DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

A31SO
Revision 14
Embraer
EMB-120
EMB-120RT
EMB-120ER
EMB-120FC
EMB-120QC

January 21, 2022

TYPE CERTIFICATE DATA SHEET NO. A31SO

This data sheet which is part of Type Certificate No. A31SO prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder

Embraer S.A.
Av. Brig. Faria Lima, 2170
12227-901 São Jose dos Campos, SP
Brazil

Type Certificate Holder Record

Yaborã Indústria Aeronaútica S.A. transferred the TC No A31SO to Embraer S.A. on January 1st, 2022.
Embraer S.A. transferred TC No A31SO to Yaborã Indústria Aeronáutica S.A. on January 31, 2020.
Empresa Brasileira de Aeronáutica S.A. (Embraer) changed company name to Embraer S.A. effective November 2010.

1. - Model EMB-120 Brasilia (Transport Category), Approved July 9, 1985

Engines

2 Pratt & Whitney of Canada Ltd PW 115

Fuel

MIL-T-5624 JP-4, JP-5 and ASTM D1655 Jet A, Jet A-1 and Jet B conforming to P&W specifications PWA522 or CPW204. See NOTE 4.

Oil

In accordance with P&W Specification
PWA521 Type II (MIL-L-23699) or CPW202 (MIL-L-23699A).

Engine Limits

	Shaft HP	Jet Thrust (lbf)	Torque %	Prop. NP %	Int-Turbine T6 Temp.°C (°F)	Gas Gen.N_H %
Max. Take-off (5 min. max.)	1760	212	110	100	785 (1445)	100
Max. Continuous	1600	212	100	100	785 (1445)	100
Transient (20 sec. max.)				110	850 (1562)	102
Starting (5 sec. max.)					950 (1742)	
Max. Reverse				80		

NOTE: The above engine limits are individual maximum operating limits and are not for setting engine power. Refer to AFM Section 4 for power setting data.

Propeller Limits
Ground Operation

Condition Levers must in MIN RPM position during all ground operations, except when cleared for takeoff or during landing roll.

Power Levers must remain at or below Flight Idle during all ground operations, except for brief (approximately 5 seconds) excursions as needed to maneuver the airplane

Max. Operating Altitude

S/N 12000004, 12000006 through 12000011
Enroute - 25,000 ft. (Bleed on)
- 20,000 ft. (Bleed off)

S/N 12000012 and up

	Bleed On	Bleed Off
Enroute - EEC on	32,000 ft.	25,000 ft
EEC off	25,000 ft	20,000 ft

Temperature Operating Limits

S/N 12000004, 12000006 through 12000020
Maximum ISA +32° C
Minimum -54° C

S/N 12000021 and up
Maximum ISA +35° C
Minimum -54° C

Maximum Weight (mass)

	lb.	kg
Start of take-off	25,353	11,500
Landing	24,802	11,250
Zero Fuel	23,148	10,500

Number of Seats: Maximum 34, including 1 pilot, 1 copilot, 1 attendant, 1 check pilot and 30 passengers.

Maximum Baggage: 1213 lb (See NOTE 7).

2. - Model EMB-120RT Brasilia (Transport Category), Approved October 23, 1986

Engines: 2 Pratt & Whitney of Canada Ltd. PW 118 or
2 Pratt & Whitney of Canada Ltd. PW 118A or
2 Pratt & Whitney of Canada Ltd. PW118B or
1 Pratt & Whitney of Canada Ltd. PW 118 and
1 Pratt & Whitney of Canada Ltd. PW 118A (see AFM for operating limits)

Fuel: MIL-T-5624 JP-4, JP-5 and ASTM D1655 Jet A, Jet A-1 & Jet B conforming to P&W. specifications PWA522 or CPW204. See NOTE 4.

Oil: In accordance with P&W Specification PWA521 Type II (MIL-L-23699) or CPW202 (MIL-L-23699A).

