



Airworthiness Directive

AD No.: 2016-0031

Issued: 23 February 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):

RB211-535C-37 engines

Effective Date: 08 March 2016

TCDS Number(s): EASA.E.061

Foreign AD: Not applicable

Supersedure: This AD cancels CAA UK AD 009-02-87 issued February 1987, and supersedes CAA UK AD 002-05-87 issued May 1987.

ATA 72 – Engine / Critical parts – Engine Health Check and Revised Operating Procedures / Critical Part Identification and Replacement

Manufacturer(s):

Rolls-Royce plc (RR)

Applicability:

RB211-535C-37 engines, all serial numbers.

These engines are known to be installed on, but not limited to, Boeing 757 series aeroplanes.

Reason:

Several instances of RB211-535C engine surge were experienced during take-off which, following investigation, were attributed to a reduction in HP compressor surge margin.

This condition, if not corrected, and if occurring during take-off or another critical phase of flight, could result in reduced control of the aeroplane.

To address this potential unsafe condition, CAA UK classified RR Non Modification Service Bulletin (NMSB) RB.211-72-8249 and NMSB RB.211-72-8251 as mandatory (recorded as AD 009-02-87 and AD 002-05-87, respectively), requiring periodic engine health checks and, depending upon the results, implementation of revised engine operating procedures. Using the instructions of either NMSB was acceptable, rather than both. In May 1989, NMSB RB.211-72-8249 was cancelled by RR, prompted by evidence that all operators were using NMSB RB.211-72-8251 exclusively.



Since these ADs were issued, a review of engine shaft speeds from aeroplanes subject to extended operations in accordance with the revised operating procedures were found to exceed the Datum Flight Profile (FP) shaft speed limits. As a result, a higher rate of cyclic life usage must be applied for each affected Group A Critical Part, as defined in the engine Time Limits Manual (TLM).

This condition, if not corrected, may lead to critical part failure, possibly resulting in release of high energy debris, damage to the aeroplane and/or injury to the occupants.

Prompted by these findings, RR published Alert NMSB RB.211-72-AJ067 to provide instructions for a retrospective assessment to identify engines having previously operated under revised procedures and related corrective actions.

For the reasons described above, this AD retains the periodic engine health checks required by CAA UK AD 002-05-87 (RR NMSB RB.211-72-8251), which is superseded, cancels CAA UK AD 009-02-87 to reflect the fact that RR NMSB RB.211-72-8249 was cancelled, and requires a one-time health check assessment and calculation of the additional life consumed on affected Group A Critical Parts.

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

Required as indicated, unless accomplished previously:

Note 1: Where, in this AD, reference is made to a 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: For the purpose of this AD, an 'affected Group A Critical Part' is a Group A Critical Part that has been or is being operated under the revised procedures referred to in any version of RR NMSB RB.211-72-8249 or RB.211-72-8251.

Note 3: For the purpose of this AD, an 'affected engine' is an engine that has one or more affected Group A Critical Parts installed, as defined in Note 2 of this AD.

- (1) Within 30 days after the effective date of this AD, determine whether the engine is an affected engine, as defined in Note 3 of this AD, in accordance with the instructions of paragraph 3.A of RR Alert NMSB RB.211-72-AJ067.
- (2) Based on the determination as required by paragraph (1) of this AD, within 30 days after the effective date of this AD, recalculate and revise the total number of flight cycles (FC) for each affected Group A Critical Part, in accordance with the instructions of paragraph 3.A of RR NMSB RB.211-72-AJ067.
- (3) If, based on the recalculation as required by paragraph (2) of this AD, an affected Group A Critical Part has exceeded its applicable Declared Safe Cyclic Life (DSCL), within 50 FC after the recalculation as required by paragraph (2) of this AD, replace the part with a serviceable part.



- (4) From the effective date of this AD, depending on the results of the last engine health check as required by CAA UK AD 002-05-87 (RR NMSB RB.211-72-8251), and, thereafter, at intervals not exceeding the values (number of flight cycles) as defined in paragraph 3.A.(2) of RR Alert NMSB RB.211-72-A8251 Revision 7, as applicable, accomplish an engine health check procedure in accordance with the instructions of paragraphs 3.A.(1) and 3.A.(2) of RR Alert NMSB RB.211-72-A8251 Revision 7.
- (5) If, during any engine health check as required by paragraph (4) of this AD, the maximum surge free fuel spike of the engine is 600 gallons per hours or less, within 50 FC after that health check, remove the engine from the aeroplane and, before release to service of the engine, contact RR for approved rework instructions and accomplish those instructions accordingly.
- (6) Depending on the results of any engine health check as required by paragraph (4) of this AD, before release to service of the engine after that health check, revise the operating procedures in accordance with the instructions of paragraphs 3.A.(3) of RR Alert NMSB RB.211-72-A8251 Revision 7, and apply the same operating procedures to the other engine installed on the same aeroplane.
- (7) Depending on the results of any engine health check as required by paragraph (4) of this AD, before operating the engine after that health check, implement the higher rate of cyclic life usage to each affected Group A Critical Part, in accordance with the instructions of paragraphs 3.A.(4) and 3.A.(5) of RR Alert NMSB RB.211-72-A8251 Revision 7, and apply the same instructions to the other engine installed on the same aeroplane.
- (8) Revising the operating procedures of an engine as required by paragraph (6) of this AD, and verifying use of the correct FP and higher rate of cyclic usage on that engine as required by paragraph (7) of this AD, does not constitute terminating action of the repetitive engine health checks as required by paragraph (4) of this AD for that engine.
- (9) From the effective date of this AD, it is allowed to install an affected engine on an aeroplane, provided the engine has passed a health check in accordance with the instructions of RR Alert NMSB RB.211-72-A8251 Revision 7.

Ref. Publications:

Rolls-Royce NMSB RB.211-72-A8251 Revision 7, dated 21 December 2015.

Rolls-Royce Alert NMSB RB.211-72-AJ067 original issue, dated 11 December 2015.

Rolls-Royce RB211-535C TLM 05-10-01-800-000, Group A Parts Lives.

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 13 January 2016 as PAD 16-001 for consultation until 10 February 2016. 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. 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**.

