



TYPE CERTIFICATE DATA SHEET Nº EA-2015T09

Type Certificate Holder:

GULFSTREAM AEROSPACE CORPORATION (GAC)
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USA

EA-2015T09-00
Sheet 01

**GULFSTREAM GVI
(G650 & G650ER)**

20 August 2015

This data sheet, which is part of Brazilian Type Certificate No. 2015T09, prescribes conditions and limitations under which the product, for which the Type Certificate was issued, meets the airworthiness requirements of the Brazilian Aeronautical Regulations.

I - Model Gulfstream GVI (Transport Category Airplane), approved 20 August 2015.

ENGINE:	2 Rolls-Royce Deutschland Ltd & Co KG (Turbofan) Engines BR700-725A1-12 per ANAC Type certificate EM		
FUEL	Fuels conforming to Specifications listed below. See AFM for additional Information		
	KEROSENE TYPE (AVTUR, JP8) NATO CODE F34/F35		
	AMERICAN	BRITISH	CANADIAN
	ASTM D1655, Jet A ASTM D1655, Jet A-1 MIL-T-83133, JP-8 MIL-DTL-83133, JP-8	DEF STAN 91-87 DEF STAN 91-91	CAN/CGSB-3.23
	FRENCH	CIS	CHINESE
	DCSEA 134/A	TS-1 & RT (GOST 10227, AM 1 GSTU 320.001149943.007-97 (RT Type) GSTU 320.001149943.011-99 (TS-1 Type)	GB 6537-2006 including the fuel additives limited to the concentrations stated in Annex A of GB 6537-2006 (see Chinese Fuel Additives note below)

NOTE: APPROVED CHINESE FUEL ADDITIVES

1. Static Dissipater additive: Stadis 450
2. Antioxidant: 2,6-ditertiary-butyl-4-methyl-phenol
3. Icing Inhibitor: Ethylene Glycol Monomethyl Ether or Diethylene Glycol Monomethyl Ether
4. Metal Deactivator: N,N'-disalicylidene 1,2-propanediamine

The following Chinese fuel additives are not approved for use on this Gulfstream aircraft model: Static Dissipater additive T 1502 and antifriction additives T1601 or T1602

ENGINE LIMITS

Static Thrust at Sea Level, kN/lbs.

- Maximum continuous 66.6/ 14,975
- Maximum Takeoff 75.2/ 16,900 up to 31.7°C
- Normal Takeoff up to 31.7°C

Maximum Continuous Permissible Engine Operating Speeds for the Engine Rotors, % RPM (RPM)

- Low pressure rotor (N1) 102.8% (9,800)
- High pressure rotor (N2) 98.7% (27,530)

Maximum Interstage Turbine Temperature (ITT), °C

- Maximum Continuous 885 °C
- Take-Off (5 minutes) 900 °C
- During starting Varies with N2
(See AFM)

Oil Temperature, °C

- Maximum Continuous 5 °C to 160 °C
- Take-Off 160 °C
- During starting (minimum) - 40 °C

Oil Pressure (PSI)

- Pressure limits Varies with N2
(See AFM)

APU

Honeywell – Model RE220[GVI]

See the approved Airplane Flight Manual for APU ratings.

APU LIMITS

Refer to ANAC approved Airplane Flight Manual (AFM)

No. GAC-AC-G650-OPS-0001 (for G650) & No. GAC-AC-G650ER-OPS-0001
(for G650ER)**OIL**

Conforming to Honeywell International Inc. Specification EMS53110, Type II.

**PROPELLER AND
PROPELLER LIMITS**

N/A

AIRSPPEED LIMITS (CAS)

- | | |
|--|----------------|
| Vmo (Max. Operating) S.L. to 10,000 ft | 300 kias |
| Vmo between 10,000 & 20,000 ft | 300 - 330 KIAS |
| Vmo between 20,000 & 28,000 ft | 340 KIAS |
| Maximum operating (M _{MO}): | 0.925 |
| Maneuvering (V _A): | |
| Below 20,000 ft | 215 - 225 KIAS |
| Between 20,000 ft to 35,000 ft | 225 - 264 KIAS |
| Between 35,000 ft to 39,200 ft | 264 KIAS |
| Between 39,200 ft to 45,000 ft | M0.85 |

Flaps extended (V_{FE})

- 39° (landing): 180 KIAS
- 20° (takeoff and approach): 220 KIAS
- 10° (takeoff): 250 KIAS
- Minimum control speed - Air (V_{MCA}): 97 KIAS
- Minimum control speed - Ground (V_{MCG}): 95 KIAS
- Minimum control speed - Landing (V_{MCL}): 95 KIAS
- L. G. operation - extend (V_{Lo}): 195 KIAS
- L. G. operation - retract (V_{Lo}): 195 KIAS