Engine Limits

	Shaft HP	Jet Thrust (lbf)	Prop Torque %	NP %	Int-Turbine, T6 Temp.°C (°F)	Gas Gen.N_H %	Gas Gen.N_L %
PW 118 Max. Take-off(5 min. max.)	1980	230	110	100	816 (1500)	100	100
PW 118A Max Take-off(5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118B Max Take-off(5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118 Max Continuous	1800	230	100	100	800 (1472)	100	100
PW 118A Max Continuous	1800	230	100	100	800 (1472)	102	102
PW 118B Max Continuous	1800	230	100	100	800 (1472)	102	102
Transient (20 Sec. max.)			120	110	850 (1562)	102	102
Starting (5 sec. max.)					950 (1742)		
Max. Reverse				80			

NOTE: The above engine limits are individual maximum operating limits and are not for setting engine power. Refer to AFM Section 4 for power setting data.

Propeller Limits
Ground Operation

Condition Levers must in MIN RPM position during all ground operations, except when cleared for takeoff or during landing roll.

Power Levers must remain at or below Flight Idle during all ground operations, except for brief (approximately 5 seconds) excursions as needed to maneuver the airplane.

Max. Operating Altitude

	Bleed On	Bleed Off
EEC on	32,000 ft	25,000 ft.
EEC off	25,000 ft.	20,000 ft

Temperature Operating Limits

Maximum ISA +35° C
Minimum -54° C

S/N 12000021 and up
Maximum ISA + 35°C
Minimum -54°C

Maximum Weight (mass)

	lb.	kg
Start of take-off	25,529	11,580
Landing	24,802	11,250
Zero Fuel	23,148	10,500

Number of Seats

Maximum 34, including 1 pilot, 1 copilot, 1 attendant, 1 check pilot and 30 passengers.

Maximum Baggage

1213 lb (See NOTE 7).

3. Model EMB-120ER Brasilia (Transport Category), Approved March 20, 1992

Engines

2 Pratt & Whitney of Canada Ltd. PW 118 or
2 Pratt & Whitney of Canada Ltd. PW 118A or
2 Pratt & Whitney of Canada Ltd. PW118B or
1 Pratt & Whitney of Canada Ltd. PW 118 and
1 Pratt & Whitney of Canada Ltd. PW 118A
(see AFM for operating limits)

Fuel

MIL-T-5624 JP-4, JP-5 and ASTM D1655 Jet A, Jet A-1 and Jet B conforming to P&W specifications PWA522 or CPW204. See NOTE 4

Oil

In accordance with P&W specification PWA521 Type II (MIL-L-23699) or CPW202 (MIL-L-23699A).

Engine Limits

	Shaft HP	Jet Thrust (lbf)	Torque %	Prop NP %	Int-Turbine, T6 Temp. °C (°F)	Gas Gen. N_H %	Gas Gen. N_L %
PW 118 Max Take-off (5 min. max)	1980	230	110	100	816 (1500)	100	100
PW 118A Max Take-off (5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118B Max Take-off (5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118 Max Continuous	1800	230	100	100	800 (1472)	100	100
PW 118A Max Continuous	1800	230	100	100	800 (1472)	102	102
PW 118B Max Continuous	1800	230	100	100	800 (1472)	102	102
Transient (0 sec. max.)			120	110	850 (1562)	102	102

Starting (5 sec. max.)					950 (1742)		
Max. Reverse				80			

NOTE: The above engine limits are individual maximum operating limits and are not for setting engine power. Refer to AFM Section 4 for power setting data.

Propeller Limits
Ground Operation

Condition Levers must in MIN RPM position during all ground operations, except when cleared for takeoff or during landing roll

Power Levers must remain at or below Flight Idle during all ground operations, except for brief (approximately 5 seconds) excursions as needed to maneuver the airplane

Max. Operating Altitude

	Bleed On	Bleed Off
EEC on	32,000 ft	25,000 ft.
EEC off	25,000 ft.	20,000 ft

Temperature Operating Limits

Maximum ISA +35° C
Minimum -54° C

Maximum Weight (mass)

	lb.	kg
Ramp	26,609	12,070
Takeoff	26,433	11,990
Landing	25,794	11,700
Zero Fuel	24,030	10,800

Number of Seats

Maximum 34, including 1 pilot, 1 copilot, 1 attendant, 1 check pilot and 30 passengers.

