

MINISTÉRIO DA AERONÁUTICA  
DEPARTAMENTO DE PESQUISAS E DESENVOLVIMENTO  
CENTRO TÉCNICO AEROESPACIAL

TYPE CERTIFICATE DATA SHEET Nº EA-7905

Type Certificate Holder:

EMBRAER - EMPRESA BRASILEIRA DE  
AERONÁUTICA S/A  
P.O. Box 343  
12200 - São José dos Campos, SP

EA-7905-04

EMBRAER

EMB-121A

EMB-121A1

February, 1982

**I - MODEL EMB-121A (Normal Category), approved May 31, 1979**

ENGINE Pratt & Whitney Aircraft of Canada  
PT6A-28.

FUEL Avjet A and Avjet A-1 (ASTM-D-1655);  
QAV-1 (CNP-8) and following Pratt &  
Whitney specification PWA-522.

OIL In accordance with P&W Specification  
PWA-521-B or CPW-202-A (MIL-L-23699A).

ENGINE LIMITS	ESHP	SHP	Prop Shaft Speed	TIT(°C)
Takeoff.....	715	680	2200	750
Max.Continuous.....	715	680	2200	750
Max.Reverse (1 min).....	-	400	2100	750
Starting (2 sec).....	-	-	-	1090

PROPELLER AND PROPELLER LIMITS 2 Hartzel HC-B3TN-3C/T10178B-8R or  
2 Hartzell HC-B3TN-3C/T10178HB-8R with  
spinner Hartzell D-3434-12P.  
Diameter 93 in (no further reduction  
permitted).  
Pitch settings at 30 in station:  
- Reverse : - 11.0° ± .5°  
- Feather : + 88.1° ± .1°  
- Primary pick up angle: + 20.2° ± .2°  
- Secondary low pitch stop angle:  
+ 14° ± 1°

AIRSPEED LIMITS (IAS) Max. operating speed:  
288 mph (250 knots) (See Pilot's Ope-  
rating Handbook, for variation with  
altitude).  
Max. landing gear extended speed:  
170 mph (148 knots)  
Maneuvering speed:  
185 mph (161 knots) (See Pilot's Ope-  
rating Handbook, for variation with  
weight.)

Max. flap extended speed:  
 13° ( 35%) - 206 mph (179 knots)  
 38° (100%) - 172 mph (149 knots)

CG RANGE (Landing gear extended) 182.6 to 189.7 inches at 10140 lb or less.  
 185.8 to 189.7 inches at 12500 lb.  
 Straight line variation between points given.  
 Moment change due to retraction of landing gear: - 11023 in lb (The CG is shifted forward with the landing gear retraction).

EMPTY WEIGHT None.  
 CG RANGE

MAXIMUM WEIGHT  
 Takeoff : 12500 lb  
 Landing : 11773 lb  
 Zero fuel : 10274 lb  
 Ramp : 12566 lb

MAXIMUM CREW One pilot (VFR conditions) (See Note 5).

NUMBER OF SEATS 9 (7 passengers, 2 crew)  
 For loading instructions see Pilots Operating Handbook sections 2 and 6.

MAXIMUM BAGGAGE 198 lb at 71.7 in  
 198 lb at 288.6 in  
 (See approved configurations in the Pilot's Operating Handbook section 6).

FUEL CAPACITY 454 gal (227 gal each tank) at 197.2 in  
 Unusable fuel 13.2 gal (6.6 gal each tank).

OIL CAPACITY 9.2 qt in each engine at 153.5 in 1.2 qt in each oil radiator.

MAX. OPERATING ALTITUDE 30000 ft

CONTROL SURFACE MOVEMENTS  
 Rudder: 25° ± 1° each side  
 Rudder in neutral:  
 trim tab right: 18°30' ± 1°  
 trim tab left : 20° ± 1°  
 Rudder right:  
 automatic tab left: 11° ± 1°  
 Rudder left:  
 automatic tab right: 6° ± 1°

SERIAL NUMBER 121001 and up  
 ELEGIBLE

II - MODEL EMB-121A1 (Normal Category), approved December 23, 1981.

ENGINE 2 Pratt & Whitney Aircraft of Canada PT6A-135.

FUEL Avjet A and Avjet A-1 (ASTM-D-1655); QAV-1 (CNP-8) and following Pratt & Whitney specification PWA-522.

