Civil Aviation Authority
United Kingdom

TYPE-CERTIFICATE DATA SHEET

UK.TC.E.00118

for

CF34-1 and CF34-3 Series Engines

Type Certificate Holder

GENERAL ELECTRIC COMPANY

GE AVIATION

1000 Western Avenue

Lynn, Massachusetts 01910

United States of America

Model(s):

CF34-1A
CF34-3A
CF34-3A1
CF34-3A2
CF34-3B
CF34-3B1

Issue: 01

Date of issue: 08 November 2024

TABLE OF CONTENTS

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.233 at Issue 02 dated 09 January 2020 and are therefore accepted by the UK under Article 15 of Annex 30 of the UK-EU Trade and Cooperation Agreement.

Section 2 CF34-1 and CF34-3 Series Engines

I. General

1. Type / Variant or Model

Type	Models
CF34-1 and CF34-3	CF34-1A
	CF34-3A
	CF34-3A1
	CF34-3A2
	CF34-3B
	CF34-3B1

2. Type Certificate Holder

GENERAL ELECTRIC COMPANY
GE AVIATION
1000 Western Avenue
Lynn, Massachusetts 01910
United States of America

3. Manufacturer

General Electric Company

4. Date of Application at FAA (Certificating Authority)

Models	Application Date
CF34-1A	24 October 1980
CF34-3A	26 November 1985
CF34-3A1	16 August 1989
CF34-3A2	03 September 1992
CF34-3B	26 July 1993
CF34-3B1	26 July 1993

5. Type Certification date at FAA (Certificating Authority)

Models	Issued/Amended date
CF34-1A	18 August 1982
CF34-3A	26 September 1986
CF34-3A1	24 July 1991
CF34-3A2	09 October 1992
CF34-3B	31 May 1995
CF34-3B1	31 May 1995

6. Date of Application at CAA (Validating Authority)

Models	Application Date
CF34-1A	11 January 2024
CF34-3A	11 January 2024
CF34-3A1	11 January 2024
CF34-3A2	11 January 2024
CF34-3B	11 January 2024
CF34-3B1	11 January 2024

Application for CAEP/11 Compliance.

7. Type Certification date at CAA (Validating Authority)

Models	Approval date
GE90-76B, GE90-85B	08 November 2024
GE90-90B	08 November 2024
GE90-77B	08 November 2024
GE90-94B	08 November 2024
GE90-113B, GE90-115B	08 November 2024
GE90-110B1	08 November 2024

Application approval for CAEP/11 compliance.

II. Certification Basis

1. Reference Date for determining the applicable airworthiness requirements.

Models	Application Date (*)
CF34-1A	24 October 1980
CF34-3A	24 October 1980
CF34-3A1	24 October 1980
CF34-3A2	24 October 1980
CF34-3B	24 October 1980
CF34-3B1	24 October 1980

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

FAA TCDS E15NE

3. State of Design Airworthiness Authority Certification Basis

Refer to FAA TCDS E15NE

4. UK CAA Certification Basis

4.1 Airworthiness Standards

Models	Airworthiness Standards
CF34-1A CF34-3A CF34-3A1 CF34-3A2 CF34-3B CF34-3B1	14 CFR Part 33, effective February 1, 1965, as amended by amendments 33-1through 33-9; amendment 33-10 for 14 CFR Section 33.14; and FAA Grant of Exemption 3473.

4.2 Special Conditions (SC)

None

4.3 Equivalent safety finding:

None

4.4 Deviations

FAA Grant of exemption 3473 as previously accepted within the EU certification performed by various EU member states.

4.5 Environmental Protection requirements:

Models	Airworthiness Standards
CF34-1 (-1A)	The environmental requirements are those implemented through EASA Basic regulation EASA Basic regulation EC (No.) 216/2008 as amended by (EU) No. 6/2013 and its implementing regulation (EU) No. 748/2012 annex Part 21, 21A.18 (b) as amended by (EU) No. 7 2013 including CS-34. By reference the emissions regulations

	of Amendment 8 of ICAO Annex 16, Volume II become applicable. The regulatory emissions levels for NOx are those prescribed in Part III, Chapter 2, paragraph 2.3.2 b) (CAEP/2) of the Annex except those engines exempted by the US FAA/EPA by Grant of Exemption Nos. 4049 and 4049A under provisions of 40 CFR 87.7(b) and Grant of Exemption Nos. 4594 and 4594A under provisions of 40 CFR 87.7(c).
CF34-3 (-3A, -3A1, 3A2, 3B, -3B1)	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

As defined by the applicable GE Model Lists.