Maximum Baggage

1213 lb (See NOTE 7).

4. Model EMB-120FC Brasilia (Transport Category, Full Cargo version), Approved July 17, 2000.

Engines

2 Pratt & Whitney of Canada Ltd. PW 118 or
2 Pratt & Whitney of Canada Ltd. PW 118A or
2 Pratt & Whitney of Canada Ltd. PW118B or
1 Pratt & Whitney of Canada Ltd. PW 118 and
1 Pratt & Whitney of Canada Ltd. PW 118A
(see AFM for operating limits)

Fuel

MIL-T-5624 JP-4, JP-5 and ASTM D1655 Jet A, Jet A-1 and Jet B conforming to P&W specifications PWA522 or CPW204. See NOTE 4.

Oil

In accordance with P&W specification PWA521 Type II (MIL-L-23699) or CPW202 (MIL-L-23699A).

Engine Limits

	Shaft HP	Jet Thrust (lbf)	Torque %	Prop NP %	Int-Turbine, T6 Temp. °C (°F)	Gas Gen. N_H %	Gas Gen. N_L %
PW 118 Max Take-off (5 min. max)	1980	230	110	100	816 (1500)	100	100
PW 118A Max Take-off (5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118B Max Take-off (5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118 Max Continuous	1800	230	100	100	800 (1472)	100	100
PW 118A Max Continuous	1800	230	100	100	800 (1472)	102	102
PW 118B Max Continuous	1800	230	100	100	800 (1472)	102	102
Transient (0 sec. max.)			120	110	850 (1562)	102	102

Starting (5 sec. max.)					950 (1742)		
Max. Reverse				80			

NOTE: The above engine limits are individual maximum operating limits and are not for setting engine power. Refer to AFM Section 4 for power setting data.

Propeller Limits
Ground Operation

Condition Levers must in MIN RPM position during all ground operations, except when cleared for takeoff or during landing roll

Power Levers must remain at or below Flight Idle during all ground operations, except for brief (approximately 5 seconds) excursions as needed to maneuver the airplane

Max. Operating Altitude

	Bleed On	Bleed Off
EEC on	32,000 ft	25,000 ft
EEC off	25,000 ft	20,000 ft

Temperature Operating Limits

Maximum ISA +35° C
Minimum -54° C

Maximum Weight (mass)

	lb.	kg
Ramp	26,609	12,070
Takeoff	26,433	11,990
Landing	25,794	11,700
Zero Fuel	24,030	10,800

Number of Seats

None. Approved for cargo only. No passengers allowed.

Maximum Occupants

Not to exceed 3, including pilot, copilot and 1 check pilot;

Maximum Load on Cargo Compartment

8150 lb.

Maximum Loading Distribution on Cargo Compartment

CARGO COMPARTMENT	STATION LIMITS X (ft)	MAX. LOAD (lb)	FLOOR LOAD LIMIT (lb/sqft)
E1	From x=18.57 to x=26.41	2490	61
E2	From x=26.41 to x=35.20	2645	61
E3	From x=35.20 to x=44.71	2550	61
E4	From x=44.71 to x=49.05	1210	100
E1+E2	From x=18.57 to x=35.20	4400	61
E1+E2+E3+E4	From x=18.57 to x=49.05	8150	According to corresponding cargo compartment

5. Model EMB-120QC Brasilia (Transport Category, Quick Change Cargo version), Approved October 1, 2003.

Engines

2 Pratt & Whitney of Canada Ltd. PW 118 or

2 Pratt & Whitney of Canada Ltd. PW 118A or
2 Pratt & Whitney of Canada Ltd. PW118B or
1 Pratt & Whitney of Canada Ltd. PW 118 and
1 Pratt & Whitney of Canada Ltd. PW 118A
(see AFM for operating limits)

Fuel

MIL-T-5624 JP-4, JP-5 and ASTM D1655 Jet A, Jet A-1 and Jet B conforming to P&W specifications PWA522 or CPW204. See NOTE 4.