OIL In accordance with specification PWA 521-B or CPW-202-A (MIL-L-23699A).

ENGINE LIMITS	<u>ESHP</u>	<u>SHp</u>	<u>Prop Shaft Speed</u>	<u>TIT(OC)</u>
Takeoff.....	787	750	1900	805
Max.Continuous.....	787	750	1900	505
Max.Reverse (1 min).....	-	215	1805	805
Starting (2 sec).....	-	-	-	1090

PROPELLER AND PROPELLER LIMITS 2 Hartzell HC-B4TN-3C/T9212B with spinner Hartzell D-3434-18P.

Diameter: 93 in (no further reduction permitted).

Pitch settings at 30 in station:

- Reverse : - 11.0° ± 0.5°
- Feather : + 86° ± 0.1°
- Primary pick up angle: +17.2° ± 0.2°
- Secondary low pitch stop angle: + 14° ± 1°

AIRSPEED LIMITS (IAS) Max. operating speed: 288 mph (250 knots) (See Pilot's Operating Handbook, for variation with altitude).

Max. landing gear extended speed: 170 mph (148 knots)

Maneuvering speed: 185 mph (161 knots) (See Pilot's Operating Handbook, for variation with weight).

Max. flap extended speed:

- 13° ( 35%) - 206 mph (179 knots)
- 38° (100%) - 172 mph (149 knots)

CG RANGE (Landing gear extended) 182.6 to 189.7 inches at 10140 lb or less.

185.8 to 189.7 inches at 12500 lb.

Straight line variation between points given.

Moment change due to retraction of landing gear: - 11023 in lb (The CG is shifted forward with the landing gear retraction).

EMPTY WEIGHT CG RANGE None

MAXIMUM WEIGHT	Takeoff : 12500 lb Landing : 11773 lb Ramp : 12566 lb Zero fuel : 10274 lb
MAXIMUM CREW	One pilot (VFR conditions) (See Note 5).
NUMBER OF SEATS	9 (7 passengers, 2 crew) For loading instructions see Pilot's Operating Handbook sections 2 and 6.
MAXIMUM BAGGAGE	198 lb at + 71.7 in 198 lb at + 288.5 in (See approved configurations in the Pilot's Operating Handbook section 6).
FUEL CAPACITY	454 gal (227 gal each tank) at 197.2 in Unusable fuel 13.2 gal (6.6 gal each tank).
OIL CAPACITY	9.2 qt in each engine at 153.5 in 1.2 qt in each oil radiator.
MAX. OPERATING ALTITUDE	30000 ft
CONTROL SURFACE MOVEMENTS	Rudder: $25^{\circ} \pm 1^{\circ}$ for right $18^{\circ} \pm 1^{\circ}$ for left Rudder in neutral: trim tab right: $18^{\circ}30' \pm 1^{\circ}$ trim tab left : $20^{\circ} \pm 1^{\circ}$ Rudder right: automatic tab left: $11^{\circ} \pm 1^{\circ}$ Rudder left: automatic tab right: $5^{\circ} \pm 1^{\circ}$
SERIAL NUMBER ELEGIBLE	121051 and up (see Note 10)

DATA PERTINENT TO ALL MODELS

DATUM	183.4 in forward of the 28% wing chords line (frame 18). This line defined as 28% wing chords line is 34.8 in forward of the rear jacking points.
LEVELING MEANS	Plumb from support in the upper internal part of frame 18, using as referende a mark on the floor.
CONTROL SURFACE MOVEMENTS	Elevator : $14^{\circ} \pm 1^{\circ}$ up $30^{\circ} \pm 1^{\circ}$ down

Aileron :  $22^\circ + 2^\circ$  up  
 $22^\circ \pm 2^\circ$  down

Flap :  $38^\circ \pm 1^\circ$  down

Trim Tabs:

- . Elevator in neutral:
  - trim tab up :  $16^\circ \pm 1^\circ$
  - trim tab down :  $11^\circ \pm 1^\circ$
- . Elevator up:
  - automatic tab up  $11^\circ 30' \pm 1^\circ$
- . Elevator down:
  - automatic tab down:  $25^\circ + 0^\circ$   
 $- 3^\circ$
- . Aileron in neutral:
  - trim tab up :  $23^\circ \pm 2^\circ$
  - trim tab down :  $22^\circ \pm 2^\circ$
- . Aileron up:
  - automatic tab down :  $0^\circ$  to  $\underline{3}^\circ$
- . Aileron down:
  - automatic tab up :  $0^\circ$  to  $3^\circ$

CERTIFICATION BASIS

Type Certificate N° 7905 issued May 31, 1979.

