TYPE-CERTIFICATE DATA SHEET

EASA.E.036

for
Trent 1000 series engines

Type Certificate Holder
Rolls-Royce Deutschland Ltd & Co KG
Eschenweg 11
Dahlewitz
15827 Blankenfelde-Mahlow
Germany

For Models:

Trent 1000-A	Trent 1000-A2	Trent 1000-AE3	Trent7000-72
Trent 1000-AE	Trent 1000-AE2	Trent 1000-CE3	Trent7000-72C
Trent 1000-C	Trent 1000-C2	Trent 1000-D3	Trent7000-68
Trent 1000-CE	Trent 1000-CE2	Trent 1000-G3	Trent7000-70
Trent 1000-D	Trent 1000-D2	Trent 1000-H3	Trent7000-72D
Trent 1000-E	Trent 1000-E2	Trent 1000-J3	
Trent 1000-G	Trent 1000-G2	Trent 1000-K3	
Trent 1000-H	Trent 1000-H2	Trent 1000-L3	
	Trent 1000-J2	Trent 1000-M3	
	Trent 1000-K2	Trent 1000-N3	
	Trent 1000-L2	Trent 1000-P3	
		Trent 1000-Q3	
		Trent 1000-R3	

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TABLE OF CONTENTS

I. General 4
1. Type/ Model 4
2. Type Certificate Holder 4
3. Manufacturer 5
4. Date of Application 5
5. Certification Reference Date 6
6. EASA Type Certification Date 6
II. Certification Basis 7
1. EASA Certification Basis 7
1.1. Airworthiness Standards 7
1.2. Special Conditions (SC) 7
1.4. Deviations 8
1.5. Environmental Protection 8
III. Technical Characteristics 10
1. Type Design Definition 10
2. Description 11
3. Equipment 11
4. Dimensions 11
5. Dry Weight 12
6. Ratings 13
7. Control System 15
8. Fluids (Fuel, Oil, Coolant, Additives) 15
9. Aircraft Accessory Drives 16
10. Maximum Permissible Air Bleed Extraction 16
IV. Operating Limitations 19
1. Temperature Limits 19
1.1. Climatic Operating Envelope 19
1.2. Turbine Gas Temperature – Trimmed (°C) 19
1.3. Fuel temperature (°C) 19
1.4. Oil temperature (°C) 20
2. Pressure Limits 22
2.1. Fuel pressure (kPa) 22
2.2. Oil pressure (kPa) 23
3. Maximum Permissible Rotor Speeds: 25
4. Installation Assumptions: 26
5. Time Limited Dispatch: 27
6. ETOPS Capability: 27
V. Operating and Service Instructions 28
VI. Notes 30
SECTION: ADMINISTRATIVE 33
I. Acronyms and Abbreviations 33
II. Type Certificate Holder Record 33
III. Change Record 33

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I. General

1. Type/ Model

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Engines incorporating SB 72-G319 are identified by Build Standard "/01".
Engines incorporating SB 72-G893 are identified by Build Standard "/01A".

Trent 1000-AE, Trent 1000-CE

These engines incorporate SB 72-G319 within the DIS minimum Type Design Definition. Engines incorporating SB 72-G893 are identified by Build Standard "/01A"

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, Trent 1000-L2

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, Trent 1000-R3

Trent7000-68, Trent7000-72, Trent7000-72C, Trent7000-70, Trent7000-72D

These engine models are approved for use on Large Aeroplanes at the ratings and within the operating limitations specified below, subject to compliance with the powerplant installation requirements appropriate to approved installations.

2. Type Certificate Holder

Rolls-Royce Deutschland Ltd & Co KG
Eschenweg 11
Dahlewitz
15827 Blankenfelde-Mahlow
Germany

DOA ref.: EASA.21J.065

formerly (until 20 February 2019):
Rolls-Royce plc
62 Buckingham Gate
London
SW1E 6AT
United Kingdom

former DOA ref.: EASA.21J.035

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3. Manufacturer

Rolls-Royce plc

4. Date of Application

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Application Date: 30 April 2004

Engine Models

Trent 1000-A2, Trent 1000-C2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, Trent 1000-L2

Application Date : 16 May 2012

Engine Models

Trent 1000-AE, Trent 1000-CE, Trent 1000-AE2, Trent 1000-CE2

Application Date : 28 March 2014

Engine 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, Trent 1000-R3

Application Date : 22 November 2013

Engine Models

Trent7000-72, Trent7000-72C

Application Date : 7 October 2014

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72D

Application Date : 28 September 2020

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5. Certification Reference Date

30 September 2004

6. EASA Type Certification Date

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

07 August 2007

Engine Models

Trent 1000-A2, Trent 1000-C2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, Trent 1000-L2

10 September 2013

Engine Models

Trent 1000-AE, Trent 1000-CE, Trent 1000-AE2, Trent 1000-CE2

06 May 2015

Engine 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, Trent 1000-R3

11 July 2016

Engine Models

Trent7000-72, Trent7000-72C

20 July 2018

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72D

25 September 2025

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II. Certification Basis

1. EASA Certification Basis

1.1. Airworthiness Standards

For all Models

- CS-E: original issue, dated 24 October 2003
- Time Limited Dispatch: CS-E 1030 amendment 3
- ETOPS: CS-E 1040 amendment 3

1.2. Special Conditions (SC)

Engine models

Trent 1000-A, Trent 1000-A2, Trent 1000-AE, Trent 1000-AE2, Trent 1000-C, Trent 1000-C2, Trent 1000-CE, Trent 1000-CE2, Trent 1000-D, Trent 1000-D2, Trent 1000-E, Trent 1000-E2, Trent 1000-G, Trent 1000-G2, Trent 1000-H, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, Trent 1000-L2, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, Trent 1000-R3, Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C, Trent7000-72D

none

Engine 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

- CS-E 25, CS-E 40, CS-E 700, CS-E 740, CS-E 820, CS-E 830, CS-E 870: 30 second IP Transient Over-speed

