# Civil Aviation Authority
# United Kingdom

# TYPE-CERTIFICATE DATA SHEET

## UK.TC.E.00120

for

CF6-80A / CF6-80C Series engines

**Type Certificate Holder**

GENERAL ELECTRIC COMPANY

GE AVIATION

1 Neumann Way

Cincinnati, OH 45215

United States of America

Model(s):

| | | |
|---|---|---|
| CF6-80A | CF6-80C2B1 | CF6-80C2B1F1 |
| CF6-80A1 | CF6-80C2B2 | CF6-80C2D1F |
| CF6-80A2 | CF6-80C2B4 | CF6-80C2A5F |
| CF6-80A3 | CF6-80C2B6 | CF6-80C2B7F |
| CF6-80C2A1 | CF6-80C2B1F | CF6-80C2B5F |
| CF6-80C2A2 | CF6-80C2B2F | CF6-80C2B8F |
| CF6-80C2A3 | CF6-80C2B3F | |
| CF6-80C2A5 | CF6-80C2B4F | |
| CF6-80C2A8 | CF6-80C2B6F | |

Issue: 01

Date of issue: 28 August 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 where EASA were the Type Certificating Authority.

This TCDS includes:

1. Details of the type design that affects 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 would have been incorporated in to the EASA issued TCDS before 31 December 2020, but such document had not been produced.

3. These engine models had been certificated in several EU member states before 28 September 2003. After which EASA assumed the state of design responsibility for EU member states including UK. On the 11 April 2022 EASA published TC/TCDS EASA.IM.E.240 Issue 01 in which the following was stated, allowing UK CAA to use TC/TCDS EASA.IM.E.240 Issue 01 as the base line for the UK TCDS; “These engine models had been certified in several EU member states before 28 September 2003. According to Article 3 Paragraph 1 (a)(i) of Commission Regulation (EU) 748/2012 for these engines the European TC and associated TCDS have been issued based on the Certification Basis as established by the State of Design.

   The basis for the Airworthiness Standards and the Special Conditions have been the former TCDS nr. M-IM 13 issued by DGAC France, German LBA TCDS nr. 6318 and UK-CAA Airworthiness Approval Notes (AAN) 22462, 22463, 22464, 23916, 25053, including Addendums and Up-issues.”

## Section 2 CF6-80A and CF6-80C

### I. General

### 1. Type / Variant or Model

CF6-80, -80A, -80A1, -80A2, -80A3, -80C2A1, -80C2A2, -80C2A3, -80C2A5, -80C2A5F, -80C2A8, -80C2B1, -80C2B1F, -80C2B1F1, -80C2B2, -80C2B2F, -80C2B3F, -80C2B4, -80C2B4F, -80C2B5F, -80C2B6, -80C2B6F, -80C2B7F, -80C2B8F, -80C2D1F.

### 2. Type Certificate Holder

GENERAL ELECTRIC COMPANY
GE AVIATION
1 Neumann Way
Cincinnati, OH 45215-6301
United States of America

### 3. Manufacturer

**Safran Aircraft Engines, formally SNECMA**

1, Rond point René Ravaud 77550 Moissy-Cramayel, France

EASA Production Certificate No. FR.21G.0007

**GE Aviation – Production Certification No. 108**

One Neumann Way

Cincinnati - Ohio 45215

United States of America

### 4. Date of Application at FAA (Certificating Authority)

| | | | |
|---|---|---|---|
| **CF6-80A** | 01 December 1978 | **CF6-80A1** | 29 July 1980 |
| **CF6-80A2** | 16 June 1981 | **CF6-80A3** | 16 June 1981 |
| **CF6-80C2A1** | 11 September 1984 | **CF6-80C2A2** | 11 September 1984 |
| **CF6-80C2A3** | 05 March 1986 | **CF6-80C2A5** | 12 May 1987 |
| **CF6-80C2A5F** | 02 April 1993 | **CF6-80C2A8** | 22 June 1990 |
| **CF6-80C2B1** | 11 September 1984 | **CF6-80C2B1F** | 26 March 1987 |
| **CF6-80C2B1F1** | 23 October 1989 | **CF6-80C2B2** | 20 November 1986 |
| **CF6-80C2B2F** | 18 May 1988 | **CF6-80C2B3F** | 11 April 1990 |
| **CF6-80C2B4** | 05 March 1986 | **CF6-80C2B4F** | 18 May 1988 |
| **CF6-80C2B5F** | 22 May 1997 | **CF6-80C2B6** | 20 February 1987 |
| **CF6-80C2B6F** | 18 May 1988 | **CF6-80C2B7F** | 27 January 1993 |
| **CF6-80C2B8F** | 02 September 1997 | **CF6-80C2D1F** | 18 May 1988 |

**5. Type Certification date at FAA (Certificating Authority)**

| | | | |
|---|---|---|---|
| **CF6-80A** | 06 October 1981 | **CF6-80A1** | 06 October 1981 |
| **CF6-80A2** | 06 October 1981 | **CF6-80A3** | 06 October 1981 |
| **CF6-80C2A1** | 28 June 1985 | **CF6-80C2A2** | 30 December 1985 |
| **CF6-80C2A3** | 09 December 1986 | **CF6-80C2A5** | 26 October 1987 |
| **CF6-80C2A5F** | 13 October 1993 | **CF6-80C2A8** | 26 February 1991 |
| **CF6-80C2B1** | 11 September 1984 | **CF6-80C2B1F** | 31 March 1988 |
| **CF6-80C2B1F1** | 15 June 1990 | **CF6-80C2B2** | 06 April 1987 |
| **CF6-80C2B2F** | 23 September 1988 | **CF6-80C2B3F** | 23 November 1992 |
| **CF6-80C2B4** | 31 October 1986 | **CF6-80C2B4F** | 23 September 1988 |
| **CF6-80C2B5F** | 22 May 1997 | **CF6-80C2B6** | 30 September 1987 |
| **CF6-80C2B6F** | 23 September 1988 | **CF6-80C2B7F** | 13 October 1993 |
| **CF6-80C2B8F** | 18 March 1999 | **CF6-80C2D1F** | 20 December 1988 |

**6. Date of Application at CAA (Validating Authority)**

| | | | |
|---|---|---|---|
| **CF6-80A** | 01 December 1978 | **CF6-80A1** | 29 July 1980 |
| **CF6-80A2** | 16 June 1981 | **CF6-80A3** | 16 June 1981 |
| **CF6-80C2A1** | 11 September 1984 | **CF6-80C2A2** | 11 September 1984 |
| **CF6-80C2A3** | 05 March 1986 | **CF6-80C2A5** | 12 May 1987 |
| **CF6-80C2A5F** | 02 April 1993 | **CF6-80C2A8** | 22 June 1990 |
| **CF6-80C2B1** | 11 September 1984 | **CF6-80C2B1F** | 26 March 1987 |
| **CF6-80C2B1F1** | 23 October 1989 | **CF6-80C2B2** | 20 November 1986 |
| **CF6-80C2B2F** | 18 May 1988 | **CF6-80C2B3F** | 11 April 1990 |
| **CF6-80C2B4** | 05 March 1986 | **CF6-80C2B4F** | 18 May 1988 |
| **CF6-80C2B5F** | 22 May 1997 | **CF6-80C2B6** | 20 February 1987 |
| **CF6-80C2B6F** | 18 May 1988 | **CF6-80C2B7F** | 27 January 1993 |
| **CF6-80C2B8F** | 02 September 1997 | **CF6-80C2D1F** | 18 May 1988 |

Application for some of the engine models had been made to individual EU States prior to existence of EASA. EASA assumed the responsibilities as a competent design authority for UK until 31st December 2020. The date of application to the FAA is taken as reference date.

