



Notification of a Proposal to issue an Airworthiness Directive

PAD No.: 21-072

Issued: 17 May 2021

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):

Trent 1000 and Trent 7000 engines

Effective Date: [TBD - planned: 7 days after AD issue date]

TCDS Number(s): EASA.E.036

Foreign AD: Not applicable

Supersedure: None

ATA 05 – Time Limits / Maintenance Checks – High Pressure Turbine Disc – Inspection

Manufacturer(s):

Rolls-Royce plc

Applicability:

Trent 1000 'Pack B' engines, models 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, all engine serial numbers (ESN);

Trent 1000 'Pack C' engines, models Trent 1000-A2, Trent 1000-AE2, Trent 1000-C2, Trent 1000-CE2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2 and Trent 1000-L2, all ESN;

Trent 1000 'TEN' engines, models Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3 and Trent 1000-R3, all ESN; and

Trent 7000-72 and Trent 7000-72C engines, all ESN.



These engines are known to be installed on, but not limited to, Boeing 787 and Airbus A330 (NEO) aeroplanes.

Definitions:

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

The applicable TLM task: Rolls-Royce Trent 1000 Time Limits Manual (TLM) T-Trent-10RRB Revision 23, or TLM T-Trent-10RRC Revision 20, sub-task 05-20-01-890-012; Trent 1000 TLM T-Trent-10RRT Revision 16, sub-task 05-20-01-890-010; or Trent 7000 TLM T-T7000-1RR Revision 7, sub-task 05-20-01-890-002; as applicable.

Affected part: High-pressure turbine (HPT) discs, having a Part Number (P/N) and serial number (s/n) as listed in Appendix 1 of this AD.

Qualified shop visit: Any engine shop visit where the 04 (HPT module) to 05 (Intermediate Pressure Turbine module) flange is separated.

Groups: Group 1 engines are those that have an affected part installed. Group 2 engines are those that do not have an affected part installed.

Reason:

Occurrences have been reported where, during an engine shop visit, in the context of which it is expected that the HPT disc is disassembled to a 'piece-part' condition, HPT maintenance tasks were accomplished in such a way that the HPT disc was never fully isolated in a 'piece-part' level condition at any moment during this shop visit. The applicable Rolls-Royce engine maintenance manual (EMM) contains instructions to accomplish focused inspections of the HPT disc when it is at 'piece-part' level, but the specific provisions to establish whether this part should be at 'piece-part' level in certain circumstances may be considered ambiguous. As there was no formal unambiguous 'piece-part level' condition of the affected part at any time during the shop visit, the engine was released to service, without inspecting the affected part as intended by the applicable EMM.

Whereas the maintenance activities as described above may not have been in direct violation of the instructions published in the applicable Rolls-Royce EMM, they did conflict with the intent of accomplishing focused inspections of critical parts when those parts are in such a condition that these inspections can be done without further substantial disassembly. Such opportunity-driven inspections are part of the service management plan for engine critical parts, which defines in-service processes for maintenance and repair, necessary to maintain the critical part lives established during engine certification.

This condition, if not corrected, could lead to HPT disc failure, possibly resulting in high energy debris release, with consequent damage to, and reduced control of, the aeroplane.

To address this potential unsafe condition, Rolls-Royce plans to publish appropriate documentation to ensure that the determination of when to accomplish any focused critical parts inspection is unambiguous and adequate to meet the intent of opportunity-driven inspections as relied upon in the service management plan for engine critical parts.



The engines on which this inspection was not accomplished have been identified. Pending the publication of appropriate documentation, it has been determined that the affected engines must be inspected to ensure an acceptable level of safety for continued operation.

For the reasons described above, this AD requires a one-time inspection of the affected part and, depending on findings, replacement.

This AD is considered an interim action and further AD action may follow.

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

Required as indicated, unless accomplished previously:

Inspection:

- (1) For Group 1 engines: During the next qualified shop visit (as defined in this AD) after the effective date of this AD, disassemble the affected part to 'piece-part' level condition and, before reassembly, inspect the affected part in accordance with the instructions of the applicable TLM task.

Corrective Action(s):

- (2) If, during the inspection as required by paragraph (1) of this AD, any discrepancy is detected, before release to service of the engine, replace the affected part with a serviceable part. This can be accomplished in accordance with the applicable Rolls-Royce maintenance instructions.

Parts Installation:

- (3) For Group 1 and Group 2 engines: From the effective date of this AD, it is allowed to install on any engine an affected part, provided that, before installation, the part has passed (no defects found) the inspection as required by paragraph (1) of this AD.

Related ADs:

- (4) Compliance with this AD does not change, or affect in any other way, compliance of an engine with the requirements of EASA AD 2020-0241, AD 2020-0242, AD 2020-0243 or AD 2020-0244, as applicable.

Ref. Publications:

Rolls-Royce Trent 1000 TLM T-Trent-10RRB Revision 25, dated 01 February 2021.