1.3. Equivalent Safety Findings

For all models

- CS-E 740: 150 Hour Endurance Test
- CS-E 740(f): Non declaration or display of Maximum Continuous Speed Limitation
- CS-E 790: Ingestion of Rain and Hail

Engine models

Trent 1000-AE, Trent 1000-CE, 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, Trent 1000-L2, 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,

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Trent 1000-Q3, Trent 1000-R3, Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C, Trent7000-72D

- CS-E 840 and CS-E 850 HP Shaft Prime Reliability

Engine 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, Trent 1000-R3

- CS-E 740 (e) and (f) (4) (v) Oil system limits
- CS-E 740 (f)(1) Supplementary test to CS-E 740 for higher rotational N3 limitation

Engine Models

Trent7000-72, Trent7000-72C

- CS-E 740 (h)(1) 150 Hour Endurance Test

1.4. Deviations

None

1.5. Environmental Protection

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

- Emissions and Fuel venting: ICAO Annex 16, Volume II, Part III, Amendment 6, implemented in Art. 6 of Regulation (EC) 216/2008 as amended by Regulation (EC) 690/2009

Engine Models

Trent 1000-A2, Trent 1000-C2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, Trent 1000-L2

- Emissions and Fuel Venting: ICAO Annex 16, Volume II, Part III, Amendment 7, implemented in Art. 6 of Regulation (EC) 216/2008 as amended by Regulation (EC) 6/2013;

Engine Models

Trent 1000-AE, Trent 1000-CE, Trent 1000-AE2, Trent 1000-CE2

- Emissions and Fuel Venting: ICAO Annex 16, Volume II, Part III, Amendment 7, implemented

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in Art. 6 of Regulation (EC) 216/2008 as amended by Regulation (EC) 6/2013
- NOx standard in accordance with ICAO Annex 16 Volume II, Part III, Chapter 2, § 2.3.2 e) (CAEP/8)

Engine 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, Trent 1000-R3, Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C, Trent7000-72D

- Emissions and Fuel Venting: ICAO Annex 16 Volume II, Amendment 10, implemented in Art. 9 of Regulation (EU) 2018/1139 as amended by Regulation (EU) 2021/1087;
  - NOx standard in accordance with ICAO Annex 16 Volume II, Part III, Chapter 2, § 2.3.2 e) (CAEP/8);
  - Maximum nvPM mass concentration levels in accordance with Part III, Chapter 4, § 4.2.2.1 (CAEP/10);
  - nvPM mass and number emissions in accordance with Part III, Chapter 4, § 4.2.2.2 a) 1) and § 4.2.2.2 b) 1) (CAEP/11 In-Production standard);
  - Note: nvPM mass and number emissions also in accordance with Part III, Chapter 4, § 4.2.2.2 a) 2) and § 4.2.2.2 b) 2) (CAEP/11 New-Type standard)

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III. Technical Characteristics

1. Type Design Definition

The minimum standard of Engine Type Design for operation in accordance with the Trent 1000 Type Certificate Data Sheet are defined in the following documents:

Model	Engine Type Definition
Trent 1000-A	DIS 2286 Issue 3
Trent 1000-AE	DIS 2374 Issue 2
Trent 1000-C	DIS 2287 Issue 3
Trent 1000-CE	DIS 2375 Issue 2
Trent 1000-D	DIS 2288 Issue 3
Trent 1000-E	DIS 2289 Issue 3
Trent 1000-G	DIS 2291 Issue 3
Trent 1000-H	DIS 2292 Issue 3
Trent 1000-A2	DIS 2327 issue 3
Trent 1000-AE2	DIS 2376 Issue 2
Trent 1000-C2	DIS 2328 issue 3
Trent 1000-CE2	DIS 2377 Issue 2
Trent 1000-D2	DIS 2329 issue 3
Trent 1000-E2	DIS 2330 issue 3
Trent 1000-G2	DIS 2331 issue 3
Trent 1000-H2	DIS 2332 issue 3
Trent 1000-J2	DIS 2333 issue 3
Trent 1000-K2	DIS 2334 issue 3
Trent 1000-L2	DIS 2335 issue 3
Trent 1000-AE3	DIS 2372 issue 3
Trent 1000-CE3	DIS 2373 issue 3
Trent 1000-D3	DIS 2357 issue 3
Trent 1000-G3	DIS 2360 issue 3
Trent 1000-H3	DIS 2361 issue 3
Trent 1000-J3	DIS 2362 issue 3
Trent 1000-K3	DIS 2363 issue 3
Trent 1000-L3	DIS 2364 issue 3
Trent 1000-M3	DIS 2365 issue 3
Trent 1000-N3	DIS 2367 issue 3
Trent 1000-P3	DIS 2368 issue 3
Trent 1000-Q3	DIS 2370 issue 3
Trent 1000-R3	DIS 2369 issue 3
Trent7000-72	DIS 2379 issue 2 plus MB73-K233, MB72-K150 and MB72-K200
Trent7000-72C	DIS 2378 issue 1 plus MB73-K233, MB72-K150 and MB72-K200
Trent7000-68	DIS 2380 issue 1
Trent7000-70	DIS 2383 issue 1
Trent7000-72D	DIS 2382 issue 1

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Changes to the Engine Type Design are introduced by approved Service Bulletins (SB). See note 12.

Additionally, for Trent7000-72 and Trent7000-72C, see note 15.

2. Description

The Trent 1000 engine is a three-shaft high bypass ratio, axial flow, turbofan with Low Pressure, Intermediate Pressure and High Pressure Compressors driven by separate turbines through coaxial shafts. The LP Compressor fan diameter is 2.85m with a swept fan blade and OGVs. The combustion system consists of a single annular combustor with 18-off fuel spray nozzles.
The LP and IP assemblies rotate independently in an anti-clockwise direction, the HP assembly rotates clockwise, when viewed from the rear of the engine. The Compressor and Turbine have the following features:

Compressor	Turbine
LP – Single stage	LP – 6 stage
IP – 8 stage	IP – single stage
HP – 6 stage	HP – single stage

The engine control system utilises an EEC (Electronic Engine Controller) which has an airframe interface for digital bus communications. An EMU (Engine Monitor Unit) is fitted (to provide vibration signals to the aircraft).

