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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2019-0693; Product Identifier 2017-NE-43-AD; Amendment 39-19758; AD 2019-20-05]

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; request for comments.

SUMMARY: The FAA is superseding airworthiness directive (AD) 2018-15-01 for certain Rolls-Royce plc (RR) Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, Trent 1000-A2, Trent 1000-C2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 model turbofan engines. AD 2018-15-01 required certain engines susceptible to intermediate-pressure turbine (IPT) blade failure not be installed on an airplane together with other engines with IPT blades of the same cyclic life. This AD requires removal of the IPT blade set at lower cyclic life limits and replacing it with a blade set eligible for installation. This AD also expands the applicability to include additional Trent 1000 turbofan engine models. This AD was prompted by the determination that certain IPT blades are susceptible to shank corrosion which leads to cracking and possible blade separation. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective October 30, 2019.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of October 30, 2019.

The FAA must receive any comments on this AD by November 29, 2019.

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 <http://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: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this AD, 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: http://www.rolls-royce.com/contact/civil_team.jsp; internet: <https://customers.rolls-royce.com/public/rollsroycecare>. 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 <http://www.regulations.gov> by searching for and locating Docket No. FAA-2019-0693.

Examining the AD Docket

You may examine the AD docket on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2019-0693; 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), regulatory evaluation, 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: Martin Adler, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7157; email: martin.adler@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued AD 2018-15-01, Amendment 39-19333 (83 FR 34755, July 23, 2018), (“AD 2018-15-01”), for certain RR Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, Trent 1000-A2, Trent 1000-C2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 model turbofan engines. AD 2018-15-01 prohibited the installation of engines susceptible to IPT blade failure on an airplane together with other engines with IPT blades of the same cyclic life. AD 2018-15-01 resulted from new operating restrictions for engines with IPT blades susceptible to shank corrosion and possible blade separation. The FAA issued AD 2018-15-01 to prevent the simultaneous failure of both engines.

Actions Since AD 2018-15-01 Was Issued

Since the FAA issued AD 2018-15-01, RR determined that unless new IPT blades are installed in accordance with RR Service Bulletin (SB) Trent 1000 72-H818, dated November 14, 2016, or RR SB Trent 1000 72-J559, dated November 27, 2017, each engine must remain subject to specific maintenance intervals to minimize the risk of IPT blade release. Both SBs introduced new IPT blades not subject to this AD. RR SB Trent 1000 72-J559 also applies to additional RRD Trent 1000 engines (Trent 1000 TEN engine standard). RR subsequently transferred its FAA type certificate for the subject model engines to Rolls-Royce Deutschland Ltd & Co KG (RRD).

Also, since the FAA issued AD 2018-15-01, the European Union Aviation Safety Agency (EASA) issued EASA AD No. 2019-0135, dated June 11, 2019 (referred to after this as the Mandatory Continuing Airworthiness Information, or the “MCAI”). The MCAI states:

Occurrences were reported of IPTB [IPT blade] shank cracking. Analysis shows that this kind of failure is due to sulphidation corrosion.

This condition, if not corrected, could lead to IPTB shank release, possibly resulting in engine in-flight shut-down (IFSD) and consequent reduced control of the aeroplane.

Prompted by these events, Rolls-Royce identified engines with a high level of sulphidation exposure using a corrosion fatigue life (CFL) model. Consequently, EASA issued AD 2017-0056 to require removal from service of certain engines, to be corrected in shop. In addition, to reduce the risk of dual IFSD, it was decided to introduce a new cyclic life limit to certain engines, determining when an engine can no longer be installed on an aeroplane in combination with certain other engines. Consequently, EASA issued Emergency AD 2017-0253-E, AD 2018-0086, and finally AD 2018-0139, each next AD superseding the previous one, to require de-pairing of the affected engines.

After EASA AD 2018-0139 was issued, prompted by further analyses of data provided by operators, Rolls-Royce developed an updated service management approach to minimise the risk of IPTB release and issued the NMSB, identifying those ESN at highest risk, and providing the corresponding cyclic limits for in-shop IPTB replacement. Consequently, EASA issued AD 2018-0257, superseding EASA AD 2017-0056 and AD 2018-0139, to require removal from service of certain engines, to be corrected in shop. That AD also required, for engines having SUM IPTB installed, the introduction of IPTB cyclic limits. Finally, that AD retained the optional terminating action as previously provided by EASA AD 2018-0139.

