



Airworthiness Directive

AD No.: 2016-0141

Issued: 18 July 2016

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: 01 August 2016

TCDS Number(s): EASA.E.042

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA AD 2014-0031 dated 04 February 2014.

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

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.

Reason:

Low Pressure (LP) compressor partial aerofoil blade release events occurred in service 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 Non-Modification Service Bulletin (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 EASA AD 2013-0060 was issued, to mitigate the risk of further partial fan blade release events, RR issued NMSB RB.211-72-AH465, providing instructions for a programme of repetitive ultrasonic inspections of the affected LP compressor blades 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.

Since EASA AD 2014-0031 was issued, the results of further analysis determined that the inspection threshold must be reduced and, consequently, RR issued Alert NMSB RB.211-72-AH465 Revision 2 to implement this change.

For the reason described above, this PAD proposes to retain the requirements of EASA AD 2014-0031, which will be superseded, but to reduce the inspection threshold.

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

Required as indicated, unless accomplished previously:

Note 1: Where in this AD, reference is made to an RR 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.

Initial and repetitive Inspections:

- (1) For 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, within the compliance time specified in Table 1 of this AD, as applicable, and, thereafter, at intervals not to exceed 2 400 flight cycles (FC), accomplish an ultrasonic inspection of each LP compressor blade in accordance with the instructions of Section 3 of RR Alert NMSB RB.211-72-AH465 (at any revision) (hereafter referred to as 'the NMSB' in this AD).

LP compressor blade ultrasonic inspections accomplished in accordance with the instructions referenced in the mandatory inspection section of the applicable engine Time Limits Manual (TLM) T-Trent-1RR are acceptable to comply with the repeat inspection requirements of paragraph (1) of this AD.



Table 1 – Inspection Threshold

FC accumulated (see Note 2 of this AD)	Compliance Time
Less than 1 800 FC since new	Before exceeding 2 400 FC since new
1 800 FC or more since new	Within 600 FC after the effective date of this AD or before exceeding 3 600 FC since new, whichever occurs first
1 800 FC or more since last inspection	Before exceeding 2 400 FC since last inspection

Note 2: The FC referenced in Table 1 of this AD are those accumulated by the LP compressor blade since new (first installation on an engine), or since last inspection per Alert NMSB RB.211-72-AH465 (any Revision).

- (2) For any blade that, on 18 February 2014 [the effective date of EASA AD 2014-0031], had already exceeded 2 200 FC since last inspection, the next inspection must be accomplished before exceeding 3 000 FC since the last inspection. Thereafter, repetitive inspections must be accomplished as required by paragraph (1) of this AD.
- (3) **Credit:** LP compressor blade ultrasonic inspections, accomplished before 18 February 2014 [the effective date of EASA AD 2014-0031] 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 Engine Manual (EM) E-Trent-1RR, Task 72-31-11-200-806, are acceptable to comply with the initial inspection requirements of paragraph (1) of this AD.
- (4) **Corrective action(s):** If, during any inspection as required by paragraph (1) of this AD, a LP compressor blade fails the ultrasonic inspection, before next flight, or before release to service of the engine, as applicable, replace the affected blade with a serviceable one.
- (5) **Part(s) Installation:** From the effective date of this AD, installation on an engine of a replacement LP compressor blade having 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 or P/N KH23404, that has accumulated or exceeded 2 400 FC 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 (3) of this AD, whichever occurred later, is allowed, provided that, prior to installation, the replacement LP compressor blade 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 2 April 2012, or Revision 1 dated 2 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.

RR Trent 700 EM E-Trent-1RR.

RR Trent 700 TLM T-Trent-1RR.

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

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
2. This AD was posted on 19 May 2016 as PAD 16-075 for consultation until 16 June 2016. The Comment Response Document can be found at <http://ad.easa.europa.eu>.
3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
4. 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**.