3. Equipment

For details of equipment included in the type design definition: refer to Installation Manual.

For details of equipment and nacelle hardware supplied by the Airframe TC holder that may be mounted on or driven by the engine: refer to Installation Manual.

Note: The engine is certified for use with an operable Thrust Reverser Unit. Note that the Thrust Reverser Unit does not form part of the engine type design and is certified as part of the aircraft type design.

4. Dimensions

<u>Engine Models</u>

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, Trent 1000-AE, Trent 1000-CE

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, Trent 1000-L2

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, Trent 1000-R3

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Overall Length mm (ins)	4771 (187.8)
Maximum Radius mm (ins)	1899 (74.8)

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C, Trent7000-70D

Overall Length mm (ins)	4775 (188.0)
Maximum Radius mm (ins)	1837 (72.3)

Length - tip of spinner to rear of the tail bearing housing inner plug flange
Radius - from centreline, not including drains mast

5. Dry Weight

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Maximum dry engine weight (kg)	Without SB 72-G319	5936
	With SB 72-G319	6033

Including nacelle EBU items certified as part of the engine but not including fluids.

Engine Models

Trent 1000-AE, Trent 1000-CE

Maximum dry engine weight (kg)	6033

Including nacelle EBU items certified as part of the engine but not including fluids

Engine 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, Trent 1000-L2

Maximum dry engine weight (kg)	5947

Including nacelle EBU items certified as part of the engine but not including fluids

Engine 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, Trent 1000-R3

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Maximum dry engine weight (kg)	6114

Including nacelle EBU items certified as part of the engine but not including fluids.

Engine Models

Trent7000-72, Trent7000-72C

Maximum dry engine weight (kg)	6445

Including nacelle EBU items certified as part of the engine but not including fluids.

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72D

Maximum dry engine weight (kg)	6405

Including nacelle EBU items certified as part of the engine but not including fluids.

6. Ratings

The ISA sea-level static thrust ratings are:

Rating		**Trent 1000-A**	**Trent 1000-AE**	**Trent 1000-C**	**Trent 1000-CE**
Thrust, kN (lbf)	Take-Off (net) (5 minutes)	307.8 (69,194)	307.8 (69,194)	331.4 (74,511)	331.4 (74,511)
	Equivalent Bare Engine Take-Off	310.9 (69,885)	310.9 (69,885)	334.7 (75,239)	334.7 (75,239)
	Maximum Continuous (net)	287.9 (64,722)	287.9 (64,722)	309.3 (69,523)	309.3 (69,523)
	Equivalent Bare Engine Maximum Continuous	290.8 (65,382)	290.8 (65,382)	312.3 (70,217)	312.3 (70,217)
Applicable Engine Models		Trent 1000-A	Trent 1000-AE Trent 1000-AE2 Trent 1000-A2 Trent 1000-AE3	Trent 1000-C	Trent 1000-CE Trent 1000-CE2 Trent 1000-C2 Trent 1000-CE3

Rating		Trent 1000-D	Trent 1000-E	Trent 1000-G	Trent 1000-H
Thrust, kN (lbf)	Take-Off (net) (5 minutes)	331.4 (74,511)	265.3 (59,631)	320.6 (72,066)	284.2 (63,897)
	Equivalent Bare Engine Take-Off	334.7 (75,239)	268.0 (60,253)	323.7 (72,777)	287.1 (64,551)
	Maximum Continuous (net)	309.3 (69,523)	261.8 (58,866)	287.9 (64,722)	261.8 (58,866)
	Equivalent Bare Engine Maximum Continuous	312.3 (70,217)	264.6 (59,481)	290.8 (65,382)	264.6 (59,481)
Applicable Engine Models		Trent 1000-D Trent 1000-D2 Trent 1000-D3	Trent 1000-E Trent 1000-E2	Trent 1000-G Trent 1000-G2 Trent 1000-G3	Trent 1000-H Trent 1000-H2 Trent 1000-H3

Rating		Trent 1000-J	Trent 1000-K	Trent 1000-L	Trent 1000-M
Thrust, kN (lbf)	Take-Off (net) (5 minutes)	347.5 (78,129)	347.5 (78,129)	331.4 (74,511)	354.6 (79,728)
	Equivalent Bare Engine Take-Off	350.9 (78,886)	350.9 (78,886)	334.7 (75,239)	358.1 (80,494)
	Maximum Continuous (net)	319.5 (71,818)	319.5 (71,818)	309.3 (69,523)	323.3 (72,691)
	Equivalent Bare Engine Maximum Continuous	322.6 (72,519)	322.6 (72,519)	312.3 (70,217)	326.5 (73,409)
Applicable Engine Models		Trent 1000-J2 Trent 1000-J3	Trent 1000-K2 Trent 1000-K3	Trent 1000-L2 Trent 1000-L3	Trent 1000-M3

Rating		Trent 1000-N	Trent 1000-P	Trent 1000-Q	Trent 1000-R
Thrust, kN (lbf)	Take-Off (net) (5 minutes)	354.6 (79,728)	331.4 (74,511)	347.5 (78,129)	360.4 (81,028)
	Equivalent Bare Engine Take-Off	358.1 (80,494)	334.7 (75,239)	350.9 (78,886)	363.9 (81,802)
	Maximum Continuous (net)	323.3 (72,691)	309.3 (69,523)	319.5 (71,818)	323.3 (72,691)
	Equivalent Bare Engine Maximum Continuous	326.5 (73,409)	312.3 (70,217)	322.6 (72,519)	326.5 (73,409)
Applicable Engine Models		Trent 1000-N3	Trent 1000-P3	Trent 1000-Q3	Trent 1000-R3

