Airworthiness Directive

AD No.: 2018-0188

Issued: 30 August 2018

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) 216/2008 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EC) 216/2008, Article 14(4) exemption].

Design Approval Holder's Name:
ROLLS-ROYCE plc

Type/Model designation(s):
RB211 Trent 700 engines

Effective Date: 13 September 2018

TCDS Number(s): EASA.E.042

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA AD 2017-0241 dated 06 December 2017.

ATA 72 – Engine – Low Pressure Compressor Blades – Inspection / Replacement

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Manufacturer(s):
Rolls-Royce plc (RR)

Applicability:
RB211 Trent 768-60, 772-60, 772B-60 and 772C-60 engines, all serial numbers.

These engines are known to be installed on, but not limited to, Airbus A330 aeroplanes.

Definitions:
For the purpose of this AD, the following definitions apply:

The NMSB: RR Alert Non-Modification Service Bulletin (NMSB) RB.211-72-AH465 Revision 5.

Affected part: Low pressure (LP) compressor blades, Part Number (P/N) FK23411, P/N FK25441, P/N FK25968, P/N FW11901, P/N FW15393, P/N FW23643, P/N FW23741, P/N FW23744, P/N KH23403 and P/N KH23404.

NSO: Non-Standard Operations (NSO), as defined in the RR Trent 700 Time Limits Manual (TLM) T-Trent-1RR, section 05-00-01.

Where in this AD, reference is made to an RR modification (mod), Service Bulletin (SB) or NMSB with an 'A' (Alert) in the number, it should be recognised that an earlier or later revision may not have that 'A'. This kind of change does not effectively alter the publication references for the purpose of this AD.

Reason:

Occurrences have been reported of LP compressor partial aerofoil blade release events on RR Trent 700 engines. While primary containment of the released sections was achieved in each case, some of the releases did exhibit secondary effects that are considered to present a potential hazard.

This condition, if not detected and corrected, could lead to LP compressor blade release with possible consequent loss of the engine nose cowl, under cowl fires and forward projection of secondary debris, possibly resulting in damage to the aeroplane and/or injury to persons on the ground.

To address this potential unsafe condition, RR published NMSB RB.211-72-G872, providing inspection instructions and, consequently, EASA issued AD 2012-0247 to require a one-time inspection of the higher life LP compressor blades. After identification of a population of these LP compressor blades that were incorrectly inspected, RR issued NMSB RB.211-72-H311 and, consequently, EASA issued AD 2013-0060, retaining the requirements of EASA AD 2012-0247, which was superseded, to require a one-time re-inspection of the affected blades.

After that AD was issued, to mitigate the risk of further partial LP compressor blade release events, RR issued NMSB RB.211-72-AH465, providing instructions for ultrasonic inspection of the affected parts to detect sub-surface anomalies in the aerofoil. Consequently, EASA issued AD 2014-0031, superseding AD 2013-0060, to require repetitive inspections of all affected LP compressor blades and, depending on findings, replacement.

Thereafter, EASA issued AD 2016-0141, retaining the requirements of AD 2014-0031, which was superseded, to reduce inspection threshold (RR Alert NMSB RB.211-72-AH465 Revision 2). Prompted by further analysis, EASA issued AD 2017-0241, retaining the requirements of EASA AD 2016-0141, which was superseded, further reducing the inspection threshold and interval (RR Alert NMSB RB.211-72-AH465 Revision 4).

Since EASA AD 2017-0241 was issued, RR issued the NMSB to distinguish between standard operations and NSO and to determine the applicable inspection threshold and interval. The flight cycles (FC) accumulated by operators conducting NSO have to be calculated using the beta factor shown in Table of the NMSB. The NMSB also introduces, for engines that have accumulated more than 600 FC or standard duty cycles (SDC, for engines used in NSO), a closing date by which these have to be inspected at least once.

For the reason described above, this AD retains the requirements of EASA AD 2017-0241, which is superseded, and requires implementation of the changes introduced by the NMSB.

Required Action(s) and Compliance Time(s):

Required as indicated, unless accomplished previously:

Inspection(s):

(1) Within the compliance time specified in Table 1 of this AD, as applicable, and, thereafter, at intervals not to exceed 1 200 FC or SDC (for NSO), as applicable, accomplish an ultrasonic inspection of each affected part in accordance with the instructions of Section 3 of the NMSB. Section 1.D of the NMSB contains details on how to determine the applicable SDC.