**7. Type Certification date at CAA (Validating Authority)**

| | | | |
|---|---|---|---|
| **CF6-80A** | 9 February 1993 | **CF6-80A1** | 14 June 1982 |
| **CF6-80A2** | 9 February 1993 | **CF6-80A3** | 14 June 1982 |
| **CF6-80C2A1** | 05 September 1985 | **CF6-80C2A2** | 04 February 1986 |
| **CF6-80C2A3** | 22 January 1987 | **CF6-80C2A5** | 14 January 1988 |
| **CF6-80C2A5F** | 22 December 1993 | **CF6-80C2A8** | 23 May 1991 |
| **CF6-80C2B1** | 23 February 1987 | **CF6-80C2B1F** | 23 August 1989 |
| **CF6-80C2B1F1** | 23 May 1991 | **CF6-80C2B2** | 27 April 1987 |
| **CF6-80C2B2F** | 23 August 1989 | **CF6-80C2B3F** | 22 December 1993 |
| **CF6-80C2B4** | 23 February 1987 | **CF6-80C2B4F** | 23 August 1989 |
| **CF6-80C2B5F** | 09 October 2002 | **CF6-80C2B6** | 25 November 1987 |
| **CF6-80C2B6F** | 23 August 1989 | **CF6-80C2B7F** | 18 February 2000 |
| **CF6-80C2B8F** | 18 February 2000 | **CF6-80C2D1F** | 23 May 1991 |

These engine models had been certificated in several EU member states before 28 September 2003. After which EASA assumed the state of design responsibility for EU member states including UK. For the purpose of issuing this UK CAA's Type Certificate Data Sheet, these dates have been read across from individual EU member states approval dates provided within EASA TCDS No. IM.E.240 Issue 01 Dated 11 April 2022, section 5. The reason for using EASA published TC/TCDS EASA.IM.E.240 Issue 01 as the baseline is given in following paragraphs.

On the 11 April 2022 EASA published TC/TCDS EASA.IM.E.240 Issue 01 in which the following was stated, allowing UK CAA to use TC/TCDS EASA.IM.E.240 Issue 01 as the base line for the UK TCDS; "These engine models had been certified in several EU member states before 28 September 2003. According to Article 3 Paragraph 1 (a)(i) of Commission Regulation (EU) 748/2012 for these engines the European TC and associated TCDS have been issued based on the Certification Basis as established by the State of Design.

The basis for the Airworthiness Standards and the Special Conditions have been the former TCDS nr. M-IM 13 issued by DGAC France, German LBA TCDS nr. 6318 and UK-CAA Airworthiness Approval Notes (AAN) 22462, 22463, 22464, 23916, 25053, including Addendums and Up-issues."

## II. Certification Basis

### 1. Reference Date for determining the applicable airworthiness requirements.

These engine models had been certificated in several EU member states before 28 September 2003. After which EASA assumed the state of design responsibility for EU member states including UK. For the purpose of issuing this UK CAA's Type Certificate Data Sheet, these dates have been read across from individual EU member states approval dates provided within EASA TCDS No. IM.E.240 Issue 01 Dated 11 April 2022, section 5. The reason for using EASA published TC/TCDS EASA.IM.E.240 Issue 01 as the baseline is given in following paragraphs.

On the 11 April 2022 EASA published TC/TCDS EASA.IM.E.240 Issue 01 in which the following was stated, allowing UK CAA to use TC/TCDS EASA.IM.E.240 Issue 01 as the base line for the UK TCDS; "These engine models had been certified in several EU member states before 28 September 2003. According to Article 3 Paragraph 1 (a)(i) of Commission Regulation (EU) 748/2012 for these engines the European TC and associated TCDS have been issued based on the Certification Basis as established by the State of Design.

The basis for the Airworthiness Standards and the Special Conditions have been the former TCDS nr. M-IM 13 issued by DGAC France, German LBA TCDS nr. 6318 and UK-CAA Airworthiness Approval Notes (AAN) 22462, 22463, 22464, 23916, 25053, including Addendums and Up-issues.".

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

FAA TCDS E13NE

### 3. State of Design Airworthiness Authority Certification Basis

Refer to FAA TCDS E13NE

### 4. UK CAA Certification Basis

### 4.1 Airworthiness Standards

| Models | Airworthiness Standards |
|---|---|
| CF6-80A, -80A1, -80A2, -80A3 | JAR-E Change 4 of 26 September 1978 |
| CF6-80C2A1, -80C2A2, -80C2A3, -80C2A5, -80C2A8, -80C2B1, -80C2B2, -80C2B4, -80C2B6 | JAR-E Change 4 of 26 September 1978 |
| CF6-80C2B1F, -80C2B1F1, -80C2B2F, -80C2B3F, -80C2B4F, -80C2B6F, -80C2D1F | JAR-E Change 4 of 26 September 1978 |
| CF6-80C2A5F | JAR-E Change 4 of 26 September 1978 |
| CF6-80C2B5F, -80C2B7F, -80C2B8F | JAR-E Change 4 of 26 September 1978 |

### 4.2 Special Conditions (SC)

| Models | Airworthiness Standards |
|---|---|
| CF6-80A, -80A1, -80A2, -80A3 | None |
| CF6-80C2A1, -80C2A2, -80C2A3, -80C2A5, -80C2A8, -80C2B1, -80C2B2, -80C2B4, -80C2B6 | None |
| CF6-80C2B1F, -80C2B1F1, -80C2B2F, -80C2B3F, -80C2B4F, -80C2B6F, -80C2D1F | NPA-E10 |

| | |
|---|---|
| | As indicated in DGCA France Letter 53052 SFACT/TC du 18 January 1989 |
| CF6-80C2A5F | NPA-E10<br>SC No 1, Birds ingestion: Medium bird 1.134 kg (2.5 Lbs)<br>SC No 2, Water and hail ingestion: AIA " Advisory proposal" PC 338-1<br>As indicated in DGAC France Letter 54154/SFACT/N du 29 October 1993. |
| CF6-80C2B5F, -80C2B7F, -80C2B8F | Electronic Engine Control: compliance with JAR-E50(b), E150(c) and E530(f) as interpreted in AMJ 20X1 (as in JAR-E change 10).<br><br>Compliance with NPA-E-20: Birds (dated 8 January 1999) - Definition of a new threat.<br><br>Compliance with JAR-E -790 as in JAR-E change 10 - Ingestion of rain and hail.<br><br>As indicated in DGAC France letter 990771-SFACT/NME du 02 February 1999, and letter SFACT 2002-3623- du 23 September 2002. |