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Rating		Trent7000-72	Trent7000-72C
Thrust, kN (lbf)	Take-Off (net) (5 minutes)	324.0 (72,834)	324.0 (72,834)
	Equivalent Bare Engine Take-Off	327.9 (73,718)	327.9 (73,718)
	Maximum Continuous (net)	289.2 (65,005)	289.2 (65,005)
	Equivalent Bare Engine Maximum Continuous	292.8 (65,830)	292.8 (65,830)
Applicable Engine Models		Trent7000-72	Trent7000-72C

Rating		Trent7000-68	Trent7000-70	Trent7000-72D
Thrust, kN (lbf)	Take-Off (net) (5 minutes)	304.9 (68,555)	313.9 (70,571)	324.0 (72,834)
	Equivalent Bare Engine Take-Off	308.7 (69,407)	317.8 (71,438)	327.9 (73,718)
	Maximum Continuous (net)	260.8 (58,634)	271.3 (61,004)	289.2 (65,005)
	Equivalent Bare Engine Maximum Continuous	264.2 (59,405)	274.9 (61,798)	292.8 (65,830)
Applicable Engine Models		Trent7000-68	Trent7000-70	Trent7000-72D

Refer to Section VI Notes 1, 2 and 3.

The Trent 1000-A and Trent 1000-C engine models have the option to include enhanced ratings that are incorporated by Service Bulletins 73-H046 and 73-H093 respectively. These two ratings become Trent 1000-AE (SB 73-H046) and Trent 1000-CE (SB 73-H093).

7. Control System

The engine is equipped with a Full Authority Digital Engine Control (FADEC) system and an Engine Monitoring Unit (EMU).

Refer to the Installation Manual and Operating Instructions for further information.
Refer to Section VI Notes 4 and 5.

8. Fluids (Fuel, Oil, Coolant, Additives)

8.1. Fuel and Additives

Refer to the Operating Instructions for information on approved fuel and additive specifications.

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8.2. Oil

Refer to the Operating Instructions for information on approved oil specifications.

9. Aircraft Accessory Drives

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, Trent 1000-AE, Trent 1000-CE

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, Trent 1000-L2

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, Trent 1000-R3

The engine's accessory gearbox may be fitted with two Variable Frequency Starter Generators (VFSG) and one Hydraulic Pump to provide electrical and hydraulic power to the aircraft. These units are part of the airframe and certified under Aircraft Airworthiness Standards. The Engine Installation Manual details installation and operational requirements, including torque and power limitations.

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C, Trent7000-70D

The engine's accessory gearbox may be fitted with an Integrated Drive Generator (IDG) and two Hydraulic Pumps to provide electrical and hydraulic power to the aircraft. These units are part of the airframe and certified under Aircraft Airworthiness Standards. The Engine Installation Manual details installation and operational requirements, including torque and power limitations.

10. Maximum Permissible Air Bleed Extraction

Only the Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D engine models supply compressor air to the airframe for the purpose of cabin ventilation ("Cabin Bleed"). All the Trent 1000 engine models (including the Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D) supply compressor air for the purpose of anti-icing of airframe components ("Nacelle Anti-Ice Bleed"). The anti-icing bleed flow demand is modulated via a regulating valve.

10.1 Thermal Anti-Icing Bleed Off takes for Normal and Abnormal operation

Engine Models

Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, 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, Trent 1000-L2

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Engine Power Setting TET (K)	Maximum Cowl Thermal Anti Ice Flow % Core Mass Flow (W26)
Idle to 1430	2.67
1430 to 1785	2.67 to 1.25 varying linearly
1785 to 1820	1.25 to 0.54 varying linearly
1820 and above	0.54

"W26" represents the air mass flow through the core of the engine.

Engine 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, Trent 1000-R3

Engine Power Setting TET (K)	Maximum Cowl Thermal Anti Ice Flow % Core Mass Flow (W26)
Idle to 1015	2.9
1015 to 1765	2.9 to 2.1 varying linearly
1765 to 1810	2.1 to 0.5 varying linearly
Above 1810	0.5

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D

Engine Power Setting TET (K)	Maximum Nacelle Anti Ice Flow % Core Mass Flow (%W26)
Idle to 1175	0.86
1175 to 1725	0.86 to 0.82 varying linearly
1725 to 1750	0.82 to 0.54 varying linearly
1750 to 1830	0.54 to 0.39 varying linearly
Above 1830	0.39

10.2 Engine Bleed Air System (EBAS) offtakes for Normal and Abnormal operation

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D
EBAS comprises both the Environmental Control System (ECS) for cabin ventilation and bleed air for aircraft anti-ice purposes. It is fed either from IP compressor stage 8 (IP8) or from HP compressor stage 6 (HP6).
%W26 represents the percentage of air mass-flow through the core of the engine at the HPC entry. Bleed flows vary linearly between the points listed.

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Engine Power Setting TET (K)	Maximum Normal ECS Bleed Schedule %W26	Bleed Source
Idle to 1260	15.8	HP6
1260 to 1600	15.8 to 5.6 (linear)	HP6
1600 to 1708	5.6 to 4.3 (linear)	IP8
1708 to 1740	4.3 to 3.2 (linear)	IP8
1740 to 1835	3.2 to 2.35 (linear)	IP8
Above 1835	2.35	IP8

Engine Power Setting TET (K)	Maximum Abnormal ECS Bleed Schedule %W26	Bleed Source
Idle to 1500	16.9	HP6
1500 to 1655	16.9 to 11.3 (linear)	HP6
1655 to 1708	11.3 to 9.5 (linear)	IP8
1708 to 1725	9.5 to 7.2 (linear)	IP8
1725 to 1835	7.2 to 4.95 (linear)	IP8
Above 1835 to redline	4.95	IP8

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IV. Operating Limitations

1. Temperature Limits

1.1. Climatic Operating Envelope

The engine may be used in ambient temperatures up to ISA +40°C. Refer to the Installation Manual for details of the Operating Envelope, including the air inlet distortion at the engine inlet.