Table 1 – Inspection Threshold (see Note 1 of this AD)

FC / SDC accumulated	Compliance Time
Less than 1 100 FC/SDC	Before exceeding 1 200 FC/SDC
1 100 FC/SDC or more	Within 100 FC/SDC after the effective date of this AD, or before exceeding 2 400 FC/SDC, whichever occurs first, but not later than 31 December 2018

Note 1: Unless specified otherwise, the FC/SDC referenced in Table 1 of this AD are those accumulated, on the effective date of this AD, by the affected part since new (first installation on an engine), or since last inspection per Alert NMSB RB.211-72-AH465 (any Revision).

Credit:

(2) LP compressor blade ultrasonic inspections accomplished in accordance with the instructions referenced in the mandatory inspection section of the applicable engine TLM are acceptable as an alternative method for the repetitive inspections as required by paragraph (1) of this AD, provided the compliance times of this AD are not exceeded.

(3) LP compressor blade ultrasonic inspections, accomplished before 18 July 2016 [the effective date of EASA AD 2016-0141] in accordance with the instructions of Rolls-Royce NMSB RB.211-72-G702, or NMSB RB.211-72-G872, or NMSB RB.211-72-H311, or NMSB RB.211-72-AH465 original issue, Revision 1, Revision 2, or Revision 3, or Revision 4, or Engine Manual (EM) E-Trent-1RR, Task 72-31-11-200-806, or Airbus A330 Aircraft Maintenance Manual (AMM) Task 72-31-41-270-801, or AMM Task 72-31-41-270-802, are acceptable to comply with the initial inspection requirements of paragraph (1) of this AD.

Corrective action(s):

(4) If, during any inspection as required by paragraph (1) of this AD, any defect is found on an affected part that exceeds the applicable pass/fail criteria as specified in the NMSB, before next flight, or before release to service of the engine, as applicable, replace the affected part with a serviceable part in accordance with the instructions of the NMSB.

Terminating Action(s):

(5) None.

Part(s) Installation:

(6) From the effective date of this AD, installation on any engine of an affected part is allowed, provided that the part meets the conditions as required by paragraph (6.1) or (6.2) of this AD, as applicable, and that, following installation, the part is inspected as required by this AD.

(6.1) The affected part has not exceeded 1 200 FC (or SDC, for NSO) since new, or since inspection in accordance with RR NMSB RB.211-72-AH465 (at any Revision), or since an inspection as specified in paragraph (2) or (3) of this AD, whichever occurred later.

(6.2) Prior to installation, the affected part has passed an ultrasonic inspection in accordance with the instructions of Section 3 of the NMSB.

Ref. Publications:

Rolls-Royce NMSB RB.211-72-G702 dated 23 May 2011.

Rolls-Royce NMSB RB.211-72-G872 dated 02 April 2012, or Revision 1 dated 02 July 2012, or Revision 2 dated 08 March 2013.

Rolls-Royce NMSB RB.211-72-H311 dated 08 March 2013.

Rolls-Royce NMSB RB.211-72-AH465 dated 15 July 2013, or Revision 1 dated 10 July 2015, or Revision 2 dated 11 May 2016, or Revision 3 dated 27 April 2017, or Revision 4 dated 03 October 2017, or Revision 5 dated 26 July 2018.

RR Trent 700 EM E-Trent-1RR.

RR Trent 700 TLM T-Trent-1RR.

The use of later approved revisions of the above-mentioned documents is acceptable for compliance with the requirements of this AD.

Airbus A330 AMM Task 72-31-41-270-801.

Airbus A330 AMM Task 72-31-41-270-802.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.

2. This AD was posted on 27 July 2018 as PAD 18-107 for consultation until 24 August 2018. No comments were received during the consultation period.

3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.

4. Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this AD, and which may occur, or have occurred on

a product, part or appliance not affected by this AD, can be reported to the EU aviation safety reporting system.

5. For any question concerning the technical content of the requirements in this AD, please contact your designated Rolls-Royce representative, or download the publication from your Rolls Royce Care account at https://customers.rolls-royce.com.

   If you do not have a designated representative or Rolls Royce Care account, please contact **Corporate Communications** at **Rolls-Royce plc**, P.O. Box 31, Derby, DE24 8BJ, United Kingdom Telephone +44 (0)1332 242424,

   or send an email through http://www.rolls-royce.com/contact/civil_team.jsp identifying the correspondence as being related to **Airworthiness Directives**.