



Airworthiness Directive

AD No.: 2020-0010R3

Issued: 30 January 2025

Note: This Airworthiness Directive (AD) 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.

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, or Annex Vb Part ML.A.301, as applicable, 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 Annex Vb Part ML.A.303, as applicable] or agreed with the Authority of the State of Registry [Regulation (EU) 2018/1139, Article 71 exemption].

Design Approval Holder's Name:

ROLLS-ROYCE DEUTSCHLAND Ltd & Co KG

Type/Model designation(s):

Trent 1000 engines

Effective Date: Revision 3: 06 February 2025
Revision 2: 11 March 2020
Original issue and Revision 1: 30 January 2020

TCDS Number(s): EASA.E.036

Foreign AD: Not applicable

Revision: This AD revises EASA AD 2020-0010R2 dated 04 March 2020.

ATA 72 – Engine – De-Pairing Limitation

Manufacturer(s):

Rolls-Royce plc

Applicability:

Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G and Trent 1000-H engines, all serial numbers, except those on which Rolls-Royce Service Bulletin (SB) TRENT1000-72-K434 (modification (mod) 72-K434) has been embodied in service.

These engines are known to be installed on, but not limited to, Boeing 787 aeroplanes.

Definitions:

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

The NMSB: Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) TRENT 1000 72-AK468. The NMSB has an 'A' (Alert) in the number, but a later revision may not have that 'A'. This kind of change does not effectively alter the publication references.

Affected part: Intermediate pressure compressor (IPC) modules.



Reason:

Occurrences have been reported of engine surges on certain Trent 1000 engines, particularly those that have accumulated a high number of flight hours (FH) and engine flight cycles (EFC). The investigation into the cause(s) of these events is on-going.

This condition, if not corrected, could lead to a dual engine surge, possibly resulting in a dual engine in-flight shut-down and consequent reduced control of the aeroplane.

To address this potential unsafe condition, Rolls-Royce published the NMSB to provide de-pairing instructions, reducing the risk of a dual surge event. Instructions for in-shop performance recovery are being developed. Prompted by some errors detected in Table 1 of the NMSB, Appendix 1 of this AD must be used instead. Rolls-Royce will revise the NMSB to correct those errors.

For the reasons described above, EASA issued AD 2020-0010 (later revised) to require de-pairing of the affected engines.

Since EASA AD 2020-0010R1 was issued, Rolls-Royce issued NMSB TRENT 1000 72-K494, providing instructions for in-shop action to restore the surge margin. Embodiment of Part B of this NMSB allows relaxation of the de-pairing actions as required by this AD. Rolls-Royce revised NMSB TRENT 1000 72-AK468 accordingly, including a new Table 1, defining de-pairing upper and lower thresholds (pre- and post-NMSB 72-K494 embodied) and Table 2 (which was Table 1 in the NMSB 72-AK468 at original issue) for de-pairing when one engine has embodied Part B of NMSB TRENT 1000 72-K494, and when both engines have embodied Part B of NMSB TRENT 1000 72-K494. Consequently, EASA issued AD 2020-0010R2 to include references to NMSB TRENT 1000 72-K494 and to NMSB TRENT 1000 72-AK468 Revision 1, and Table 2 thereof.

Since that AD was issued Rolls-Royce developed mod 72-K434, introducing revised IPC Stages 1 and 2 rotor blades featuring optimised manufacturing and geometry changes and Rolls-Royce issued SB TRENT 1000-72-K434 making mod 72-K434 available for in-service engines. Post-SB TRENT 1000 72-K434 (post-mod 72-K434) engines are subject to a life limitation in accordance with the Time Limit Manual Task 05-20-01-800-801, subtask 05-20-01-890-003 (see EASA AD 2024-0062) which ensures that the engine remains free from dangerous surge and instability throughout approved operation and environmental envelope. It was determined that engines in post-SB TRENT 1000 72-K434 configuration are not prone to the unsafe condition addressed by this AD.