The EMB-121 was certificated showing compliance with:

FAR part 23 effective February 1, 1965 as amended by 23-1 through 23-16 effective February 14, 1975.

FAR Part 36 effective December 1, 1969 as amended by 36-1 through 36-6 effective January 24, 1977.

Special conditions as established in the letter n° 089-AVH/75, dated December 19, 1975.

SFAR Part 27 effective January 1975 as amended 27-1.

Has an equivalent level of safety for 23.77S(d), 23.1S45(a), 23.1019(a)(3).

Comply with 25.777 (except 25.777(g)), 25.779 and 25.781 as amended by 25-46 (Dec 1st, 1978), instead of FAR-23 equivalents items.

PRODUCTION BASIS

Production Certificate N9 E-7203-01.

EQUIPMENT

The basic required equipment as prescribed in the applicable airworthiness

regulations (See Certification Basis) must be installed in the aircraft for certification.

This equipment must include a CTA approved Pilot's Operating Handbook, as follows:

- POH P/N MO 121/208 applicable to S/N 121001 to 121013.
- POH P/N MO 121/262 applicable to S/N 121014 and up.

NOTE 1

A weight and balance report, listing all equipment included in the empty weight must be delivered with each airplane. The approved Pilot's Operating Handbook contains detailed loading instructions.

The certificated empty weight and corresponding center of gravity location must include system undrainable oil and unusable fuel as follows:

- Fuel : 86 lb at 197.2 in
- Oil : 1.1 lb at 153.5 in

NOTE 2

The markings and placards specified in the Pilot's Operating Handbook, Section 2 must be installed in the aircraft.

NOTE 3

The service life limits of the main structural parts are listed in the approved Pilot's Operating Handbook.

The most important are:

- Main landing gear piston tube (P/N 14333): 15900 landings
- Upper part of the drag strut (P/N 14284A and 14334A): 18750 landings
- Upper and lower nuts (P/N ERAM 6359A) of the normal brake and main generation hydraulic accumulators: 20000 landings.

NOTE 4

If fuel per specifications PWA-522 or CPW-46 is not available, it is possible to use aviation gasoline MIL-G-7752 of all grades for a total time period not exceeding 150 hours during any overhaul period.

NOTE 5

a) The S/N 121009, 121013 and up may be operated in IFR condition with one pilot only if, in addition to the minimum equipment required by the applicable operational rules ( See IAC-3121-0378 of the Departamento de Aviação Civil), the following equipment is installed in the aircraft:

- boom microphone
- approved automatic pilot, operational and with a approach coupler (See Pilot's Operating Handbook to identify the approved models).

- b) The S/N 121002 to 121008, 121010, 121011 and 121012 are not approved for single pilot operation above 10000 ft. The flight will be allowed with a single pilot, above 10000 ft, when the oxygen control is located in the cockpit left side.

NOTE 6

Military aircrafts (VU-9) may be converted to civilian version when all modifications required to establish conformity with the approved type design are incorporated.

NOTE 7

The required Civil Aviation Authority (CAA) modifications for the aircraft to be exported to UK, as defined by EMBRAER drawing n° 121-9001, have been also approved by CTA, with the following exceptions:

- a) Removal of the main vent line flame arrestor (CAA Special Condition n. 5(1)).
- b) Installation of an anticollision light red filter (CAA Special Condition n. 6(1)).
- c) Installation of markings and placards in English (CAA Condition n. 8(2)).
- d) Installation of as irreversible dump switch and a Q" switch in the stick pusher system (CAA Special Condition n. 9(1)).

NOTE 8

Cancelled

NOTE 9

Cancelled

NOTE 10

The EMB-121A models can be converted in the EMB-121A1 models through the incorporation of the Engineering Order n° 121-054106.

Original in Portuguese signed by:

JURACY CASTELLARI - Ten Cel Eng°  
Vice-Diretor de Homologação