### 4.3 Equivalent Safety Findings (ESF)

None

### 4.4 Deviations

None

### 4.5 Environmental Protection

| | |
|---|---|
| All models | ICAO emissions standards identified in Annex 16, Volume II, Third Edition, Part III, Chapter 2, Section 2.2.2 for SN, Section 2.3.2 for CO and HC, Section 2.3.2.e.3 for NOx (also known as CAEP/8), and Part II Chapter 2 for fuel venting have also been demonstrated. |
| CF6-80C2B1F, CF6-80C2BSF<br>CF6-80C2B6F, CF6-80C2B7F | CS-34 Amendment 3 as implemented by ED Decision 2019/014/R (29 July 2019); ICAO Annex 16 Volume II, Fourth Edition, Amendment 9 applicable 01 January 2018 as implemented into EU legislation 11 September 2018.<br>• NOx levels in compliance with Part III, Chapter 2, paragraph 2.3.2 d) (CAEP/6),<br>• Maximum nvPM mass concentration levels in compliance with Part III, Chapter 4, paragraph 4.2.2 (CAEP/10) |
| CF6-80C2B1F, CF6-80C2BSF<br>CF6-80C2B6F, CF6-80C2B7F | CS-34 Amendment 4 as adopted by CAA ORS9 Decision No.36 (applicable from 20 December 2023), meeting the requirement of ICAO Annex 16 Volume II, Amendment 10 applicable 1 January 2021<br>• NOx levels in compliance with ICAO Annex 16 Volume II, Part III, Chapter 2, paragraph 2.3.2 e) (CAEP/8).<br>• HC, CO levels in compliance with ICAO Annex 16 Volume II, Part III, Chapter 2, paragraph 2.3.2.<br>• 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, paragraphs 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 List and approved design changes:

CF6-80A, CF6-80A1, CF6-80A2, CF6-80A3, CF6-80C2A1, CF6-80C2A2, CF6-80C2A3, CF6-80C2A5, CF6-80C2A5F, CF6-80C2A8, CF6-80C2B1, CF6-80C2B1F, CF6-80C2B1F1, CF6-80C2B2, CF6-80C2B2F, CF6-80C2B3F, CF6-80C2B4, CF6-80C2B4F, CF6-80C2B5F, CF6-80C2B6, CF6-80C2B6F, CF6-80C2B7F, CF6-80C2B8F, CF6-80C2D1F.

### 2. Description

The series CF6-80A (CF6-80A, -80A1, -80A2, -80A3) Dual rotor, axial flow, high bypass turbofan. The 14-stage high pressure compressor is driven by a 2-stage high pressure turbine and the integrated front fan and low-pressure compressor are driven by a 4-stage low pressure turbine.

The series CF6-80C2 (CF6-80C2A1, -80C2A2, -80C2B1, -80C2B4, -80C2A3, -80C2B2, -80C2B6, -80C2A5, -80C2A8, -80C2B1F, -80C2B2F, -80C2B4F, -80C2B6F, -80C2D1F, -80C2B1F1, -80C2B3F, -80C2A5F, -80C2B7F, -80C2B5F, -80C2B8F) Dual rotor, axial flow high bypass turbofan. The 14-stage compressor is driven by a 2-stage high pressure turbine and the integrated front fan and low-pressure compressor are driven by a 5-stage low pressure turbine.

See notes 13 and 18

### 3. Equipment

As defined by the applicable GE Model Lists.

### 4. Dimensions

| Models | Dimensions mm (Inches) | | |
|---|---|---|---|
| | Overall Length | Overall Length | Overall Length |
| CF6-80A, CF6-80A2 | 4239.3 (166.9) | 2486.6 (97.9) | 2415.5 (95.1) |
| CF6-80A1, CF6-80A3 | 4239.3 (166.9) | 2400 (94.5) | 2682.2 (105.6) |
| Series CF6-80C2 (CF6-80C2A1, -80C2A2, -80C2B1, -80C2B4, -80C2A3, -80C2B2, -80C2B6, -80C2A5, -80C2A8) | 4273.8 (168.26) | 2669.5 (105.10) | 2691.6 (105.97) |
| Series CF6-80C2 (CF6-80C2B1F, -80C2B2F, -80C2B4F, -80C2B6F, -80C2D1F, -80C2B1F1, -80C2B3F, -80C2A5F, -80C2B7F, -80C2B5F, -80C2B8F) | 4273.8 (168.26) | 2830.1 (111.42) | 2691.6 (105.97) |

### 5. Dry Weight

| Models | Dry Weight<br>Kg (lbs) |
|---|---|
| CF6-80A, CF6-80A2 | 3980.7 kg (8776 lbs) |
| CF6-80A1, CF6-80A3 | 3973.5 kg (8760 lbs) |
| Series CF6-80C2 (CF6-80C2A1, -80C2A2, -80C2A3, -80C2A5, -80C2A8) | 4300.1 kg (9480 lbs) |
| Series CF6-80C2 (CF6-80C2B1, -80C2B4, -80C2B2, -80C2B6) | 4386.2 kg (9670 lbs) |

| | |
|---|---|
| Series CF6-80C2 (CF6-80C2B1F, -80C2B2F, -80C2B4F, -80C2B6F, -80C2D1F, -80C2B1F1, -80C2B3F, -80C2A5F, -80C2B7F, -80C2B5F, -80C2B8F) | 4440.7 kg (9790 lbs) |
| CF6-80C2D1F | 4467.9 kg (9850 lbs) |
| CF6-80C2B3F | 4308.7 kg (9499 lbs) |
| CF6-80C2A5F | 4472.4 kg (9860 lbs) |

See Note 1.

## 6. Ratings

| **Models** | **Thrust kN (lbf)** | |
|---|---|---|
| | **Take-off (5 minutes)** | **Maximum Continuous** |
| A | 208.755 (46930) | 194.209 (43660) |
| A1 | 209.022 (46990) | 193.987 (43610) |
| A2 | 216.494 (48670) | 203.373 (45720) |
| A3 | 217.829 (48970) | 203.728 (45800) |
| C2A1 | 257.374 (57860) | 237.490 (53390) |
| C2A2 | 233.354 (52460) | 213.870 (48080) |
| C2A3 | 262.223 (58950) | 243.718 (54790) |
| C2A5 | 267.338 (60100) | 250.034 (56210) |
| C2A8 | 257.374 (57860) | 213.870 (48080) |
| C2B1 | 249.011 (55980) | 220.409 (49550) |
| C2B1F1 | 267.027 (60030) | 221.566 (49810) |
| C2B2 | 231.085 (51950) | 218.052 (49020) |
| C2B4 | 254.349 (57180) | 232.953 (52370) |
| C2B6 | 267.205 (60070) | 249.545 (56100) |
| C2B1F | 254.260 (57160) | 221.566 (49810) |
| C2B2F | 231.352 (52010) | 218.586 (49140) |
| C2B4F | 254.794 (57280) | 233.398 (52470) |
| C2B5F | 267.027 (60030) | 221.566 (49810) |
| C2B6F | 267.027 (60030) | 249.857 (56170) |
| C2D1F | 269.962 (60690) | 252.348 (56730) |
| C2A5F | 267.338 (60100) | 250.034 (56210) |
| C2B3F | 231.352 (52010) | 177.262 (39850) |
| C2B7F | 267.027 (60030) | 249.857 (56170) |
| C2B8F | 267.027 (60030) | 249.857 (56170) |

See Notes 2, 3, and 4.

## 7. Control System

The following engines are equipped with a Full Authority Digital Engine Control (FADEC) consisting primarily of a dual channel Electronic Control Unit (ECU), a Hydro Mechanical Unit (HMU), an ECU Rating Plug and a Main Fuel Pump. Refer to the Installation Manuals (§ V.) for unit part numbers.

- CF6-80C2B1F, CF6-80C2B2F, CF6-80C2B4F, CF6-80C2B6F, CF6-80C2D1F, CF6-80C2B1F1, CF6-80C2B3F, CF6-80C2A5F, CF6-80C2B7F, CF6-80C2B5F, CF6-80C2B8F.

