Civil Aviation Authority
United Kingdom

TYPE-CERTIFICATE DATA SHEET

UK.TC.E.00121

for

GEnx Series Engines

Type Certificate Holder

GENERAL ELECTRIC COMPANY

GE AVIATION

One Neumann Way

Cincinnati – Ohio 45215

United States of America

Model(s):

Genx-1B	GEnx-1B54, GEnx-1B58, GEnx-1B64, GEnx-1B67, GEnx-1B70. GEnx-1B54/P1, GEnx-1B58/P1, GEnx-1B64/P1, GEnx-1B67/P1, GEnx-1B70/P1, GEnx-1B70/72/P1, GEnx-1B70/75/P1, GEnx-1B74/75/P1, GEnx-1B75/P1. GEnx-1B54/P2, GEnx-1B58/P2, GEnx-1B64/P2, GEnx-1B67/P2, GEnx-1B70/P2, GEnx-1B70/72/P2, GEnx-1B70/75/P2, GEnx-1B74/75/P2, GEnx-1B75/P2, GEnx-1B76/P2, GEnx-1B76A/P2, GEnx-1B78/P2.
Genx-2B	GEnx-2B67 GEnx-2B67B GEnx-2B67/P

Issue: 01

Date of issue: 08 November 2024

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Section 1 General (All Models)

I. General

This Type-Certificate Data Sheet (TCDS) is the concise definition of the type-certificated product accepted and or approved by the CAA in the UK for the affected types and models.

This TCDS includes:

1. Details of the type design that affect the TCDS that have been approved or accepted by the CAA in the UK from 01 January 2021.

2. Details of the type design that affected the TCDS and were approved or accepted by EASA before 01 January 2021, and were incorporated into EASA TCDS IM.E.102 at Issue 10 dated 13 December 2019 and are therefore accepted by the UK under Article 15 of Annex 30 of the UK-EU Trade and Cooperation Agreement.

Section 2 GEnx Series Engines

I. General

1. Type / Variant or Model

GEnx-1B models	GEnx-1B54, GEnx-1B58, GEnx-1B64, GEnx-1B67, GEnx-1B70. GEnx-1B54/P1, GEnx-1B58/P1, GEnx-1B64/P1, GEnx-1B67/P1, GEnx-1B70/P1, GEnx-1B70/72/P1, GEnx-1B70/75/P1, GEnx- 1B74/75/P1, GEnx-1B75/P1. GEnx-1B54/P2, GEnx-1B58/P2, GEnx-1B64/P2, GEnx-1B67/P2, GEnx-1B70/P2, GEnx-1B70/72/P2, GEnx-1B70/75/P2, GEnx-1B74/75/P2, GEnx-1B75/P2, GEnx-1B76/P2, GEnx-1B76A/P2, GEnx-1B78/P2
GEnx-2B models	GEnx-2B67 GEnx-2B67B GEnx-2B67/P

2. Type Certificate Holder

GENERAL ELECTRIC COMPANY
GE AVIATION
One Neumann way
Cincinnati – Ohio 45215
United States of America

3. Manufacturer

General Electric Company

4. Date of Application at FAA (Certificating Authority)

Models	Application Date
GEnx-1B54	13 December 2004
GEnx-1B58	24 May 2005
GEnx-1B64	13 December 2004
GEnx-1B67	24 May 2004
GEnx-1B70	13 December 2004
GEnx-1B54/P1	21 September 2010
GEnx-1B58/P1	21 September 2010
GEnx-1B64/P1	21 September 2010
GEnx-1B67/P1	21 September 2010
GEnx-1B70/P1	21 September 2010
GEnx-1B70/72/P1	21 September 2010
GEnx-1B70/75/P1	21 September 2010
GEnx-1B74/75/P1	21 September 2010
GEnx-1B75/P1	21 September 2010
GEnx-1B54/P2	06 October 2010
GEnx-1B58/P2	06 October 2010
GEnx-1B64/P2	06 October 2010
GEnx-1B67/P2	06 October 2010
GEnx-1B70/P2	06 October 2010
GEnx-1B70/72/P2	06 October 2010
GEnx-1B70/75/P2	06 October 2010
GEnx-1B74/75/P2	06 October 2010
GEnx-1B75/P2	06 October 2010
GEnx-1B78/P2	06 October 2010
GEnx-2B67	28 February 2006
GEnx-2B67B	15 October 2010
GEnx-2B67/P	15 October 2010
GEnx-1B70C/P1	10 December 2013
GEnx-1B70C/P2	10 December 2013

GEnx-1B76/P2	24 March 2016
GEnx-1B76A/P2	24 March 2016

5. Type Certification date at FAA (Certificating Authority)

Models	Application Date
GEnx-1B54	31 March 2008
GEnx-1B58	31 March 2008
GEnx-1B64	31 March 2008
GEnx-1B67	31 March 2008
GEnx-1B70	31 March 2008
GEnx-1B54/P1	14 June 2012
GEnx-1B58/P1	14 June 2012
GEnx-1B64/P1	14 June 2012
GEnx-1B67/P1	14 June 2012
GEnx-1B70/P1	14 June 2012
GEnx-1B70/72/P1	14 June 2012
GEnx-1B70/75/P1	14 June 2012
GEnx-1B74/75/P1	14 June 2012
GEnx-1B75/P1	14 June 2012
GEnx-1B54/P2	12 April 2013
GEnx-1B58/P2	14 June 2012
GEnx-1B64/P2	14 June 2012
GEnx-1B67/P2	14 June 2012
GEnx-1B70/P2	14 June 2012
GEnx-1B70/72/P2	14 June 2012
GEnx-1B70/75/P2	14 June 2012
GEnx-1B74/75/P2	14 June 2012
GEnx-1B75/P2	14 June 2012
GEnx-1B78/P2	14 June 2012
GEnx-2B67	22 July 2010
GEnx-2B67B	12 September 2011
GEnx-2B67/P	22 November 2013
GEnx-1B70C/P1	06 February 2015
GEnx-1B70C/P2	06 February 2015
GEnx-1B76/P2	20 June 2016
GEnx-1B76A/P2	20 June 2016

