspection threshold as indicated in Table 1 to paragraph (g)(1) of this AD, or within 30 days after the effective date of this AD, whichever occurs later.

(ii) Thereafter, perform a repetitive ultrasonic root or surface wave inspection of each LPC fan blade at intervals not to exceed engine flight cycles (EFCs) since the previous inspection using the applicable EFCs specified in Table 1 to paragraph (g)(1) of this AD.

Table 1 to Paragraph (g)(1) – Flight Profile Inspection Intervals

Model	Flight Profile	Initial Inspection Threshold, EFCs Since New	Reinspection Interval; Root Probe Method	Reinspection Interval; Surface Wave Probe Method
535 E4-37	B and G	15,000 EFCs	850 EFCs	700 EFCs
535E4-C-37	F	15,000 EFCs	850 EFCs	700 EFCs
535E4-B-37	E and C	20,000 EFCs	1,200 EFCs	1,000 EFCs
535E4-B-75	All	20,000 EFCs	1,200 EFCs	1,000 EFCs
535E4-37	A	20,000 EFCs	1,400 EFCs	1,150 EFCs
535E4-B-37	D	20,000 EFCs	1,500 EFCs	1,200 EFCs

(2) For engine models that, after the effective date of this AD, change flight profiles, inspect the affected fan blades before exceeding the initial threshold of the new flight profile or reinspection interval, as applicable, or within 200 EFCs after changing flight profiles, whichever occurs later, without exceeding the previous flight profile initial inspection threshold or reinspection interval.

(3) If, during any inspection required by paragraph (g)(1) or (2) of this AD, any crack is found in the affected fan blades that exceeds the criteria in the Accomplishment Instructions, paragraphs 3.A., 3.B., or 3.C., of RR Alert NMSB RB211–72–AC879, Revision 9, dated April 23, 2018, before the next flight, replace the LPC fan blade with a LPC fan blade eligible for installation.

(h) Optional Terminating Action

Modification of any RRD RB211–535E4–37, RB211–535E4–B–37, RB211–535E4–C–37, and RB–211–535E4–B–75 model turbofan engine in accordance with RR SB RB.211–72–C946, Revision 4, dated June 22, 2010, constitutes terminating action to this AD.

(i) Credit for Previous Actions

Any initial USI accomplished before the effective date of this AD that uses RR NMSB No. RB.211–72–C879, Revision 8, dated November 18, 2015, or earlier versions, meets the requirement of the initial inspection, as applicable. Any repetitive USI accomplished before the effective date of this AD that uses RR NMSB No. RB.211–72–C879, Revision 8, dated November 18, 2015, or earlier versions, meets the requirement of that single repetitive inspection, as applicable. Further repetitive inspections, as mandated by paragraph (g) of this AD, are still required.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO 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 ECO Branch, send it to the attention of the person identified in paragraph (k)(1) of this AD. You may email your request to: *ANE-AD-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.

(k) Related Information

(1) For more information about this AD, contact Scott Stevenson, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA, 01803; phone: 781–238–7132; fax: 781–238–7199; email: *scott.m.stevenson@faa.gov.*

(2) Refer to European Union Aviation Safety Agency (EASA) AD 2018–0202R1, dated September 25, 2018, for more information. You may examine the EASA AD in the AD docket on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2018–1034.

(l) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rolls-Royce (RR) Alert Non-Modification Service Bulletin No. RB.211–72–AC879, Revision 9, dated April 23, 2018.

(ii) RR Service Bulletin RB.211–72–C946, Revision 4, dated June 22, 2010.

(3) For RR service information identified in this AD, contact Rolls-Royce plc, PO Box 31, Derby, England, DE248BJ; telephone: 011–44–1332–242424; fax: 011–44–1332–249936.

(4) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA, 01803. For information on the availability of this material at the FAA, call 781–238–7759.

(5) You may view this service information at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: *fedreg.legal@nara.gov,* or go to: *https://www.archives.gov/federal-register/cfr/ibr-locations.html.*

Issued on April 7, 2020.

Lance T. Gant,

Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2020–07675 Filed 4–10–20; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2020–0314; Project Identifier AD–2020–00369–E; Amendment 39–21110; AD 2020–07–51]

RIN 2120–AA64

Airworthiness Directives; International Aero Engines AG (IAE) Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain International Aero Engines AG (IAE) V2522–A5, V2524–A5, V2525–D5, V2527–A5, V2527E–A5, V2527M–A5, V2528–D5, V2530–A5, and V2533–A5 model turbofan engines. This emergency AD was sent previously to all known U.S. owners and operators of these engines. This AD requires removal of affected high-pressure turbine (HPT) 1st-stage disks from service. This AD was prompted by investigative findings from an event involving an uncontained failure of a HPT 1st-stage disk that resulted in high-energy debris penetrating the engine cowling. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective April 28, 2020 to all persons except those persons to whom it was made immediately effective by Emergency AD 2020–07–51, issued on March 21, 2020, which contained the requirements of this amendment.

The FAA must receive comments on this AD by May 28, 2020.

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- *Federal eRulemaking Portal:* Go to *https://www.regulations.gov.* Follow the instructions for submitting comments.
- *Fax:* 202–493–2251.
- *Mail:* U.S. Department of Transportation, Docket Operations, M–30, West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- *Hand Delivery:* Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Examining the AD Docket

You may examine the AD docket on the internet at *https://www.regulations.gov* by searching for and locating Docket No. FAA–2020–0314; 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 street address for Docket Operations is listed above. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Nicholas J. Paine, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781–238–7116; fax: 781–238–7199; Email: *nicholas.j.paine@faa.gov.*

SUPPLEMENTARY INFORMATION:

Discussion

On March 21, 2020, the FAA issued Emergency AD 2020–07–51, which requires removal from service of affected HPT 1st-stage disks installed on IAE V2522–A5, V2524–A5, V2525–D5, V2527–A5, V2527E–A5, V2527M–A5, V2528–D5, V2530–A5, and V2533–A5 model turbofan engines. This emergency AD was sent previously to all known U.S. owners and operators of these engines. This action was prompted by investigative findings from an event that occurred on March 18, 2020, in which an Airbus Model A321–231 airplane, powered by IAE V2533–A5 model turbofan engines, experienced an uncontained HPT 1st-stage disk failure that resulted in an aborted takeoff. This condition, if not addressed, could result in uncontained HPT failure, release of high-energy debris, damage to the engine, damage to the airplane, and loss of the airplane.

FAA's Determination

The FAA is issuing this AD because the Agency evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

AD Requirements

This AD requires removal from service of affected HPT 1st-stage disks installed on IAE V2522–A5, V2524–A5, V2525–D5, V2527–A5, V2527E–A5, V2527M–A5, V2528–D5, V2530–A5, and V2533–A5 model turbofan engines.

Interim Action

The FAA considers this AD interim action. The root cause of this event is still under investigation.

FAA's Justification and Determination of the Effective Date

Section 553(b)(3)(B) of the Administrative Procedure Act (APA) (5