



AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL - BRASIL

TYPE CERTIFICATE DATA SHEET Nº EA-2010T08

Type Certificate Holder:

PIAGGIO AERO INDUSTRIES SpA
Viale Castro Pretorio,116
00185 Roma
ITALY

EA-2010T08
Sheet 01

PIAGGIO
P180

05 November 2010

This data sheet, which is part of Type Certificate No. 2010T-08, 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 P180 (Normal Category), approved 05 November2010.

ENGINE 2 Pratt & Whitney of Canada PT6A-66 turboprop
(CHT 9410)

For airplanes incorporating the Mod. n. 80-0657 or SB 80-0231:

2 Pratt & Whitney of Canada PT6A-66B turboprop
(CHT 9410)

ENGINES LIMITS

Operating Conditions	Shaft (shp.)	N1 Gas Generator Speed (%)	Torque ft-lbs (kgm)	Prop. Shaft speed (r.p.m.)	Maximum Permissible Interstage Temperature(°C)
Takeoff Max. Continuous Max. Climb Max. Cruise	850	104.1	2230 (308,3)	2000	830
Normal Climb Normal Cruise	850	104.1	2230 (308,3)	2000	820
Starting Limits (5 sec.)	–	–	–	–	1000
Transient (20 sec.)	–	104.1	2750 (380,2)	2205	870

Oil Temperature

- Starting: - 40°C (min.)
- Minimum Idle: - 40°C to 110°C
- Transient: 0°C to 110°C
- Max. continuous and max. reverse: 0°C to 110°C

Note: The above mentioned engine limits are applicable to both engine models: PT6A-66 and PT6A-66B

FUEL Refer to the latest revision of Pratt & Whitney Service Bulletin No. 14004 (including JET A, JET A-1, JET B, JP4 e JP8).
Fuel Anti-Ice Additive compliant with Specification MIL-I-27686 must be used

OIL Mobile Jet Oil II, AeroShell Turbine Oil 500 and Castrol 5000.
Refer also to the Limitations Section of the Pilot's Operating Handbook and Airplane Flight Manual (latest revision).

PROPELLER AND PROPELLER LIMITS

No	2
Right:	Hartzell HC-E5N-3L or HC-E5N-3AL (hub) / LE8218 (each blade) (TCDS EH-2009T05)
Left:	Left: HC-E5N-3 or HC-E5N-3A (hub) / HE8218 (each blade) (TCDS EH-2009T05)

Number of blades: 5

Diameter: 2159 mm (85 in.) Nominal, 2146 mm (84.5 in.) minimum-no further reduction allowed.

Nominal feather pitch angle at 0,761 m (30 in.) station $89^{\circ} \pm 0,5^{\circ}$

Nominal reverse pitch angle at 0,761 m (30 in.) station $-13^{\circ} \pm 0,5^{\circ}$

Minimum on ground: $14^{\circ} \pm 0,5^{\circ}$

Minimum in flight: $18^{\circ} \pm 0,5^{\circ}$

Stabilized ground operation below 900 rpm is prohibited, except when feathered operation at or below 600 rpm.

Stabilized ground operation between 1300 and 1600 rpm is prohibited

Sense of Rotation

Right propeller rotates Clockwise in view of flight direction

Left propeller rotates Counterclockwise in view of flight direction

AIRSPEED LIMITS (CAS)

(from S/N 1004 to S/N 1025)

	KIAS	KCAS
Vmo (maximum operating)	260	258
Mmo (maximum operating Mach No.)	.67	.665
Va (maneuvering at 10810 lbs.)	195	194
Vfe (max. flap extended, t.o. conf.)	175	174
Vfe (max. flap extended, Ind. conf.)	165	163
Vfo (max. flap operating, t.o. conf.)	170	169
Vfo (max. flap operating, Ind. conf.)	150	149
Vlo (max. landing gear operating)	175	174
Vle (max. landing gear extended)	185	184
Vllo/Vlle (maximum landing light operating/extended)		
Vmc (min. control, prop. feathered)	160	159
	100	99
Vmc (min. control, prop. windmill)	128	127

(from S/N 1026 to subsequent and from S/N 1004 to S/N 1025 modified with S.B. 80-0023)