6. Date of Application at CAA (Validating Authority)

Models	Application Date
GEnx-1B54	11 January 2024
GEnx-1B58	11 January 2024
GEnx-1B64	11 January 2024
GEnx-1B67	11 January 2024
GEnx-1B70	11 January 2024
GEnx-1B54/P1	11 January 2024
GEnx-1B58/P1	11 January 2024
GEnx-1B64/P1	11 January 2024
GEnx-1B67/P1	11 January 2024
GEnx-1B70/P1	11 January 2024
GEnx-1B70/72/P1	11 January 2024
GEnx-1B70/75/P1	11 January 2024
GEnx-1B74/75/P1	11 January 2024
GEnx-1B75/P1	11 January 2024
GEnx-1B54/P2	11 January 2024
GEnx-1B58/P2	11 January 2024
GEnx-1B64/P2	11 January 2024
GEnx-1B67/P2	11 January 2024

GEnx-1B70/P2	11 January 2024
GEnx-1B70/72/P2	11 January 2024
GEnx-1B70/75/P2	11 January 2024
GEnx-1B74/75/P2	11 January 2024
GEnx-1B75/P2	11 January 2024
GEnx-1B78/P2	11 January 2024
GEnx-2B67	11 January 2024
GEnx-2B67B	11 January 2024
GEnx-2B67/P	11 January 2024
GEnx-1B70C/P1	11 January 2024
GEnx-1B70C/P2	11 January 2024
GEnx-1B76/P2	11 January 2024
GEnx-1B76A/P2	11 January 2024

Application for CAEP/11 Compliance.

7. Type Certification date at CAA (Validating Authority)

Application approval for CAEP/11 compliance.

Models	Approval Date
GEnx-1B54	08 November 2024
GEnx-1B58	08 November 2024
GEnx-1B64	08 November 2024
GEnx-1B67	08 November 2024
GEnx-1B70	08 November 2024
GEnx-1B54/P1	08 November 2024
GEnx-1B58/P1	08 November 2024
GEnx-1B64/P1	08 November 2024
GEnx-1B67/P1	08 November 2024
GEnx-1B70/P1	08 November 2024
GEnx-1B70/72/P1	08 November 2024
GEnx-1B70/75/P1	08 November 2024
GEnx-1B74/75/P1	08 November 2024
GEnx-1B75/P1	08 November 2024
GEnx-1B54/P2	08 November 2024
GEnx-1B58/P2	08 November 2024
GEnx-1B64/P2	08 November 2024
GEnx-1B67/P2	08 November 2024
GEnx-1B70/P2	08 November 2024
GEnx-1B70/72/P2	08 November 2024
GEnx-1B70/75/P2	08 November 2024
GEnx-1B74/75/P2	08 November 2024
GEnx-1B75/P2	08 November 2024
GEnx-1B78/P2	08 November 2024
GEnx-2B67	08 November 2024
GEnx-2B67B	08 November 2024
GEnx-2B67/P	08 November 2024
GEnx-1B70C/P1	08 November 2024
GEnx-1B70C/P2	08 November 2024
GEnx-1B76/P2	08 November 2024
GEnx-1B76A/P2	08 November 2024

II. Certification Basis

1. Reference Date for determining the applicable airworthiness requirements.

Models	Approval Date
GEnx-1B54	13 December 2004
GEnx-1B58	13 December 2004
GEnx-1B64	13 December 2004
GEnx-1B67	13 December 2004
GEnx-1B70	13 December 2004
GEnx-1B54/P1	13 December 2004
GEnx-1B58/P1	13 December 2004
GEnx-1B64/P1	13 December 2004
GEnx-1B67/P1	13 December 2004
GEnx-1B70/P1	13 December 2004
GEnx-1B70/72/P1	13 December 2004
GEnx-1B70/75/P1	13 December 2004
GEnx-1B74/75/P1	13 December 2004
GEnx-1B75/P1	13 December 2004
GEnx-1B54/P2	13 December 2004
GEnx-1B58/P2	13 December 2004
GEnx-1B64/P2	13 December 2004
GEnx-1B67/P2	13 December 2004
GEnx-1B70/P2	13 December 2004
GEnx-1B70/72/P2	13 December 2004
GEnx-1B70/75/P2	13 December 2004
GEnx-1B74/75/P2	13 December 2004
GEnx-1B75/P2	13 December 2004
GEnx-1B78/P2	13 December 2004
GEnx-2B67	13 December 2004
GEnx-2B67B	13 December 2004
GEnx-2B67/P	13 December 2004
GEnx-1B70C/P1	13 December 2004
GEnx-1B70C/P2	13 December 2004
GEnx-1B76/P2	13 December 2004
GEnx-1B76A/P2	13 December 2004