**AIRSPEED LIMITS (CAS)
CONT.**

L. G. extended (V_{LE}):	195 KIAS
Main landing gear tire ground speed limit	195 KTS
Nose landing gear tire ground speed limit	182 KTS

**CG RANGE
(Landing gear extended)**

Refer to ANAC approved GVI (G650 & G650ER) Airplane Flight Manual (AFM)
No. GAC-AC-G650-OPS-0001 & No. GAC-AC-G650ER-OPS-0001

**CG RANGE
(Zero Fuel Weight)**

<u>Gross Weight</u>	<u>Forward Limit</u>	<u>Aft Limit</u>
27,467 kg	30.50 % MAC	45.60 % MAC
27,240 kg	30.00 % MAC	45.60 % MAC
27,013 kg	30.00 % MAC	45.40 % MAC

DATUM

The 0 datum is located 2.540 meters (100 inches) forward of the tip of radome for weight and balance.

LEVELING MEANS

Longitudinally: Lugs at left nose wheel well door longeron STA 163.0 & 174.0.

Laterally: Lugs on rear face of bulkhead STA 148.5 in nose wheel well.

**MEAN AERODYNAMIC
CHORD**

475.59 meters (187.24 in.) (L.E. of M.A.C. = Fuselage Section 624.56).

MAXIMUM WEIGHT

Configuration	Takeoff:	Zero Fuel:	Ramp:	Landing:
TC				
Configuration	99,600	60,500	100,000	83,500
ASC 014	103,600	60,500	104,000	83,500
ASC 026	74,900	60,500	74,900	74,900
ASC 027	90,000	60,500	90,000	83,500
ASC 028	95,000	60,500	95,000	83,500
ASC 030	99,600	60,000	100,000	83,500
ASC 046	99,600	59,500	100,000	83,500

MINIMUM CREW

Two (Pilot and Copilot)

MAXIMUM PASSENGERS

19 as limited by exit door arrangement (See Note 1)

MAXIMUM BAGGAGE

898 kg

FUEL CAPACITY

Total Usable Fuel All Tanks: 6622.5 kg (density: 0.8028 kg/liter)

	LH WING TANK	LH FEED TANK	CENTER TANK	AFT TANK	FWD TANK	RH FEED TANK	RH WING TANK
Tank Capacity (kg)	1985	245	976	513.4	734	245	1985
Tank Usable Fuel (kg)	1968	240	971	512.5	730	240	1968
Arm, (meters)	11.20	11.15	10.05	13.75	8.20	11.15	11.20
Unusable Fuel (kg)	17	5	6	0.9	4	5	17
Arm, (meters)	11.20	11.15	10.05	13.75	8.20	11.15	11.20

Fuel System kilograms Unusable:

- Drainable from tanks drain and lines 40.7
- Undrainable (trapped in tanks and lines) 13.4

OIL CAPACITYUsable (kg / lbs.): 8.7 / 19.2 for both engines combined.
Density: 0.975 / 8.14 (kg / liter / lbs/U.S. gallon)**HYDRAULIC FLUID CAPACITY**

32 Liters (nominal) total for both left and right hydraulic systems combined.

WING ANTI-ICE FLUID

N/A

MAXIMUM OPERATING ALTITUDE

51,000 ft

TEMPERATURE OPERATING LIMITS

Maximum: 50°C (at Sea Level)

Minimum: -54°C (at Sea Level)

**CONTROL SURFACE
MOVEMENTS**

Elevator:	Up 27.5° ±0.5°	Down 20° ±0.5°
Stabilizer trim:	Up 12.5° ±0.3°	Down 2.5° ±0.3°
Rudder:	Right 30° ±1.5°	Left 30° ±1.5°
Rudder trim:	Right 9° ±1.1°	Left 9° ±1.1°
Aileron:	Up 15° ± 0.25°	Down 15° ± 0.25°
Aileron trim tab:	Up 15° ± 1°	Down 15° ± 1°
Aileron gear tab:	Up 15° ± 1°	Down 15° ± 1°
Wing flaps:	Down 0 to 39° ± 1°	
Roll Spoiler	Up 45° ±1.65°	
Ground brake	Up 55° ±1.7°	

SERIAL NUMBER ELIGIBLE

2001 and subsequent. A Certificate of Airworthiness for Export endorsed as noted under "Import Requirements" must be submitted for each individual aircraft for which application for a Brazilian Certificate of Airworthiness is made.