Since that AD was issued, it was determined that, unless mod/SB 72-H818 or mod/SB 72-J559 is embodied, each engine must remain subject to service management to minimise the risk of IPTB release. Rolls-Royce mod/SB 72-J559 applies to the Trent 1000 TEN engine standard, introducing IPTB P/N KH71526 and additional IPTB coating.

For the reason described above, this [EASA] AD retains the requirements of EASA AD 2018-0257, which is superseded, expands the Applicability by including Trent 1000 TEN engine models, and including reference to the NMSB, as defined in this AD.

You may obtain further information by examining the MCAI in the AD docket on the internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2019-0693.

Related Service Information Under 1 CFR Part 51

The FAA reviewed RR Alert Non-Modification Service Bulletin (NMSB) Trent 1000 72-AK186, Revision 2, dated April 16, 2019. This service information establishes cyclic life limits for IPT blades and specifies removing RRD Trent 1000 engines with IPT blades that have a cyclic life exceeding the new cyclic life limits.

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.

Other Related Service Information

The FAA reviewed RR NMSB Trent 1000 72-J442, Revision 3, dated October 8, 2018, and RR NMSB Trent 1000 72-J465, Revision 4, dated October 8, 2018. These NMSBs both describe procedures, as applicable to different sets of RRD Trent 1000 model turbofan engines, for cleaning and inspecting affected IPT blades so that they are suitable for reuse.

The FAA also reviewed RR SB Trent 1000 72-H818, dated November 14, 2016, and RR SB Trent 1000 72-J559, dated November 27, 2017. RR SB Trent 1000 72-H818 introduced a new IPT blade that is less susceptible to shank corrosion. RR SB Trent 1000 72-J559 introduced a new IPT blade with additional blade coating and applies to additional Trent 1000 engines (Trent 1000 TEN engine standard).

FAA's Determination

This product has been approved by EASA, and is approved for operation in the United States. Pursuant to our bilateral agreement with the European Union, EASA has notified us of the unsafe

condition described in the MCAI and service information referenced above. The FAA is issuing this AD because it evaluated all the relevant information provided by EASA 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 of the IPT blade set at lower cyclic life limits and its replacement with a blade set eligible for installation for affected RRD Trent 1000 model turbofan engines.

FAA's Justification and Determination of the Effective Date

No domestic operators use this product. Therefore, the FAA finds that notice and opportunity for prior public comment are unnecessary. In addition, for this same reason, the FAA finds that good cause exists for making this amendment effective in less than 30 days.

Comments Invited

This AD is a final rule that involves requirements affecting flight safety, and the FAA did not provide you with notice and an opportunity to provide your comments before it becomes effective. However, the FAA invites you to send any written data, views, or arguments about this final rule. Send your comments to an address listed under the ADDRESSES section. Include the docket number FAA-2019-0693 and product identifier 2017-NE-43-AD at the beginning of your comments. The FAA specifically invites comments on the overall regulatory, economic, environmental, and energy aspects of this final rule. The FAA will consider all comments received by the closing date and may amend this final rule because of those comments.

The FAA will post all comments received, without change, to <http://www.regulations.gov>, including any personal information you provide. The FAA will also post a report summarizing each substantive verbal contact received about this final rule.

Regulatory Flexibility Act

The requirements of the Regulatory Flexibility Act (RFA) do not apply when an agency finds good cause pursuant to 5 U.S.C. 553 to adopt a rule without prior notice and comment. Because the FAA has determined that it has good cause to adopt this rule without notice and comment, RFA analysis is not required.

Costs of Compliance

The FAA estimates that this AD affects 0 engines installed on airplanes of U.S. registry.

In the event an affected engine becomes installed on a U.S.-registered product, 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 IPT blades	48 work-hours × \$85 per hour = \$4,080	\$100,000	\$104,080	\$0

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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

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.

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) 2018-15-01, Amendment 39-19333 (83 FR 34755, July 23, 2018), and adding the following new AD:



FAA
Aviation Safety

AIRWORTHINESS DIRECTIVE

www.faa.gov/aircraft/safety/alerts/
www.gpoaccess.gov/fr/advanced.html

2019-20-05 Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc) Turbofan Engines: Amendment 39-19758; Docket No. FAA-2019-0693; Product Identifier 2017-NE-43-AD.

(a) Effective Date

This AD is effective October 30, 2019.

(b) Affected ADs

This AD replaces AD 2018-15-01, Amendment 39-19333 (83 FR 34755, July 23, 2018).