2. State of Design Airworthiness Authority Type Certification Data Sheet Number

FAA TCDS E00078NE

3. State of Design Airworthiness Authority Certification Basis

Refer to FAA TCDS E00078EN

4. UK CAA Certification Basis

4.1 Airworthiness Standards

Models	Airworthiness Standards
GEnx-1B models	CS-E Initial Issue, dated 24th October 2003 CS-E 1040 (ETOPS) of CS-E Amendment 3, dated 23rd December 2010
GEnx-2B models	CS-E Initial Issue, dated 24th October 2003

4.2 Special Conditions (SC)

GEnx-1B, GEnx-1B/P1, GEnx-1B/P2 models	SC-1 - Fan blade containment
GEnx-2B67 model	
GEnx-2B67B model	
GEnx-2B67/P model	
GEnx-1B/P1 and GEnx-1B/P2 models	SC 2 - Endurance Test 30 second transient over-temperature
GEnx-2B67/P model	

4.3 Equivalent Safety Findings (ESF)

GEnx-1B models	CS-E 740 Endurance tests for 1B/P1 CS-E 740 Endurance tests for 1B/P2
GEnx-2B models	CS-E 740 Endurance tests for 2B/P
GEnx – all models	CS-E 840 HPT st 2 rotor, Rotor Integrity Compliance

4.4 Deviations

GEnx-1B models	None
GEnx-2B models	
GEnx 2B67/P model	Temporary Deviation – CS-E 780 Tests in ice forming conditions, compliance has been established on 2 Nov 2015, see.Note 7 (2).

4.5 Environmental Protection

GEnx-1B Models	Emissions and Fuel Venting: CS-34 Amendment 3 as implemented by ED Decision 2019/014/R (29th July 2019); ICAO Annex 16 Volume II, Amendment 9 (1st January 2018) as implemented into EU legislation 11/09/2018 ; NOx levels in compliance with Part III, Chapter 2, paragraph 2.3.2e) (CAEP/8) of the above mentioned Annex. Maximum nvPM mass concentration levels in compliance with Part III, Chapter 4, paragraph 4.2.2 (CAEP/10) of the above mentioned Annex.
GEnx-2B models	

GEnx-1B78/P2, GEnx-1B76A/P2, GEnx-1B76/P2,GEnx-1B75/P2, GEnx-1B74/75/P2, GEnx-1B70/75/P2,GEnx-1B70/72/P2, GEnx-1B70C/P2, GEnx-1B70/P2,GEnx-1B67/P2, GEnx-1B64/P2,-1B58/P2, GEnx -1B54/P2, GEnx-2B67/P.	In accordance with Article 9 of Assimilated Regulation (EU) 2018/1139, as amended, meeting the requirement of ICAO Annex 16 Volume II, Amendment 10 applicable 01 January 2021. 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 compliance with ICAO Annex 16 Volume II, Part III, Chapter 4, paragraph 4.2.2.1 nvPM mass and number emissions in compliance with Part III, Chapter 4, paragraph 4.2.2.2 a) 1) and 4.2.2.2 b) 1) (CAEP/11 In-Production standard.

III. Technical Characteristics

1. Type Design Definition

Engine type is identified by an engine model list reference and an engine identification plug reference:

	Engine model List reference		
GEnx-1B models	GEnx-1B54/G03 GEnx-1B58/G03 GEnx-1B64/G03 GEnx-1B67/G03 GEnx-1B70/G03	GEnx-1B54/G04 GEnx-1B58/G04 GEnx-1B64/G04 GEnx-1B67/G04 GEnx-1B70/G04	GEnx-1B54/G05 GEnx-1B58/G05 GEnx-1B64/G05 GEnx-1B67/G05 GEnx-1B70/G05
GEnx-1B/P1 models	GEnx-1B54/P1G01 GEnx-1B58/P1G01 GEnx-1B64/P1G01 GEnx-1B67/P1G01 GEnx-1B70/P1G01 GEnx-1B70/72/P1G01 GEnx-1B70/75/P1G01 GEnx-1B74/75/P1G01 GEnx-1B75/P1G01		
GEnx-1B/P2 models	GEnx-1B54/P2G01 GEnx-1B58/P2G01 GEnx-1B64/P2G01 GEnx-1B67/P2G01 GEnx-1B70/P2G01 GEnx-1B70/72/P2G01 GEnx-1B70/75/P2G01 GEnx-1B74/75/P2G01 GEnx-1B75/P2G01 GEnx-1B76/P2G01 GEnx-1B76A/P2G01 GEnx-1B78/P2G01	GEnx-1B54/P2G02 GEnx-1B58/P2G02 GEnx-1B64/P2G02 GEnx-1B67/P2G2 GEnx-1B70/P2G02 GEnx-1B70/72/P2G02 GEnx-1B70/75/P2G02 GEnx-1B74/75/P2G02 GEnx-1B75/P2G02 GEnx-1B76/P2G02 GEnx-1B76A/P2G02 GEnx-1B78/P2G02	
GEnx-2B67 model	GEnx-2B67G01	GEnx-2B67G02	
GEnx-2B67B model	GEnx-2B67BG01	GEnx-2B67BG02	
GEnx-2B67/P model	GEnx-2B67/PG01	GEnx-2B67/PG02	