Vmo (maximum operating)	260	258
Mmo (maximum operating Mach No.)	.67	.665
Va (maneuvering at 11550 lbs.)	199	198
Vfe (max. flap extended, t.o. conf.)	180	179
Vfe (max. flap extended, Ind. conf.)	175	173
Vfo (max. flap operating, t.o. conf.) Vfo (max. flap operating, Ind. conf.)	170	169
	150	149
Vlo (max. landing gear operating)	180	179
Vle (max. landing gear extended)	185	184
Vllo/Vlle (maximum landing light operating/extended)		
Vmc (min. control, prop. feathered)	160	159
	100	99
Vmc (min. control, prop. windmill)	128	127

AIRSPEED LIMITS (CAS) (continued)

(from S/N 1004 to subsequent modified with S.B. 80-0215 or with Mod 80-0642 installed)

	KIAS	KCAS
Vmo (maximum operating)	260	258
Mmo (maximum operating Mach No.)	.67	.665
Va (maneuvering at 12100 lbs)	202	201
Vfe (max. flap extended, t.o. conf.)	183	182
Vfe (max. flap extended, lnd conf.)	177	176
Vfo (max. flap operating, t.o. conf.)	170	169
Vfo (max. flap operating, lnd. conf.)	150	149
Vlo (max. landing gear operating) Vle (max. landing gear extended)	181 185	180 184
Vllo/Vlle (maximum landing light operating/extended)	160	159
Vmc (min. control, prop. feathered)	100	99
Vmc (min. control, prop. windmill)	128	127

(*) From S/N 1063 to subsequent and from S/N 1034 to S/N 1062 modified with S.B. 80-0159
Mmo (maximum operating Mach No) .70 .694

CG RANGE**(Landing Gear Extended)** (from S/N 1004 to S/N 1025)

FS 5,189 m (204.3") to FS 5,435 m (214.0")	at 4903 kg (10,810 lbs)
FS 4,958 m (195.2") to FS 5,435 m (214.0")	at 3967 kg (8,745 lbs)
FS 4,927 m (194.0") to FS 5,410 m (213.0")	at 3856 kg (8,500 lbs)
FS 4,927 m (194.0") to FS 5,328 m (209.8")	at 3493 kg (7,700 lbs) or less
Straight line variation between limits given.	

(from S/N 1026 to subsequent and from S/N 1004 to S/N 1025 modified with S.B. 80-0023)

FS 5,273 m (207.6") to FS 5,435 m (214.0")	at 5239 kg (11,550 lbs)
FS 4,958 m (195.2") to FS 5,435 m (214.0")	at 3967 kg (8,745 lbs)
FS 4,927 m (194.0") to FS 5,410 m (213.0")	at 3856 kg (8,500 lbs)
FS 4,927 m (194.0") to FS 5,328 m (209.8")	at 3493 kg (7,700 lbs) or less
Straight line variation between limits given.	

Airplanes modified with Mod. 80-0642 or SB-80-0215:

FS 5,340 m (210.25") to FS 5,435 m (214.0")	at 5511 kg (12,100 lbs)
FS 4,958 m (195.2") to FS 5,435 m (214.0")	at 3967 kg (8,745 lbs)
FS 4,927 m (194.0") to FS 5,410 m (213.0")	at 3856 kg (8,500 lbs)
FS 4,927 m (194.0") to FS 5,328 m (209.8")	at 3493 kg (7,700 lbs) or less
Straight line variation between limits given.	

EMPTY WEIGHT C.G RANGE

None

DATUM

6,000 m (236.22 inches) forward of the rear pressure bulkhead centerline (at the intersection between the forward pressure bulkhead and cockpit floor centerline).