1.2. Turbine Gas Temperature – Trimmed (°C)

	Maximum trimmed TGT (displayed) (See note 16)
Maximum during ground starts and shutdown:	700
Maximum during in-flight relights	900
Maximum for take-off (5 min. limit):	900
Maximum Continuous (unrestricted duration):	850
Maximum over-temperature (20 second limit):	920

Refer to Section VI Notes 6 and 7.

1.3. Fuel temperature (°C)

Engine Models

Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H, 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, Trent 1000-L2

Minimum fuel temperature:	minus 45
Maximum fuel temperature:	65

Refer to the Installation Manual for additional information.

Engine 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, Trent 1000-R3

Minimum fuel temperature before start:	minus 54
Minimum fuel temperature for engine acceleration:	minus 45
Maximum fuel temperature:	65

Refer to the Installation Manual for additional information.

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Engine Models

Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D

Minimum fuel temperature: (at, or below 14,600ft)	minus 44
Minimum fuel temperature: (above 14,600 ft)	minus 54
Maximum fuel temperature:	55

Refer to the Installation Manual for additional information.

1.4. Oil temperature (°C)

Combined oil scavenge temperature:

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Limit	Without SB 72-G319	With SB 72-G319	Fuel Inlet Temperature
Minimum for engine starting	Minus 40		-
Minimum for acceleration to power	40		For fuel inlet temperature minus 23°C and higher
	Varies linearly from 40 to 77		For fuel inlet temperature between minus 23°C and minus 45°C
Maximum for unrestricted use	196	193	-
Maximum transient (15 minutes)	205	201	-

Engine Models

Trent 1000-AE, Trent 1000-CE, 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, Trent 1000-L2

Limit		Fuel Inlet Temperature
Minimum for engine starting	Minus 40	
Minimum for acceleration to power	40	For fuel inlet temperature minus 23°C and higher
	Varies linearly from 40 to 77	For fuel inlet temperature between minus 23°C and minus 45°C
Maximum for unrestricted use	193	
Maximum transient (15 minutes)	201	

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Engine 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, Trent 1000-R3

Limit		Fuel Inlet Temperature
Minimum for engine starting	Minus 40	
Minimum for acceleration to power	40	For fuel inlet temperature minus 23°C and higher.
	Varies linearly from 40 to 90	For fuel inlet temperature between minus 23°C and minus 45°C.
Maximum for unrestricted use	196	
Maximum transient (15 minutes)	201	

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D

Limit		Fuel Inlet Temperature
Minimum for engine starting	Minus 40	
Minimum for acceleration to power	40	For fuel inlet temperature minus 11°C and higher.
	Varies linearly from 40 to 106	For fuel inlet temperature between minus 11°C and minus 54°C.
Maximum for unrestricted use	191.8	
Maximum transient (15 minutes)	197.3	

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2. Pressure Limits

2.1. Fuel pressure (kPa)

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Trent 1000-AE, Trent 1000-CE, 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, Trent 1000-L2

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, Trent 1000-R3

Minimum absolute inlet pressure (measured at engine inlet):

	kPa	psi
Steady state conditions with engine running:	34.5 + Vapour Pressure	5 + Vapour Pressure
Transient conditions with engine running (2 seconds):	13.8 + Vapour Pressure	2 + Vapour Pressure

For engine operation with the aircraft boost pumps inoperative the engine minimum fuel pressure limit is reduced to 3.4 psi at altitudes of up to 35000 feet for up to 600 minutes.

Refer to the Installation Manual for additional information.

Maximum pressure at inlet (measured at the pylon interface):

	kPa	psi
Steady state conditions with engine running:	483	70
Transient conditions with engine running (2 seconds):	966	140
Static after engine shut down:	1172	170

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Engine Models

Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D

Minimum absolute inlet pressure (measured at engine inlet):

	kPa	psi
Steady state conditions with engine running:	34.5 + Vapour Pressure	5 + Vapour Pressure

Refer to the Installation Manual for additional information.

Maximum pressure at inlet (measured at the pylon interface):

	kPa	psi
Steady state conditions with engine running:	276	40
Transient conditions with engine running (2 seconds):	689	100
Static after engine shut down:	689	100

2.2. Oil pressure (kPa)

Minimum oil pressure:

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

	Without SB 72-G319		With SB 72-G319	
	kPa	psi	kPa	psi
Ground idle to 74% IP rpm	207	30	207	30
Between 74% and 100% IP rpm	Varies linearly from 207 to 517	Varies linearly from 30 to 75	Varies linearly from 207 to 621	Varies linearly from 30 to 90
Above 100% IP rpm	517	75	621	90

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Engine Models

Trent 1000-AE, Trent 1000-CE, 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, Trent 1000-L2, Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D

	kPa	psi
Ground idle to 74% IP rpm	207	30
Between 74% and 100% IP rpm	Varies linearly from 207 to 621	Varies linearly from 30 to 90
Above 100% IP rpm	621	90

Engine 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, Trent 1000-R3

	kPa	psi
Ground idle to 74% IP rpm	207	30
Between 74% and 100% IP rpm	Varies linearly from 207 to 621	Varies linearly from 30 to 90
Above 100% IP rpm	621	90

See note 13.

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3. Maximum Permissible Rotor Speeds:

When maintenance running is performed above idle thrust with the aircraft static, the control system automatically applies a temperature dependent LP speed Keep Out Zone. Refer to the Maintenance Manual for details.

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Rotor		HP	IP	LP
Reference speeds, 100% rpm		13391	8937	2683
Without SB 72-G319	Maximum for Take-off (5 minute limit, refer to Section VI Note 3)	98.6%	100.8%	101.4%
	Maximum Continuous (refer to Section VI Note 8)	97.8%	99.5%	101.4%
With SB 72-G319	Maximum for Take-off (5 minute limit, refer to Section VI Note 3 and 11)	100.2%	103.5%	101.5%
	Maximum Continuous (refer to Section VI Note 8 and 11)	99.2%	100.8%	101.5%

(Data makes allowance for instrumentation accuracies)

For engines without SB 72-G319, LP speed must not exceed 96.5% during any aircraft operation with an apparent tailwind, ie tailwind greater than aircraft forward speed. This limitation does not apply to an engine with SB 72-G319.

