



TYPE-CERTIFICATE DATA SHEET

No. E.067

for
CFM56-5 series engines

Type Certificate Holder
CFM International S.A.

2, boulevard du Général Martial Valin
F-75724 Paris Cedex 15
France

For Models:

CFM56-5
CFM56-5-A1/F (originally identified as CFM56-5A2)
CFM56-5A3
CFM56-5A4
CFM56-5A4/F
CFM56-5A5
CFM56-5A5/F



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I. General

1. Type/ Model

| | |
|---------|--|
| CFM56-5 | CFM56-5, CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F |
|---------|--|

2. Type Certificate Holder

CFM International S.A.
2, boulevard du Général Martial Valin
F-75724 Paris Cedex 15
France

Design Organisation Approval No.: EASA.21J.086

3. Manufacturers

| | |
|--|---|
| Safran Aircraft Engine 10 allée du Brévent CE 1420 - Courcouronnes F-91019 Evry Cedex France | GE Aviation One Neumann Way Cincinnati - Ohio 45215 United States of America |
|--|---|

4. Date of Application

| | |
|--|-----------------------|
| CFM56-5 | 06 September 1984 (*) |
| CFM56-5-A1/F (originally identified as CFM56-5A2), CFM56-5A3 | 15 December 1988 (*) |
| CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 03 February 1994 (*) |

(*) = Application was made to DGAC-France before EASA was established – See note 7

Certification Reference Date: 06 September 1984

5. EASA Type Certification Date

| | |
|--|------------------|
| CFM56-5 | 27 August 1987 |
| CFM56-5-A1/F (originally identified as CFM56-5A2), CFM56-5A3 | 05 February 1990 |
| CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 27 February 1996 |



II. Certification Basis

1. EASA Certification Basis

1.1. Airworthiness Standards

| | |
|---|---|
| CFM56-5 | JAR-E Change 6 (28 August 1981 – based on Section C, Issue 13 of British Civil Airworthiness Requirements) as amended by BCAR Paper N° C791 (18 April 1984) |
| CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | JAR-E Change 6 (28 August 1981 – based on Section C, Issue 13 of British Civil Airworthiness Requirements) as amended by BCAR Paper N° C791 (18 April 1984) and NPA-E-10 "Approval of Engines and Associated Equipment" |

1.2. Special Conditions (SC)

| | |
|--|---|
| CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | S.C. N° 1, Bird Strikes: 1134 g (2.5 lbs) Bird Ingestion Test S.C. N° 2, Ingestion of Rain and Hail: Rain and Hail Ingestion in accordance with AIA Advisory Proposal PC 338-1 |
|--|---|

1.3. Equivalent Safety Findings

None

1.4. Deviations

None

1.5. Environmental Protection

ICAO Annex 16, Volume II, First Edition, 18th February 1982

III. Technical Characteristics

1. Type Design Definition

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

| | Engine part list reference |
|--|----------------------------|
| CFM56-5 | 9324M40G01 through G06 |
| CFM56-5-A1/F | 9324M40G03 through G06 |
| CFM56-5A3 | 9324M40G03 through G06 |
| CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 9324M40G05 and G06 |



| | Engine identification plug kit reference |
|--------------|--|
| CFM56-5 | 336-404-501-0; 336-404-502-0; 336-404-503-0; 336-404-504-0; 336-404-505-0; 336-404-506-0; 336-404-510-0; 336-404-511-0 |
| CFM56-5-A1/F | 336-404-520-0; 336-404-525-0; 336-404-521-0; 336-404-526-0; 336-404-545-0 |
| CFM56-5A3 | 336-404-530-0; 336-404-535-0; 336-404-531-0; 336-404-536-0 |
| CFM56-5A4 | 336-414-201-0; 336-414-202-0; 336-414-205-0; 336-414-206-0 |
| CFM56-5A4/F | 336-414-210-0; 336-414-215-0 |
| CFM56-5A5 | 336-414-220-0; 336-414-221-0; 336-414-225-0; 336-414-226-0 |
| CFM56-5A5/F | 336-414-230-0; 336-414-235-0 |

2. Description

Dual rotor, axial flow, high bypass ratio turbofan engine:

- single stage fan, 3-stage low pressure compressor (LPC), 9-stage high pressure compressor (HPC)
- annular combustion chamber
- single stage high pressure turbine (HPT), 4-stage low pressure turbine (LPT)
- dual channel full authority digital engine control (FADEC)

3. Equipment

The engine starter is part of the engine type design.

