



AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL - BRASIL

TYPE CERTIFICATE DATA SHEET Nº EM-2002T05

Type Certificate Holder:

GE Aviation Czech s.r.o.
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(formerly WALTER ENGINES a.s.)

EM-2002T05-01
Sheet 01
GE Aviation Czech s.r.o.
M601D-1

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Engines models described herein conforming with this data sheet, which is part of Type Certificate No.EM-2002T05, 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	M601D-1
TYPE	Turboprop engine, co-axial two shafts with free running turbine, reverse flow of air and combustion gases. It combines two axial and one radial stages of compression driven by one high pressure turbine single stage, annular combustion chamber with a spray ring, accessory drive box comprising fuel and oil devices, dyna-starter and drives for hydraulic pump, electrical alternator and for propeller accessories. Single stage low pressure turbine running the free turbine, two exhaust nozzles and a propeller shaft.
POWER RATINGS (See Note 1 and 2)	M601D-1
Take-off , Sea Level Static, kW (shp).	540 (724)
Maximum continuous, Sea Level Static, kW (shp).	490 (657)

		M601D-1
DIMENSIONS	Length, cm (in)	167.5 (66)
(Exhaust nozzles removed)	Height, cm (in)	65 (25.6)
	Width, cm (in)	59 (23.2)
CENTER OF GRAVITY	On the engine center line, forward of mount Pad plane, cm (in)	8.6 (3.39)
WEIGHT	Dry Powerplant, kg (lb)	193 (425.5) ± 2%
	The weight includes standard equipment delivered with the engine but without exhaust nozzles.	
FUEL AND ADDITIVES	Approved Fuels: See relevant M601D-1 Operating Manual for approved fuels and additives. (see Note 11)	
FUEL CONTROL	Fuel Control Unit	LUN 6 590.03-8
	Fuel Pump	LUN 6 290.03-8
OIL LUBRICATION	Approved oils: See relevant M601D-1 Operating Manual for approved oils.	
OIL CAPACITY	Nominal total system capacity, l (U.S. gal)	10.8 (2.85)
	Nominal oil tank capacity, l (U.S. gal)	5.5 to 7.0 (1.45 to 1.85)
AIR BLEED	Flow rate of 62 g/s can be bleed at TAS of 220 km/h (118.8 knots) at an altitude of 2 000 m (6 562 ft) This flow rate may not be used at Take-off rating due to the increase of the ITT.	
ROTATIONAL SPEED LIMITATIONS	See Note 2	
INTER-TURBINE TEMPERATURE (ITT) LIMITATIONS	See Note 3	
TORQUE LIMITATIONS	See Note 4	
FUEL AND OIL LIMITATIONS	See Note 5 for Pressures and Temperatures; See Note 11 for Additives.	
ACCESSORY DRIVE LIMITATIONS	See Note 6 for Speed Ratio and Torque Requirements.	

AIRWORTHINESS LIMITATIONS See Note 10.

CERTIFICATION BASIS The Certification Basis for the engine are those indicated in the RBHA 33 which endorses the 14 CFR Part 33 effective 01 February 1965, as amended for each engine model through the following amendments :

<u>Model</u>	<u>Amendment</u>	<u>Application date</u>	<u>Type Certification Date</u>
M601D-1	1 through 33-11	22 December 1998	24 May 2002

IMPORT REQUIREMENTS Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approval issued by **EASA** (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 **ANAC** approved Type design.

NOTES:

NOTE 1 Engine ratings:

- a. The engine ratings are based on ISA conditions, sea level, static condition, no installation losses, no air bleed, no external accessory loads. Compressor protective intake screen installed.
- b. Take-off power is flat rated to 22°C (71.6°F) at 101.325 kPa (14.7 psi), Maximum continuous power is flat rated to 15°C (59°F) at 101.325 kPa (14.7 psi).
- c. At Take-off, a short time propeller torque increase up to 106% is permitted.