CF34-1A: 6040T69G01/G02
CF34-3A: 6063T01G01/G02/G03
CF34-3A1: 6078T27G01
CF34-3A2: 6063T01G04
CF34-3B: 6089T11G01
CF34-3B1: 6089T11G02

2. Description

Dual rotor, axial flow, high bypass ratio turbofan with single stage fan, fourteen stage axial compressor, annular combustion chamber, two stage high pressure turbine, four stage low pressure turbine, exhaust nozzle, starter, and an integrated hydromechanical-electrical fuel control system.

3. Equipment

Equipment are included in Type Design Definition.

4. Dimensions

Models	CF34-1, CF34-3 models
Overall Length	262.1 cm (103.2 inches)
Overall Diameter	126.0 cm (49.6 inches)

See Note 1

5. Dry Weight

	CF34-1A	CF34-3A	CF34-3A1	CF34-3A2	CF34-3B	CF34-3B1
Weight kg (lb)	737.1 (1625)	737.1 (1625)	750.7 (1655)	737.1 (1625)	757.5 (1670)	757.5 (1670)

6. Ratings

Rating (see Note 2)		CF34-1A	CF34-3A	CF34-3A1	CF34-3A2	CF34-3B	CF34-3B1
Thrust kN (lb)	APR Take-off (5 min) (see Notes 3 and 4)	40.66 (9140)	41.01 (9220)	41.01 (9220)	41.01 (9220)	41.01 (9220)	41.01 (9220)
	Take-off (5 min) (see Notes 3 and 4)	38.48 (8650)	38.83 (8729)	38.83 (8729)	38.83 (8729)	38.83 (8729)	38.83 (8729)
	Maximum Continuous	39.68 (8920)	40.66 (9140)	40.66 (9140)	40.66 (9140)	40.66 (9140)	40.66 (9140)

Automatic Power Reserve (APR) is a single engine thrust rating used during One Engine Inoperable (OEI) operating conditions. Twin engine use of this thrust level may be limited. APR Take-off represents the thrust that the engine can deliver for 5 minutes in the take-off envelope of the aircraft. The thrust stated at the rating condition is the minimum thrust that the engine will deliver at the rating condition without exceeding and speed or temperature limits at that rating condition. Per the operating instructions (SEI-579). Any time APR activates during a take-off/go-around, a logbook entry containing time at APR (min/sec) and ITT during APR operation must be recorded. A limited number of APR usages are permitted without the need for special hardware inspections or replacement. If overtemperature should occur, the provisions of Chapter 3 of the operating instructions applies.

Take-off is the thrust that the engine can deliver for 5 minutes in the take-off envelope of the aircraft. The thrust stated at the rating condition is the minimum thrust that the engine will deliver at the rating condition without exceeding and speed or temperature limits at that rating condition. This thrust level represents and unlimited twin engine use.

7. Control System

The engine is equipped with an integrated hydromechanical-electrical fuel control system.

Model	CF34-1A	CF34-3A	CF34-3A1	CF34-3A2	CF34-3B	CF34-3B1
Main Fuel Control Vendor – Woodward Governor GE Part Number	6047T74	6046T74	6078T55 4147T69	6091T07	6078T55 4147T70	6078T55 4147T70
Ignition Exciter, Qty 2 Vendor – Simmonds / Bendix / Unison GE Part Number	5027T49	5027T49 9238M66	1538M69 9328M66	1538M69 9238M66	1538M69 9238M66	1538M69 9238M66

Model	CF34-1A	CF34-3A	CF34-3A1	CF34-3A2	CF34-3B	CF34-3B1
Ignition Plugs, Qty 2 Vendors – Champion / Unison GE Part Number	4048T30	4048T30	4096T38	4096T38	4096T38	4096T38
Fuel Pump Vendor – Triumph GE Part Number	6047T53 6052T06	6047T53 6052T06	6078T39	6047T53 6052T06	6078T39	6078T39

8. Fluids (Fuel, Oil)

8.1 Fuel:

Fuel conforming to GE Jet Fuel Specification No. D50TF2 is applicable for all models. See SEI-579, Operating Instructions, for specific fuels approved per the subject specifications. On CF34-1A/- 3A/-3A2, unless the engine is equipped with an optional fuel heater, the following approved fuel additives must be used individually or in combination: Phillips PFA-55MB or anti-icing additives to specification MIL-1-27686E at a concentration of 0.10 to 0.15% by volume.