4. Dimensions (mm)

| | Length (*) | Width | Height |
|---|------------|-------|--------|
| CFM56-5, CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 2422 | 1908 | 2101 |

(*) = From fan casing forward flange to turbine frame aft flange

5. Dry Weight (kg)

| | |
|---|------|
| CFM56-5, CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 2331 |
|---|------|

Dry engine = Basic engine, its accessories and optional accessories, as well as engine condition monitoring equipment



6. Ratings (daN)

| | Take Off | Maximum Continuous (d) |
|------------------------|-----------|------------------------|
| CFM56-5, CFM56-5-A1/F | 11120 (a) | 10540 |
| CFM56-5A3 | 11787 (a) | 10540 |
| CFM56-5A4, CFM56-5A4/F | 9786 (b) | 9195 |
| CFM56-5A5, CFM56-5A5/F | 10453 (c) | 9195 |

Constant thrust for ambient temperature below: (a): 30°C, (b): 45°C, (c): 37°C, (d): 25°C (See notes 1 and 2)

7. Control System

The software is part of the Electronic Control Unit (ECU) Type Design – P/N 1459M55 at initial certification

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

8.1 Fuel and Additives:

Refer to the applicable engine “Specific Operating Instructions” document.

8.2 Oil:

Refer to the latest revision of CFM Service Bulletin CFM56-5 S/B 79-001.

9. Aircraft Accessory Drives

| Drive | Rotation | Gear ratio / HP rotor | Max. Power or Torque | Shear Torque (m.daN) | Overhung Moment (m.daN) |
|-------------------------------|----------|-----------------------|----------------------|----------------------|-------------------------|
| Aircraft Electrical Generator | CCW | 0.595 | 135 kW | 107 | 11.3 |
| Aircraft Hydraulic Generator | CCW | 0.256 | 17 m.daN | 49.7 | 1.8 |

CCW = Counter Clock-Wise



10. Maximum Permissible Air Bleed Extraction

| Bleed location | LP rotor speed | Airflow limit |
|---|--|--|
| Bypass duct | All speeds above 20 % N1K | 2 % of secondary airflow |
| HPC 5 th stage only | All speeds above 20 % N1K | 10 % of primary airflow |
| HPC 9 th stage only | From 20% to 61 % of N1K From 61 % to 82.5 % of N1K Above 82.5 % of N1K | 14 % of primary airflow Linear variation between 14% and 7% of primary airflow 7% of primary airflow |
| HPC 5 th and 9 th stages combined | From 20% to 61 % of N1K From 61 % to 82.5 % of N1K Above 82.5 % of N1K | 14 % of primary airflow Linear variation between 14% and 10% of primary airflow 10% of primary airflow |

IV. Operating Limitations

1. Temperature Limits

1.1 Exhaust Gas Temperature (°C):

The exhaust gas temperature is measured at station T49.5 (stage 2 LPT nozzle).

| | Take Off | Take Off Transitory (20 seconds) | Maximum Continuous |
|---|---------------------|----------------------------------|---------------------|
| CFM56-5, CFM56-5A4, CFM56-5A5 | 890 | 900 | 855 |
| CFM56-5-A1/F, CFM56-5A3, CFM56-5A4/F, CFM56-5A5/F | 915 (890 Indicated) | 925 (900 Indicated) | 880 (855 Indicated) |

1.2 Oil Temperature (°C):

At the pressure pump outlet:

| | Maximum Continuous | Maximum Transitory (15 minutes) |
|--|--------------------|---------------------------------|
| CFM56-5, CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 140 | 155 |



1.3 Fuel Inlet Temperature (°C):

At engine fuel pump inlet:

| | |
|---------|--|
| Minimum | - 46 with servo-fuel heater installed |
| Maximum | + 49 (JET B or equivalent when boost pump inoperative) + 54.4 (JET A or equivalent) |

1.4 Engine Equipment Temperatures:

Refer to the applicable engine "Installation Manual" document.