NOTE 2 Speed Limitation Rotational Ratings:

Max. continuous gas generator speed (%)	99
Max. continuous propeller speed (rpm)	2 080
Take-off gas generator speed (%)	101.5
Take-off propeller speed (rpm)	2 080

(100% gas generator speed equals to 36 660 rpm)

(2 080 propeller speed equals to 31 123 rpm of turbine)

NOTE 3	<u>Inter-Turbine Temperature (ITT) Limitation Ratings:</u>	°C (F)
	Acceleration up to 95% of Take-off power	735 (1 355)
	Max. continuous (5 min)	670 (1 238)
	Max. continuous (sea level)	690 (1 274)
	Take-off (5 min)	700 (1 292)
	Take-off (sea level)	735 (1 355)
	Reverse	710
	Maximum acceptable value if EC of ECU is switched on	710

NOTE 4	Torque Limitation Ratings-	%	N.m (lb-ft)
	Acceleration up to 95% of Take-off power	106	
	Max. continuous torque	100	2 365 (1 744)
	Take-off	100	2 365 (1 744)
	Maximum acceptable value if EC of ECU is switched on	100	

NOTE 5 Fuel and Oil Limitations (pressure & temperature)-

Fuel: The airframe should provide fuel pressure at all specified operation conditions.

Fuel pressure at main fuel filter inlet must be in the range of 0.2 mPa (29 psi abs.) to 0.30 mPa (43.51 psi abs.)

Fuel temperature at the fuel pump inlet must be in the range of -50°C (-58°F) to + 60°C (140°F).

Oil: Pressure at the gas generator speed of 80% to 101.5% is min. 0.18 mPa (26.11 psi) to max. 0.27 mPa (39.2 psi).

Pressure gauge at the gas generator speed below 60 % is min. 0.12 mPa (17.4 psi).

Pressure gauge at oil temperature below 0°C (32°F) is max. 0.35 mPa (50.76 psi).

Temperature range: min. -20°C (-4°F) to max. +85°C (185°F).

NOTE 6 Accessory Drive Limitations-

On the accessory gearbox (Note : CW – clockwise , CCW–counter clockwise):

Drive	Sense of Rotation	Speed Ratio	Max. Continuous Torque N.m (lb-in)	Max. Overhang N.m (lb-in)
Starter / Generator	CW	0.2998	11.2 (90)	21 (186)
Spare for Hydraulic Pump	CCW	0.1974	5.8 (51)	4 (35.4)
Fuel Pump	CW	0.1196	4.5 (40)	-
Fuel Control Unit	CCW	0.1223	1.1 (10)	-
Integrated Gas Generator Speed Transmitter	CW	0.1145	0.5 (4.5)	4 (35.4)
Manual Turning By	CCW	0.1145	11.5 (102)	4 (35.4)

On the reduction gearbox:

Drive	Sense of Rotation	Speed Ratio	Max. Continuous Torque N.m (lb-in)	Max. Overhang N.m (lb-in)
Propeller speed governor	CCW	2.0285	5.7 (50)	7 (62)
Propeller Speed transmitter	CCW	2.0285	0.5 (4.5)	4 (35.4)

NOTE 7 The fuel filter and impending by-pass as well as the oil impending by-pass signalers are parts of the airframe installation, hence, RBHA/14 CFR Part 33.67.b.5.and RBHA/14 CFR Part 33.79.b.6 are complied with by the airframe manufacturer.

NOTE 8 The M601D-1 engine meets the requirements of RBHA/14 CFR Part 33.65 for surge free operation, when the intake system conforms with the approved design PN B 062350.

NOTE 9 The M601E-11 engine meets the requirements of RBHA/14 CFR Part 33.77 for bird ingestion when the intake system conforms with the approved design PN B 062350.

- NOTE 10** Life limits for critical rotating components are published in the M601D-1 Maintenance Manual, PN 0982309.
- NOTE 11** Additives for improving anti-corrosion and lubricating properties, additives for bonding free water in the fuel shall be used within the manufacturer's instructions and relevant specifications and/or with supplementary requirements of authorities.
- NOTE 12** Installation, Overhaul, Operating, Service Bulletins, Structural Repair, Vendor and Aircraft Flight Manuals which contain a statement that the document is approved by **EASA** are accepted by the **ANAC** and are **ANAC** approved unless otherwise noted. These approvals pertain to the Type Design only.

**HÉLIO TARQUÍNIO JÚNIOR****Gerente-Geral Substituto, Certificação de Produto Aeronáutico
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