# DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

A56NM Revision 20 Embraer ERJ 170-100 STD ERJ 170-100 LR ERJ 170-100 SU ERJ 170-200 STD ERJ 170-200 LR ERJ 170-200 SU ERJ 170-200 LL

January 21, 2022

# FAA TYPE CERTIFICATE DATA SHEET NO. A56NM

This data sheet which is part of Type Certificate No. A56NM prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the US 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 Aeronáutica S.A. transferred TC No A56NM to Embraer S.A. on

January 1, 2022.

Embraer S.A. transferred TC No A56NM 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.

# I. Model ERJ 170-100 STD (Transport Category Airplane) approved February 20, 2004

Engines Two – General Electric Models CF34-8E5 or CF34-8E5A1 (Engine Type Certificate E00063EN).

<u>Auxiliary Power Unit</u> One – Hamilton Sundstrand APS 2300 Auxiliary Power Unit.

<u>Fuel</u> Specifications:

Brazilian Specification ANP nº 1/2003 - QAV1.

ASTM D-1655 JET A or JET A1.

MIL-T-83133 JP-8.

Oil Types of approved oils for use in engines or APU are:

Synthetic Oil conforming to MIL-PRF-23699 or MIL-PRF-7808

Engine Limits Refer to AFM No. AFM-1385

APU Limits Maximum RPM 108%

Maximum EGT 717° C (continuous) 1032° C (start)

Other limitations as stated in Hamilton Sundstrand Document No. ESR 1235.

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Airspeed Limits (I.A.S.)	$V_{MO}$	AS from sea level to 8,000 ft ng linearly to 320 KIAS at 10,000 ft			
	$ m V_{MO}$	CIAS from 10,000 ft to 28,887 ft			
	Ммо		m 28,887 ft to 41,000 ft		
	V <sub>A</sub> (Maneuvering)	AS from sea level, increasing linearly to AS at 20,000 ft., 269 KIAS at 28,888 ft., 286 KIAS at 33,999 ft.			
	V <sub>A</sub> (Maneuvering)	ach from 33,999 ft. to 41,000 ft.			
	W (Pl - F - 1 1)	D 1	220 W. L. G		
	V <sub>FE</sub> (Flaps Extended)	Detent 1	230 KIAS		
		Detent 2	215 KIAS		
		Detent 3	200 KIAS		
		Detent 4	180 KIAS		
		Detent 5	180 KIAS		
		Detent FULL	165 KIAS		
Maximum Landing Gear Operati		erating Speed (VI	LO) 250 KIAS		
	Maximum Landing Gear Ext	tended Speed (VL	LE) 250 KIAS		
	Tire Speed	- `	225 MPH		

<u>Datum</u>

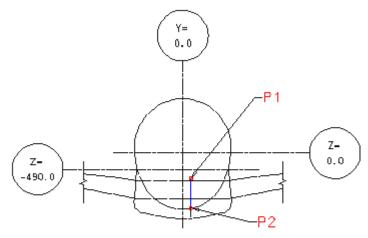
A perpendicular plane to the fuselage centerline, located at 11650 mm ahead of the wing stub front spar. This spar is located 373 mm ahead of the wing jack points.

Mean Aerodynamic Chord

The MAC length is 3194 mm.

Leveling Means

Plumb line between the points P1 and P2 located inside of the landing gear compartment on the left side, as illustrated below.



LEVELING OF FUSLG COORDINATE POINTS						
P01NT	×	Υ	z			
P1	14935.36	-246.60	-768.91			
P2	14935.36	-246.60	-1675.09			

#### Center of Gravity Limits Refer to AFM No. AFM-1385

Maximum Weights	Max Ramp Weight:	79,697 lb (36,150 k	g)
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85,450 lb (38,760 kg)\*\*
Max Takeoff Weight: 79,344 lb (35,990 kg)
85,097 lb (38,600 kg)\*\*
Max Landing Weight: 72,311 lb (32,800 kg)

73,414 lb (33,300 kg)\*

73,413 lb (33,300 kg)\*\* 65,257 lb (29,600 kg)

66,447 lb (30,140 kg)\*\*\* 68,122 lb (30,900 kg)\*\*

170-57-0037

Maximum Baggage Forward Cargo Compartment 3,020 lb (1,370 kg)

Max Zero Fuel Weight:

Aft Cargo Compartment 2,271 lb (1,030 kg)

Fuel Capacity 3063.4 gallons (11596 liters) in two tanks of 1531.7 gallons (5798 liters) each.

