

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION TYPE CERTIFICATE DATA SHEET E2GL	TCDS NUMBER E2GL REVISION: 11*
	DATE: April 5, 2007
	CFM INTERNATIONAL, S.A.
	MODELS: CFM56-2 CFM56-3 CFM56-2A CFM56-3B CFM56-2B CFM56-3C

Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E2GL) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations, provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER: CFM International, S.A.
 2 Boulevard du General Martial Valin
 75015 Paris, France

I. MODELS (See NOTE 12)	CFM56-2	CFM56-2B	CFM56-2A	CFM56-3	CFM56-3B
TYPE	High bypass turbofan; coaxial front fan/booster driven by multi-stage low pressure turbine, multi-stage compressor with one stage turbine and annular combustor.				
RATINGS (See NOTE 4)					
Takeoff (5 min., see NOTE 16), sea level, static thrust, lb./daN.	24,000/10,676	22,000/9,786	24,000/10,676	20,100/8,941	22,100/9,830
Maximum continuous, sea level static thrust, lb.	23,000/10,230	21,580/9,599	23,405/10,411	18,900/8,407	20,500/9,118
Flat rating	AMBIENT TEMPERATURE				
Takeoff	86°F / 30°C	90°F/32.2°C	95°F / 35°C	86°F / 30°C	--
Maximum continuous	77°F / 25°C	--	--	--	--
FUEL SYSTEM	See NOTE 8 for approved fuels				
	GE PART NO.				
Fuel Control, Woodward	9378M47 9275M73	9278M96	1323M36	9368M57	9387M15
CIT Sensor, Woodward	9178M37	--	--	9334M96	--
Power Management Control, GE	7076M20 7157M60 7045M91	7084M61 7157M61 ---	7129M23 7157M64 ---	7090M98 7139M84 7157M62 7157M66	7125M15 7139M91 7157M63 7157M67

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LEGEND: "--" INDICATES "SAME AS PRECEDING MODEL"
 "---" NOT APPLICABLE
 NOTE: SIGNIFICANT CHANGES ARE BLACK-LINED IN THE LEFT MARGIN.

II. MODELS (See NOTE 12)	CFM56-3C				
TYPE	High bypass turbofan; coaxial front fan/booster driven by multi-stage low pressure turbine, multi-stage compressor with one stage turbine and annular combustor.				
RATINGS (See NOTE 4)					
Takeoff (5 min., see NOTE 16), sea level, static thrust, lb./daN	23,515/10,460				
Maximum continuous, sea level static thrust, lb.	21,850/9,719				
Flat rating	AMBIENT TEMPERATURE				
Takeoff	86°F / 30°C				
Maximum continuous	77°F / 25°C				
FUEL SYSTEM	See NOTE 8 for approved fuels				
	GE PART NO.				
Fuel Control, Woodward	1459M27 9387M15				
CIT Sensor, Woodward	9334M96				
Power Management Control, GE	7147M10 7157M68				

I. MODELS (Continued)	CFM56-2	CFM56-2B	CFM56-2A	CFM56-3	CFM56-3B
FUEL SYSTEM (Cont.)	SNECMA PART NUMBER				
Fuel Pump, TRW	301-776-101-0	301-776-101-0	301-779-101-0	301-778-801-0	--
Combined boost and single element gear type pump	301-776-102-0	301-776-102-0	301-779-102-0	301-778-802-0	--
	301-776-103-0	301-776-104-0	301-779-103-0	301-778-804-0	--
	301-776-104-0	301-776-105-0	---	301-778-805-0	--
	301-776-105-0	301-776-106-0	---	301-778-806-0	--
	301-776-106-0	301-776-109-0	---	301-779-001-0	--
	301-776-108-0	301-776-111-0	---	301-779-002-0	--
	301-776-109-0	301-776-112-0	---	301-779-005-0	--
	301-776-110-0	301-776-113-0	---	301-779-006-0	--
	301-776-111-0	301-776-114-0	---	301-779-007-0	--
	301-776-112-0	301-776-115-0	---	---	---
	301-776-113-0	301-779-001-0	---	---	---
	301-776-114-0	301-779-005-0	---	---	---
	301-776-115-0	301-779-007-0	---	---	---
	301-778-801-0	301-779-101-0	---	---	---
	301-778-802-0	301-779-102-0	---	---	---
	301-778-804-0	301-779-103-0	---	---	---
	301-778-805-0	---	---	---	---
	301-778-806-0	---	---	---	---
	301-779-001-0	---	---	---	---
	301-779-002-0	---	---	---	---
	301-779-005-0	---	---	---	---
	301-779-006-0	---	---	---	---
	301-779-007-0	---	---	---	---
Fuel/Oil Heat Exchanger	301-771-402-0	301-771-402-0	301-779-401-0	301-776-401-0	--
	301-771-403-0	301-779-401-0	301-779-402-0	301-776-402-0	--
	301-771-404-0	301-779-402-0	---	301-776-403-0	--
				301-780-501-0	--
Servo Fuel Heater	301-772-901-0	301-772-901-0	301-779-501-0	301-776-501-0	--
		301-779-501-0	301-779-502-0	301-776-502-0	--
		301-779-502-0	---	---	---