Oil

In accordance with P&W specification PWA521 Type II (MIL-L-23699) or CPW202 (MIL-L-23699A).

Engine Limits

	Shaft HP	Jet Thrust (lbf)	Torque %	Prop NP %	Int-Turbine, T6 Temp. °C (°F)	Gas Gen. N_H %	Gas Gen. N_L %
PW 118 Max Take-off (5 min. max)	1980	230	110	100	816 (1500)	100	100
PW 118A Max Take-off (5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118B Max Take-off (5 min. max.)	1980	230	110	100	816 (1500)	102	102
PW 118 Max Continuous	1800	230	100	100	800 (1472)	100	100
PW 118A Max Continuous	1800	230	100	100	800 (1472)	102	102
PW 118B Max Continuous	1800	230	100	100	800 (1472)	102	102
Transient (0 sec. max.)			120	110	850 (1562)	102	102
Starting (5 sec. max.)					950 (1742)		
Max. Reverse				80			

NOTE: The above engine limits are individual maximum operating limits and are not for setting engine power. Refer to AFM Section 4 for power setting data.

Propeller Limits
Ground Operation

Condition Levers must in MIN RPM position during all ground operations, except when cleared for takeoff or during landing roll

Power Levers must remain at or below Flight Idle during all ground operations, except for brief (approximately 5 seconds) excursions as needed to maneuver the airplane

Max. Operating Altitude

	Bleed On	Bleed Off
EEC on	32,000 ft	25,000 ft.
EEC off	25,000 ft.	20,000 ft

Temperature Operating Limits

Maximum ISA +35° C
Minimum -54° C

Maximum Weight (mass)

	lb.	kg
Ramp	26,609	12,070
Takeoff	26,433	11,990
Landing	25,794	11,700
Zero Fuel (see NOTE 11)	24,030	10,800

Maximum Number of Occupants

With an original forward lavatory configuration, maximum 34 including 1 pilot, 1 copilot, 1 flight attendant, 1 check pilot and 30 passengers. With an original aft lavatory configuration, maximum 31 including 1 pilot, 1copilot, 1 flight attendant, 1 check pilot and 27 passengers. With a cargo configuration, maximum 03, 1 pilot, 1copilot and 1 check pilot, no passengers or flight attendant are allowed.

Maximum Load on Cargo Compartment

When operating with passenger version, 1213 lb (see NOTE 7).
When operating with cargo (class E) version:
7715 lb to comply with the requirement FAR 121
7500 lb to comply with the requirement FAR 135

Maximum Loading Distribution on Cargo (Class E) Compartment

CARGO COMPARTMENT	STATION LIMITS X (ft)	MAX. LOAD (lb)	FLOOR LOAD LIMIT (lb/sqft)
E1	From x=20.5 to x=28.4	2490	61
E2	From x=28.4 to x=36.6	2645	61
E3	From x=36.6 to x=44.5	2550	61
E4	From x=44.5 to x=49.0	1210	100
E1+E2	From x=20.5 to x=36.6	4400	61

Data Pertinent to All Models

Propeller and Propeller Limits

2- Hamilton Standard Model 14RF-9
Blade: RFC11E1-6A, RFC11M1-6A, RFC11N1-6A or RFC11U1-6A
Diameter: 10.5 ft. nominal