The following engines are not equipped with a Full Authority Digital Engine Control (FADEC). The engines are controlled by a Woodward Main Engine Control (MEC), supervised by Power Management Control (PMC), and a Main Fuel Pump. Refer to the Installation Manuals (§ V.) for unit part numbers.

- CF6-80A, CF6-80A1, CF6-80A2, CF6-80A3, CF6-80C2A1, CF6-80C2A2, CF6-80C2B1, CF6-80C2B4, CF6-80C2A3, CF6-80C2B2, CF6-80C2B6, CF6-80C2A5, CF6-80C2A8.

See Note 13

The incorporation of the Engine Identification Plug is applicable to the CF6-80C2 FADEC engine models only. See Note 16.

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

### 8.1 Fuel and Additives:

The approved fuels and additives must conform to GE Specification D50TF2. The latest revision of the specification will apply.

### 8.2 Oil:

The engine oil must be a synthetic type conforming to GE Specification D50TF1, Class B. For approved brands of oil refer to Service Bulletin 79-001.

## 9. Aircraft Accessory Drives

**For CF6-80A/A2**

| Drive Pad | Rotation Facing Gearbox Pad | Gear Ratio to Core Speed | Horsepower Continuous Pad Rating | Shear Torque[(2)] | Maximum Overhung Moment[(2)] |
|---|---|---|---|---|---|
| Starter | CCW | 0.956 | 949.07 (8400)[(2)] | 1898.1 (16800) | 45.2 (400) |
| IDG | CCW | 0.832 | 130.5 (175)[(1)] | 1072.45 (9492) | 226.0 (2000) |
| Hydraulic Pump | CCW | 0.344 | 63.4 (85)[(1)] | 481.1 (4260) | 45.2 (400) |
| IDG Overload Limits | 225 hp (167.8 kw) for 5 minutes per 1000 hours of operation<br>225 hp (167.8 kw) for 5 seconds per hour of operation<br>450 hp (335.6 kw) for 5 seconds per 1000 hours of operation | | | | |

**For CF6-80A1/A3**

| Drive Pad | Rotation Facing Gearbox Pad | Gear Ratio to Core Speed | Horsepower Continuous Pad Rating | Shear Torque[(2)] | Maximum Overhung Moment[(2)] |
|---|---|---|---|---|---|
| Starter | CCW | 0.956 | 1220.24 (10800)[(2)] | 2169.31 (19200) | 45.2 (400) |
| IDG | CCW | 0.832 | 130.5 (175)[(1)] | 1072.45 (9492) | 226.0 (2000) |
| Hydraulic Pump | CCW | 0.350 | 63.4 (85)[(1)] | 836.1 (7400) | 45.2 (400) |
| IDG Overload Limits | 225 hp (167.8 kw) for 5 minutes per 1000 hours of operation<br>225 hp (167.8 kw) for 5 seconds per hour of operation<br>450 hp (335.6 kw) for 5 seconds per 1000 hours of operation | | | | |

| **For CF6-80C2A1 / A2 / A3 / A5 / A8 / D1F / A5F** | | | | | |
|---|---|---|---|---|---|
| **Drive Pad** | **Rotation Facing Gearbox Pad** | **Gear Ratio to Core Speed** | **Horsepower Continuous Pad Rating** | **Shear Torque(2)** | **Maximum Overhung Moment(2)** |
| Starter | CCW | 0.956 | 949.07 (8400)(2) | 1898.1 (16800) | 45.2 (400) |
| IDG | CCW | 0.832 | 160.3 (215)(1) | 1186.4 (10500) | 226.0 (2000) |
| Hydraulic Pump | CCW | 0.344 | 31.3 (42)(1) | 481.1 (4260) | 45.2 (400) |
| IDG Overload Limits | 225 hp (167.8 kw) for 5 minutes per 1000 hours of operation<br>225 hp (167.8 kw) for 5 seconds per hour of operation<br>450 hp (335.6 kw) for 5 seconds per 1000 hours of operation | | | | |

| **For CF6-80C2B1 / B2 / B4 / B6 / B1F/ B2F / B3F / B4F / B6F / B1F1 / B7F / B5F / B8F:** | | | | | |
|---|---|---|---|---|---|
| Drive Pad | Rotation Facing Gearbox Pad | Gear Ratio to Core Speed | Horsepower Continuous Pad Rating | Shear Torque(2) | Maximum Overhung Moment(2) |
| Starter | CCW | 0.956 | 949.07 (8400)(2) | 1898.1 (16800) | 45.2 (400) |
| IDG | CCW | 0.832 | 164.1 (220)(1) | 1186.4 (10500) | 226.0 (2000) |
| Hydraulic Pump | CCW | 0.344 | 63.4 (85)(1) | 481.1 (4260) | 45.2 (400) |
| IDG Overload Limits | 225 hp (167.8 kw) for 5 minutes per 1000 hours of operation<br>225 hp (167.8 kw) for 5 seconds per hour of operation<br>450 hp (335.6 kw) for 5 seconds per 1000 hours of operation | | | | |

CCW = Counter Clockwise

(1) Unites: kW (hp)
(2) Units: Torque Nm (lb-in)

## 10. Maximum Permissible Air Bleed Extraction

| Bleed location | CF6-80A/A2 | CF6-80A1/A3 |
|---|---|---|
| Stage 8, compressor airflow, normal | 5.00% | 5.00% |
| Stage 8, compressor airflow, intermittent(1) | | |
| N2 RPM 8009-8600 | 5.75% | 5.75% |
| N2 RPM 8600-8850 | 6.25% (2) | --- |
| N2 RPM 8850-9680 | 5.75% | --- |
| Compressor discharge | | |
| Steady state at take-off rating | 5.00% | 5.00% |
| Steady state between 80% N2 and maximum continuous | 10.00% | 10.00% |
| During acceleration above 80% N2 | 7.00% | 7.00% |
| Operating at 80% N2 or below | 12.50% | 12.50% |
| Stage 10 | 2.00% | 2.00% |
| Stage 11 | --- | --- |

(1) Intermittent operation is defined as "dispatch with a system inoperative, or bleed system, or engine failure inflight" and should be confined to the physical core speed (N2) range of 8009 (81.5%) to 9680 (98.5%) rpm as shown in the above tabulation. At all normal flight conditions, maximum bleed will remain 5% of core engine physical airflow. The manufacturer is to be consulted regarding conditions, number of occurrences, and duration of each occurrence within the limitations of:

The average of $2 \times 10^{-3}$ occurrences per engine operating hour; and a maximum of 0.5 hour duration per occurrence (cumulative total of 50 hours).

(2) 5.75 maximum allowable stage 8 bleed when 10th stage customer bleed is also used.

| Bleed location | CF6-80C2 FADEC | CF6-80C2 PMC |
|---|---|---|
| Stage 8, compressor airflow, normal | 8.8% | 8.8% |
| Stage 11 | 1.5% | 1.5% |
| Compressor discharge | | |
| Steady state at take-off rating | 5.00% | 5.00% |
| Steady state at maximum continuous or below | 10.00% | 10.00% |
| Transient operation above maximum continuous rating | 7.00% | --- |
| Steady state between 80% N2 and maximum continuous | --- | 10.00% |
| During acceleration above 80% N2 | --- | 7.00% |
| Operating at 80% N2 or below | --- | 12.00% |

# IV. Operating Limitations

## 1. Temperature Limits

### 1.1. Climatic Operating Envelope.

The engine may be used in:

- Altitude: from 0 to 13700 m
- Temperature: minus 55 ° to 55 °C ground temperature
- Mach No: 0 to 0.94

Refer to the Installation Manual for details of the Operating Envelope, including the air inlet distortion at the engine inlet.