Rolls-Royce Trent 1000 TLM T-Trent-10RRC Revision 21, dated 01 November 2020.

Rolls-Royce Trent 1000 TLM T-Trent-10RRT Revision 18, dated 01 February 2021.

Rolls-Royce Trent 7000 TLM T-T7000-1RR Revision 8, dated 10 March 2021.

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 31 May 2021.
2. Enquiries regarding this PAD should be referred to the EASA Safety 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](#). This may include reporting on the same or similar components, other than those covered by the design to which this PAD 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.
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 <https://www.rolls-royce.com/contact-us/civil-aerospace.aspx> identifying the correspondence as being related to **Airworthiness Directives**.



Appendix 1 – List of affected parts

Note A1: ESN references listed in this table correspond to the condition (installed ESN, or in shop) of the corresponding part as was known at the moment of issuance of this PAD. Determination of the part and engine compliance status can be established on the basis of the part P/N and s/n.

ESN	Disc P/N	Disc s/n	ESN	Disc P/N	Disc s/n
10121	FW56599	RRSUNDE029	11122	KH14275	RRSU02E244
10165	FW56599	RRSUNDG494	11123	KH14275	RRSU02D853
10182	FW56599	RRSUNDH421	11127	KH14275	RRSU02E414
10193	FW56599	RRSUNDH082	11129	KH14275	RRSUNDC89E
10260	KH20922	RRSUNDN038	11134	KH14275	RRSU02E361
10365	KH20922	RRSUNDU444	11136	KH14275	RRSU02E542
10419	KH20922	RRSUNDA89B	11142	KH14275	RRSU02E610
10440	KH20922	RRSUNDB15E	11143	KH14275	RRSU02E488
10479	KH20922	RRSUNDB40R	11144	KH14275	RRSU02E672
10519	KH20922	RRSUNDB65T	11147	KH14275	RRSUNDB91R
10525	KH20922	RRSUNDB86R	11148	KH14275	RRSU02E757
10529	KH20922	RRSUNDC18B	11153	KH14275	RROBRD341
10536	KH20922	RRSUNDC12F	11155	KH14275	RRSU02E451
10537	KH20922	RRSUNDC13K	11162	KH14275	RROBRD361
10589	KH20922	RRSUNDC75B	11166	KH14275	RROBRD345
11025	KH14275	RRSUNDB26B	11167	KH14275	RROBRD347
11035	KH14275	RRSUNDC83E	11168	KH14275	RROBRD338
11036	KH14275	RRSUNDC70N	11173	KH14275	RRSUNDB89F
11037	KH14275	RRSUNDC75G	11174	KH14275	RROBRD356
11043	KH14275	RRSUNDB89G	11175	KH14275	RROBRD354
11045	KH14275	RRSUNDC89N	11176	KH14275	RROBRD367
11046	KH14275	RRSUNDC84J	11177	KH14275	RROBRD371
11048	KH14275	RRSUNDC64P	11181	KH14275	RROBRD377
11049	KH14275	RRSUNDC89M	11183	KH14275	RRSU02F493
11050	KH14275	RRSUNDC89D	11190	KH14275	RROBRD365
11051	KH14275	RRSUNDC89F	11192	KH14275	RROBRD384
11052	KH14275	RRSUNDC83F	11201	KH14275	RRSU02G085
11060	KH14275	RRSUNDC01B	11205	KH14275	RROBRD413
11063	KH14275	RRSUNDD01C	11206	KH14275	RROBRD394
11064	KH14275	RRSUNDD13D	11208	KH14275	RRSU02G084
11066	KH14275	RRSUNDC98G	11220	KH14275	RROBRD455
11067	KH14275	RRSUNDC98B	11223	KH14275	RROBRD441
11069	KH14275	RRSUNDD13F	11237	KH14275	RRSU02G485



ESN	Disc P/N	Disc s/n	ESN	Disc P/N	Disc s/n
11072	KH14275	RRSUNDC89B	11238	KH14275	RRSU02F212
11075	KH14275	RRSUNDD17J	11245	KH14275	RRSU02H034
11078	KH14275	RRSUNDD27N	11252	KH14275	RROBRD478
11079	KH14275	RRSU02C703	11259	KH14275	RROBRD10002
11080	KH14275	RRSUNDD06A	11261	KH14275	RRSU02G996
11091	KH14275	RRSU02D423	11265	KH14275	RROBRD538
11093	KH14275	RRSU02D513	75046	KH14275	RROBRD370
11101	KH14275	RRSUNDD23D	in shop	KH14275	RRSUNDD28C
11107	KH14275	RRSUNDD01D	in shop	KH14275	RRSU02D827
11110	KH14275	RRSU02D711	in shop	KH14275	RRSU02E527
11112	KH14275	RRSU02E184	in shop	KH14275	RROBRD350
11117	KH14275	RRSU02E185	in shop	KH14275	RROBRD407
11119	KH14275	RRSU02D825			

