MINISTÉRIO DA AERONÁUTICA
DEPARTAMENTO DE PESQUISAS E DESENVOLVIMENTO
CENTRO TÉCNICO AEROESPACIAL

TYPE CERTIFICATE DATA SHEET Nº EM-9701

Type Certificate Holder:

CFE COMPANY
111 South 34th Street
Phoenix, Arizona - AZ 85010
USA

EM-9701
Sheet 01
CFE
CFE738-1-1B
April 1999

Engines of models described herein conforming with this data sheet, which is part of Type Certificate No. 9701, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

MODEL CFE738-1-1B

TYPE Turbofan, Single Stage Fan, Five Stage Axial Compressor, Single Stage Centrifugal Compressor, Annular Combustion Chamber, Two Stage High Pressure Turbine, Three Stage Low Pressure Turbine

RATINGS

(See Note 5)	CFE738-1-1B
Sea Level Static Thrust / ambient temperature – lb / ^{o}C(^{o}F)	
Maximum Takeoff (5 min.) (See Notes 12, 16, & 17)	5 937 / 37°C (100°F)
Normal Takeoff (5 min.) (See Notes 12, 16, & 17)	5 918 / 30°C (86°F)
Maximum Continuous (See Note 12)	5 613 / 30°C (86°F)

CFE738-1-1B

FUEL CONTROL	Fuel control and power management are controlled by a Full Authority Digital Electronic Control (FADEC) computer based system. The hardware and software configurations of this system and the associated engine fuel pump and hydromechanical unit are controlled by an approved engine equipment list for each specific engine model and aircraft application.
FUEL TYPE	Fuel conforming to General Electric Fuel Specification No. D50TF2, or current revision. See CFE738 Engine Installation Manual IM-7550 for specific fuels approved per the subject specifications.
OIL, LUBRICATION	Oil conforming to General Electric Specification No. D50TF1, or Allied Signal oil specification EMS53110, current revision. See CFE738 Engine Installation Manual IM-7550 for specific oils approved per the subject specifications.
TEMPERATURE LIMITS	See Note 2
PRESSURE LIMITS	See Note 3
PRINCIPAL DIMENSIONS	The Principal Dimensions are listed on the approved Installation Drawing for each engine model.
WEIGHT (dry maximum), (kg/lb)	601 / 1325 (See Note 14)
CENTER OF GRAVITY LOCATION, (in)	The Center of Gravity is listed on the approved Installation Drawing for each engine model.
IGNITION SYSTEM	The ignition system is a dual-channel, continuous duty, capacitive discharge unit with independent circuits to each ignitor plug. The authorized ignition system components are controlled by the approved engine equipment list.
IMPORT REQUIREMENTS	Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approval issued by FAA (or a third country authority, in case of used engine imported from such country) attesting that the particular engine and/or parts were submitted to the governmental quality control before delivery and are in conformity with the CTA approved type design. The CTA type design corresponds to the FAA approved type design, as stated in CTA Report V33-0560-0 dated April, 1999 or further revisions

CERTIFICATION BASIS	RBHA 33 (Brazilian Requirements for Aeronautical Certification), which endorses the FAR 33, effective February 1 , 1965, as amended by 33-1 through 33-14, dated August 10, 1990.	Application	Issued TC	
		CFE738-1-1B	27 Nov. 1996	05 Feb. 1997

PRODUCTION BASIS Production Certificate No. 107 issued February 19, 1960, and No. 413 issued March 4, 1965, under license from CFE Company, Phoenix, AZ.

NOTES

NOTE 1 Maximum permissible engine operating speeds for the engine rotors are as follows:

	CFE738-1-1B
Low pressure rotor (N1), rpm	
Maximum Takeoff/Normal Takeoff	9 400
Maximum continuous	9 400
High pressure rotor (N2), rpm	
Maximum Takeoff/Normal Takeoff	28 000
Maximum continuous	27 715

NOTE 2 Maximum permissible temperatures are as follows:

Interturbine temperature (T4.5), °C (°F)	
Maximum Takeoff (5 min.)	890°C (1634°F)
Normal Takeoff (5 min.)	864°C (1587°F)
Maximum Continuous	861°C (1582°F)

NOTE 2 (cont.) Oil inlet temperature, °C(°F)

Continuous operation: 138°C (280°F)
Transient operation (3 min.): 138°C (280°F) - 155°C (311°F)