### 1.2. Turbine Exhaust Gas Temperature (EGT), °C (°F)

| | Exhaust Gas Temperature °C (°F) | | | | |
|---|---|---|---|---|---|
| **Models** | **Take-off (5 minutes)** | **Maximum Continuous** | **Starting Maximum Transient (40 sec)** | **Starting (Ground) Max (no time limit)** | **120 second maximum transient** |
| CF6-80A (ALL MODELS) | 940 (1724)[(1)] | 895 (1643)[(1)] | 870 (1598) | 750 (1382) | --- |
| CF6-80C2 (ALL MODELS) | 960 (1760)[(2)] | 925 (1697) | 870 (1598) | 750 (1382) | 965 (1769)[(3)] |

See Note 5 for time temperature envelope.

(1) See Note 20 for further information regarding maximum permissible parameters on CF6-80A engines.

(2) See Notes 11 and 15 for further information regarding EGT Redline and EGT Junction Box.

(3) 120 second maximum transient is only for CF6-80C2B8F

### 1.3. Fuel Temperature (Degree Centigrade)

| **Models** | **Installation manual** |
|---|---|
| CF6-80A / CF6-80A2 | CF6-80A Installation Manual GEK 50460 |
| CF6-80A1 / CF6-80A3 | CF6-80A Installation Manual GEK 50490 |
| CF6-80C2A1 / A2 / A3 / A5 / A8 / B1 / B2 / B4 / B6 | CF6-80C2 Installation Manual GEK 50492 |
| CF6-80C2B1F / B2F / B3F / B4F / B6F / D1F / B1F1 / A5F / B7F / B5F / B8F | CF6-80C2 FADEC Installation Manual GEK 97284 |

For the fuel temperature at the Fuel Pump Inlet, refer to the Installation Manual for additional information:

### 1.4. Oil Temperature (Degree Centigrade)

| | Maximum Oil Temperature °C (°F) | |
|---|---|---|
| **Models** | **Continuous Operation** | **Transient (15 minutes maximum)** |
| Oil Outlet | 160 (320) | 175 (347) |

## 2. Pressure Limits

**Fuel pressure limits at engine pump inlet**

- **CF6-80A / A2**
  - GROUND STARTING
  - This limit is from minimum fuel pressure of not less than 82.7 kPa, absolute (12 psia) to a maximum of 441.3 kPa gage (64 psig) (relative to atmosphere) with vapor/liquid ratio of zero at all conditions.

  - OPERATION AND AIR STARTING
    - Operation and air starting pressure limit extends from a minimum fuel pressure of more than 34.5 kPa (5.0 psi) above the true vapor fuel pressure to a normal

maximum fuel pressure of 441.3 kPa gage (64 psig) with transient pressure (2 minute maximum) up to 489.5 kPa gage (71 psig) permitted (relative to the atmosphere) at all conditions.

- **CF6-80A1 / A3**
  - GROUND STARTING
  - This limit is from a minimum fuel pressure of not less than 82.7 kPa, absolute (12 psia) to a maximum of 344.8 kPa gage (50 psig) (relative to atmosphere) with vapor/liquid ratio of zero at all conditions.

  - OPERATION AND AIR STARTING
  - The engine fuel system will provide fuel flow and pressure required for starting and operating the engine throughout the defined operational envelope when the fuel pressure at the fuel pump inlet connections to the engine ranges from a minimum of true vapor pressure of the fuel plus 34.5 kPa (5.0 psi) to a maximum of 344.8 kPa gage (50 psig) supplied with vapor-free fuel for all normal operating conditions except idle power at altitudes greater than 3.048 km (10,000 feet). For altitudes greater than 3.048 km (10,000 feet) at least 103.4 kPa gage pressure (15 psig) is required at the main fuel pump inlet at metered fuel flow levels of 1134 kg/hr (2500 pph) or less.

- **CF6-80C2 (ALL MODELS)**
  - GROUND STARTING, AIR STARTING, AND OPERATION
  - This limit is from a minimum fuel pressure of not less than 34.34 kPa, absolute (5.0 psia) above the true vapor pressure to a maximum of 482.6 kPa gage (70 psig) (relative to atmosphere) with vapor/liquid ratio of zero at all conditions.

**Oil pressure at idle**

- **CF6-80A / A1 / A2 / A3**
  - The pressure limit at idle is 69.0 kPa differential minimum (10 psid); varying from 179.4 to 827.6 kPa diff. (26 to 120 psid) in the normal operating range.

- **CF6-80C2 (ALL MODELS)**
  - The pressure limit at idle is 65.5 kPa differential minimum (9.5 psid); varying from 179.4 to 827.6 kPa diff (26 to 120 psid) in the normal operating range. See Note 10.

## 3. Rotational Speed Limits.

**Maximum speed at all flight phases:**

| | Maximum Permissible Rotor Speeds rpm (%) | |
|---|---|---|
| Models | Low Pressure Rotor (N1) | High Pressure Rotor (N2) |
| CF6-80A (ALL MODELS) | 4016 rpm (117.0%) | 10859 rpm (110.5%) **(1)** |
| CF6-80C2 (ALL MODELS) | 3854 rpm (117.5%) | 11055 rpm (112.5%) |

(1) See Note 20 for further information regarding maximum permissible parameters on CF6-80A engines.

## 4. Installation Assumptions

The installation assumptions are stated in the appropriate engine Installation Manual.

See Note 14 and 17.

## 5. Time Limited Dispatch

Criteria pertaining to the dispatch and maintenance requirements for CF6-80C2 FADEC engines are specified in the Airworthiness Limitations Section of CF6-80C2 Engine Manual GEK 92451, which define the various configurations and maximum operating intervals.

## V. Operating and Service Instructions

| | Document Reference | | | |
|---|---|---|---|---|
| **Document** | **CF6-80A / CF6-80A2** | **CF6-80A1 / CF6-80A3** | **CF6-80C2 (ALL MODELS)** | **CF6-80C2B1F / B2F / B3F / B4F / B6F / D1F / B1F1 / A5F / B7F / B5F / B8F** |
| Installation Manual | GEK 50460 | GEK 50490 | GEK 50492 | --- |
| Specific Operating Instructions | GEK 72506 | GEK 72506 | GEK 92462 | --- |
| Engine Manual | GEK 72501 | GEK 72501 | GEK 92451 | --- |
| Maintenance Manual | GEK 72500 | GEK 72500 | GEK 92450 | --- |
| FADEC Installation Manual | --- | --- | --- | GEK 97284 |
| Service Bulletin | As Issued for each engine model | | | |

See Notes 6, 7, 8 and 9.

## VI. Notes

1. Dry weight includes basic engine accessories & optional equipment as listed in the manufacturer's engine specifications, including condition monitoring instrumentation sensors.

2. The engine ratings are based on the following conditions:
   - Fan inlet air at 15°C (59°F) and 14.69 psia (29.92 in. hg.) abs. zero humidity.
   - Ideal engine inlet (100% bellmouth recovery).
   - No external air bleed or accessory drive power for aircraft accessories.
   - Turbine temperature and engine rotor speed limits not exceeded.

