



Notification of a Proposal to issue an Airworthiness Directive

PAD No.: 19-136

Issued: 23 July 2019

Note: This Proposed Airworthiness Directive (PAD) is issued by EASA, acting in accordance with Regulation (EU) 2018/1139 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 129 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 900 engines

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

TCDS Number(s): EASA.E.012

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA AD 2018-0199 dated 06 September 2018, including its Correction dated 26 September 2018.

ATA 72 – Engine – Oil Service Pipe Sealing Rings – Inspection / Replacement / Modification / Rework

Manufacturer(s):

Rolls-Royce plc

Applicability:

RB211 Trent 970-84, 972-84 and 972E-84 engines, all serial numbers (ESN).

These engines are known to be installed on, but not limited to, Airbus A380 aeroplanes.

Definitions:

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

Where, in this AD, reference is made to a Rolls-Royce mod, Service Bulletin (SB) or Non-Modification SB (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.

The NMSB: Rolls-Royce Trent 900 Alert NMSB RB.211-72-AJ868 Revision 1 [on ballot].



The SB: Rolls-Royce Trent 900 SB RB.211-72-J589 Revision 1 (modification), or SB RB.211-72-J395 (rework).

Affected part: High pressure / intermediate pressure (HP/IP) support structure oil service tube buffer sealing rings, having Part Number (P/N) FW64487. These sealing rings are installed on HP/IP support structure assemblies, identified by P/N FW64481, P/N KH13661, P/N KH13811, P/N KH57620, P/N KH57797 and P/N KH66347.

Serviceable part: An affected part that is new (not previously installed); or an affected part that has not exceeded the applicable life limit as specified in Table 1 of this AD and that, before installation, passed an inspection (no defects found) in accordance with the instructions of the NMSB.

Groups: Group 1 engines are those identified by ESN as Population 1 in Appendix 1 of the NMSB. Group 2 engines are those identified by ESN as Population 2 in Appendix 2 of the NMSB. Group 3 engines are those that have embodied Rolls-Royce modification (mod) 72-J395 in production, or have embodied Rolls-Royce SB RB.211-72-J395 or SB RB.211-72-J589 in service.

Qualified shop visit: Scheduled shop visit for M51 - IPT Module rework level of Module Refurbishment, or Module Overhaul, or Engine Refurbishment.

Reason:

Occurrences were reported of finding wear on certain HP/IP support structure oil service tube buffer sealing rings on in-service RB211 Trent 900 engines. Investigation showed the wear rate to be higher than expected. It was also determined that this was most likely due to a large pressure drop across the outer hub sealing ring, and consequent increased wear as a result of movement of the sealing ring across the hub surface.

This condition, if not corrected, could lead to cracking of the sealing ring, allowing high pressure air into the bearing chamber, consequent over-heating and failure of the IP shaft, possibly resulting in IP turbine disc burst and high-energy debris release, with consequent damage to, and reduced control of, the aeroplane.

To address this potential unsafe condition, Rolls-Royce initially published NMSB RB.211-72-AJ299, providing in-shop instructions for 11 ESN which were considered to have a high-wear risk. Consequently, EASA issued AD 2016-0061, to require removal of those engines from service for corrective action.

Since that AD was issued, Rolls-Royce published NMSB RB.211-72-AJ868 (original issue) to provide instructions to replace the affected sealing rings on all pre-mod/SB 72-J395 engines. Consequently, EASA issued AD 2018-0199 (later corrected), superseding EASA AD 2016-0061, to require implementation of a life limit for the affected parts. That AD also prohibited installation of affected parts on Group 3 engines.

Since that AD was issued, Rolls-Royce developed mod 72-J589 and issued the SB to provide instructions for in-service rework. Prompted by information obtained during development of mod 72-J589, Rolls-Royce also issued the NMSB [currently on ballot at Rolls-Royce Care – see section



Remarks of this AD for contact details], reducing the replacement interval for the affected parts in Group 2 engines. Finally, the NMSB also introduces on-wing borescope inspections of the affected parts.

