



AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL - BRASIL

TYPE CERTIFICATE DATA SHEET Nº EM-9403

Type Certificate Holder:

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

EM-9403-03
Sheet 01
GE Aviation Czech s.r.o.
M601E, M601E-11,
M601E-21
07 November 2008

Engines models described herein conforming with this data sheet, which is part of Type Certificate No. 9403, 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.

MODELS M601E, M601E-11, M601E-21.

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. See Note 9 for design differences.

RATINGS (See Note 1)	M601E	M601E-11	M601E-21
Takeoff power with water injection, kW (hp).	560 (751)	--	--
Takeoff power, kW (hp).	560 (751)	--	--
Maximum continuous power, kW (hp).	560 (751)	490 (657)	560 (751)

Legend: "--" Same as preeding

		M601E	M601E-11	M601E-21
DIMENSIONS (Exhaust nozzles removed)	Length, cm (in)	167.5 (65.95)	--	--
	Height, cm (in)	65.0 (25.59)	--	--
	Width , cm (in)	59.0 (23.23)	--	--
CENTER OF GRAVITY	On the engine center line, forward of mount Pad plane, cm (in)	8.6 (3.39)	--	--
WEIGHT	Dry Powerplant, kg (lb)	203 (447.6) ± 2%	--	--
	The weight includes standard equipment delivered with the engine but without exhaust nozzles and alternator gearbox.			
FUEL	Approved Fuels: See relevant Operating Manual PN 0982406 for approved fuels.			
FUEL CONTROL	Fuel Control Unit	LUN 6 590.05-8	--	--
	Fuel Pump	LUN 6 290.04-8	--	--
OIL LUBRICATION	Approved oils: See relevant Operating Manual PN 0982406 for approved oils.			
OIL CAPACITY	Nominal total system capacity, liters (US pints)	10.8 (56.5) min.	--	--
	Nominal oil tank capacity, liters (US pints)	5.5 (2.6) to max. 7.0 (3.3)	--	--
AIR BLEED	Flow rate of 62 g/s can be bleed at max. continuous rating at TAS of 400 km/h (249 miles/h) at altitude of 4 200 m (13 780 ft). This flow rate may not be used at Takeoff rating.			
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.

ACCESSORY DRIVE LIMITATIONS

See Note 6 for Speed Ratio and Torque requirements.

COOLANT (water injection)

See Operation Manual PN 0982406 for approved fluids.

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.

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 Certificate Date</u>
M601E	1 through 33-11	02 June 1993	28 March 1994
M601E-21	1 through 33-12	15 June 2001	13 September 2001
M601E-11	1 through 33-12	09 October 2001	19 April 2002

NOTES :**NOTE 1**

- 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.
- For the M601E, the takeoff power is flat rated to 23°C (73.4°F) at 101.325 kPa (14.7 psi), maximum continuous power is flat rated to 18°C (64.4°F) at 101.325 kPa (14.7 psi).
- For the M601E-11, the take-off power is flat rated to 23°C (73.4°F) at 101.325 kPa (14.7 psi), the take-off power with water injection is flat rated to 33°C at 97.325 kPa; Maximum continuous power is flat rated to 18°C (64.4°F) at 101.325 kPa (14.7 psi).
- For the M601E-21, the take-off power is flat rated to 28°C (82.4°F) at 101.325 kPa (14.7 psi), maximum continuous power is flat rated to 21°C (69.8°F) at 101.325 kPa (14.7 psi).

NOTE 2

SPEED LIMITATIONS ROTATIONAL RATING (100% gas generator speed equals to 36 660 rpm)	M601E	M601E-11	M601E-21
Maximum continuous gas generator speed (%). Maximum continuous propeller speed (rpm).	100.5 2 080	97 2080	100.5 2 080
Takeoff gas generator speed (%). Takeoff propeller speed (rpm).	100 2 080	-- --	-- --
Takeoff gas generator speed (%) with water injection. Takeoff propeller speed (rpm) with water injection.	100 2 080	-- --	-- --
Maximum takeoff Gas generator speed (%) Propeller speed	102 2080	-- --	-- --