   Also, with the following flight exhaust system definition:

| Models | Exhaust system definition |
|---|---|
| CF6-80A, -80A1, -80A2, -80A3 | NS-CF6-1<br>NS-CF6-1G01<br>NS-CF6-1G02<br>NS-CF6-1G03<br>NS-CF6-1G04 |
| CF6-80C2A1, -80C2A2, -80C2A3, -80C2A5, -80C2A8 | ES-CF6-1G01<br>ES-CF6-1G02<br>ES-CF6-1G03<br>ES-CF6-1G04 |
| CF6-80C2B1 | TR-CF6-F23G03<br>TR-CF6-F23G04<br>TR-CF6-F23G07<br>TR-CF6-F23G08<br>TR-CF6-F23G11<br>TR-CF6-F23G12<br>TR-CF6-F23G13<br>TR-CF6-F23G14 |
| CF6-80C2B2, -80C2B4, -80C2B6 | TR-CF6-F23G01<br>TR-CF6-F23G02<br>TR-CF6-F23G05<br>TR-CF6-F23G06<br>TR-CF6-F23G09<br>TR-CF6-F23G10 |
| CF6-80C2B1F/<br>B1F1/B3F/B5F | TR-CF6-F23FG03<br>TR-CF6-F23FG04<br>TR-CF6-F23FG07<br>TR-CF6-F23FG08<br>TR-CF6-F23FG11<br>TR-CF6-F23FG12<br>TR-CF6-F23FG13<br>TR-CF6-F23FG14 |
| CF6-80C2<br>B2F/B4F/B6F/B7F/B8F | TR-CF6-F23FG01<br>TR-CF6-F23FG02<br>TR-CF6-F23FG05<br>TR-CF6-F23FG06<br>TR-CF6-F23FG09<br>TR-CF6-F23FG10 |
| CF6-80C2D1F | ES-CF6-2G01<br>ES-CF6-2G02<br>ES-CF6-2G03<br>ES-CF6-2G04<br>ES-CF6-2G05<br>ES-CF6-2G06<br>ES-CF6-2G07<br>ES-CF6-2G08<br>ES-CF6-2G09<br>ES-CF6-2G10 |

| | |
|---|---|
| | ES-CF6-2G11<br>ES-CF6-2G12 |
| CF6-80C2A5F | ES-CF6-5G01<br>ES-CF6-5G02<br>ES-CF6-5G03<br>ES-CF6-5G04 |

3. Take off rating is limited to a continuous period of not more than 5 minutes except in the event of a power unit having failed or been shut down when a continuous period of not more than 10 minutes is allowed.

4. Take-off thrust and Maximum Continuous thrust is flat rated up to ambient temperature of:

| | **Flat rating ambient temperature °C (°F)** | |
|---|---|---|
| **Models** | **Take-off** | **Maximum Continuous** |
| A, A1, A2, A3 | 33.3°C (92°F) | 25°C (77°F) |
| C2A1 | 30°C (86°F) | 25°C (77°F) |
| C2A2 | 44°C (111°F) | 25°C (77°F) |
| C2A3 | 30°C (86°F) | 25°C (77°F) |
| C2A5 | 30°C (86°F) | 25°C (77°F) |
| C2A8 | 35°C (95°F) | 25°C (77°F) |
| C2B1 | 30°C (86°F) | 25°C (77°F) |
| C2B1F1 | 30°C (86°F) | 25°C (77°F) |
| C2B2 | 32.2°C (90°F) | 30°C (86°F) |
| C2B4 | 32.2°C (90°F) | 25°C (77°F) |
| C2B6 | 30°C (86°F) | 25°C (77°F) |
| C2B1F | 32.2°C (90°F) | 25°C (77°F) |
| C2B2F | 32.2°C (90°F) | 30°C (86°F) |
| C2B4F | 32.2°C (90°F) | 25°C (77°F) |
| C2B5F | 30°C (86°F) | 25°C (77°F) |
| C2B6F | 30°C (86°F) | 25°C (77°F) |
| C2D1F | 30°C (86°F) | 25°C (77°F) |
| C2A5F | 30°C (86°F) | 25°C (77°F) |
| C2B3F | 32.2°C (90°F) | 25°C (77°F) |
| C2B7F | 30°C (86°F) | 25°C (77°F) |
| C2B8F | 30°C (86°F) | 25°C (77°F) |

5. Refer to CF6-80A Operating Instruction GEK 72506, or CF6-80C2 Operating Instruction GEK 92462 for time temperature envelope.

6. Cyclic life limits for critical rotating and static components are published in the Airworthiness Limitations Sections of CF6-80A Engine Manual GEK 72501, CF6-80C2 Engine Manual GEK 92451.

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

8. For CF6-80A inflight operation during icing conditions, the minimum permissible N1 rpm is 40% for CF6-80 series engines. However, momentary N1 excursions below 40%, not to exceed 60 seconds duration, are permissible for approach and landing operation below 10,000 feet pressure altitude. For CF6-80C2 operation, the minimum idle permissible inflight corresponds to N2 (core) = 6050 rpm, which is a preset limit within the Main Engine Control, (PMC engines) or Electronic Control Unit (FADEC engines) and is not field adjustable.

9. CF6-80A1/A3 Models:

   The engine manufacturer supplies Nacelle System NS-CF6-1. The following kits listed, which are part of this Nacelle system, have been approved for installation on CF6-80A1/A3 engines.

| System | Kit Number |
|---|---|
| Nozzle & Centerbody | 681L287 |
| Engine Attach Fittings | |
| Lower Aft Mount | 681L288 |
| Upper Aft Mount | 681L294 |
| Engine Assembled EBU | 681L185 |
| Fan Reverser TR-CF6-F23G02 | |
| Position #1 | 681L292 |
| Position #2 | 681L293 |
| Fan Reverser Actuation System | |
| Supply Air – Pylon Mounted | 681L188 |
| Supply Air – Engine Mounted | 681L189 |
| Compartment Cooling Air System | 681L244 |
| Fuel Flowmeter | 681L250 |

   CF6-80C2 Models
   The engine manufacturer supplies the engine assembled EBU for CF6-80C2A1 / A2 / A3 / A5 / A8 / A5F; CF6-80C2B1 / B2 / B4 / B6; CF6-80C2B1F / B2F / B3F / B4F / B5F / B6F / B7F / B1F1; and CF6-80C2D1F engines. The components, which had been approved for installation on CF6-80C2 engines, are defined in the model lists CF6-80C2A1 / A2 / A3 / A5/ A8; CF6-80C2B1 / B2 /B4 / B6; CF6-80C2B1F / B2F / B3F / B4F / B5F / B6F / B7F / B1F1 / B8F; CF6-80C2D1F; CF6-80C2A5F.

   The engine manufacturer also supplies total exhaust system and engine attach fittings for the CF6-80C2A1 / A2 / A3 / A5 / A8; the CF6-80C2A5F, and CF6-80C2D1F (except D1F upper aft mount beam) but supplies only the Fan Reverser System for the CF6-80C2B1 / B2 / B4 / B6 and CF6-80C2B1F / B2F / B3F / B4F / B5F / B6F / B7F / B1F1 / B8F engines.

   The exhaust system (ES) and Fan Reverser (TR) Kit numbers approved for installation are listed in Note 2 of this TCDS.