I. MODELS (Continued)	CFM56-2	CFM56-2B	CFM56-2A	CFM56-3	CFM56-3B
OIL					
Models CFM56-2/-2B/-2A	Synthetic type conforming to GE Specification D50TF1, Type 1 or 2. CFM Service Bulletin (CFM56-2) 79-0001 lists approved oil brands.				
Models CFM56-3/-3B/-3C	Synthetic type conforming to GE Specification D50TF1, Type 1 or 2. CFM Service Bulletin (CFM56-3/-3B/-3C) 79-0001 lists approved oil brands.				
IGNITION SYSTEM	GE PART NO.				
Two ignition units	9238M66 1538M69 9101M52	--	--	--	--
Two igniter plugs	1153M38 1374M12 1153M38 1374M13	9275M71 -- 9276M36 --	--	--	--
PRINCIPAL DIMENSIONS	INCHES / MILLIMETERS				
Length, (fan case forward flange to LPT rear frame aft flange)	95.7/2430	--	--	93.1/2364	--
Width, (fan casing forward flange diameter)	72.04/1830	--	--	63.39/1610	--
Height, (bottom of accessory gearbox to top of fan casing forward flange)	84.25/2140	--	--	66.61/1692	--
WEIGHT (dry)	Includes basic engine accessories and optional equipment as listed in manufacturers engine specification, including engine mounted portions of the condition monitoring instrumentation.				
Pounds / Kilograms	4711/2139	--	4850/2200	4309/1954	4334/1966
CENTER OF GRAVITY LOCATIONS	STATION, ENGINE ONLY (REFER TO INSTALLATION DRAWING)				
Inches	206±1	--	205±1	209±1	--
Millimeters	5233±25	--	5220±25	5319±25	--

II. MODELS (Continued)	CFM56-3C				
FUEL SYSTEM (Cont.)	SNECMA PART NUMBER				
Fuel Pump, TRW	301-778-802-0				
Combined boost and single element gear type pump	301-779-001-0 301-779-002-0				
Fuel/Oil Heat Exchanger	301-776-401-0 301-776-402-0 301-776-403-0 301-780-501-0				
Servo Fuel Heater	301-776-501-0 301-776-502-0				
OIL					
Models CFM56-2/-2B/-2A	Synthetic type conforming to GE Specification D50TF1, Type 1 or 2. CFM Service Bulletin (CFM56-2) 79-0001 lists approved oil brands.				
Models CFM56-3/-3B/-3C	Synthetic type conforming to GE Specification D50TF1, Type 1 or 2. CFM Service Bulletin (CFM56-3/-3B/-3C) 79-0001 lists approved oil brands.				
IGNITION SYSTEM	GE PART NO.				
Two ignition units	9238M66 1538M69				
Two igniter plugs	9275M71 1374M12 9276M36 1374M13				