NOTE 3

INTER-TURBINE (ITT) TEMPERATURE LIMITATIONS RATING	M601E	M601E-11	M601E-21
Max. continuous ITT , °C (F)	760 (1401)	690 (1272)	760 (1401)
Takeoff , °C (F)	735 (1 355)	--	--
Takeoff with water injection °C (F)	735 (1 355)	--	--
Maximum takeoff °C (F)	780 (1437)	--	--

NOTE 4

TORQUE LIMITATIONS RATINGS (For max. permitted overshoots refer to Operation Manual)	M601E	M601E-11	M601E-21
Maximum continuous torque, N.m (ft-lb)	2 570 (1 896)	--	--
Takeoff, N.m (ft-lb)	2 737 (2 018)	--	--
Takeoff with water injection, N.m (ft-lb)	2 737 (2 018)	--	--
Maximum takeoff N.m (ft-lb)	3831 (2825)	--	--

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

Fuel: Fuel pressure at the main fuel filter inlet must be in the range of 0.15 mPa (21.76 psi) to 0.30 mPa (43.51 psi).
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 100% is min. 0.18 mPa (26.11 psi) to max. 0.27 mPa (39.16 psi).
Pressure at the gas generator speed below 80 % is min. 0.12 mPa (17.4 psi).
Pressure 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, 100% gas generator speed equals to 36 660 rpm; Note : CW – clockwise , CCW–counter clockwise

Drive	Sense of rotation	Speed ratio	Max. continuous torque, N.m (ft-lb)	Max. overhang, N.m (ft-lb)
Starter/Generator	CW	0.2899	11.2 (8.27)	21 (15.49)
Spare for Hydraulic Pump	CCW	0.1974	5.8 (4.28)	21 (15.49)
Spare for Alternator	CCW	0.1145	11.5 (8.49)	33 (24.34)
Speed Transmitter	CW	0.1145	0.5 (0.37)	4 (2.9)
Propeller governor	CCW	2.028	5.7 (4.2)	7 (5.2)
Speed transmitter	CCW	2.028	0.5 (0.37)	4 (2.9)

On the reduction gearbox, 100% propeller speed equals to 2 080 rpm.

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 From the M601E and M601E-21 models installed on the LET L410 UVP-E airplane, also the following ratings were approved:

Ratings (JAR E-40)	Power kW (hp)	Limitations			
		Max. gas generator speed (%)	Max. propeller speed (rpm)	Max. ITT °C (°F)	Max. torque N.m (ft-lb)
Intermediate contingency	560 (751)	100	2080	760 (1 400)	2 570 (22 746)
Maximum ontgency	560 (751)	102	2080	760 (1 400)	2 737 (24 224)

NOTE 9 Design differences between engine projects:

M601E-11 is similar to M601E.

Additional differences:

M601E-11

M601E

Fuel is drained form combustion chamber back to engine.

Fuel is drained from combustion chamber under the engine.

Signaler of oil filter impending by-pass LUN 1493-08

Signaler of oil filter impending by-pass not used.

Fuel filter LUN 7691-8 with signaler of impending by-pass LUN 1493-8

Fuel filter part of airframe (without signaler of impending by-pass).

M601E-21 is similar to M601E, fitted with exhaust duct with lower pressure loss.

NOTE 10 The M601E-11 engine meets the requirements of 14 CFR Part 33.68 for operation in icing conditions as defined in FAR 25, Appendix C, when the intake system conforms with the approved design PN B 062350.

NOTE 11 The M601E-11 engine meets the requirements of 14 CFR Part 33.65 for surge free operation, when the intake system conforms with the approved design PN B 062350.

- NOTE 12** The M601E-11 engine meets the requirements of 14 CFR Part 33.77 for bird ingestion when the intake system conforms with the approved design PN B 062350.
- NOTE 13** Life limits for critical rotating components are published in the M610E-11 Maintenance Manual, PN 0982302.
- NOTE 14** Power may be restored in hot day conditions by means of water injection when accomplished in accordance with the requirements of the Installation Manual and the Operating Manual.
- NOTE 15** 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 16** 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.



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