Pitch settings at STA 42 ins

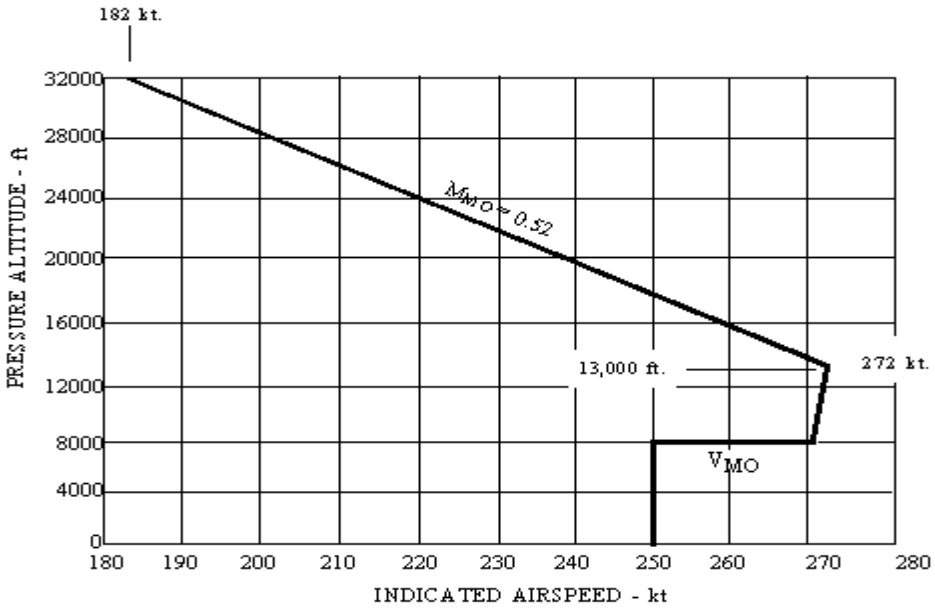
Feather	79.2°
Flight fine	17.3°
Ground fine	-4.5°
Full reverse	-15.0°

Propeller (N_p)

- Takeoff	1300 rpm	(100%)
- Max. Continuous	1300 rpm	(100%)

Airspeed Limits (IAS)

Maximum Operating Limit Speed (V_{mo})



		Knots	MPH
V_{fe} (Flaps extended)	Flaps 15°	200	230
	Flaps 25°	150	175
	Flaps 45°	135	156
V_A (Maneuvering)		200	230
V_{LO} (Landing gear operation)		200	230
V_{LE} (Landing gear extended)		200	230

Minimum Crew — 2 (Pilot and Copilot)

Fuel Capacity — 882 gallons (441 gallons each tank)
Unusable fuel 7.4 gallons (3.7 gallons each tank)

Oil Capacity — 13.0 gal. (6.5 gal. in each engine).