For the reasons described above, this AD is revised to exclude post-SB TRENT1000-72-K434 engines from the Applicability.

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

Required as indicated by this AD, unless the action(s) required by this AD have been already accomplished:

De-pairing:

- (1) Within 30 days after 30 January 2020 [the effective date of the original issue of this AD], replace one engine on the aeroplane so that both engines meet one of the 'ACCEPTABLE' installation requirements as specified in Appendix 1 of this AD and, thereafter, ensure that both engines installed on the aeroplane, if affected by this AD (see Note 1 of this AD), continue to meet one



of the 'ACCEPTABLE' installation requirements specified in Table 2 of NMSB TRENT 1000 72-AK468 Revision 1 as 'example configurations'.

Engine Installation:

- (2) From 11 March 2020 [the effective date of the EASA AD 2020-0010R2], it is allowed to install an engine on an aeroplane, provided that both engines installed on the aeroplane, if affected by this AD (see Note 1 of this AD), meet one of the 'ACCEPTABLE' installation requirements specified in Table 2 of NMSB TRENT 1000 72-AK468 Revision 1 as 'example configurations'.

Note 1: Following modification of an engine in accordance with the instructions of the Rolls-Royce SB TRENT1000-72-K434, that engine is no longer affected by this AD.

Ref. Publications:

Rolls-Royce Trent 1000 Alert NMSB 72-AK468 original issue dated 09 December 2019, or Revision 1 dated 03 March 2020, or Revision 2 dated 07 April 2020, or Revision 3 dated 17 October 2024.

Rolls-Royce Trent 1000 NMSB 72-K494 original issue dated 03 March 2020.

Rolls-Royce SB TRENT 1000 72-K434 original issue dated 21 July 2021, or Revision 1 dated 25 November 2021.

The use of later approved revisions of the above-mentioned 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. The original issue of this AD was posted on 18 December 2019 as PAD 19-216 for consultation until 01 January 2020. The Comment Response Document can be found in the [EASA Safety Publications Tool](#), in the compressed (zipped) file attached to the record for this AD.
3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
4. Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this AD, and which may occur, or have occurred on a product, part or appliance not affected by this AD, can be reported to the [EU aviation safety reporting system](#). This may include reporting on the same or similar components, other than those covered by the design to which this AD applies, if the same unsafe condition can exist or may develop on an aircraft with those components installed. Such components may be installed under an FAA Parts Manufacturer Approval (PMA), Supplemental Type Certificate (STC) or other modification.
5. 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 <https://www.rolls-royce.com/contact-us/civil-aerospace.aspx>
identifying the correspondence as being related to **Airworthiness Directives**.



Appendix 1 – De-pairing Requirements / Limitations

ON-AIRCRAFT INSTALLATION REQUIREMENTS			
	ENG POS 1*	ENG POS 2*	ACCEPTABLE / NOT ACCEPTABLE - DE-PAIR REQUIREMENTS
1	ABOVE 24 000 HRS or 8 000 EFC**	ABOVE 24 000 HRS or 8 000 EFC**	NOT ACCEPTABLE - DE-PAIR REQUIRED
2	ABOVE 24 000 HRS or 8 000 EFC**	BELOW 24 000 HRS AND 8 000 EFC BUT ABOVE 17 000 HRS or 5 500 EFC**	NOT ACCEPTABLE - DE-PAIR REQUIRED
3	ABOVE 24 000 HRS or 8 000 EFC**	BELOW 17 000 HRS AND 5 500 EFC	ACCEPTABLE - DE-PAIR NOT REQUIRED
4	BELOW 24 000 HRS AND 8 000 EFC	BELOW 24 000 HRS AND 8 000 EFC	ACCEPTABLE - DE-PAIR NOT REQUIRED
*= ENGINE POSITIONS MAY BE REVERSED **= WHICHEVER OCCURS FIRST			

Note A1: deleted.

Note A2: The HRS and EFC specified in the table above are those accumulated by the affected part since new (first installation on an engine).