	Engine identification plug reference
GEnx-1B54G03, G04, G05 GEnx-1B58G03, G04, G05 GEnx-1B64G03, G04, G05 GEnx-1B67G03, G04, G05 GEnx-1B70G03, G04, G05	2125M31P62 2125M31P08 2125M31P68 2125M31P20 2125M31P74
GEnx-1B54/P1G01 GEnx-1B58/P1G01 GEnx-1B64/P1G01 GEnx-1B67/P1G01 GEnx-1B70/P1G01 GEnx-1B70/72/P1G01 GEnx-1B70/75/P1G01 GEnx-1B74/75/P1G01 GEnx-1B75/P1G01	2125M31P62 2125M31P08 2125M31P68 2125M31P20 2125M31P74 2125M31P32 2125M31P80 2125M31P44 2125M31P50
GEnx-1B54/P2G01, G02 GEnx-1B58/P2G01, G02 GEnx-1B64/P2G01, G02 GEnx-1B67/P2G01, G02 GEnx-1B70/P2G01, G02	2125M31P62 2125M31P08 2125M31P68 2125M31P20 2125M31P74

GEnx-1B70/72/P2G01, G02 GEnx-1B70/75/P2G01, G02 GEnx-1B74/75/P2G01, G02 GEnx-1B75/P2G01, G02 GEnx-1B76/P2G01, G02 GEnx-1B76A/P2G01, G02 GEnx-1B78/P2G01, G02	2125M31P32 2125M31P80 2125M31P44 2125M31P50 2125M31P56 2125M31P92 2125M31P86
GEnx-2B67G01, G02 GEnx-2B67BG01, G02 GEnx-2B67/PG01, G02	2125M31P20

2. Description

GEnx-1B, GEnx-1B/P1 and GEnx-1B/P2 models:

The GEnx-1B engine is a dual rotor, axial flow, high bypass ratio turbofan. The 10-stage high pressure compressor is driven clockwise (Aft Looking Forward) by a 2-stage high pressure turbine. The single stage fan and 4-stage low pressure compressor are driven counterclockwise (Aft Looking Forward) by a 7-stage low pressure turbine. The engine control system includes a Full Authority Digital Engine Control (FADEC),

which has an aircraft connection for digital communication. An engine monitoring unit (EMU) provides vibration level signals to the aircraft.

GEnx-2B models:

The GEnx-2B engine is a dual rotor, axial flow, high bypass ratio turbofan. The 10-stage high pressure compressor is driven clockwise (Aft Looking Forward) by a 2-stage high pressure turbine. The single stage fan and 3-stage low pressure compressor are driven counterclockwise (Aft Looking Forward) by a 6-stage low pressure turbine. The engine control system includes a Full Authority Digital Engine Control (FADEC), which has an aircraft connection for digital communication. An engine monitoring unit (EMU) provides vibration level signals to the aircraft.

3. Equipment

The engine starter is part of the engine type design. Refer to the engine part list for details.

4. Dimensions

	Overall Length	**Width**	**Height**
GEnx-1B models	4950,5 mm	3533,1 mm	3484,9 mm
GEnx-1B/P1 models	4950,5 mm	3533,1 mm	3484,9 mm
GEnx-1B/P2 models	4950,5 mm	3533,1 mm	3484,9 mm
GEnx-2B models	4699,0 mm	3200,4 mm	3233,4 mm

5. Dry Weight

Dry weight includes basic engine, basic engine accessories and optional equipment as listed in the manufacturer's engine specifications.

GEnx-1B models	6147,1 kg
GEnx-1B/P1 models	6147,1 kg
GEnx-1B/P2 models	6147,1 kg
GEnx-2B67 model	5613,2 kg
GEnx-2B67B model	5613,2 kg
GEnx-2B67/P model	5613,2 kg

6. Ratings

Take-off Thrust

GEnx-1B54	GEnx-1B58	GEnx-1B64	GEnx-1B67	GEnx-1B70
255,3 kN	271,3 kN	298 kN	308,7 kN	321,6 kN

GEnx-1B54/P1	GEnx-1B58/P1	GEnx-1B64/P1	GEnx-1B67/P1	GEnx-1B70/P1
255,3 kN	271,3 kN	298 kN	308,7 kN	321,6 kN
GEnx-1B70/72/P1	**GEnx-1B70/75/P1**	**GEnx-1B74/75/P1**	**GEnx-1B75/P1**	
321,6 kN	321,6 kN	341,2 kN	345,2 kN	

GEnx-1B54/P2	GEnx-1B58/P2	GEnx-1B64/P2	GEnx-1B67/P2	GEnx-1B70/P2
255,3 kN	271,3 kN	298 kN	308,7 kN	321,6 kN
GEnx-1B70/72/P2	**GEnx-1B70/75/P2**	**GEnx-1B74/75/P2**	**GEnx-1B75/P2**	**GEnx-1B76/P2**
321,6 kN	321,6 kN	341,2 kN	345,2 kN	349,2 kN

GEnx-1B76A/P2	GEnx-1B78/P2	GEnx-2B67	GEnx-2B67B	GEnx-2B67/P
349,2 kN	357,6 kN	299,8 kN	299,8 kN	299,8 kN

Maximum Continuous Thrust

GEnx-1B54	GEnx-1B58	GEnx-1B64	GEnx-1B67	GEnx-1B70
250,4 kN	250,4 kN	273,6 kN	273,6 kN	295,8 kN

GEnx-1B54/P1	GEnx-1B58/P1	GEnx-1B64/P1	GEnx-1B67/P1	GEnx-1B70/P1
250,4 kN	250,4 kN	273,6 kN	273,6 kN	295,8 kN
GEnx-1B70/72/P1	**GEnx-1B70/75/P1**	**GEnx-1B74/75/P1**	**GEnx-1B75/P1**	
295,8 kN	295,8 kN	305,1 kN	306,0 kN	