(c) Applicability

This AD applies to Rolls-Royce Deutschland Ltd. & Co KG (Type Certificate previously held by Rolls-Royce plc) (RRD) Trent 1000-A, Trent 1000-A2, Trent 1000-AE, Trent 1000-AE2, Trent 1000-AE3, Trent 1000-C, Trent 1000-C2, Trent 1000-CE, Trent 1000-CE2, Trent 1000-CE3, Trent 1000-D, Trent 1000-D2, Trent 1000-D3, Trent 1000-E, Trent 1000-E2, Trent 1000-G, Trent 1000-G2, Trent 1000-G3, Trent 1000-H, Trent 1000-H2, Trent 1000-H3, Trent 1000-J2, Trent 1000-J3, Trent 1000-K2, Trent 1000-K3, Trent 1000-L2, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3 and Trent 1000-R3 model turbofan engines, with an engine serial number (ESN) listed in Appendix 1, 2, or 3 of Rolls-Royce plc (RR) Alert Non-Modification Service Bulletin (NMSB) Trent 1000 72-AK186, Revision 2, dated April 16, 2019, except those engines that have incorporated the modifications in RR Service Bulletin (SB) Trent 1000 72-H818, dated November 14, 2016, or RR SB Trent 1000 72-J559, dated November 27, 2017.

(d) Subject

Joint Aircraft System Component (JASC) Code 7250, Turbine Engine, Turbine Section.

(e) Unsafe Condition

This AD was prompted by the determination that certain intermediate-pressure turbine (IPT) blades are susceptible to shank corrosion which leads to cracking and possible blade separation. The FAA is issuing this AD to prevent the simultaneous failure of both engines installed on an airplane, during flight. The unsafe condition, if not addressed, could result in a dual engine in-flight shutdown and loss of the airplane.

(f) Compliance

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

(g) Required Actions

(1) For engines with an ESN listed in Appendix 1 of RR Alert NMSB Trent 1000 72-AK186, Revision 2, dated April 16, 2019 (“RR Alert NMSB Trent 1000 72-AK186”), prior to reaching the blade cycle life limit listed in Appendix 1 of RR Alert NMSB Trent 1000 72-AK186, or within 30 days of the effective date of this AD, whichever occurs later, remove the IPT blade set and replace with an IPT blade set eligible for installation.

(2) For engines with an ESN listed in Appendix 2 of RR Alert NMSB Trent 1000 72-AK186:

(i) If the engine is in an engine shop visit on the effective date of this AD, remove the IPT blade set and replace with an IPT blade set eligible for installation prior to returning the engine to service; or

(ii) If the engine is not in an engine shop visit on the effective date of this AD and the IPT blade set was not replaced during the previous engine shop visit, remove the IPT blade set and replace with an IPT blade set eligible for installation within 30 days of the effective date of this AD.

(3) For engines that have replaced the IPT blade set per RR NMSB Trent 1000 72-J442, Revision 3, dated October 8, 2018, or RR NMSB Trent 1000 72-J465, Revision 4, dated October 8, 2018, as applicable, remove and replace those blades prior to reaching the “Permitted Cycles of operation since installation in accordance with NMSB 72-J442 or 72-J465” listed in Appendix 3 of RR Alert NMSB Trent 1000 72-AK186, as applicable for each ESN, or within 30 days of the effective date of this AD, whichever occurs later.

Note 1 to paragraph (g): An IPT blade set eligible for installation is a full set of new IPT blades, or a full set of blades that have been inspected per RR NMSB Trent 1000 72-J442, Revision 3, dated October 8, 2018, or RR NMSB Trent 1000 72-J465 Revision 4, October 8, 2018, as applicable by engine model.

(h) Definition

For the purpose of this AD, an “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine case flanges, except that the separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance does not constitute an engine shop visit.

(i) 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 certification office, send it to the attention of the person identified in paragraph (j)(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.

(j) Related Information

(1) For more information about this AD, contact Martin Adler, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7088; fax: 781-238-7157; email: martin.adler@faa.gov.

(2) Refer to European Union Aviation Safety Agency (EASA) AD 2019-0135, dated June 11, 2019, for more information. You may examine the EASA AD in the AD docket on the internet at <http://www.regulations.gov> by searching for and locating it in Docket No. FAA-2019-0693.

(k) 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 plc (RR) Alert Non-Modification Service Bulletin Trent 1000 72-AK186, Revision 2, dated April 16, 2019.

(ii) [Reserved]

(3) For RR service information identified in this AD, 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: http://www.rolls-royce.com/contact/civil_team.jsp; internet: <https://customers.rolls-royce.com/public/rollsroycecare>.

(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: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on October 3, 2019.

Robert J. Ganley,
Manager, Engine & Propeller Standards Branch,
Aircraft Certification Service.