



# Notification of a Proposal to issue an Airworthiness Directive

**PAD No.: 18-147**

**Issued: 05 November 2018**

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 DEUTSCHLAND Ltd & Co KG

**Type/Model designation(s):**

BR700-710A2-20 engines

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

**TCDS Number(s):** EASA.E.018

**Foreign AD:** Not applicable

**Supersedure:** None

## ATA 72 – Engine – Life-Limited Critical Parts – Service Life Calculation / Replacement

**Manufacturer(s):**

Rolls-Royce Deutschland Ltd & Co KG (RRD)

**Applicability:**

BR700-710A2-20 engines, all manufacturer serial numbers.

These engines are known to be installed on, but not limited to, Bombardier BD-700-1A10 and BD-700-1A11 aeroplanes.

**Definitions:**

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

**The NMSB:** RRD Alert Non-Modification Service Bulletin (NMSB) SB-BR700-72-A900584, Revision 2.

**The TLM:** RRD BR700-710A2-20 Time Limits Manual (TLM) T-710-2BR, dated 15 August 2018.

**Affected LLP:** Life limited parts (LLP), as defined in the NMSB: low pressure compressor (LPC) discs, LPC fan blades, fan shafts, low pressure turbine (LPT) stage 1 discs, LPT stage 2 discs, LPT rotor shaft



and annulus fillers; and high pressure compressor (HPC) stage 1-6 rotor discs, HPC stage 7-10 rotor discs, curvic rings, high pressure turbine (HPC) stage 1 discs and HPT stage 2 discs.

**Serviceable part:** An affected LLP that has not exceeded the applicable life limit as specified in the TLM.

**Pre-mod aeroplane:** Bombardier BD-700-1A10 and BD-700-1A11 aeroplanes, having serial number (s/n) 9381, 9386, 9401, or 9432 to 9786 inclusive, except those that have embodied Bombardier Service Bulletin (SB) 700-34-5021 or SB 700-34-6021 (at any revision), as applicable, in service.

**Affected engine:** An engine that is currently installed and operated on a pre-mod aeroplane, or has been installed and operated on a pre-mod aeroplane during a period of 24 months prior to its current installation.

**Post-mod aeroplane:** Aeroplanes that have embodied Bombardier ModSum 700T901940 and ModSum 700T901938 (BD-700-1A10), or ModSum 700T901940 and ModSum 700T901939 (BD-700-1A11), as applicable, in production; or have embodied Bombardier SB 700-34-5021 (BD-700-1A10) or SB 700-34-6021 (BD-700-1A11), as applicable, in service.

#### Reason:

Flight data obtained from aeroplanes equipped with certain Rockwell Collins avionics and auto-throttle system demonstrated significant oscillation of the engine rotor revolution speed during cruise. Analysis indicates that this affects the service life of the affected LLP.

This condition, if not corrected, may lead to failure of an affected LLP, possibly resulting in release of high-energy debris, with consequent damage to, and/or reduced control of, the aeroplane.

To address this potentially unsafe condition, RRD issued the NMSB, providing instructions to recalculate the consumed and remaining service life of the affected LLP.

For the reasons described above, this AD requires repetitive recalculation of the service life (consumed and remaining) of each affected LLP and, depending on the results, replacement of each affected LLP before exceeding the life limit, taking the re-calculated life consumption into account.

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

Required as indicated, unless accomplished previously:

##### Consumed Service Life Re-calculation:

- (1) For each affected engine: Within 250 flight cycles (FC) or 12 months, whichever occurs first after the effective date of this AD, and, thereafter, each time after removal from service of the engine, the LPC module or the LPC disc, as applicable, determine the operational history of the LPC disc and, based on that determination, re-calculate the consumed (and remaining) service life of the LPC disc in accordance with the instructions of Part B "Requirement 1" of the NMSB.
- (2) For each affected engine: Upon accumulation of 250 FC or 12 months, whichever occurs first after the effective date of this AD, accomplish a one-time re-calculation of the service life



accumulated by the LPC disc on that affected engine in accordance with the instructions of Part B “Requirement 1” of the NMSB.

- (3) Following the re-calculation of the service life accumulated by the LPC Disc on an affected engine, as required by paragraph (2) of this AD, as long as that affected engine remains installed on a pre-mod aeroplane, for each subsequent flight, re-calculate the consumed (and remaining) service life of each affected LLP in accordance with the instructions of Part B “Requirement 2” of the NMSB.

**Part Replacement:**

- (4) From the effective date of this AD, before the re-calculated service life of an affected LLP, determined as required by paragraph (1), (2) or (3) of this AD, as applicable, exceeds the maximum approved life limit as defined in the TLM, or within 90 days after the effective date of this AD, whichever occurs later, replace that affected LLP with a serviceable part in accordance with approved RRD maintenance instructions.

**Credit:**

- (5) Re-calculations and LLP replacements, accomplished on an affected engine before the effective date of this AD in accordance with the instructions of RRD Alert NMSB SB-BR700-72-A900584, original issue or Revision 1, are acceptable to comply with the initial requirements of paragraphs (1), (2) and (3) of this AD, as applicable, for that affected engine. From the effective date of this AD, the instructions of the NMSB (Revision 2, as defined in this AD) must be used.

**Terminating Action:**

- (6) Re-calculation of the consumed (and remaining) service life of each affected LLP on an affected engine in accordance with the instructions of Part B “Requirement 2” of the NMSB, as required by paragraph (3) of this AD, constitutes terminating action for the repetitive re-calculations of the LPC disc life as required by paragraph (1) of this AD for that affected engine.
- (7) Installation of an affected engine on a post-mod aeroplane, as defined in this AD, constitutes terminating action for the repetitive re-calculation requirements of paragraph (3) of this AD for that engine, except as specified in paragraph (8) of this AD.

**Engine Installation:**

- (8) From the effective date of this AD, it is allowed to install any engine on a pre-mod aeroplane, provided that, prior to operational use of the engine, the operational history of the engine is reviewed to determine whether the engine is an affected engine, as defined in this AD, and that, following installation, the consumed (and remaining) service life of each affected LLP installed on that engine is re-calculated as required by paragraphs (1), (2) and (3) of this AD, as applicable.

**Ref. Publications:**

RRD Alert NMSB SB-BR700-72-A900584, original issue dated 31 January 2017, or Revision 1 dated 05 October 2017, or Revision 2 dated 22 November 2017.

RRD BR700-710A2-20 TLM T-710-2BR dated 15 August 2018.



Bombardier SB700-34-5021 original issue dated 31 January 2017, or Revision 01 dated 24 February 2017, or Revision 02 dated 08 March 2017, or Revision 03 dated 05 January 2018.

Bombardier SB700-34-6021 original issue dated 31 January 2017, or Revision 01 dated 24 February 2017, or Revision 02 dated 08 March 2017, or Revision 03 dated 05 January 2018.

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 03 December 2018.
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. 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: Rolls-Royce Deutschland Ltd & CoKG, Eschenweg 11, Dahlewitz, 15827 Blankenfelde-Mahlow, Germany, Telephone: +49 (0) 337086 1200, E-mail: [rrd.techhelp@rolls-royce.com](mailto:rrd.techhelp@rolls-royce.com).