GEnx-1B54/P2	GEnx-1B58/P2	GEnx-1B64/P2	GEnx-1B67/P2	GEnx-1B70/P2
250,4 kN	250,4 kN	273,6 kN	273,6 kN	295,8 kN
GEnx-1B70/72/P2	**GEnx-1B70/75/P2**	**GEnx-1B74/75/P2**	**GEnx-1B75/P2**	**GEnx-1B76/P2**
295,8 kN	295,8 kN	305,1 kN	306,0 kN	305,2 kN

GEnx-1B76A/P2	GEnx-1B78/P2	GEnx-2B67	GEnx-2B67B	GEnx-2B67/P
305,2 kN	305,1 kN	260,2 kN	260,2 kN	260,2 kN

7. Control System

	GEnx-1B models	GEnx-1B/P1 models	GEnx-1B/P2 models	GEnx-2B67	GEnx-2B67B	GEnx-2B67/P	GEnx-1B76 models
Fuel Metering Unit	2122M20	2122M20	2459M17 2122M20	2122M20	2122M20	2122M20	2459M17 2122M20
Full Authority Digital Engine Control (FADEC) Hardware	2121M82	2121M82	2447M85	2124M70	2124M70	2124M70	2447M85
FADEC Software	2124M23	2124M23	2124M23	2124M22	2124M22	2124M22	2124M23
Configuration Box	2400M60P03 (G03 model list) 2400M6	2400M60P10	2400M60P07	2400M60P04	2400M60P08	2400M60P09	2400M60P07

	0P06 (G04/G 05 model list)						
FADEC Rating Plug	See Section III.1.						
Fuel Pump	2122M22	2122M22	2122M22	2122M22	2122M22	2122M22	2122M22
Two ignition exciters GE P/N	2121M94	2121M94	2121M94	2139M52	2139M52	2139M52	2121M94
Two igniter plugs GE P/N	1754M84	1754M84	1754M84	1754M84	1754M84	1754M84	1754M84

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

8.1 Fuel and Additives:

Refer to GEnx-1B Service Bulletin 73-0001 and GEnx-2B Service Bulletin 73-0001 for detailed information pertaining to fuels and additives. This Service bulletin covers the eligible fuels listed per GE Aviation Specification D50TF2. Eligible fuel classifications are:

Class A – Aviation Kerosene
Class C – Low Freeze Kerosene
Class D – High Flash Kerosene
Class E – Low Flash Kerosene
NOTE: Class B – (Jet B, JP4) is prohibited

8.2 Oil:

Refer to GEnx-1B Service Bulletin 79-0001 and GEnx-2B Service Bulletin 79-0001 and its latest revision for detailed information pertaining to Type 2 oils. This Service Bulletin covers the approved oils conforming to General Electric Specification D50TF1 only the latest revisions are authorized.

9. Aircraft Accessory Drives

GEnx-1B models

Drive		**Rotation (*)**	**Gear ration/ HP rotor**	**Max. Power or Torque**	**Shear Torque (Nm)**	**Overhung Moment (Nm)**
Aircraft Electrical Generation	VFSG 1	CCW	1.1331	516 kW	2214-2285	194.4
	VFSG 2	CCW	1.1331	516 kW	2214-2285	194.4
Aircraft Hydraulic Generation		CCW	0.4438	46.2 kW	297-420	15.8

GEnx-1B/P1 model

Drive		**Rotation (*)**	**Gear ration/ HP rotor**	**Max. Power or Torque**	**Shear Torque (Nm)**	**Overhung Moment (Nm)**
Aircraft Electrical Generation	VFSG 1	CCW	1.1331	504 kW	2214-2285	194.4
	VFSG 2	CCW	1.1331	504 kW	2214-2285	194.4
Aircraft Hydraulic Generation		CCW	0.4438	46.2 kW	297-420	15.8

GEnx-1B/P2 models

Drive		Rotation (*)	Gear ration/ HP rotor	Max. Power or Torque	Shear Torque (Nm)	Overhung Moment (Nm)
Aircraft Electrical Generation	VFSG 1	CCW	1.1331	473.5 kW	2214-2285	194.4
	VFSG 2	CCW	1.1331	473.5 kW	2214-2285	194.4
Aircraft Hydraulic Generation		CCW	0.4438	44 kW	297-420	15.8

GEnx-2B67, -2B67B, \and -2B67/P models

Drive	Rotation (*)	Gear ratio/HP rotor	Max. Power or Torque	Shear Torque (Nm)	Overhung Moment (Nm)
Aircraft Electrical Generation	CCW	0.6696	254 Nm	972-1062	101.7
Aircraft Hydraulic Generation	CCW	0.3157	125 Nm	480-548	29.5

(*) CCW=Counterclockwise

10. Maximum Permissible Air Bleed Extraction

GEnx-1B54, GEnx-1B58, GEnx-1B64, GEnx-1B67, and GEnx-1B70 models (applicable to engines not equipped with booster anti-ice system)

	Stage 7 – Percent W25
Any Power Setting	3.3%

GEnx-1B54, GEnx-1B58, GEnx-1B64, GEnx-1B67, GEnx-1B70, GEnx-1B54/P1, GEnx-1B58/P1, GEnx-1B64/P1, GEnx-1B67/P1, GEnx-1B70/P1, GEnx-1B70/72/P1, GEnx-1B70/75/P1, GEnx-1B74/75/P1, GEnx-

1B75/P1, GEnx-1B54/P2, GEnx-1B58/P2, GEnx-1B64/P2, GEnx-1B67/P2, GEnx-1B70/P2, GEnx-

1B70/72/P2, GEnx-1B70/75/P2, GEnx-1B74/75/P2, GEnx-1B75/P2, GEnx-1B76/P2, GEnx- 1B76A/P2 and GEnx-1B78/P2 models (applicable to engines equipped with booster anti-ice system).