10. CF6-80C2 models only: During negative-g operation only, it is permissible to operate below minimum oil pressure 69 kPa differential (10 psi differential) for a maximum of 30 seconds. See Sections 6 of CF6-80C2 Specific Operating Instructions, GEK 92462.

11. The indicated 960°C EGT Redline for the CF6-80C2 engines using EGT Shunt Junction Box P/N 1325M15P05 or 1325M15P07 corresponds to an actual 1005°C EGT. The indicated 960°C EGT Redline for CF6-80C2 engines using EGT Shunt Junction Box P/N 1383M97P03 or 1383M97P07 corresponds to an actual 1020°C EGT. CF6-80C2A1/A2/A3/B1/B2/B4 and CF6-80C2B1F/B2F/B3F/B4F models equipped with EGT Shunt Junction Box P/N 1383M97P03/P07 must also incorporate the HP/LP turbine hardware and associated changes per General Electric CF6-80C2 Service Bulletins 72-201, 72-222, 72-240, 72-241, 72-248, 72-255, 72-268, 77-005, and 77-006.

12. CF6-80A1/A3 engines and parts thereof manufactured by Safran Aircraft Engines (formerly SNECMA), 1, Rond point René Ravaud 77550 Moissy-Cramayel, France under Production agreement No. 6-3032 with the General Electric Company, are identified by engine Serial Numbers 585-.

    CF6-80C2 engines and parts thereof manufactured by Safran Aircraft Engines (formerly SNECMA), 1, Rond point René Ravaud 77550 Moissy-Cramayel, France under Production agreement No. 6.3592 with the General Electric Company, are identified by engine Serial Numbers 695- assigned to CF6-80C2 PMC engines manufactured by Safran Aircraft Engines, and Numbers 703- and 705-204 and up are assigned to CF6-80C2 FADEC engines manufactured by Safran Aircraft Engines

13. These models incorporate the following general characteristics

SERIES CF6-80A

| | |
|---|---|
| CF6-80A | Basic model. |
| CF6-80A1 | Same as CF6-80A, except the engine incorporates a fan case mounted gearbox. |
| CF6-80A2 | Same as CF6-80A, except increased take-off thrust rating. Corresponding PMC and MEC changes. |
| CF6-80A3 | Same as CF6-80A1, except increased take-off thrust rating. Corresponding PMC and MEC changes. |

SERIES CF6-80C2

| | |
|---|---|
| CF6-80C2A1 | Basic model (take-off ideal thrust rating: 59,000 pounds). |
| CF6-80C2A2 | Same as 80C2A1, except lower take-off thrust rating (53,500 ideal). Corresponding PMC and MEC changes. |
| CF6-80C2A3 | Same as 80C2A1, except higher take-off thrust rating (60,200 ideal). Corresponding PMC and MEC changes. |
| CF6-80C2B1 | Same as 80C2A1, except lower take-off thrust rating (56,700 ideal). Corresponding PMC and MEC changes. Minor airframe related hardware changes and added servo fuel heater |
| CF6-80C2B2 | Same as 80C2A1, except lower take-off thrust rating (52,500 ideal). Corresponding PMC and MEC changes. Minor airframe related hardware changes and added servo fuel heater. |
| CF6-80C2B4 | Same as 80C2A1, except lower take-off thrust rating (57,900 ideal). Corresponding PMC and MEC changes. Minor airframe related hardware changes and added servo fuel heater. |
| CF6-80C2B6 | Same as 80C2A1, except higher take-off thrust rating (60,800 ideal). Corresponding PMC and MEC changes. Minor HPT and LPT hardware changes, minor airframe related hardware changes, and added servo fuel heater. |
| CF6-80C2A5 | Same as 80C2A1, except higher take-off thrust rating (61,300 ideal). Corresponding PMC and MEC changes. Minor HPT and LPT hardware changes |
| CF6-80C2A8 | Same as 80C2A1, except take-off thrust is flat rated to 95ºF. Corresponding PMC and MEC changes. Minor HPT and LPT hardware changes. |
| CF6-80C2B1F | Same as 80C2A1, except lower take-off thrust rating (58,000 ideal). Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling, two levels of 11th stage cooling to the HPT and redesigned accessory gearbox. Minor airframe related hardware changes and added servo fuel heater. |
| CF6-80C2B1F1 | Same as 80C2A1, except higher take-off thrust rating (60,800 ideal) and maximum continuous rating same as 80C2B1F. Minor HPT and LPT hardware changes. Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling, two levels of the 11th stage cooling to the HPT and redesigned accessory gearbox. Minor airframe related hardware changes and added servo fuel heater. Only ECU P/N 1820M33P04 incorporating 8.2.N software can be used on the CF6-80C2B1F1. See Note 19. |
| CF6-80C2B2F | Same as 80C2A1, except lower take-off thrust rating (52,700 ideal). Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling, two levels of 11th stage cooling to the HPT and redesigned accessory gearbox. Minor airframe related hardware changes and added servo fuel heater. |
| CF6-80C2B3F | Same as 80C2A1, except lower take-off thrust rating (52,700 ideal). Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling, two levels of 11th stage cooling to the HPT and redesigned accessory gearbox. Minor airframe related hardware changes and added servo fuel heater. Only ECU P/Ns 1471M63P31, 1519M89P21, or 1820M33P04 incorporating 8.2.N software can be used on the CF6-80C2B3F. See Note 19. |

| | |
|---|---|
| CF6-80C2B4F | Same as 80C2A1, except lower take-off thrust rating (58,100 ideal). Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling, two levels of 11th stage cooling to the HPT and redesigned accessory gearbox. Minor airframe related hardware changes and added servo fuel heater. |
| CF6-80C2B6F | Same as 80C2A1, except higher take-off thrust rating (60,800 ideal). Minor HPT and LPT hardware changes. Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling, two levels of 11th stage cooling to the HPT and redesigned accessory gearbox. Minor airframe related hardware changes, and added servo fuel heater |
| CF6-80C2D1F | Same as CF6-80C2A1, except higher take-off rating (61,960 ideal). Minor HPT and LPT hardware changes. Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling, and two levels of 11th stage cooling to the HPT. Minor airframe related changes. |
| CF6-80C2A5F | Same as 80C2A1, except higher take-off thrust rating (61,300 ideal). Minor HPT and LPT hardware changes. Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT and LPT, modulated bore cooling. Minor airframe related hardware changes and added servo fuel heating system. |
| CF6-80C2B7F | Same as 80C2A1, except higher take-off thrust rating (60,800 ideal). Minor HPT and LPT hardware changes. Incorporates Full Authority Digital Engine Control (FADEC), modulating active clearance control for the HPT and LPT, modulated bore cooling, two levels of 11th stage cooling to the HPT and redesigned accessory gearbox. Minor airframe related hardware changes and added servo fuel heater. |
| CF6-80C2B5F | Same as 80C2A1 except higher take-off thrust rating (60,800 ideal). Minor HPT and LPT hardware changes. Incorporates Full Authority Digital Engine Control (FADEC), modulated active clearance control for the HPT, and a constant level of 11th stage cooling to HPT. Minor airframe related changes and added servo fuel heater. |
| CF6-80C2B8F | Same as CF6-80C2B7F except for increased thrust during take-off. In addition, the CF6-80C2B8F incorporates a 965°C transient EGT redline for a maximum of two minutes. Incorporates improved HPT and LPT rotors |

14. The CF6-80C2A5/A8/B5F/B6/B6F/B7F/B1F1/D1F/A5F engine models require the incorporation of General Electric CF6-80C2 Service Bulletins 72-201, 72-222, 72-240, 72-241, 72-248, 72-255, 72-268, 77-005 and 77-006.