8.2 Oil:

Oil conforming to GE Specification No. D50TF1 is applicable for all models. See SEI-579, Operating Instructions, for specific oils approved per the subject specifications.

9. Aircraft Accessory Drives

Accessory	Location on AGB Axis	Speed, rpm	Power (max.cont.) kW (HP)	Direction of rotation (facing AGB)	Torque Static/ Continuous/Overload, Nm (lb-in)	Max. Acc. Wt, kg (lb)	Overhung Moment Nm (lb-in)
Electrical Generator	Axis-BB Aft	16686	123.1 (165) (*2)	CW	593.2 (5250) / 118.6 (1050) / NA	68.04 (150)	282.5 (2500)
Air Turbine Starter (*1)	Axis-D Aft	6778	NA	CW	1468.8 (13000) / 677.9 (6000) / NA	36.29 (80)	70.6 (625)
Hydraulic Pump	Axis-F Aft	5590	52.94 (71)	CW	423.7 (3750) / 84.7 (750) (*3) / NA	22.68 (50)	39.5 (350)

CW – Clockwise CCW – Counterclockwise

Accessory Speeds are based on Core Speed: 17000 rpm

(*1) Pneumatic starter must be fitted with a deflector to prevent impingement of starter discharge air on engine casing.
(*2) Pad rated at constant horsepower from 9,900 to 17,815 pad rpm with a 5-minute overload rating of 134.3 KW (180 HP) and a 5 second overload rating of 179 KW (240 HP).
(*3) A short-time overload rating of 1468.8 Nm (1300 in-lb) can be applied for six (6) seconds at a time.

10. Maximum Permissible Air Bleed Extraction (See Note 5)

	Maximum Bleed Air (% of Total Compressor Mass flow)
Location	CF34-1A/-3 models
Compressor Stage 10, (for cabin condition use) 426.7°C (800°F) max.	4
Compressor Stage 14 (Compressor Discharge), 537.8°C (1000°F) max.	6

IV. Operating Limitations

1. Temperature Limits

1.1. Exhaust Gas Temperature °C (°F):

Maximum permissible temperatures are as follows:

Inter-turbine temperature (T5)*,°C (°F)

	CF34-1A	CF34-3A/-3A2	CF34-3A1	CF34-3B/-3B1
APR take-off (5 min)	875 (1575)	871 (1600)	899(1650)	899 (1650)
APR take off (2 min. transient)	886 (1627)	900 (1652)	928 (1702)	928 (1702)
Take-off (5 min)	842 (1548)	856 (1573)	884 (1623)	884 (1623)
Take off (2 min transient)	864 (1587)	878 (1613)	906 (1663)	906 (1663)
Max. continuous	838 (1540)	888 (1630)	888 (1630)	899 (1650)

*The inter-turbine temperature is measured by 10 thermocouples mounted in the low-pressure turbine transition casing. Additional transient temperature and time limits of less than 1 minute are defined in GE Operating Instructions SEI-579. Refer to GE Maintenance Manual SEI-580 and Overhaul Manual SEI-582 for CF34-1A/-3A/-3A2, and GE Engine Manual SEI-756 for CF34-3A1/- 3B/-3B1, for inspection requirements when limits are exceeded.

1.2 Oil Temperature (measured in the oil tank) °C (°F):

	All Models
Continuous Operation	155 (311)
Transient Operation (limited to 15 minutes)	163 (325)

Transient operation above 155 (311) is limited to 15 minutes.