For the reasons described above, this AD partially retains the requirements of EASA AD 2019-0199, which is superseded, and requires a modification which constitutes terminating action for the repetitive replacements (life limit) as required by this AD. This AD also reduces the replacement interval for affected parts on Group 2 engines and introduces on-wing inspections of the affected parts on Group 1 and Group 2 engines.

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

Required as indicated, unless accomplished previously:

Replacement (life Limitation):

- (1) Within the compliance time specified in Table 1 of this AD, as applicable, or within 100 flight cycles (FC) after the effective date of this AD, whichever occurs later, and thereafter, before each affected part exceeds the limit as specified in Table 1 of this AD, replace each affected part in accordance with the instructions of the NMSB.

Table 1 – Affected Parts Replacement (see Note 1 of this AD)

Group	Compliance Time / Life Limitation (not to exceed)
1	2 800 FC
2	3 300 FC

Note 1: The FC specified in Table 1 of this AD are those accumulated by the affected part since its first installation on an engine. Consequently, the FC of the affected part may be less than the FC of the HP/IP support structure assembly on which it is installed, accumulated since its first installation on an engine.

Inspection(s):

- (2) For Group 1 and Group 2 engines operated using Rolls-Royce Engine Health Monitoring (EHM) service: After receipt of an EHM notification to inspect the seal rings, within the time specified in that notification, inspect each affected part in accordance with the instructions of the NMSB.
- (3) For Group 1 and Group 2 engines operated without using Rolls-Royce EHM service: Within 100 FC after the effective date of this AD and, thereafter, at intervals not to exceed 100 FC, inspect each affected part in accordance with the instructions of the NMSB.

Corrective Action(s):

- (4) If, during any inspection as required by paragraph (2) or (3) of this AD, as applicable, an affected part does not meet the 'pass' criteria as defined in the NMSB, before next flight, replace that affected part with a serviceable part, as defined in this AD, in accordance with the instructions of the NMSB.



Modification / Rework:

- (5) For Group 1 and Group 2 engines: During the next qualified shop visit (as defined in this AD) after the effective date of this AD, but not later than 31 December 2027, modify the engine in accordance with the instructions of the SB.

Terminating Action:

- (6) Modification of an engine as required by paragraph (5) of this AD constitutes terminating action for the life limitation and repetitive inspections as required by this AD for that engine. For the purpose of paragraphs (8.2) and (9) of this AD, this modification effectively redefines the engine as a Group 3 engine – see also section Definitions of this AD.

Part Installation:

- (7) For Group 1 and Group 2 engines: From 20 September 2018 [the effective date of EASA AD 2018-0199], until modification as required by paragraph (5) of this AD, it is allowed to install an affected part on an engine, provided the part is a serviceable part, as defined in this AD.

- (8) Do not install an affected part on an engine, as required by paragraph (8.1) or (8.2) of this AD, as applicable.

(8.1) For Group 1 and Group 2 engines: After modification of the engine as required by paragraph (5) of this AD.

(8.2) For Group 3 engines: From 20 September 2018 [the effective date of EASA AD 2018-0199].

Engine Installation:

- (9) From the effective date of this AD, except as required by paragraph (8) of this AD, it is allowed to install a Group 1 or Group 2 engine on any aeroplane, provided the affected part installed on that engine is a serviceable part, as defined in this AD.

Ref. Publications:

Rolls-Royce Trent 900 NMSB RB.211-72-AJ868 original issue dated 18 July 2018, and Revision 1 [to be published].

Rolls-Royce Trent 900 SB RB.211-72-J395 original issue dated 20 April 2017.

Rolls-Royce Trent 900 SB RB.211-72-J589 Revision 1 dated 29 January 2019.

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

Remarks:

1. This Proposed AD will be closed for consultation on 20 August 2019.
2. Enquiries regarding this PAD should be referred to the EASA Programming and Continued Airworthiness Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.



3. Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this PAD, and which may occur, or have occurred on a product, part or appliance not affected by this PAD, can be reported to the [EU aviation safety reporting system](#).
4. 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 identifying the correspondence as being related to **Airworthiness Directives**.