15. Incorporation of EGT Junction Box P/N 1519M97P01 (direct readout) in lieu of EGT Shunt Junction box P/N 1325M15P07 or 1383M97P03/P07 is applicable to CF6-80C2 FADEC engine models only and requires the simultaneous introduction of ECU P/N's 1471M63P16 (or later) or 1519M89P08 (or later) or 1820M33P01 (or later) for CF6-80C2B1F/B2F/B3F/B4F/ B5F/ B6F/ B1F1/ B7F/ B8F engine models as listed on the data sheet. EGT Junction Box P/N 1519M97P01 is used on all CF6-80C2DF and CF6-80C2AF models.

16. The incorporation of the Engine Identification Plug is applicable to the CF6-80C2 FADEC engine models only. The applicable part numbers are as follows:

    **CF6-80C2BF Engine Models**

    Engine Identification Plug P/N 7157M87 must be used with ECU P/N's 1471M63P07/P08/P11/ P12 and with 1519M89P05/P06.

    Engine Identification Plug P/N 7161M98 must be used with ECU P/N's 1471M63P16 (or later) or 1519M89P08 (or later) or 1820M33P01 (or later). Engine Identification Plug P/N 7161M98 or 1851M56 must be used with ECU P/N's 1471M63P31 (or later) or 1519M89P21 (or later) or 1820M33P04 (or later) or 2121M25P01 (or later), or 2121M26P01 (or later), or 2121M29P01 (or later), or 2121M37P01

(or later), or 2121M38P01 (or later), or 2121M41P01 (or later). The exact Engine Identification Plug P/N is determined by engine hardware options and engine test results.

**CF6-80C2DF Models**

Engine Identification Plug P/N's 7161M98 must be used with ECU P/N 1519M91P04 (or later) or 1820M34P01 (or later). Engine Identification Plug P/N 7161M98 or 1851M56 must be used with ECU P/N's 1519M91P07 (or later) or 1820M34P02(or later) or 1851M51P01(or later) or 1851M52P01(or later) or 1851M53P01(or later). The exact Engine Identification Plug P/N is determined by engine hardware options and engine test results.

**CF6-80C2AF Models**

Engine Identification Plug P/N 7161M98 or 1851M56 must be used for all ECU P/N's. The exact Identification Plug P/N is determined by engine hardware options and engine test results

17. The CF6-80C2B3F does not require the incorporation of General Electric CF6-80C2 Service Bulletins 72-201, 72-222, 72-240, 72-241, 72-248, 72-255, 72-268, 77-005 and 77-006. If these bulletins are not incorporated, the engine must use one of the Identification Plug P/N's 7161M98G26 through G49 or P/N's 7161M98G74 through G97. See Note 16

18. A suffix may be added to the CF6-80C2B7F basic engine model number on the engine nameplate to identify minor variations in the engine configuration, installation components, or differences peculiar to aircraft requirements. For example: CF6-80C2B7FX.

    CF6-80C2B7F1 – Same as CF6-80C2B7F except for a minor variation in the installation components and engine control software to interface with aircraft requirements for higher bleed demand. All hardware, limitations, and other ratings are identical. Only ECU P/N 1820M33P04 incorporating 8.2.N software can be used on the CF6-80C2B7F1. See note 19.

19. The engine Instructions for Continued Airworthiness (ICA's) are incomplete and do not include the CF6-80C2B1F1 / B3F / B7F1 engine models. Aircraft with CF6-80C2B1F1 / B3F / B7F1 engine models installed are not eligible for an airworthiness certificate until the ICA's are revised and accepted by the FAA Engine Certification Office.

20. The maximum high pressure rotor speed and maximum turbine exhaust gas temperatures permissible for all CF6-80A models, determined in (§. IV), have been increased from originally certified operating limits. This limit increase was approved by the FAA in Service Bulletin No. CF6-80 S/B 72-260, Revision 2, dated January 31, 1984. The life limits, dependent on the operating limits, applicable to certain rotating components are listed in Chapter 5 of the Engine Manual GEK 72501.

## Section 3 Administration

### I. Acronyms and Abbreviations

| Acronym / Abbreviation | Definition |
|---|---|
| ARINC | Aeronautical Radio, Incorporated |
| AGB | Accessories Gearbox |
| CNA | Common Nozzle Assembly |
| DIS | Drawing Introduction Sheet |
| EASA | European Union Aviation Safety Agency |
| ESF | Equivalent Safety Finding |
| EBU | Engine Build Unit |
| EEC | Engine Electronic Controller |
| EMI | Electro Magnetic Interference |
| EGT | Exhaust Gas Temperature |
| FAA | Federal Aviation Administrator |
| FADEC | Full Authority Digital Engine Control |
| GE | General Electric |
| HP | High Pressure |
| HPC/HPT | High Pressure Compressor/Turbine |
| ICAO | International Civil Aviation Organisation |
| IDG | Integrated Drive Generator |
| JAA | Joint Aviation Authority |
| JAR | Joint Aviation Requirements |
| IP | Intermediate Pressure |
| LP | Low Pressure |
| LPC/LPT | Low Pressure Compressor/Turbine |
| RPM | Revolutions Per Minute |
| SC | Special Conditions |
| TCDS | Type Certificate Data Sheet |
| TC | Type Certificate |
| TGT | Turbine Gas Temperature |
| CAA | Civil Aviation Authority |

## II. Type Certificate Holder Record

| TCH Record | Period |
|---|---|
| GENERAL ELECTRIC COMPANY<br>GE AVIATION<br>1 Neumann Way<br>Cincinnati, OH 45215-6301<br>United States of America<br><br>Design Organisation Approval No.: NA | Since initial issue |

## III. Amendment Record

| TCDS Issue No. | TCDS Issue Date | Changes | TC Issue and Date |
|---|---|---|---|
| 01 | 28 Aug 2024 | - This Initial Issue has included following.<br>- 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.<br>- Details of the type design that affected the TCDS and were approved or accepted by EASA before 01 January 2021 and would have been incorporated in to the EASA issued TCDS before 31 December 2020, but such document had not been produced.<br>- These engine models had been certificated in several EU member states before 28 September 2003. After which EASA assumed the state of design responsibility for EU member states including UK.<br>- On the 11 April 2022 EASA published TC/TCDS EASA.IM.E.240 Issue 01 in which the following was stated, allowing UK CAA to use TC/TCDS EASA.IM.E.240 Issue 01 as the base line for the UK TCDS; “These engine models had been certified in several EU member states before 28 September 2003. According to Article 3 Paragraph 1 (a)(i) of Commission Regulation (EU) 748/2012 for these engines the European TC and associated TCDS have been issued based on the Certification Basis as established by the State of Design.<br><br>- The basis for the Airworthiness Standards and the Special Conditions have been the former TCDS nr. M-IM 13 issued by DGAC France, German LBA TCDS nr. 6318 and UK-CAA Airworthiness Approval Notes (AAN) 22462, 22463, 22464, 23916, 25053, including Addendums and Up-issues.”<br><br>- Section 2 (II) (1), (2), (3), and (4) added to provide information about certifying authority and certification basis applied by the certificating authority.<br>- 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.00366). | Issue 01<br>28 Aug 2024 |

– END –