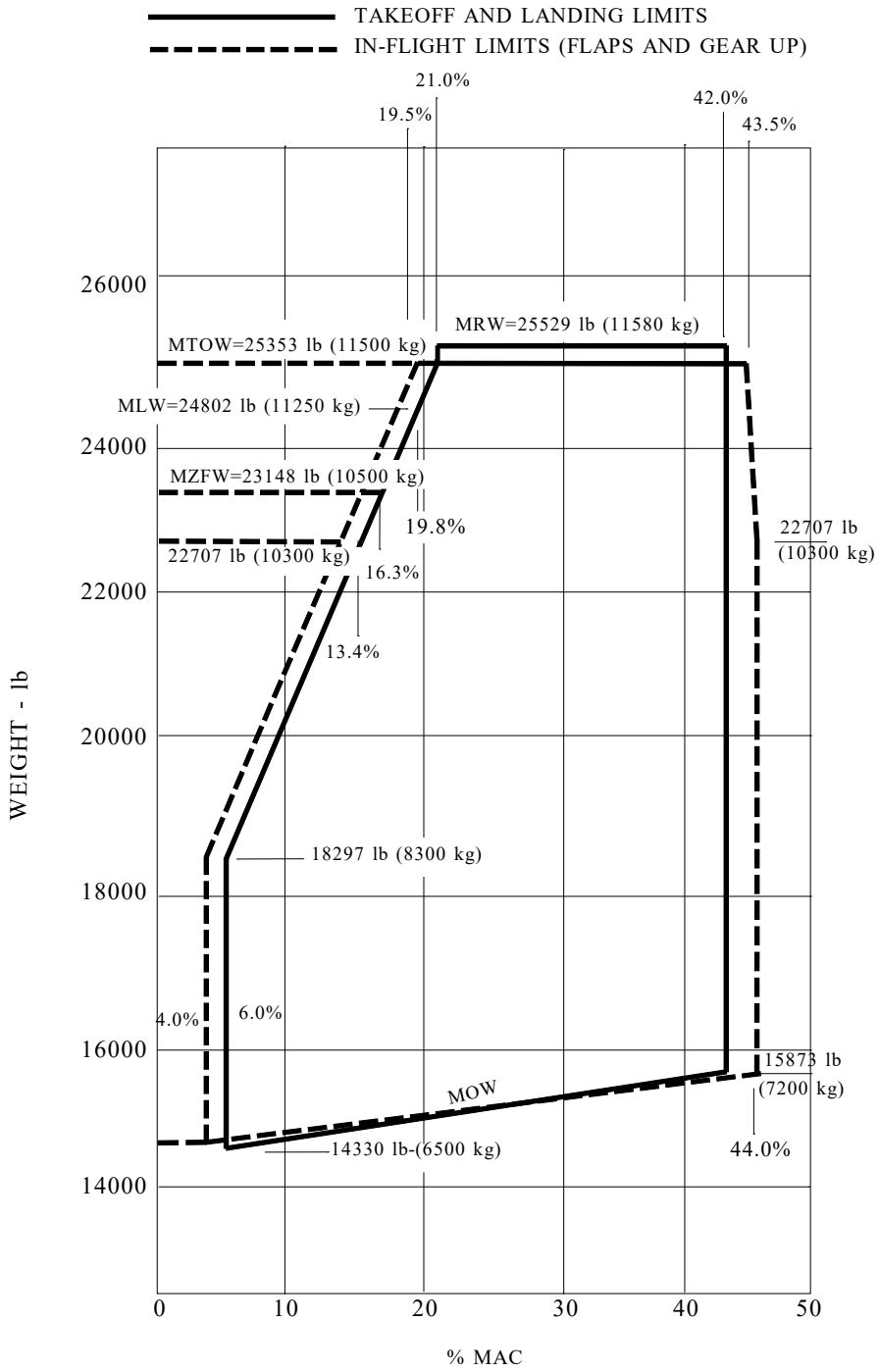
Datum — 366.4" forward of the 66% wing chord line (frame 28).
The 66% wing chord line is 0.67" aft of the rear jack points.

Leveling Means — Plumb from the upper part of the floor frame 28 using a mark in the lower part of the frame as a reference.