IMPORT ELIGIBILITY

A Brazilian Certificate of Airworthiness may be issued on the basis of on an Civil Aviation Authority of Israel or United States FAA Export Certificate of Airworthiness (or a third country Export Certificate of Airworthiness, in case of used aircraft imported from such country), subject to Notes 1 and 3 below, and including the following statement:

"The aircraft covered by this certificate has been inspected, tested and found to be in conformity with the Brazilian approved type design as defined by the Brazilian Type Certificate no. 2015T09 and in condition of safe operation".

The ANAC Report H.10-2475-00, dated 20/Aug/20215 or further revisions, contains the Brazilian requirements for the acceptance of these airplanes. (See note 4)

CERTIFICATION BASIS

Brazilian Type Certificate No. 2015T09 issued on 20 August 2015 based on the RBAC 25 "REQUISITOS DE AERONAVEGABILIDADE: AVIÕES CATEGORIA TRANSPORTE", which endorses:

- 14 CFR Part 25, effective February 1, 1965, including Amendments 25-1 through 25-120 and Amendment 25-122 for §25.1317 and Section L 25.1.
- 14 CFR Part 36, effective February 3, 2006, including Amendments 36-1 through 36-28.
- 14 CFR Part 34, effective June 29, 2009 including Amendment 34-1 through 34 - 4.

Special Conditions:

- a) HIRF; Maintenance of Lightning and HIRF Protection
- b) § 25.773(b) Windshield Precipitation Removal by Hydrophobic Coatings
- c) Go-Around Performance Credit for Use of Automatic Power Reserve (ATTCS)
- d) Engine Torque Loads for Sudden Engine Stoppage
- e) Design Roll Maneuver
- f) Operation Without Normal Electrical Power
- g) Interaction of Systems and Structures
- h) Use of Magnesium Alloys for Pedals
- i) Aircraft System Security for the Aircraft Control Domain and Airline Information Services Domain from External Internet and Operator Network Access and Electronic Transmission of Field-Loadable Software Applications and Databases
- j) Aircraft System Isolation or Security Protection of Aircraft

**CERTIFICATION BASIS
CONT.**Control Domain and Airline Information Services Domain
from the Passenger Information Services Domain

Equivalent levels of safety findings:

- a) § 25.812 Emergency Exit Marking and Emergency Lighting floor surfaces and emergency egress assist means
- b) § 25.831(g) Cabin Time-Temperature-Humidity conditions following improbable ECS failure
- c) § 25.331(c) Checked Pitch Maneuver
- d) Aircraft Pressurization Outflow and Safety Valves
- e) §25.341, 25.343, 25.345, 25.371, 25.373 and 25.391 Design gust Criteria and Continuous turbulence
- f) Emergency Landing/Gear Breakaway
- g) § 25.391, 25.395, and 25.415 Ground Gust
- h) § 25.1309 Equipment, systems, and installations – GALP elected to comply with ARAC Recommended 25.1309
- i) § 25.671(a-d), § 25.629 Flight Control System
- j) § 25.1203(a) Engine Fire Detection in Tailpipe
- k) § 25.933.Flight Critical Thrust Reverser
- l) § 25.841(b) Cabin Pressurization - High Altitude Airport Take-off and Landing Operations
- m) § 25.901, 25.1305, 25.1321, 25.1549 Digital Display of Engine Rotor Speed N2
- n) External Lights Installation
- o) Position Light System Intensity Exceedances in Overlap Regions
- p) Adoption of Draft Harmonized Rules for APU Certification

Exemptions:

- a) § 25.901(c) Time-limited Exemption - Uncontrollable High Thrust (see Note 6)
- b) § 25.981(a) (3) Lightning Protection Fuel Tanks.
- c) § 25.901(b)(2) and 25.903(d)(2) Time-limited Exemption - engine installation, limitation, operational and indication requirements for the Gulfstream G280, during certain Wing Anti-Ice System (WAI System) operations (see Note 7).

Compliance with the following optional requirements has been established:

Section 25.801 Ditching
Section 25.1411(d),(e),(f),(g) Safety Equipment – General
Section 25.1415(a)(b)(c)(d) Ditching Equipment
Section 25.1419 Ice Protection

Noise requirements:

14 CFR part 36, effective December 1, 1969 including amendments 36-1 through 36-28 effective February 3, 2006

Emission requirements:

14 CFR part 34, as amended by Amendments 34-1 through 34-4, effective June 29, 2009

- REQUIRED EQUIPMENT** The basic required equipment, as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the airplane. Refer to Master Equipment List Report No. 30P000/110634 rev A or latest FAA approved revision
- AIRPLANE FLIGHT MANUAL** ANAC approved Brazilian Airplane Flight Manual no. GAC-AC G650-OPS-001 (for G650) & GAC-AC G650ER-OPS-001 (for G650ER)

DATA PERTINENT TO ALL MODELS:

NOTES:

- NOTE 1** The type design defined by GAC drawings 60P0000000-001 Revision Y "GVI Aircraft Level Configuration Control Document" and report GVI-GER-6855, Revision C "GVI Interior Certification Requirements Document" includes approved seating for pilot and copilot only. Modifications intended to expand occupancy provisions to other than pilot and copilot seating approved under the TC must be approved. Certification guidance for interior installations is provided in GAC report GVI-GER-6855, Revision C, or higher.