2. Speed Limits

Maximum rotational speeds:

| | Low pressure rotor (N1) | High pressure rotor (N2) |
|--|-------------------------|--------------------------|
| CFM56-5, CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 5100 (102 %) | 15183 (105 %) |

Minimum rotational speed in icing condition:

| | High pressure rotor (N2) |
|--|--------------------------|
| CFM56-5, CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F | 8500 (58.8 %) |

3. Pressure Limits

3.1 Fuel Pressure Limits:

When the engine is running, the fuel pressure at engine pump inlet must be kept 37.9 kPa above the true vapour pressure of the fuel (Refer to the applicable engine "Installation Manual" document, section 5).

3.2 Oil Pressure Limits:

Minimum: 90 kPa (differential pressure)

When the engine is running, the oil pressure varies with the rotating speed of the HP rotor (Refer to the applicable engine "Specific Operating Instruction" document).

Engine operation with an oil pressure lower than the minimum is limited to 10 seconds maximum.



4. Oil capacity, consumption limit

The installation assumptions are quoted in the applicable engine "Installation Manual" document.

5. Time Limited Dispatch:

Criteria pertaining to the dispatch and maintenance requirements for the FADEC engine control system are specified in CFM/GE Document No. GEK 98455.

V. Operating and Service Instructions

| | |
|-------------------------------------|---|
| | CFM56-5, CFM56-5-A1/F, CFM56-5A3, CFM56-5A4, CFM56-5A4/F, CFM56-5A5, CFM56-5A5/F |
| Turbofan Engine Installation Manual | CFM 2026 |
| Specific Operating Instructions | CFM TP.OI.11 |
| Engine Maintenance Manual | Refer to the Engine Section of the Appropriate Aircraft Maintenance Manual |
| Engine Shop Manual | CFM TP.SM.7 |

VI. Notes

1. The take-off thrust, with the associated limits, shall not be used continuously more than 5 minutes. The duration may be extended to 10 minutes in case of engine failure in multi-engine aircraft. If the duration exceeds 5 minutes, this shall be recorded in the engine log book.
2. Engine ratings are based on calibrated test stand performance, and performance calculations are based on accepted parameter correction methods documented in the "Production Test Requirements" document. These calculations assume the following conditions:
Static sea level standard conditions of 15°C and 101.32 kPa;
No aircraft accessory loads or air extraction;
No anti-icing; no inlet distortion; no inlet screen losses; and 100% ram recovery;
Production acceptance inlet and cowling as defined in the Production Test Requirements.
3. The life limits of certain engine parts are defined in the applicable "Engine Shop Manual" document, chapter 5 "Airworthiness Limitations".
4. The type certificate holder, CFM International S.A., is a company jointly owned by SNECMA (France) and GE Aviation (USA). CFM International S.A. is responsible for the certification program, the sale and the customer support activities of the CFM56 engines. With respect to the benefits of type certification for production of series engines, SNECMA and GE Aviation function as licensees of CFM International S.A.



5. The engine assembly line is identified by a 3 digit prefix in the engine serial number: even number for GE Aviation and odd number for SNECMA.
6. The engine model number stamped on the engine identification plate may include a suffix to identify minor variations in relation with the aircraft application (by example CFM56-5-A1). Such model identification numbers are listed in CFM56-5 S/B 72-0001.
7. EASA Type Certificate and Type Certificate Data Sheet N°E.067 replace DGAC-France Type Certificates and Type Certificate Data Sheets N°M-IM19 and N°M15.



SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

n/a

II. Type Certificate Holder Record

CFM International S.A.

III. Change Record

| Issue | Date | Changes | TC issue |
|--------------|---------------|--|-----------------|
| Issue 01 | 01 May 2009 | Initial Issue | 01 May 2009 |
| Issue 02 | 17 April 2018 | Certification of the CFM56-5 engine cold soak capability from -45°C to -46°C according to Major Change Approval 10059853 issued on 24 October 2016 | |
| | | | |
| | | | |
| | | | |

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