LEVELING MEANS

Three leveling marks are provided to level the airplane: one is located on the forward mast of cabin door, the other two are located each side to the fuselage, close to the rearmost baggage compartment frame. The airplane may be leveled either on jacks or on wheels using the communicating vessel system and deflecting the tires or the shock absorbers. Normally the airplane is leveled first laterally then longitudinally. Some aircraft may have longitudinal level marks on the external power receptacle housing, and lateral level marks on the external power receptacle housing and on the ground test refueling panel housing

MEAN AERODYNAMIC CHORD (MAC)

1,270 m (50")

MAXIMUM WEIGHT

(*) - Taxi and ramp	5262 kg	(11600 lbs)
(*) - Take-off	5239 kg	(11550 lbs)
(*) - Landing	4965 kg	(10945 lbs)
- Zero Fuel	4309 kg	(9500 lbs) at forward C.G. limit
	4218 kg	(9300 lbs) at aft C.G. limit
	Straight line variation between limits given	
	4445 kg (9800 lbs) C.G. whereas (S.N. 1016 and up airplanes)	

(*) Airplanes incorporating the opt. MOD. n. 80-0642 or SB 80-215:

- Taxi and ramp	5511 kg	(12150 lbs)
- Take-off	5489 kg	(12100 lbs)
- Landing	5216 kg	(11500 lbs)

MINIMUM CREW

1 (Pilot)

MAXIMUM PASSENGERS

9 Passengers and 2 crew

MAXIMUM BAGGAGE

Baggage/Cargo Compartments maximum weight

	Weight	Station
Cabin compartment:		
on the floor	23 kg (50 lbs)	5,588 m (220")
on the coat rod:	18,1 kg (40 lbs)	5,588 m (220")
Rear Compartment:		
	181,4 kg (400 lbs)	7,569 m (298")

FUEL CAPACITYS/N 1004 to S/N 1035

1500 lt (396.3 U.S. Gals.) at FS 6,304 m (248.2 in)

1486 lt (392.6 U.S. Gals.) Usable

S/N 1004 to S/N1035 with SB-80-0123 installed and from S/N 1036 to subsequent:

1597 lt (421.9 U.S. Gals.) at FS 6,304 m (248.2 in)

1583 lt (418.2 U.S. Gals.) Usable

OIL CAPACITY

Total:	25 lt	(6.7 US Gal)
Usable quantity:	9,4 lt	(2.5 US Gal)

MAXIMUM OPERATING ALTITUDE

41.000ft

**CONTROL SURFACE
MOVEMENTS**

Outboard Wing Flaps		10° TED(**)
Movements(*) (t.o. position)		
Outboard Wing Flaps		30° TED
(Ind. position)		
Inboard Wing Flaps		20° TED
(t.o. position)		
Inboard Wing Flaps		45° TED
(Ind. position)		
Aileron	19° TEU(***)	- 15°30 TED
Aileron Tab	20° TEU	- 19° TED
(only right aileron)		
Forward Wing Flaps		13° TED

(t.o. position)	
Forward Wing Flaps	30° TED
(Ind. position)	
Rudder	23° RIGHT - 23° LEFT
Rudder Tab	30° RIGHT - 30° LEFT
Stabilizer	8° TEU - 2° TED
Elevator	14° TEU - 12° TED
(*) Nominal	

(*) Nominal Values

See P.180 Maintenance Manual for rigging instructions, deflections and corresponding tolerances.

(**) TED = Trailing Edge Down

(***) TEU = Trailing Edge Up

SERIAL NUMBER ELIGIBLE

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. P-180: S/N 1004 to subsequent

IMPORT ELIGIBILITY

A Brazilian Certificate of Airworthiness may be issued on the basis of an EASA Export Certificate on Airworthiness (or a third country Export Certificate on Airworthiness, in case of used aircraft imported from such country), 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. 2010T-08 and in condition of safe operation".

The ANAC Report H.10-2420-0, dated 05 November 2010 or further revisions, contains the Brazilian requirements for the acceptance of these airplanes. (See note 4)

CERTIFICATION BASIS

Brazilian Type Certificate No. 2010T-08 issued on 05 November 2010 based on the RBHA 23 according to the Italian regulation "Regolamento Tecnico del RAI Parte 223" including Amendments 223-1 Certification through 223-33, corresponding to USA FAA 14 CFR Part 23, effective February 1, 1965, including Amendments 23-1 through 23-33. The aircraft has one model P180 and two commercial names, the AVANTI (serial number 1004 to 1104) and AVANTI II (Design Change 80-0587, serial number 1105 and up). The Certification Basis is classified below by serial numbers:

S/N 1004 up to 1104 Federal Aviation Regulations - 14 CFR Part 23, effective February 1, 1965, including Amendments 23-1 through 23-33 and Section 23.2 Amendment 36.

