Airworthiness Directive

AD No.: 2016-0223

Issued: 08 November 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 800 engines

Effective Date: 22 November 2016

TCDS Number(s): EASA.E.047

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA AD 2010-0087 dated 05 May 2010, including its Correction dated 06 May 2010.

ATA 72 – Engine – High Pressure Compressor Stage 1-4 Rotor Disc Shafts – Life Limit Reduction

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

Applicability:
RB211 Trent 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17 and 895-17 engines, all serial numbers.

These engines are known to be installed on, but not limited to, Boeing 777 aeroplanes.

Reason:
During manufacture of high pressure (HP) compressor stage 1-4 rotor disc shafts, Part Number (P/N) FK32580, a small number of parts were rejected due to a machining defect that was found during inspection. Analysis showed that less severe examples may have been undetected and passed into service, creating a risk of failure.

Prompted by these findings, it was decided to reduce the life limit of all P/N FK32580 HP compressor stage 1-4 rotor disc shafts in service. Those new life limits were required by EASA AD 2008-0099, which was subsequently superseded by EASA AD 2010-0087, as some life limits for the Heavy Flight Profile (HFP) parts were incorrect. RB211 Trent 800 Critical Part lives may be monitored

by one of two methods: Multiple Flight Profile (MFP) monitoring, or HFP monitoring. The applicable RR Trent 800 Engine Manual, Airworthiness Limitations Section (ALS), provides the necessary details.

EASA AD 2010-0087 required a phased life draw down, which on completion resulted in a revised approved life of 5 580 standard duty cycles (SDC) for engines operated in accordance with MFP monitoring, or 5 280 heavy duty cycles (HDC) for engines operated in accordance with HFP monitoring.

Since that AD was issued, the phased life draw down of P/N FK32580 HP compressor stage 1-4 rotor disc shafts is now complete and the approved reduced final lives of 5 580 SDC (MFP), or 5 280 HDC (HFP), respectively, were published in the ALS of the RR Trent 800 Engine Time Limits Manual (TLM), as task 05-10-01-800-801 (MFP) and task 05-10-01-800-802 (HFP). RR published Service Bulletin (SB) RB.211-72-F867 to provide rework instructions (including change to P/N FW61622) that restore the approved life of the compressor drum.

Subsequently, it was determined that the HP compressor stage 1-4 rotor disc shaft, P/N FK26167, also requires a reduction in its approved lives. Prompted by this finding, RR introduced a controlled replacement through Non-Modification SB (NMSB) RB.211-72-G150, or rework (including change to P/N FW11590) through SB RB.211-72-C768. Having completed the rework programme for all affected components, the approved reduced lives for P/N FK26167 HP compressor stage 1-4 rotor disc shafts of 5 580 SDC (MFP), or 5 280 HDC (HFP), were also published in the ALS of the RR Trent 800 Engine TLM, in the same task 05-10-01-800-801 (MFP) and task 05-10-01-800-802 (HFP).

Failure to implement these critical parts limitations could lead to failure of a part, possibly resulting in damage to, and reduced control of, the aeroplane.

For the reasons described above, this AD supersedes EASA AD 2010-0087, and requires implementation of the reduced life limitation.

Required Action(s) and Compliance Time(s):
Required as indicated, unless accomplished previously:

Note 1: For the purpose of this AD, HP compressor stage 1-4 rotor disc shafts, having P/N FK26167 or P/N FK32580, are collectively referred to as the 'affected parts' in this AD. Task 05-10-01-800-801 (MFP) and task 05-10-01-800-802 (HFP) in the ALS of the RR Trent 800 Engine TLM, as applicable, are collectively referred to as 'the applicable task' in this AD.

Parts Replacement:

(1) From the effective date of this AD, replace each affected part before exceeding the applicable life limit as specified in the applicable task, as applicable to engine configuration and monitoring method.

For an affected part that, on the effective date of this AD, has already exceeded 5 530 SDC (MFP) or 5 230 HDC (HFP), as applicable, replace that part within 50 SDC (MFP), or within 50 HDC (HFP), as applicable, after the effective date of this AD.

Aircraft Maintenance Programme (AMP) Revision:

(2) Within 12 months after the effective date of this AD, revise the approved AMP, on the basis of which the operator or the owner ensures the continuing airworthiness of each operated aeroplane, by incorporating the life limitations described in the applicable task, as applicable to the engine configuration and monitoring method.

(3) When the AMP of an aeroplane has been revised as required by paragraph (2) of this AD, that action ensures (see Note 2 of this AD) continued accomplishment of the tasks as required by paragraph (1) of this AD for the affected engines on that aeroplane. Consequently, after revising the AMP as required by paragraph (2) of this AD, it is not necessary that accomplishment of individual tasks is recorded for demonstration of AD compliance on a continued basis.

Note 2: For aeroplanes registered in Europe, complying with the approved AMP as specified in paragraph (2) of this AD is required by Commission Regulation (EU) No 1321/2014, Part M.A.301, paragraph 3.

Parts Installation:

(4) Installation on an engine of an affected part is allowed, provided that, following installation, the part is removed from service before exceeding the applicable life limit as specified in the applicable task, as applicable to engine configuration and monitoring method, as required by this AD.

Ref. Publications:

Rolls-Royce ALS of the RR Trent 800 Engine TLM, task 05-10-01-800-801, or task 05-10-01-800-802, both dated 15 June 2016.

Rolls-Royce SB RB.211-72-C768 original issue dated 8 October 1999, or Revision 1 dated 25 October 2000, or Revision 2 dated 25 September 2006, or Revision 3 dated 3 January 2007, or Revision 4 dated 16 April 2010.

Rolls-Royce SB RB.211-72-F867 original issue dated 1 February 2008, or Revision 1 dated 16 April 2010.

Rolls-Royce NMSB RB.211-72-G150 original issue dated 23 April 2009.

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 08 September 2016 as PAD 16-129 for consultation until 06 October 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**.