1.3 Fuel Inlet Temperature (at engine fuel filter inlet) °C (°F):

All Models Continuous Operation
(JP5, JP4, JP4/JP5 (Mixture), Ground Operation)

	CF34-1	CF34-3A/-3A2	CF34-3A1	CF34-3B/-3B1
Fuel Inlet Temperature	70 (158)	70 (158)	121 (250)	121 (250)

2. Maximum Permissible Rotor Speed:

		CF34-1A	CF34-3 models
APR take off	Low pressure rotor (N1), rpm	7300	7300
	High pressure rotor (N2), rpm	17710	17710
Take off	Low pressure rotor (N1), rpm	7120	7120
	High pressure rotor (N2), rpm	17510	17510
Maximum Continuous	Low pressure rotor (N1), rpm	7300	7300
	High pressure rotor (N2), rpm	17674	17674

Refer to GE Maintenance Manual SEI-580 and Overhaul Manual SEI-582 for CF34-1A/-3A/-3A2, and GE Engine Manual SEI-756 for CF34-3A1/-3B/-3B1 for inspection requirements when limits are exceeded.

100% N1 rotor speed is 7,400 rpm

100% N2 rotor speed is 17,820 rpm

3. Pressure Limits

3.1 Fuel Pressure

At engine pump inlet: minimum pressure of 34 kPa (5 PSID) above the true vapour pressure of the fuel with a vapour liquid ratio of zero with aircraft boost operative. Operating range 34kPa (5 PSIG) to 345 kPa (50 PSIG). At engine motive flow discharge: minimum pressure of 1034 kPa (150 PSIG) at idle or above. Operating range is 1034 kPa (150 PSIG) to 4826 kPa (700 PSIG). See GE Installation Manual SEI-567 (CF34-1A / CF34-3 models).

3.2 Oil Pressure

CF34-1A/-3A/-3A2: at idle on the ground, 172 kPa (25 PSID) minimum to 345 kPa (50 PSID) maximum. At take-off, 276 kPa (40 PSID) minimum to 552 kPa (80 PSID) maximum. Operating range, 172 kPa (25 PSID) to 552 kPa (80 PSID), allowable to 655 kPa (95 PSID) above 4877m (16,000 feet).

CF34-3A1/-3B/-3B1: At idle on the ground, 172 kPa (25 PSID) minimum to 517 kPa (75 PSID) maximum. At take-off 310 kPa (45 PSID) minimum to 655 kPa (95 PSID) maximum. Operating range, 172 kPa (25 PSID) to 655 kPa (95 PSID), allowable to 758 kPa (110 PSID) above 4877m (16,000 feet).

See GE Installation Manual SEI-567 (CF34-1A / CF34-3 models).

4. Installation Assumptions:

The installation assumptions are quoted in the GE Engine Installation Manual: SEI-567 (CF34-1A / CF34-3 models)

5. Time Limited Despatch

Not applicable, Time Limited Despatch is not approved for any CF34-1 / -3 engine model.

6. ETOPS

Not applicable

V. Operating and Service Instructions

	CF34-1/-3A/-3A2 (BJ)	**CF34-3A1-3B (BJ)**	**CF34-3A1/-3B1(RJ)**
Operating Instruction	SEI-579	SEI-579	SEI-579
Installation manual	SEI-567	SEI-567	SEI-567
Engine Maintenance Manual	SEI-580	SEI-780	SEI-756
Engine Overhaul manual	SEI-582	SEI-782	SEI-756

VI. Notes

Note 1: Weight (dry maximum) kg (lb).

CF34-1A	CF34-3A	CF34-3A2	CF34-3A1	CF34-3B/-3B1
737 (1625)	737 (1625)	737 (1625)	761 (1655)	757 (1670)

Note 2: Engine ratings are based on calibrated test stand performance, and performance calculations are based on accepted parameter correction methods documented in the production data folder. These calculations assume the following conditions:

1. Static sea level standard conditions of 15°C (59°F) and 101.32 kPa (29.92 inches Hg).
2. No aircraft accessory loads or air extraction.
3. No anti-icing; no inlet distortion; no inlet screen losses; and 100% ram recovery.
4. Inlet belllmouth per Table in Zone D-8 of Installation Drawing 6036T80, Sheet 6, for CF34-1A/-3A/-3A2; Installation Drawing 6078T61, Sheet 6, for CF34-3A1/-3B/-3B1; contained in GE Installation Manual SEI-567.
5. Specified fuel having an average lower, heating value of 42,798 kJ/kg (18,400 BTU/lb)

Note 3: When the automatic reset mechanism in the fuel control is utilized, operation to the Take-off rating operating limits will insure the APR Take-off rating operating limits are not exceeded when the reset mechanism is actuated.