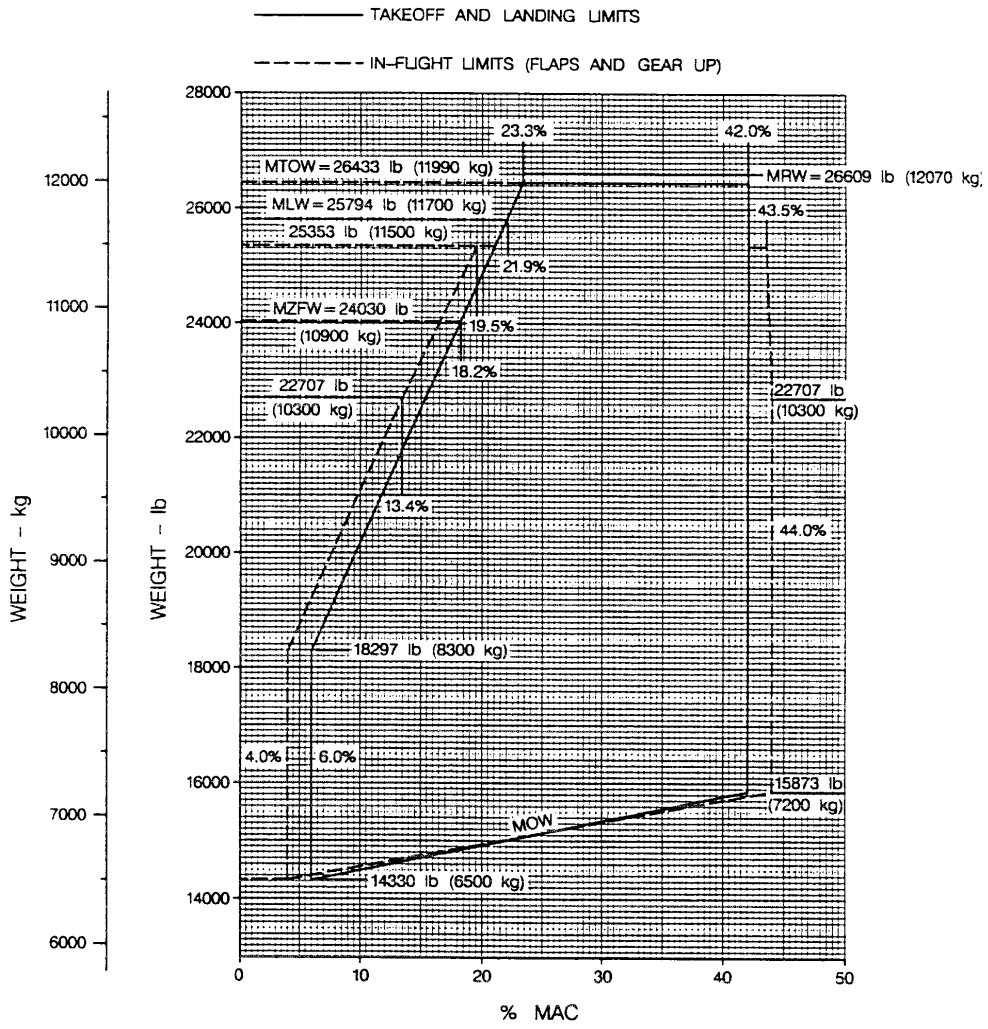
Maximum Baggage
(Passenger Configuration) — 1213 lb

Maximum Cargo — Deleted. Previous note not applicable to US configuration

C.G. Limits EMB-120 and EMB-120RT



C.G. Limits EMB-120ER, EMB-120FC and EMB-120QC



Control Surface Movements

Deflections measured normal to hinge lines:				
Main Rudder (hinge at 70% chord)	Right	20° ± 1°	Left	17° ± 1°
Secondary Rudder (hinge at 86% chord)	Right	15°± 1°	Left	13°± 1°
Elevators	Up	20° + 1°	Down	15° ± 1°
Ailerons	Up	25° ± 1°	Down	15° ± 1°
Flaps (Outboard and Inboard)				
Max. deflection		45° ± 1°		
Flap (Middle) - Max. deflection		51° ± 1°		
Elevator Tabs (Trim deflections)	Up	3.3° ± 0.5° or 5.5° ± 0.5°	Down	22° ± 1°
Right Aileron Tab Trim Deflections (Aileron Neutral)	Up	11° ± 1°	Down	11° ± 1°
Aileron Automatic Tab	25° Up	14.7° ± 1°	15° down	8.5° ± 1°

Serial Numbers Eligible	A Brazilian Certificate of Airworthiness for Export endorsed as noted under "Import Requirements" must be submitted for each individual aircraft for which application for U.S. certification is made.
Import Requirements	Refer to the applicable bilateral agreement to verify eligibility for import into the United States of both new and used aircraft based on the scope of the agreement, to identify any required statements by the exporting authority on the export certificate of airworthiness (or equivalent document), and for procedures for coordinating exceptions to conformity statements on these documents. Refer to FAA Order 8130.2, *Airworthiness Certification of Aircraft*, for requirements for issuance of an *airworthiness certificate* for imported aircraft.
Certification Basis	Federal Aviation Regulation (FAR) Part 21, including Amendments through 21-49, effective September 10, 1979; FAR 25, including Amendments through 25-54, effective October 14, 1980; FAR 25.832, Amendment 25-56; Special FAR (SFAR) 27, including Amendments through 27-5 effective January 11, 1984, and FAR 36, including Amendments through 36-12 effective August 1, 1981 for EMB-120 and EMB-120RT, through 36-18 effective August 18, 1992 for EMB-120ER, through 36-22 effective October 13, 1999 for EMB-120FC and through 36-24 effective August 07, 2002 for EMB-120QC ; Exemption from FAR 25.571 (e) (2) as specified in Exemption No. 3722; Equivalent Safety Finding to FAR 25.783 (f) Cargo Door. Airplanes incorporating Embraer Service Bulletin No. 120-25-0220 comply with FAR 25.811(c)(2)(ii), Amendment 25-79, instead of FAR 25.811(e)(3), Amendment 25-54. Date of application for EMB-120; June 8, 1981. Date of application for EMB-120RT; August 20, 1986. Date of application for EMB-120ER; August 16, 1991. Date of application for EMB-120FC; December 2, 1999. Date of application for EMB-120QC; October 6, 2000.