Engine Models

Trent 1000-AE, Trent 1000-CE

Rotor	HP	IP	LP
Reference speeds, 100% rpm	13391	8937	2683
Maximum for Take-off (5 minute limit, refer to Section VI, note 3and 11)	100.2 %	103.5%	101.5%
Maximum Continuous (Refer to Section VI, note 8 and 11)	99.2%	100.8%	101.5%

(Data makes allowance for instrumentation accuracies)

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Engine 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, Trent 1000-L2

Rotor	HP	IP	LP
Reference speeds, 100% rpm	13391	8937	2683
Maximum for Take-off (5 minute limit, refer to Section VI, note 3)	101.0%	103.5%	101.5%
Maximum Continuous (Refer to Section VI, note 8)	99.5%	100.8%	101.5%

(Data makes allowance for instrumentation accuracies)

Engine 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

Rotor	HP	IP	LP
Reference speeds, 100% rpm	13391	8937	2683
Maximum for Take-off (5 minute limit, refer to Section VI, note 3)	101.5%	103.6%	101.5%
Maximum Transient (30 second limit, refer to section VI, note 17)	N/A	103.9%	N/A
Maximum Continuous (Refer to Section VI, note 8)	99.5%	100.8%	101.5%

(Data makes allowance for instrumentation accuracies)

Engine Models

Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, Trent 1000-R3, Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D

Rotor	HP	IP	LP
Reference speeds, 100% rpm	13391	8937	2683
Maximum for Take-off (5 minute limit, refer to Section VI, note 3)	101.5%	103.5%	101.5%
Maximum Continuous (Refer to Section VI, note 8)	99.5%	100.8%	101.5%

(Data makes allowance for instrumentation accuracies)

4. Installation Assumptions:

Refer to Installation Manual for details.

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5. Time Limited Dispatch:

All Engine Models

These engine models have been approved for Time Limited Dispatch in accordance with CS-E 1030. The maximum rectification period for each dispatchable state is specified in the Installation Manual.

6. ETOPS Capability:

Engine Models

Trent 1000-A, Trent 1000-C, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Trent 1000-AE, Trent 1000-CE, 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, Trent 1000-L2

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, Trent 1000-R3

These engine models are approved for ETOPS capability in accordance with CS-E 1040 for a Maximum Approved Diversion Time of 330 minutes at MCT thrust plus 15 minutes at hold power. ETOPS does not require any special engine limitation, marking, placard, or configuration. This approval does not constitute an approval to conduct ETOPS operations.

Engine Models

Trent7000-72, Trent7000-72C

The engine is approved for ETOPS capability in accordance with CS-E1040 amendment 3 by EASA Certificate 10068130 dated 19th December 2018 for a Maximum Approved Diversion Time of 330 minutes at Maximum Continuous thrust plus 15 minutes at hold thrust. ETOPS is restricted to engines incorporating MB72-K203 and NMSB Trent 1000 72-AK269. ETOPS does not require any other special engine limitation, marking, placard, or configuration. Engine Condition Monitoring is required. This approval does not constitute an approval to conduct ETOPS operations.

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72D

The engine is approved for ETOPS capability in accordance with CS-E1040 amendment 3 by EASA Certificate 10088151 dated 25th September 2025 for a Maximum Approved Diversion Time of 330 minutes at Maximum Continuous thrust plus 15 minutes at hold thrust. ETOPS does not require any other special engine limitation, marking, placard, or configuration. Engine Condition Monitoring is required. This approval does not constitute an approval to conduct ETOPS operations.

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V. Operating and Service Instructions

Engine Models

Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H

Document	Document Reference
Installation Manual including Engine Control System Dispatch Statement	DNS 130613
Operating Instructions	OI-Trent 1000-B787
Engine Manual	E-Trent-10RR
Maintenance Manual	B787-81205-Axxxx
Time Limits Manual (for engines without SB 72-G319 fitted)	T-Trent-10RR
Time Limits Manual (for engines with SB 72-G319 fitted)	T-Trent-10RRB
Service Bulletins	Trent 1000 — as required

Note: The Maintenance Manual is compiled by the Airframer and is specific to Aircraft Operators, “xxxx” denotes the Airlines customer code.

Engine 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, Trent 1000-L2

Document	Document Reference
Installation Manual including Engine Control System Dispatch Statement	DNS193530
Operating Instructions	OI-Trent 1000-B787C1
Engine Manual	E-Trent-10RRC
Maintenance Manual	B787-81205-Axxxx
Time Limits Manual	T-Trent-10RRC
Service Bulletins	Trent 1000 — as required

Note: The Maintenance Manual is compiled by the Airframer and is specific to Aircraft Operators, “xxxx” denotes the Airlines customer code.

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Engine 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, Trent 1000-R3

Document	Document Reference
Installation Manual	EDNS01000566257
Operating Instructions	OI-Trent 1000-TEN-B787
Engine Manual	E–Trent–10RRT
Maintenance Manual	B787-81205-Axxxx
Time Limits Manual	T-Trent-10RRT
Service Bulletins	Trent 1000 – as required

Note: The Maintenance Manual is compiled by the Airframer and is specific to Aircraft Operators, “xxxx” denotes the Airlines customer code.

Engine Models

Trent7000-72, Trent7000-72C

Document	Document Reference
Installation Manual	EDNS01000696188
Operating Instructions	EDNS01000696186
Engine Manual	E–T7000–1RR
Maintenance Manual	Airbus A330 Customer Aircraft Maintenance Manual
Time Limits Manual	T–T7000–1RR
Service Bulletins	Trent 1000 – as required

Note: The Maintenance Manual is compiled by the Airframer.

Engine Models

Trent7000-68, Trent7000-70, Trent7000-72D

Document	Document Reference
Installation Manual	EDNS01001274221
Operating Instructions	EDNS01001273558
Engine Manual	E–T7000–1RR
Maintenance Manual	Airbus A330 Customer Aircraft Maintenance Manual
Time Limits Manual	T–T7000–1RR
Service Bulletins	Trent 1000 – as required

Note: The Maintenance Manual is compiled by the Airframer.