Percent Corrected Fan Speed (N1K*)	Stage 7 – Percent W25
0 to 31.3	5.0%
31.3 to 66.4	4.7%
> 66.4	3.3%

GEnx-2B67 and GEnx-2B67B Models

%N1K*	CDP Bleed Percent W25	
	T2>67F	T2<67F
0	13	13
81.1	13	13
81.1	8	10
88.2	8	10
88.2	8	8.5
91.7	8	8.5
91.7	8	8
120.0	8	8

%N1K*	S4 Bleed Percent W25
0	7.28%
15.9	7.28%
21.2	7.28%
50.0	7.28%
50.0	7.85%
75.8	7.85%
75.8	7.65%
81.1	7.65%
84.7	7.85%
91.7	7.85%
108.6	6.00%
108.6	5.00%
120.0	5.00%

GEnx-2B67/P Models

%N1K*	CDP Bleed Percent W25	
	T2>67F	T2<67F
0	13	13
81.1	13	13
81.1	8	10
88.2	8	10
88.2	8	8.5
91.7	8	8.5
91.7	8	8
120.0	8	8

%N1k*	S4 Bleed Percent W25
0	7.28%
15.9	7.28%
21.2	7.28%
50.0	7.28%
50.0	7.85%
75.8	7.85%
75.8	7.65%
81.1	7.65%
84.7	7.85%
91.7	7.85%
108.6	6.00%
108.6	5.00%
120.0	5.00%

N1K is defined as N1/(√Tamb/√288)

IV. Operating Limitations

1. Temperature Limits

1.1 Exhaust Gas Temperature °C:

The exhaust gas temperature is measured at station T49 (stage 2 LPT nozzle). GEnx-1B54, GEnx-1B58,GEnx-1B64,GEnx-1B67, and GEnx-1B70 Models

	Max temperature °C
Take-Off	1035
30 sec max transients	1040
Max Continuous	1005
Ground Starting	750
In flight Starting (Manual or Auto)	875
In flight Starting (High Power Fuel Cut)	975

GEnx-1B54/P1, GEnx-1B58/P1, GEnx-1B64/P1, GEnx-1B67/P1, GEnx-1B70/P1, GEnx-1B70/72/P1, GEnx- 1B70/75/P1, GEnx-1B74/75/P1, and GEnx-1B75/P1 Models

	Max temperature °C
Take-Off	1060
30 sec max transients	1065
Max Continuous	1030
Ground Starting	750
In flight Starting (Manual or Auto)	875
In flight Starting (High Power Fuel Cut)	975

GEnx-1B54/P2, GEnx-1B58/P2, GEnx-1B64/P2, GEnx-1B67/P2, GEnx-1B70/P2, GEnx-1B70/72/P2, GEnx- 1B70/75/P2, GEnx-1B74/75/P2, GEnx-1B75/P2, GEnx-1B76/P2, GEnx-1B76A/P2 and GEnx-1B78/P2 Models

	Max temperature °C
Take-Off	1065
30 sec max transients	1070
Max Continuous	1030
Ground Starting	750
In flight Starting (Manual or Auto)	875
In flight Starting (High Power Fuel Cut)	975

GEnx-2B67, GEnx-2B67B, and GEnx-2B67/P Models

	Max temperature °C
Take-Off	1065
30 sec max transients	1070
Max Continuous	1030
Ground Starting	750
In flight Starting (Manual or Auto)	875
In flight Starting (High Power Fuel Cut)	975

1.2 Oil Temperature °C:

GEnx-1B, GEnx-1B/P1, GEnx-1B/P2, and GEnx-2B Engine Series:

	Max temperatures °C
Continuous	166
Transitory (15 minutes)	177

1.3 Fuel Inlet Temperature (°C):

At engine fuel pump inlet:
GEnx-1B Engine Series

	Max temperatures °C
Minimum	-53.8
Maximum	65.5

GEnx-2B Engine Series

	Max temperatures °C
Minimum	-53.8
Maximum	54.4

1.4 Engine Equipment Temperatures:

See GEnx-1B Installation Manual GEK 112856 or GEnx-2B Installation Manual GEK 114114.

2. Speed Limits:

Maximum rotational speeds (R/L):

	Lower pressure rotor (N1)	High Pressure rotor (N2)
GEnx-1B Series	2726 (106%)	13,425 (118%)
GEnx-1B/P1 Series	2778 (108%)	13,539 (119%)
GEnx-1B/P2 Series	2778 (108%)	13,368 (117.5%)

Notes:
A) 100 percent N1 is 2,560 RPM
B) 100 percent N2 is 11,377 RPM

	Lower pressure rotor (N1)	High pressure rotor (N2)
GEnx-2B67	3026 (106%)	13,425 (118%)
GEnx-2B67B	3026 (106%)	13,425 (118%)
GEnx-2B67/P	3026 (106%)	13,368 (117.5%)

Notes:
A) 100 percent N1 is 2,835 RPM
B) 100 percent N2 is 11,377 RPM

3. Pressure Limits

3.1 Fuel Pressure

Fuel pressure limits are specified at the engine fuel pump inlet.
The limit is from minimum fuel pressures of not less than true vapour pressure plus 34,5 kPa to a maximum of 482,6 kPa.