EASA Special Conditions enclosed to RAI paper n. 257.440/SCMA, dated 21 Jul. 1989 (Docket n. 031, FAA Special Conditions n. No. 23-ACE-29 and No. 23-ACE-52) which include the following Special Condition:

C-1 Composite Structures Fatigue/Damage Tolerance (FAA N. 23-ACE-29 No. 4)

C-2 Full Scale Airload Verification (FAA N. 23-ACE-29 No. 5)

C-3 Doors and Exits (Outward Opening) (FAA N. 23-ACE-29 No. 6)

C-4 Lightning Protection of Composite Structure (FAA N. 23-ACE-29 No. 4)

C-6 Forward and Main Wing Flap Interconnection (FAA N. 23-ACE-29 No. 7)

C-7 Loads for P180 Configuration (FAA N. 23-ACE-29 No. 5)

F-1 Buffet Onset Envelope (FAA N. 23-ACE-29 No. 1)

F-2 Effect of Rain or Contamination on Laminar Flow Airfoils (FAA N. 23-ACE-29

No. 3)
F-5 Inadvertent Excursion Beyond Maximum Operating Speed (FAA N. 23-ACE-29 No. 2)
P-6 Propeller Ground Clearance (FAA N. 23-ACE-29 No. 8)
P-7 Propeller marking (FAA N. 23-ACE-29 No. 9)
P-8 Propeller Ice Protection and Exhaust Gas Impingement (FAA N. 23-ACE-29 No. 10)
SE-4 Cockpit Smoke Evacuation (FAA N. 23-ACE-29 No. 11)
SE-5 Protection for Systems from Lightning and High Energy Radio Frequency (HERF) (FAA N. 23-ACE-52 No. 2)

Requirements elected to comply:

- Special Federal Aviation Regulations n. 27, effective 1st February 1974, including amendments 27-1 through 27-5.
- FAR 23.2, amendment 36.
- FAR 91 Appendix A dated August 18, 1989.
- Applicable JAR 23 (first issue dated March 11, 1994) requirements for the following modifications:
 - 80-0228 "Vertical fin - aluminum alloy instead of composite"
 - 80-0229 "Aluminum canard wing instead of composite"
 - 80-0241 "Aluminum rudder and trim tab"

and for the relevant Service Bulletins:

- 80-0106 "Replacement of the Composite Forward Wing Assembly with the new metallic one"
- 80-0142 "Replacement of the Composite Material Tail-cone/Vertical Fin Assembly, with the Metal Construction Assembly, in the event of not repairable damages" 14 CFR Part 36, effective 1st December 1969, including amendments 36-1 through 36-16.

Noise - ICAO Annex 16, Ed. 1988, Vol. I, Chapter 10. For airplanes incorporating Mod 80-0642 or SB 80-0215: ICAO Annex 16, Ed. 1993, Vol. I, Chapter 10.
Emissions - ICAO Annex 16, Ed. 1993, Vol. 11, Part 11, Chapter 2 (Fuel Venting).

Equivalent safety findings exist with respect to the following regulations:

- Section 23.1305(g): Fuel Pressure Indicator
- Section 23.1545(b) (5): Marking of airspeed Indicator for VEE.

Exemption: Brazilian Temporary Exemption DOU Decisão No- 140, dated 19 October 2010 published on 05 November 2010 in Diário Oficial da União. Report PIAGGIO No. 180-RPT-0000-03859 rev.00 dated 24/08/2010 titled: "P.180 Avanti II- Temporary Exemption Related To Barometric Correction Scale For Cabin Pressurization Control System". This exemption is effective until 31 December 2011.

When type design is increased MTOW from 11550 lbs to 12100lbs with Mod n. 80.0642 or SB 80.0215, the requirements applicable for this modification are included in EASA CRI A-01 Mod. n.80.0642.