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VI. Notes

1. The Equivalent Bare Engine Take-off and Maximum Continuous thrusts quoted in Section III sub level 6 are derived from the approved Net Take-off and Net Maximum Continuous thrust by excluding the losses attributable to the inlet, cold nozzle, hot nozzle, by-pass duct flow leakage and the after body.

2. The Ratings are based on having no power offtakes to aircraft accessories nor air bleeds.

3. The take-off rating and the associated operating limitations may be used for up to 10 minutes in the event of an engine failure.

4. All Models except Trent7000-68, Trent7000-70, Trent7000-72, Trent7000-72C and Trent7000-72D.
The control and monitoring system software meets the following levels according to EUROCAE ED-12B/RTCA DO178B:
• EEC is designated Level “A”.
• EMU is designated Level “E”, except that the flight deck vibration display is Level “C”.

   Trent7000-72 and Trent7000-72C. The control and monitoring system software meets the following levels:
• EEC is designated EUROCAE ED-12B/RTCA DO178B Level “A”.
• Pre SB 77-L241: EMU is designated EUROCAE ED-12C/RTCA DO178C Level “C”.
• Post SB 77-L241: EMU is designated EUROCAE ED-12C/RTCA DO178C Level “E”, except that the flight deck vibration display is Level “C”.

   Trent7000-68, Trent7000-70 and Trent7000-72D. The control and monitoring system software meets the following levels:
• EEC is designated EURCAE ED-12B/RTCA DO178B Level “A”.
• EMU is designated EUROCAE ED-12C/RTCA DO178C Level “C”.

5. Refer to Installation Manual for details of Electro-Magnetic Interference (EMI), High Intensity Radiated Fields (HIRF) and Lightning capability.

6. The maximum exhaust gas over temperature limit is approved for inadvertent use for the periods specified without requiring maintenance action. The cause of the over temperature must be investigated and corrected.

7. Turbine Gas Temperature is measured by thermocouples positioned at the 1st stage Nozzle Guide Vane of the LP Turbine.

8. The Maximum Continuous Speed limitations defined in this Data Sheet are not displayed as limitations on the Aircraft flight deck. Non-display of these limitations was agreed during the certification programme.

9. The Trent 1000-Z Model approved at original certification was deleted at Issue 2 of TCDS E.036. No examples of this Model have been produced and this model is no longer required.

10. Issue 2 of TCDS E.036 also updated the minimum build standard approved under the Type Certificate as defined in Section III paragraph 1. Only engines complying with the new minimum

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build standard can be operated. Examples of the earlier build standard are no longer approved and must be reworked to comply with the new minimum build standard prior to service operation.

11. Trent 1000-E model Engine type definition always embodies SB 72-G319.

12. The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in the applicable "Time Limits Manual".

13. The minimum oil pressure limits defined for 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, Trent 1000-R3 shows trimmed/indicated kPa (psi) to ensure cockpit display is consistent with the other engine models.

14. Reserved

15. The Engine Type Definition listed in Section III. Technical Characteristics for the Trent7000-72 and Trent7000-72C lists the minimum engine type definition for service. This includes the CS-E certification standard (DIS), modifications required for Airframe CS-25 certification and modification required for engine foreign authority validation.

16. The measured TGT is modified by trimming to provide consistent cockpit maximum trimmed TGT indications across all engine models. The TGT trim profile is programmed into the Data Entry Plug (DEP), which is fitted to the Engine Electronic Controller (EEC). The EEC processes the measured TGT and calculates the indicated TGT. The maximum TGT pull-down is the maximum value permitted, which corresponds to the maximum cleared turbine temperature.

Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G, Trent 1000-H			
TGT Trim Profile	**Take-Off (2 minute / 5-minute)**	**Maximum Continuous**	**Maximum exhaust gas overtemperature (20 seconds)**
Original Certification DIS issue 2 (Profile 1)	N/A / -57K	-88K	-50.5K
DIS issue 3 (Profile 8)	N/A / -83K	-105K	-64.5K
SB73-G537 (Profile 11)	N/A / -52.5K	-79K	-46K

Trent 1000-A/01, Trent 1000-AE/01, Trent 1000-C/01, Trent 1000-CE/01, Trent 1000-D/01, Trent 1000-E/01, Trent 1000-G/01, Trent 1000-H/01			
TGT Trim Profile	**Take-Off (2 minute / 5-minute)**	**Maximum Continuous**	**Maximum exhaust gas overtemperature (20 seconds)**
Basic (Profile 11)	N/A / -52.5K	-79K	-46K
SB73-H016 (Profile 12)	N/A / -59.5K	-82.5K	-54.5K
SB73-H389 (Profile 13)	N/A / -65.5K	-85K	-66K
SB73-H646 (Profile 14)	-72.5K / -65.5K	-85K	-66K
SB73-K153 (Profile 19)	-70.5K / -63.5K	-83K	-63.5K
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, Trent 1000-L2			

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TGT Trim Profile	Take-Off (2 minute / 5-minute)	Maximum Continuous	Maximum exhaust gas overtemperature (20 seconds)
Basic (Profile 15)	-81K / -74.5K	-101.5K	-72K
SB73-K177 (Profile 16)	-77.5K / -69.5K	-97.5K	-68K

Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3			
TGT Trim Profile	**Take-Off (2 minute / 5-minute)**	**Maximum Continuous**	**Maximum exhaust gas overtemperature (20 seconds)**
Basic (Profile 17)	-55K / -53.5K	-84K	-52.5K
SB 73-K827 (Profile 20)	-58.5K / -54.5K	-84.5K	-53K
SB 73-L276 (profile 24)	-76.5K / -68.5K	-112.5K	-67.5K

Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3, Trent 1000-R3			
TGT Trim Profile	**Take-Off (2 minute / 5-minute)**	**Maximum Continuous**	**Maximum exhaust gas overtemperature (20 seconds)**
Basic (Profile 17)	-55K / -53.5K	-84K	-52.5K