For the GEnx-1B, on the 787 aircraft, the minimum fuel pressure limit is extended down to minimum fuel pressure of 24,1 kPa and maximum vapour-to-liquid ratio (v/l) of 0.45 for up to 60 minutes followed by up to 600 minutes with minimum fuel pressure of 3.5 psia and a maximum vapour-to-liquid ratio (v/l) of 0.28.

3.2 Oil Pressure

See Figure 8-1 of GEnx-1B Operating Instructions GEK 112857 and GEnx-2B Operating Instructions GEK 114113 for definition of minimum and maximum oil pressures.

4. Installation Assumptions:

The installation assumptions are in the GEnx-1B Installation Manual GEK 112856 or GEnx-2B Installation Manual GEK 114114.

5. Time Limited Dispatch (TLD)

The GEnx engine models are approved for Time Limited Dispatch in accordance with CS-E 1030. The maximum rectification period for each dispatchable state is specified in the Airworthiness Limitations Section of the applicable “Engine Shop Manual”, GEK 112851 for the GEnx-1B models and GEK 114119 for the GEnx-2B models.

6. ETOPS Capability

The GEnx-1B54, GEnx-1B58, GEnx-1B64, GEnx-1B67, GEnx-1B70, GEnx-1B54/P1, GEnx-1B58/P1, GEnx- 1B64/P1, GEnx-1B67/P1, GEnx-1B70/P1, GEnx-1B70/72/P1, GEnx-1B70/75/P1, GEnx-1B74/75/P1, GEnx-1B75/P1, GEnx-1B54/P2, GEnx-1B58/P2, GEnx-1B64/P2, GEnx-1B67/P2, GEnx-1B70/P2, GEnx-1B70/72/P2, GEnx-1B70/75/P2, GEnx-1B74/75/P2, GEnx-1B75/P2, GEnx-1B76/P2, GEnx-1B76A/P2 and GEnx-1B78/P2 engine models have demonstrated eligibility for ETOPS for a Maximum Approved Diversion Time of 330 minutes at MCT thrust plus 15 minutes at hold power. (For limitations see Note 13).

V. Operating and Service Instructions

	GEnx-1B models	**GEnx-2B models**
Turbofan Engine Installation Manual	GEK 112856	GEK 114114
Specific Operating Instructions	GEK 112857	GEK 114113
Engine Shop Manual	GEK 112851	GEK 114119
Maintenance Manual	GEK 112862	GEK 114120

VI. Notes

Note 1: Engine Ratings

Engine ratings are based on calibrated test stand performance under the following conditions:

A. Sea level static, standard pressure 101,3 Pa (14.696 psia), 15 deg C
B. No customer bleed or customer horsepower extraction
C. Ideal inlet, 100% ram recovery
D. Production aircraft flight cowling
E. Production instrumentation
F. Fuel lower heating value of 8813 kJ/kg

Note 2: Take-off Time Limits

The normal 5-minute take-off time limit may be extended to 10 minutes for engine out contingency.

Note 3: Life Limits

The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in Chapter 5 of the GEnx Engine Manual, GEK 112851 for GEnx-1B54, -1B58, -1B64, -1B67, -1B70, -1B54/P1, -1B58/P1, -1B64/P1, -1B67/P1, -1B70/P1, -1B70/72/P1, -1B70/75/P1, -1B74/75/P1,-1B75/P1,-1B54/P2,-1B58/P2, -1B64/P2, -1B67/P2, -1B70/P2, -1B70/72/P2,-1B70/75/P2,-1B74/75/P2,-1B75/P2, -1B76/P2, -1B76A/P2 and -1B78/P2.

For the GEnx-2B67, GEnx-2B67B, and GEnx-2B67/P this is published in Chapter 5 of the GEnx Engine Manual GEK 114119.

The GEnx-1B, GEnx-1B/P1, and GEnx-1B/P2 and GEnx-2B67, GEnx-2B67B, and GEnx-2B67/P cyclic life limits are based on a commercial mission cycle, which consists of a start, take-off, climb, cruise, descent, and landing. Use (or non-use) of a fan reverser for

braking during landing does not affect cycle counts. Each of the following constitutes one cycle:

(1) a flight consisting of a take-off and landing,
(2) a touch-and-go landing or simulated touch-and-go landing (no weight on wheels) for pilot training.

Note 4: Fan Blade Criticality and Repair

For the purposes of the EASA Validation the Fan Blade is declared as an Engine Critical Part.

Approval of repairs of the fan blade composite material in the root section of the fan blade up to the inner annulus flow path line must be coordinated with the Airworthiness Agency. Substantiation of the repairs must show that compliance to GEnx-1B and -2B Special Condition GEnx CRI-T5 is maintained.

Note 5: Induction System Icing

Demonstration of compliance for Induction System Icing, is installation specific to the Boeing B787-8 model aircraft for the GEnx-1B, GEnx-1B/P1, and GEnx-1B/P2 engine models and B747-8 for the GEnx- 2B67, GEnx-2B67B, and GEnx-2B67/P engine models. Installation of these engine models on different airplane models or type will require a separate evaluation and finding of compliance.

Note 6: Thrust Setting Parameter

Power setting, power checks, and control of engine thrust output in all operations are based on Fan Speed (N1). Speed sensors are included in the engine assembly for this purpose.