Note 4: The time limit at the Take-off rating is five minutes and shall include any time accumulated above the Take-off rating for that take-off.

Note 5: Air Bleed Extraction - maximum customer air bleed extraction is as follows: Customer bleed air is available from Stages 10 and 14 (compressor discharge) of the compressor at all operating conditions at or above idle. (No compressor bleed is permitted below idle). Minimum required bleed above 12,192 m (40,000 ft) is 2 percent; maximum power extraction above 12,192 m (40,000 ft) is 23.9 Kw (32 HP)

Note 6: The maximum permissible inlet distortion is specified in GE Installation Manual SEI-567 (CF34- 1A/-3 models).

Note 7: This engine meets the applicable requirements for operation in icing conditions provided a minimum core speed (N2) of 11,400 rpm, corrected to 30°C (59°F), is maintained.

Note 8: The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in the applicable GE Manual, chapter 5 "Airworthiness Limitations". GE Maintenance Manual SEI-580 for CF34-1A/-3A/-3A2, GE Engine Manual SEI-756 for CF34- 3A1/-3B1 and GE Service Manual SEI-780 for CF34-3A1/-3B**.**

Note 9: Recommended maintenance inspection intervals for are published in GE Maintenance Manual SEI-580 for CF34-1A/-3A/-3A2, (BJs) GE Engine Manual SEI-756 for CF34-3A1/-3B1 (BJs) and GE Service Manual SEI-780 for CF34-3A1/-3B (RJs).

Note 10: The operating temperature limit for specific components and accessories specified in GE installation Manual SEI-567 (CF34-1A/-3 models) must be observed when installing the engine.

Note 11: The static thrust at sea level are rated at 15°C (59°F) ambient temperature and below for CF34- 1A model and at 21°C (70°F) ambient temperature and below for CF34-3A/-3A1/-3A2 models. For the CF34-3B, static thrusts at sea level are rated at 30°C (86°F) ambient temperature and below. For CF34-3B1, static thrusts at sea level is rated at 30°C (86°F) ambient temperature and below for APR Take-off and at 23°C (73°F) and below for Take-off and maximum continuous. The computer performance decks for calculating engine performance are as follows:

Engine Model	Computer Deck No.
CF34-1A	82070
CF34-3A/-3A1/-3A2	85168A
CF34-3B/-3B1	94111D

Note 12: Per CAA Certificate UK.MAJ.00364 08 November 2024, the engine models CF34-3 series were recertified to show compliance with the CAEP/11 nvPM Emissions as defined in II 2.5 above.

Section 3 Administration

I. Acronyms and Abbreviations

Acronym / Abbreviation	Definition
CS-E	Certification Specifications for Engines
EASA	European Union Aviation Safety Agency
EGT	Exhaust Gas Temperature
ESF	Equivalent Safety Finding
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FADEC	Full Authority Digital Engine Control
GE	General Electric
HPC/HPT	High Pressure Compressor/Turbine
H/W	Hardware
ICAO	International Civil Aviation Organisation
IDG	Integrated Drive Generator
JAA	Joint Aviation Authorities
JAR	Joint Aviation Requirements
LPC/LPT	Low Pressure Compressor/Turbine
PMG	Permanent Magnet Generator
P/N	Part Number
SC	Special Condition
S/W	Software
TC	Type Certificate
TCDS	Type Certificate Data Sheet
TLD	Time Limited Dispatch
VSCF	Variable Speed Constant Frequency

II. Type Certificate Holder Record

TCH Record	Period
GENERAL ELECTRIC COMPANY GE AVIATION 1000 Western Avenue Lynn, Massachusetts 01910 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 were incorporated into EASA TCDS IM.E.233 at Issue 02 dated 09 January 2020 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.00364).	Issue 01 08 Nov 2024

– END –