II. MODELS (Continued)	CFM56-3C				
PRINCIPAL DIMENSIONS	INCHES / MILLIMETERS				
Length, (fan case forward flange to LPT rear frame aft flange)	93.1/2364				
Width, (fan casing forward flange diameter)	63.39/1610				
Height, (bottom of accessory gearbox to top of fan casing forward flange)	66.61/1692				
WEIGHT (dry)	Includes basic engine accessories and optional equipment as listed in manufacturers engine specification, including engine mounted portions of the condition monitoring instrumentation.				
Pounds / Kilograms	4334/1966				
CENTER OF GRAVITY LOCATIONS	STATION, ENGINE ONLY (REFER TO INSTALLATION DRAWING)				
Inches	209±1				
Millimeters	5319±25				

CERTIFICATION BASIS

Code of Federal Regulations Part 33 effective February 1, 1965, with Amendments 33-1 through 33-6 thereto. In addition, the engines are in compliance with the emissions requirements of Special Federal Aviation Regulation No. 27-5. Exemption No. 2641 from compliance with 14 CFR §33.88 issued Nov. 20, 1978, Exemption No. 2850 from compliance with 14 CFR §33.7 issued October 31, 1979, and Exemption No. 83-ANE-001E from compliance with 14 CFR §33.14 issued July 27, 1983.

MODEL	APPLICATION DATE	TYPE CERTIFICATE ISSUED/AMENDED	TYPE CERT. WITHDRAWN
CFM56-2	AUG 07, 1975	NOV 08, 1979	
CFM56-2B	JUL 28, 1981	JUN 25, 1982	
CFM56-3	SEP 17, 1980	JAN 12, 1984	
CFM56-3B	MAR 05, 1984	JUN 19, 1984	
CFM56-2A	DEC 15, 1983	JUN 06, 1985	
CFM56-3C	APR 07, 1986	DEC 18, 1986	

PRODUCTION BASIS

Production Certificate No. 108 for engines produced in the United States by General Electric under license from CFM International, S.A. (See NOTE 11).

IMPORT REQUIREMENTS

See NOTE 11

NOTES

MODELS	CFM56-2	CFM56-2B	CFM56-2A	CFM56-3	CFM56-3B	CFM56-3C
NOTE 1.	MAXIMUM PERMISSIBLE TEMPERATURES					
	For engine configurations designated by a suffix for specific installation (see NOTE 12), refer to the appropriate S.O.I. for maximum operating temperatures.					
TURBINE EXHAUST GAS (T495)	As measured by a harness of six or nine thermocouples located at the second stage low pressure turbine vanes.					
Takeoff (5 min., see NOTE 16)	905°C	--	930°C	--	--	--
Takeoff Transient (20 sec.)	---	---	---	940°C	--	--
Maximum continuous	870°C	--	895°C	--	--	--
Starting						
Time temperature envelope						
Refer to model's S.O.I.	TP.01.6	TP.01.7	TP.01.10	TP.01.9	--	--
OIL (See NOTE 15)	Refer to the appropriate installation manual and S.O.I.					
Continuous Operation	140°C	160°C	140°C	160°C	--	--
Transient (15 minutes)	155°C	175°C	155°C	165°C	--	--

MODELS	CFM56-2	CFM56-2B	CFM56-2A	CFM56-3	CFM56-3B	CFM56-3C
NOTE 2.	FUEL AND OIL PRESSURE LIMITS					
Fuel limits	Refer to the appropriate installation manual					
Oil limits						
Refer to model's S.O.I.	TP.01.6	TP.01.7	TP.01.10	TP.01.9	--	--
NOTE 3.	ACCESSORY DRIVE PROVISIONS (see also next page)					
STARTER						
Rotation (1)	CW	CW	CW	CCW	--	--
Speed ratio to core	1.343:1	1.343:1	1.343:1	0.996:1	--	--
Maximum torque (in-lbs)						
Continuous	4,150	4,150	4,900	5,400	--	--
Static	10,444	10,444	9,700	13,370	--	--
Maximum overhung moment (in-lbs)	300	300	340	300	--	--
ELECTRICAL						
Rotation (1)	CW	CW	CW	CW	--	--
Speed ratio to core	0.561:1	0.561:1	0.5823:1	0.562:1	--	--
Maximum torque (in-lbs)						
Continuous	(125 kw)	(125 kw)	165 hp	2,500/135 kw	--	--
Static	10,900	10,900	7,000	8,800	--	--
Maximum overhung moment (in-lbs)	2,100	2,100	1,600	2,500	--	--
FORWARD HYDRAULIC PUMP						
Rotation (1)	CCW	---	CW	CW	--	--
Speed ratio to core	0.254:1	---	0.255:1	0.255:1	--	--
Maximum torque (in-lbs)						
Continuous	1,500	---	1,000	1,500	--	--
Static	6,398 (2)	---	4,400	4,400	--	--
Maximum overhung moment (in-lbs)	500	---	400	500	--	--
AFT HYDRAULIC PUMP						
Rotation (1)	CW	CW	---	---	---	---
Speed ratio to core	0.254:1	0.254:1	---	---	---	---
Maximum torque (in-lbs)						
Continuous	1,000	2,390	---	---	---	---
Static	6,398 (2)	6,398	---	---	---	---
Maximum overhung moment (in-lbs)	400	400	---	---	---	---
(1)	Facing Drive Pad CW = CLOCKWISE / CCW = COUNTERCLOCKWISE					
(2)	Total torque for forward and aft hydraulic pump drives must not exceed 6,398 in-pounds static.					