Note 7: Icing Conditions

1) For ground operation in icing conditions, requirements, limitations, and notes are specified in GEnx- 1B, GEnx-1B/P1, and GEnx-1B/P2 Operating Instructions Manual GEK 112857 and GEnx-2B67, GEnx- 2B67B, and GEnx-2B67/P Operating Instructions GEK 114113.
2) For engine operation in ice crystal cloud conditions limitations are specified in GEnx-1B, GEnx-1B/P1, and GEnx-1B/P2 Operating Instructions Manual GEK 112857 and GEnx-2B67, GEnx-2B67B, and GEnx- 2B67/P Operating Instructions GEK 114113.

The Temporary Deviation to CS-E 780 “Tests in ice forming conditions” for the GEnx 2B67/P model is recorded closed at TCDS issue 7 with compliance having been established by provision of the following modifications:

FADEC software C075 (or later) and booster outlet guide vane assembly to propulsor group 2330M20G12 standard (or later).

Note 8: Negative-G Operation

During "negative-G" operation only, it is permissible to operate below minimum oil pressure for a maximum of 15 seconds. See GEnx Operating Instructions, GEK 112857, Section 8, for GEnx-1B, GEnx- 1B/P1, and GEnx-1B/P2 definition of minimum oil pressure. See GEnx Operating Instructions, GEK 114113, Section 8, for GEnx-2B67, GEnx-2B67B, and GEnx-2B67/P definition of minimum oil pressure**.**

Note 9: Aircraft Models

The GEnx-1B, GEnx-1B/P1, and GEnx-1B/P2 engine models are limited to installation on the Boeing B787- 8 model aircraft only with respect to the installed power response characteristics. The GEnx-2B67, GEnx- 2B67B, and GEnx-2B67/P engine models are limited to installation on the Boeing B747-8 model aircraft only with respect to the

installed power response characteristics. Any bill-of- material changes that could significantly and adversely affect power response will have to be reassessed.

Note 10: Fan Reverser

Boeing 787-8 Aircraft/GEnx-1B Engine Series Fan Reversers:

LH Wing: 721Z3030-103, 721Z3040-103

RH Wing: 721Z3050-103, 721Z3060-103

Boeing 747-8 Aircraft/GEnx-2B Engine Series Fan Reversers:

LH Wing: 608C0100-565, 608C0100-566, 608C0100-567, 608C0100-568

RH Wing: 608C0100-571, 608C0100-572, 608C0100-573, 608C0100-574

Note 11: ETOPS Limitations

For the GEnx-1B54, -1B58, -1B64, -1B67,-1B70,-1B54/P1, -1B58/P1, -1B64/P1, -1B67/P1, -1B70/P1, -1B70/72/P1, -1B70/75/P1, -1B74/75/P1, -1B75/P1, -1B54/P2, -1B58/P2, -1B64/P2, -1B67/P2, -1B70/P2, -1B70/72/P2, -1B70/75/P2, -1B74/75/P2, -1B75/P2, -1B76/P2, -1B76A/P2 and -1B78/P2 engine models installed on B787 aircraft, the engine fuel pump must be replaced prior to the next ETOPS flight after any single suction feed operation event of duration greater than 30 minutes. Suction feed operation is defined by engine pump inlet fuel pressure less than the greater of true vapor pressure plus 5.0 psi or ambient plus 5.0 psi.

Note that ETOPS eligibility does not constitute airplane or operational level approvals necessary to conduct ETOPS flights.

Note 12: Flow Split Value Fuel Accumulator Applicability

The GEnx-2B67 (defined by the GEnx-2B67G01 and GEnx-2B67G02 model lists) for the B747-8 aircraft will not support the installation of the flow split valve fuel accumulator system. Fuel accumulator system installation is required in order to eliminate post-engine shutdown intermittent fuel releases and observed vapors.

Section 3 Administration

I. Acronyms and Abbreviations

Acronym / Abbreviation	Definition
AMC	Alternative Means of Compliance
CCW	Counterclockwise
CDP	Compressor Discharge Pressure
EMU	Engine Monitoring Unit ()
ETOPS	Extended Range Twin Operations
FAA	Federal Aviation Administration
FADEC	Full Authority Digital Engine Control
GE	General Electric
HPT	High Pressure Turbine
LPT	Low Pressure Turbine
N1	Low Pressure Rotor Speed
N1K	Corrected Low Pressure Rotor Speed
N2	High Pressure Rotor Speed
S4	Stage 4
SC	Special Condition
T49	Temperature at Station 49
TCDS	Type Certificate Data Sheet
TLD	Time Limited Dispatch
VFSG	Variable Frequency Generator
W25	Air Flow at Station 25

II. Type Certificate Holder Record

TCH Record	Period
GENERAL ELECTRIC COMPANY GE AVIATION One Neumann way Cincinnati – Ohio 45215 United States of America Design Organisation Approval No.: NA	Since initial issue

III. Amendment Record

TCDS Issue No.	TCDS Issue Date	Changes	TC Issue and Date
01	08 Nov 2024	- Section 1 is added to provide explanatory notes about the details of the type design that affect the TCDS, that have been approved or accepted by the CAA in the UK from 01 January 2021 and that the design changes accepted by EASA before 01 January 2021 and were incorporated into EASA TCDS IM.E.102 at Issue 10 dated 13 December 2019 and are therefore accepted by the UK under Article 15 of Annex 30 of the UK-EU Trade and Cooperation Agreement. - Section 2 (II) (1), (2), (3), and (4) added to provide information about certifying authority and certification basis applied by the certificating authority. - Section 2 (II) (4.5) updated with regards to the compliance with applicable engine emissions requirements (CAEP/11) according to Annex Part 21.B.85 (UK CAA major change approval UK.MAJ.00367).	Issue 01 08 Nov 2024

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