Fuel inlet temperature
(at engine fuel pump inlet), °C(°F): 57°C (135°F)

NOTE 3 Fuel and Oil Pressure Limits

Fuel Pump Inlet Pressure:
Minimum: 5 psi above true vapor pressure
Maximum: 50 psig

Oil Pressure:

Minimum (idle): 30 psig
Normal Operating Range: 60-85 psig
Transient (3 min): 85-100 psig

NOTE 4 The following accessory drive provisions are incorporated:

Accessory Drive	Pad Type	Speed Ratio [3]	Rotation Facing Pad	Maximum Torque – in.lb Static	Continuous	Overload[2]	Max. Acces. Weight -lb	Overhung Moment Max. lb.in
Alternator (D1)	AS468B-AV1 Mod[1]	0.4418	CC	1 700	218	327	40	200
Alternator (D2)	AS468B-AV1 Mod[1]	0.3666	CC	1 700	263	394	40	200
Sarter (D3)	AS468B-AV1 Mod[1]	0.5868	CC	3 900	1 764[5]	2 712[5]	25	150
Hydraulic Pump (D4)	AS961B-1 Mod[1]	0.3082	CC	600	210	315	10	30
Optional Hydr. Pump (D5)	AS961B-1 Mod[1]	0.3666	CC	1 700	263	394	40	200

NOTE 4 (cont.)
(1) Refer to the application pad definition on the Installation Drawing for detailed information.
(2) 5 minutes per each 4 hour period.
(3) The accessory gearbox is driven from the High Pressure spool.
(4) The engine Installation Manual lists the maximum combined simultaneous horsepower extraction for the alternator and hydraulic pump drives.
(5) Limited to starts.

NOTE 5 Engine ratings are based on calibrated test stand performance under the following conditions:

Static sea level standard conditions of 15°C (59°F) and 29.92 inches Hg.
No aircraft accessory loads or air extraction.
No anti-icing; no inlet distortion; no inlet screen losses; and 100% ram recovery.
Inlet and exhaust system as defined in the engine Installation Manual IM-7550.
Specified fuel having an average lower heating value of 18 400 BTU/lb; specified lube oil.

NOTE 6 Maximum Compressor Bleed Air Extraction:

	Percent of Core Airflow
Low Pressure Bleed	8.0
High Pressure Bleed	5.5
Total LP and HP Bleed	12.0

NOTE 7 These engine models meet FAA requirements for operation in icing conditions within the envelope defined in FAR 25, Appendix C when installed and operated in accordance with approved data and instructions.

NOTE 8 The maximum permissible inlet distortion is defined in the Engine Installation Manual IM-7550.

NOTE 9 Life limits, established for critical rotating components, are published in the approved engine Light Maintenance Manual, Report Number 72-06-03, Airworthiness Limitations Section.

NOTE 10 Recommended engine inspection intervals are published in the approved engine Light Maintenance Manual, Report Number 72-06-03.

NOTE 11 The operating temperature limits for specified components and accessories defined in the Engine Installation Manual IM-7550 must be observed when operating the installed engine.

NOTE 12 Sea level static minimum rated thrust varies linearly between ambient temperature points shown below, but is flat rated below 15°C (59°F)

	SLS/15°C (59°F)	SLS/30°C(86°F)	SLS/37°C(100°F)
Maximum Takeoff	5 888	5 918	5 937
Normal Takeoff	5 888	5 918	5 454
Maximum Continous	5 613	5 613	N/A

NOTE 13 The engine model meets the requirements of FAR Part 34.

NOTE 14 The engine weight includes all components of the basic engine as defined by the approved engine equipment list. Components that are certified as part of the aircraft under FAR Part 25 and other optional equipment which are mounted on the engine are not included in the basic engine weight.

NOTE 15 Engine Installation Manual IM-7550 and Operating Instructions IM-8007 contain additional FAA approved engine data.

NOTE 16 The CFE738-1-1B engine normal takeoff interturbine temperature (T4.5) limit has been established to assure that a fully degraded engine at the normal takeoff rating will achieve the maximum takeoff (APR) rated thrust without exceeding the maximum takeoff T4.5 limit.

NOTE 17 The time limit at the normal takeoff rating is five minutes and shall include any time accumulated above the normal takeoff rating.

NOTE 18 Criteria pertaining to the dispatch and maintenance requirements for engine control systems are specified in CFE Report No. CFE1229(33)-3, which defines the various configurations and maximum operating intervals.

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