NOTE 4.

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

For the CFM56-2/-3/-3B/-3C, takeoff thrust is nominally independent of ambient temperature (flat rated) up to ambient temperature of Std + 15°C; for the CFM56-2B, Std +17.2°C; and for the CFM56-2A, Std +20°C;

Maximum continuous is nominally independent of ambient temperature (flat rated) to Std +10°C;

Zero customer bleed and horsepower extraction;

No scrubbing drags;

100% inlet recovery; and

Based on CFM International referee separate flow exhaust system.

NOTE 5.

Fan exhaust/reverser system models CFM56-FR02B and CFM56-FR03B are approved for incorporation on CFM56-2 and CFM56-2A engine models, respectively, in accordance with 14 CFR Part 33.

MODELS**NOTE 6.**

Low pressure rotor (N1), rpm
High pressure rotor (N2), rpm

CFM56-2	CFM56-2B	CFM56-2A	CFM56-3	CFM56-3B	CFM56-3C
MAXIMUM PERMISSIBLE ENGINE ROTOR SPEEDS					
5,280 (102%)	--	--	5,490 (106%)	--	--
15,183 (105%)	--	--	--	--	--

NOTE 7.

Maximum permissible air bleed extraction: Refer to the appropriate Installation Manual.

NOTE 8.

Approved fuel conforming to GE Specification D50TF2. MIL-T-5624, Grades JP-4 or JP-5, ASTM D1655, Jet A, A1, and B are consistent with this GE specification.

PRIMARY FUEL

For the CFM56-2/-3/-3B/-3C, the primary fuel is Jet A.

For the CFM56-2A/-2B, the primary fuel is JP4.

AVIATION GASOLINE, MOTOR GASOLINE, EMERGENCY FUELS, AND FUEL ADDITIVES

For the CFM56-2/-3/-3B/-3C use of aviation gasoline is not authorized. Consult appropriate Operating Manual for additive usage.

For the CFM56-2B and -2A use of aviation gasoline and motor gasoline is authorized for periods not to exceed six hours. Consult appropriate Operating Manual for action following use of emergency fuels and for additive usage.

For limitations on use of emergency fuels with the CFM56-2B and -2A, consult the appropriate Installation Manual.

NOTE 9.

Life limits established for critical rotating components are published in each model's Shop Manual.

NOTE 10.

Power setting, power checks and control of engine thrust output in all operations is to be based on CFM engine charts referring to fan speed. Fan speed sensors are included in the engine assembly for this purpose.

NOTE 11.

The type certificate holder, CFM International, S.A., is a company established and jointly owned by Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA) of France and the General Electric Company for the certification, sale, and support of CFM56 series engines. With respect to the benefits of type certification for production, SNECMA and General Electric function as licensees of CFM International, S.A.

This type certificate applies only to engines produced in the United States under Type Certification No. E2GL. Engines of the same model designation produced in France and imported under Type Certificate No. E21EU are identical to and fully interchangeable with engines produced under this type certificate. Similarly, modules, assemblies, or parts produced in France are eligible for use in engines produced under this type certificate, provided an airworthiness approval tag, (EASA Form 1- Authorized Release Certificate or JAA Form 1), issued by SNECMA under authority of the European Aviation Safety Agency (EASA) Production Certificate No. FR.21G.0007 attached to each item or invoice covering a shipment of similar items (reference 14 CFR § 21.502). Engines and parts produced prior to September 28, 2004 were produced by SNECMA under French production certificate P03.