Trent7000-72, Trent7000-72C			
TGT Trim Profile	**Take-Off (2 minute / 5-minute)**	**Maximum Continuous**	**Maximum exhaust gas overtemperature (20 seconds)**
Basic (Profile 17)	-55K / -53.5K	-84K	-52.5K
SB72-K336 (Profile 22)	-84K / -72.5K	-101.5K	-76.5K
SB73-L176 (Profile 23)	-78K / -70K	-105.5K	-69.5K

Trent7000-68, Trent7000-70, and Trent7000-72D			
TGT Trim Profile	**Take-Off (2 minute / 5-minute)**	**Maximum Continuous**	**Maximum exhaust gas overtemperature (20 seconds)**
Basic (Profile 22)	-84K / -72.5K	-101.5K	-76.5K
SB73-L176 (Profile 23)	-78K / -70K	-105.5K	-69.5K

17. The transient IP limit is applicable for take-off and go-around manoeuvres only and lasts for 30 seconds, before reverting to the steady-state limit.

18. The introduction of the Trent7000-68, Trent7000-70, and Trent7000-72D models is based on the approval of the corresponding major change to type certificate. Newly introduced product models include pre-existing unsafe conditions in the non-affected areas. They will be addressed through supersedure of the following EASA ADs: 2021-0146R1, 2023-0186, 2024-0041, 2024-0029, and 2024-0178 where the new models will be added to Applicability section.

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SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

n/a

II. Type Certificate Holder Record

Rolls-Royce Deutschland Ltd & Co KG

formerly (until 20 February 2019): Rolls-Royce plc

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	07.08.2007	Initial Issue.	Initial Issue, 07.08.2007
Issue 02	14 March 2011	Miscellaneous modifications.	
Issue 03	11 November 2011	Introduction of Pack B models and miscellaneous modifications.	
Issue 04	10 September 2013	Introduction of Pack C models and miscellaneous modifications.	
Issue 05	27 March 2014	Introduction of Pack C ETOPS.	
Issue 06	06 May 2015	Introduction of Trent 1000-AE, Trent 1000-CE, Trent 1000-AE2, Trent 1000-CE2 models.	
Issue 07	11 July 2016	Introduction of 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, Trent 1000-R3.	11 July 2016
Issue 08	17 August 2017	Change of DIS Issue 2 to Issue 3 for 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, Trent 1000-R3. ETOPS capacity, TLD, change of Minimum Fuel Temperature and change of Maximum Permissible Rotor Speeds for these models.	
Issue 09	23 March 2018	Change of TC Holder's address	23 March 2018
Issue 10	20 July 2018	Introduction of models: Trent7000-72 and Trent7000-72C.	20 July 2018
Issue 11	13 November 2018	Trent7000: Restricted approval of ETOPS (EASA Certificate 10067382), change of Type Definition, change of Technical manuals (EASA certificate 10067469); change of Trent Pack B and C1 DIS for Enhance Rating models (EASA certificate 10067387). Corrections of errors.	13 November 2018

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Issue	Date	Changes	TC issue
Issue 12	6 December 2018	Addition of Temporary Deviation for 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, Trent 1000-R3 (EASA Major Change Approval 10067811).	
Issue 13	19 December 2018	Addition of ETOPS capability limitations for 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 (EASA Major Change Approval 10068103) Trent 7000 ETOPS 330min capability approval (EASA Major Change Approval 10068130).	
Issue 14	21 February 2019	Transfer of TC from Rolls-Royce plc to Rolls-Royce Deutschland Ltd & Co KG. Deletion of ETOPS capability limitations for 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 (Major Change Approval 10068103 Rev. 1).	21 February 2019
Issue 15	30 April 2019	Addition of Temporary Deviation for models: Trent7000-72 and Trent7000-72C (EASA Major Change Approval 10069569).	
Issue 16	5 November 2019	Introduction of CAEP/10 for nvPM compliance (EASA Major Change Approval 10071178).	
Issue 17	22 August 2022	Update to Trent7000 minimum start temperature (EASA Major Change Approval 10079134) Correction of errors: issue 13 release date Trent7000 maximum oil temperature Addition of Trim pull down values (Note 16) (EASA Major Change Approval 10079412).	
Issue 18	13 October 2022	Record of nvPM emissions compliance with CAEP/11 Standard (EASA Major Change approval 10080323).	
Issue 19	16 October 2023	Removal of Temporary Deviation (CS-E 650 Vibration surveys / High Cycle Fatigue endurance limits) for engine 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, Trent 1000-R3, Trent7000-72, and Trent7000-72C (EASA Major Change Approval 10082286).	

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Issue	Date	Changes	TC issue
Issue 20	2 April 2024	Addition of TGT trim Profile 20 for Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3 (EASA Major Change Approval 10084218).	
Issue 21	1 April 2025	Addition of TGT trim Profile 23 for Trent 7000-72 and Trent7000-72C (EASA Major Change Approval 10086445).	
Issue 22	16 September 2025	Engine 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: - Addition of SC to CS-E 25, CS-E 40, CS-E 700, CS-E 740, CS-E 820, CS-E 830, CS-E 870 - 30 second IP Transient Over-speed. - Change to Operating Limits, Maximum Permissible Rotor Speeds. - Addition of TGT trim Profile 24. (EASA Major Change Approval 10087861) Engine models: Trent 7000-72 and Trent7000-72C: - Introduction of an additional EMU partition to include a DAL-E section alongside the DAL-C. (EASA Major Change Approval 10087750) All listed engine models: - Administrative update to the wording used for Environmental Protection certification basis.	
Issue 23	26 September 2025	Introduction of models: Trent7000-68, Trent7000-70 and Trent7000-72D. Administrative formatting updates and dates correction.	25/09/2025
Issue 24	09 June 2026	Addition of TGT trim Profile 23 and update of Installation Manual as well as Operating Instructions references for Trent7000-68, Trent7000-70 and Trent7000-72D (EASA Major Change Approval 10090030).	

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