In addition to occupancy considerations noted above, compliance to 14 CFR 25.809(a) was found:

- (a) for the over wing exit by using both the window in the exit and the window immediately forward of the exit. It isn't possible to view the likely area of evacuee ground contact from the over wing exit window therefore the window immediately forward of the exit was used for this purpose. No items may be installed between the over wing exit and the window immediately forward of the over wing exit that would prevent viewing of the conditions outside the exit when the exit is closed.
- (b) for the Main Entry Door (MED) exit by using the left hand (LH) forward-most cabin window which is immediately aft of and adjacent to the MED. No items may be installed that could cause an obstruction of this window, unless alternative viewing means are approved.

- NOTE 2** Weight ad balance
Current weight and balance report including list of equipment included in certificated empty weight and loading instructions must be provided for each aircraft at the time of original certification.

- NOTE 3** Markings and placards.
All eligible aircraft shall comply with the placards requirements established in section 21.41-I of the Regulamentos Brasileiros da Aviação Civil (RBAC).

- NOTE 4** Continuing Airworthiness.
Maintenance Program, including Service Life Limits and Required Maintenance, Inspections, and Reporting:
Chapter 5-10-10 of the Gulfstream G650 & G650ER Maintenance Manuals basic issue, dated August 15, 2014 contains the Airworthiness Limitations Section required by 14 CFR part 25 appendix H25.4. Later revisions to the Chapter 5-10-10 must be approved by the Federal Aviation Administration of USA prior to incorporation into the maintenance program of airplanes operated under the type certificate. The Chapter 5-10-10 includes the following components:
- Life limited components
 - The mandatory systems certification maintenance requirements, raised from the safety analysis
 - The fuel tank system airworthiness limitations
 - The fuel tank system critical design configuration control limitations (CDCCLs)

- NOTE 5** The differences of the Brazilian airplanes in relation to the basic FAA type design are summarized below:
1. The Brazilian Airplane Flight Manual No. GAC-AC-G650-OPS-0001 (for G650) & No. GAC-AC-G650ER-OPS-0001 (for G650ER).
 2. Airplane Flight Manual Supplement No. ANAC-G650-2015-01 or Airplane Flight Manual Supplement No. ANAC-G650ER-2015-01.
 3. ANAC approved AFM Supplements Index for Airplane Registered in Brazil.
 4. Markings and placards in accordance with section 21.41-I of the Regulamentos Brasileiros da Aviação Civil (RBAC).
- NOTE 6** With regards to the activities outlined in the FAA IP P-5 regarding the § 25.901(c) Time limited Exemption - Uncontrollable High Thrust GAC has completed the activities as outlined in the requirements of the stated issue paper and this exemption is closed.
- NOTE 7** In accordance with the FAA decision contained in Time-limited Exemption IP P-14:
- NOTE 8** The following FAA Supplemental Type Certificates (STC's) owned by Gulfstream Aerospace Corp., applicable to the Gulfstream G650 model were validated by ANAC without corresponding Brazilian CST document issuance and may be incorporated on Brazilian registered aircraft, provided the modification does not affect compliance with the Brazilian acceptance requirements (see paragraph import eligibility)":

STC NUMBER	DESCRIPTION OF TYPE DESIGN CHANGE	AIRPLANE FLIGHT MANUAL SUPPLEMENT (AFMS)
ST04252AT-D	Installation of an Airplane Interior in accordance with Gulfstream Index List GDL100000001, Rev. CP, dated 09 July 2015, or later approved revision.	Doc N° GC61468M001, Rev. E, dated 18 June 2014, or later FAA approved revision.
ST04253AT-D	Installation of a Honeywell AIS-2000 Satellite TV System in accordance with Gulfstream Index List GDL100000003, Rev. B, dated 29 Jan. 2013, or later approved revision.	Doc N° GC61507M001, Rev. A, dated 14 Dec. 2012, or later FAA approved revision.
ST04254AT-D	Installation of a Broadband Multi-Link (BBML) System in accordance with Gulfstream Index List GDL100000004, Rev. G, dated 25 Mar. 2015, or later approved revision.	Doc N° GC61303M001, Rev. -, dated 16 Jan. 2013, or later FAA approved revision.



MÁRIO IGAWA

**Gerente-Geral de Certificação de Produto Aeronáutico
(Manager, Aeronautical Product Certification)**