CFM56-2 engines produced by General Electric are identified by the serial number prefix "692"; those produced by SNECMA are identified by the prefix "693".

CFM56-2B engines produced by General Electric are identified by the serial number prefix "710", "712" and "714"; those produced by SNECMA are identified by the prefix "711", "713" and "715".

CFM56-3/-3B/-3C engines produced by General Electric are identified by the serial number prefix "720, 722, 724, 726, 856, 858 and 860"; those produced by SNECMA are identified by the prefix "721, 723, 725, 727, 857, 859 and 861".

CFM56-2A engines produced by General Electric are identified by the serial number prefix "782"; those produced by SNECMA are identified by the prefix "783".

NOTE 12.

A suffix may be added to the basic engine model number on the engine nameplate to identify minor variations in engine configuration, installation components or reduced ratings peculiar to aircraft installation requirements. For example: CFM56-2-xx.

Engines that have a suffix added to the basic model number are identified in CFM International Service Bulletins, and are summarized below:

<u>Engine Model</u>	<u>Service Bulletin No.</u>	<u>Application</u>
CFM56-2-C1/-C5	72-0001 (CFM56-2)	DC8-71/-72/-72F/-73
CFM56-2-C2	72-0001 (CFM56-2)	None
CFM56-2-C3/-C6	72-0001 (CFM56-2)	DC8-72F
CFM56-2A-2/-3	72-0001 (CFM56-2A)	No Commercial Application
CFM56-2B-1	72-0001 (CFM56-2B)	No Commercial Application
CFM56-3-B1	72-0001 (CFM56-3/-3B/-3C)	737-300/-500
CFM56-3B-2	72-0001 (CFM56-3/-3B/-3C)	737-300/-400
CFM56-3C-1	72-0001 (CFM56-3/-3B/-3C)	737-300/-400/-500

NOTE 13.

For the CFM56-3/-3B/-3C models, the throat area of the inlet installed on the engine shall not exceed 2700 sq. in. (1.742 sq. meters) of area.

NOTE 14.

For inflight operation during icing conditions:

For the CFM56-2 series engines, the minimum permissible N1 RPM is 37 percent. However, momentary N1 excursions below 37 percent, not to exceed 60 seconds duration, are permissible for approach and landing operation below 10,000 feet pressure altitude.

For CFM56-2 series engines which are equipped with 43 percent rich pilot fuel nozzles, in accordance with CFM56-2 Service Bulletin Number 73-0047, the minimum permissible N1 RPM for inflight operation is 29 percent.

For CFM56-3/-3B/-3C engines, the minimum permissible N1 RPM for inflight operation during icing conditions is 21.8 percent.

NOTE 15.

The oil temperature for the CFM56-2B, CFM56-3, CFM56-3B, and CFM56-3C is measured at the scavenge pump discharge. The oil temperature for the CFM56-2A and CFM56-2-C series engines is measured at the supply pump discharge.

The transient limit is defined as 15 minutes for all models except for the CFM56-2B. The transient limit is defined as 10 minutes for the CFM56-2B.

The continuous operation and transient oil temperature limits for the CFM56-2-C1, -2-C3, -2-C5, and -2-C6 is 140°C and 155°C respectively. The continuous operation and transient oil temperature limits for the CFM56-2-C2 is 150°C and 155°C respectively. Refer to S.O.I. TP.01.6.

NOTE 16.

The normal 5 minute takeoff rating may be extended to 10 minutes for engine out contingency for the CFM56-3/-3B/-3C.

NOTE 17.

Installation Manuals, Specific Operating Instructions, Service Bulletins, Overhaul and Maintenance Manuals, Repair Manuals, Vendor Manuals, and Design Changes which contain a statement that the document is EASA approved or approved under authority of DOA No. EASA.21J.086 or for approvals made before September 28, 2003 by DGAC are accepted by the FAA and considered FAA approved. Repair data and related instructions are considered FAA approved or accepted as applicable. These approvals pertain to the type design only.

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