Part 26 – Continued Airworthiness and Safety Improvements for Transport Category Airplanes:

Based on § 21.29(a) for new import TCs, or § 21.101(g) for changes to TCs, applicable provisions of Part 26 are included in the certification basis. For any future Part 26 amendments, the holder of this TC must demonstrate compliance with the applicable sections.

Service Information	Service bulletins, structural repair manuals, vendor manuals, aircraft flight manuals, and overhaul and maintenance manuals, which contain a statement that the document is ANAC approved, are accepted by the FAA and are considered FAA approved. These approvals pertain to the type design only.
Ditching	Compliance has been shown with the ditching requirements of FAR 25.801. When the operating rules require emergency ditching equipment, compliance with 25.1415 must be demonstrated.
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification. The "Basic Equipment Checklist," "Chart A," lists all the required and optional equipment and is included in the POH and ANAC approved AFM

NOTE 1. 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. For loading procedures the Weight and Balance Manual WB120/701, must be followed. The certificated empty weight and corresponding center-of-gravity location must include system (undrainable) oil (not included in oil capacity) and unusable fuel (not included in usable fuel) as follows:

Fuel:	48 lbs.	at 348.8 in.
Oil:	16 lbs.	at 272.2 in.

NOTE 2 The aircraft must be operated in accordance with the ANAC Approved Airplane Flight Manual. For cargo configuration required placards see also Embraer Service Bulletin nº 120-25-0245

NOTE 3 The Airworthiness Limitations are listed on Section 6 of document MRB-HI-200 “Maintenance Review Board Report”, as follows

Part A - System & Powerplant
Part B - Strucuture
Part C - Life-Limited Components
Part D - Critical Design Configuration Control Limitations (CDCCL)
Part E - Fuel System Limitations

NOTE 4 If fuel conforming to specifications PWA522 or CPW204 is not available it is permissible to use aviation gasoline MIL-G-5572 of all grades for a total time period not exceeding 150 hours during any overhaul period.
JET B or JP-4 fuel should only be used when no other fuel is available.

NOTE 5 Aircraft S/N 12000004 and 12000006 through 12000021, inclusive, have been converted to the model EMB-120RT by the accomplishment of the Embraer Service Bulletin nº 120-72-0001.

NOTE 6 The engine Pratt & Whitney PW-118A may be installed in accordance with the Embraer Service Bulletin nº 120-072-0002.

NOTE 7 The passenger baggage compartment maximum capacity may be increased to 1540 lb thru accomplishment of SB 120-25-0205. All pax aircraft S/Ns 12000281, 12000286 through 12000288, and 12000290 and on are factory modified for 1540 lb.

NOTE 8 All EMB-120RT S/Ns may be converted into the model EMB-120ER by the accomplishment of Embraer Service Bulletin nº 120-00-0008.

NOTE 9 All EMB-120ER S/Ns may be converted into the model EMB-120FC by the accomplishment of Embraer Service Bulletin nº 120-25-0245

NOTE 10 All EMB-120ER S/Ns may be converted into the model EMB-120QC by the accomplishment of Embraer Service Bulletins nº 120-25-0244 and 120-25-0243.

NOTE 11. All EMB-120QC operating cargo must comply with Embraer Service Bulletins nº 120-25-0252 and 120-25-0253.

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