**S/N1105 to
subsequent**

The Certification Basis is the same as above, except the requirements applicable to the areas affected by the Piaggio P180 major change PA-05. This change consist of a complete redesign of the fight deck, avionics and autopilot systems, equipped with the Rockwell Collins Pro Line 21 Avionics systems, see EASA CRI n. A-1 Type Certification Basis.

Special Conditions :

- ENAC Special Condition for HIRF Protection (EASA CRI F-1) and for Protection From the Effects of Lightning Strikes Indirect Effects (EASA CRI F-02). This Special condition replaced the EASA SE-5 Protection for Systems from Lightning and High Energy Radio Frequency / FAA N. 23-ACE-52 No. 2.

Equivalent Levels of Safety:
 ENAC Equivalent Levels of Safety
 CRI B-02 - Airspeed Indicator Markings
 CRI F-05 - Powerplant Display Instruments
 CRI F-06 - Use of Digital Only Display for Engine Oil Pressure and Temperature,
 Fuel Quantity and Flow

Exemption: Brazilian Temporary Exemption DOU Decisão No- 140, dated 19 October 2010 published on 21 October 2010 in Diário Oficial da União. Report PIAGGIO No. 180-RPT-0000-03859 rev.00 dated 24/08/2010 titled: "P.180 Avanti II- Temporary Exemption Related To Barometric Correction Scale For Cabin Pressurization Control System". This exemption is effective until 31 December 2011.

REQUIRED EQUIPMENT The basic required equipment, as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the airplane. Please see the Brazilian Temporary Exemption DOU Decisão No- 140, dated 19 October 2010 published on 05 November 2010. This exemption is effective until 31 December 2011.

NOTES:

NOTE 1 Weight and balance. A current weight and balance report including list of equipment included in the certificated empty weight, and loading instructions when necessary, must be provided for each aircraft at the time of original certification. The certification empty weight and balance data shall include the unusable fuel and the total engine oil as follows:

	Quantity	Station
Unusable fuel:	11,24 kg (24,8 lbs)	6,319 m (248.8")
Undrainable fuel:	3,94 kg (8,7 lbs)	6,304 m (248.2")
Undrainable oil:	2,2 kg (4,9 lbs)	6,975 m (274.6").
Total oil quantity:	25 Kg (55 lbs)	6,975 m (274.6").

NOTE 2 Markings and placards. All markings and placards for passenger information, external markings for emergency, and load limits in cargo/baggage compartments must be presented in Portuguese or bilingual. A list of these placards and the respective translations acceptable to ANAC is provided in ANNEX II of the report H.10-2024-0. All placards required in the EASA approved installed in the same appropriate location.

NOTE 3 Continuing Airworthiness. Airworthiness Limitations and Service Life Limits of some equipment are contained in Chapter 4 (Airworthiness Limitations) and Chapter 5 (Maintenance Schedule and Time Limits) of the Airplane Maintenance Manual (Piaggio Report n. 9066 for S/N 1004 to 1104 and Report n. 180-MAN-0200-01105, for S/N 1105 and up).

All manufacturer's service bulletins (and other manual material) which contain a statement that the document is approved by the exporting airworthiness authority (EASA) may be interpreted as ANAC approved. These approvals pertain to the type design only.

NOTE 4 The differences of the Brazilian airplanes in relation to the basic EASA type design are summarized below:

- 1 - The Brazilian Airplane Flight Manual.
EASA AFM Approval 10031940 issued 23 September 2010.
- 2 - Markings and placards.
(see note 2)

- 3 - Brazilian Temporary Exemption DOU Decisão No- 140, dated 19 October 2010 published on 21 October 2010 in Diário Oficial da União in accordance with this exemption a conversion table between hectopascal and HG inches is effective until 31 December 2011, after this date the equipment with the barometric correction scale (CPCS – Cabin Pressurization Control System) shall be presented in “m bar” or “hPa”.

NOTE 5

Changing the color and the thickness of the exterior paint (including registration numbers) for composite components is only permissible after prior approval of the Type Certificate Holder.

**HÉLIO TARQUÍNIO JÚNIOR**

Gerente Geral Substituto, Certificação de Produto Aeronáutico
(Acting Manager, Aeronautical Product Certification)
