



## Notification of a Proposal to issue an Airworthiness Directive

**PAD No.: 17-144**

**Issued: 09 October 2017**

Note: This Proposed Airworthiness Directive (PAD) 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.

In accordance with the EASA Continuing Airworthiness Procedures, the Executive Director is proposing the issuance of an EASA Airworthiness Directive (AD), applicable to the aeronautical product(s) identified below.

All interested persons may send their comments, referencing the PAD Number above, to the e-mail address specified in the 'Remarks' section, prior to the consultation date indicated.

### Design Approval Holder's Name:

ROLLS-ROYCE plc

### Type/Model designation(s):

RB211 Trent 700 engines

**Effective Date:** [TBD - standard: 14 days after AD issue date]

**TCDS Number(s):** EASA.E.042

**Foreign AD:** Not applicable

**Supersedure:** This AD supersedes EASA AD 2016-0141 dated 18 July 2016, including its Correction dated 20 July 2016.

## 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. Consequently, EASA issued AD 2016-0141, retaining the requirements of AD 2014-0031, which was superseded, to reduce inspection threshold.

Since that AD was issued, the results of further analysis determined that the inspection threshold must be further reduced and, consequently, RR issued Alert RR Alert NMSB RB.211-72-AH465 Revision 4 (hereafter referred to as 'the NMSB' in this AD) to implement this change.

For the reason described above, this AD retains the requirements of EASA AD 2016-0141, which is superseded, but reduces 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.

Note 2: 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 are hereafter collectively referred to as 'affected blade' in this AD.

Note 3: Group 1 engines are those that have an affected blade (see Note 2 of this AD) installed. Group 2 engines are those that do not have an affected blade installed.

#### **Inspection(s):**

- (1) For Group 1 engines (see Note 3 of this AD): Within the compliance time specified in Table 1 of this AD, as applicable, and, thereafter, at intervals not to exceed 1 200 flight cycles (FC), accomplish an ultrasonic inspection of each affected blade in accordance with the instructions of Section 3 of the NMSB (see Note 1 of this AD).



Table 1 – Inspection Threshold (see Note 4 of this AD)

FC accumulated	Compliance Time
600 FC or less	Before exceeding 1 200 FC
More than 600 FC	Within 600 FC after the effective date of this AD, or before exceeding 2 400 FC, whichever occurs first

Note 4: Unless specified otherwise, the FC referenced in Table 1 of this AD are those accumulated, on the effective date of this AD, by the affected blade 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 Time Limits Manual (TLM) T-Trent-1RR are acceptable as an alternative method for the repetitive inspections required by paragraph (1) of this AD.
- (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 Engine Manual (EM) E-Trent-1RR, Task 72-31-11-200-806, or 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, an affected 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 part in accordance with the instructions of the NMSB (see Note 1 of this AD).

**Part(s) Installation:**

- (5) For Group 1 and 2 engines: From the effective date of this AD, installation of an affected blade (see Note 2 of this AD) is allowed, provided that conditions, as required by paragraphs (5.1) or (5.2), as applicable, and (5.3) are met.
  - (5.1) The part has not exceeded 1 200 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 (2) or (3) of this AD, whichever occurred later.
  - (5.2) Prior to installation, the affected blade has passed an ultrasonic inspection in accordance with the instructions of Section 3 of the NMSB.
  - (5.3) Following installation, the part is inspected as required by this AD.



**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, or Revision 3 dated 27 April 2017, or Revision 4 dated 03 October 2017.

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.

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

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

**Remarks:**

1. This Proposed AD will be closed for consultation on 06 November 2017.
2. Enquiries regarding this PAD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: [ADs@easa.europa.eu](mailto:ADs@easa.europa.eu).
3. For any question concerning the technical content of the requirements in this PAD, 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](http://www.rolls-royce.com/contact/civil_team.jsp) identifying the correspondence as being related to **Airworthiness Directives**.