Unusable fuel of 22.2 gallons (84 liters); 11.1 gallons (42 liters) in each tank.

<u>Minimum Crew</u> 2 - Pilot and copilot

Maximum Passenger Seating Capacity 78

Oil Capacity Per Engine

Total 9.9 liters (10.5 US quarts) Useable 6.8 liters (7.2 US quarts)

Maximum Altitudes 41,000 ft. (operating)

10,000 ft. (takeoff and landing)

# Control Surface Movements

Ailerons 25° TE up, 15° TE down
Elevator 24.7° TE up, 14.9° TE down
Stabilizer 13° TE up, 2° TE down
Rudder 30.7° right, 30.7° left

Ground Spoiler 60° Outboard Spoiler 40°

Flap and Slat Detent Inboard Flap Outboard Flap Slat 1/Slat 2.3.&4 Main/Aft Main/Aft 0°/0° 0°/0° 0  $0^{\circ}/0^{\circ}$ 4.9°/7.3° 4.5°/7.4° 12°/15° 1 9.7°/9.2° 12°/15° 2 9.2°/10.2° 3 19.6°/11.8° 19.3°/13.3° 12°/15° 4 19.6°/11.8° 19.3°/13.3° 20°/25° 5 19.6°/11.8° 19.3°/13.3° 20°/25° Full 34.5°/13.8° 34.2°/15.3° 20°/25°

Deflections are in the planes normal to the hinge lines, except for the flaps, which are in streamwise planes normal to the wing reference plane. Deflections of a surface supported by another moveable surface are relative to the parent surface. Stabilizer deflections are relative to the airplane horizontal reference. Elevator and rudder maximum deflections are scheduled by the flight control system as a function of airspeed; the data presented herein correspond to zero airspeed. Control surface deflection tolerances are given in the Embraer report 170EBD001 "Engineering Basic Data", rev. C dated 27 January 2004.

<sup>\*</sup> post-mod. SB 170-00-0003

<sup>\*\*</sup> post-mod SB 170-00-0016

<sup>\*\*\*</sup> applicable to airplane serial numbers 1700001 to 1700064, post-mod SB 170-00-0024, 170-53-0078, 170-53-0079, 170-53-0080, 170-55-0007, and

#### II. Model ERJ 170-100 LR (Transport Category Airplane) approved February 20, 2004

Same as model ERJ 170-100 STD, except for the following items:

Maximum Weights	Max Ramp Weight:	82,363 lb	(37,360 kgf)

Max Takeoff Weight: 82,011 lb (37,200 kgf) 85,097 lb (38,600 kg)\* Max Landing Weight: 72,311 lb (32,800 kgf)

73,413 lb (33,300 kg)\*

Max Zero Fuel Weight: 65,257 lb (29,600 kgf) 68,122 lb (30,900 kg)\*

66,447 lb (30,140 kg)\*\*

85,450 lb (38,760 kg)\*

\* post-mod SB 170-00-0016

\*\* applicable to airplane serial numbers 1700001 to 1700064, post-mod SB 170-00-0024, 170-53-0078, 170-53-0079, 170-53-0080, 170-55-0007, and 170-57-0037

Center of Gravity Limits Refer to AFM No. AFM-1385

# III. Model ERJ 170-100 SU (Transport Category Airplane) approved May 14, 2004

Same as model ERJ 170-100 LR, except for the following item:

Maximum Passenger Seating Capacity 76

## IV. Model ERJ 170-100 SE (Transport Category Airplane) approved September 17, 2004

Same as model ERJ 170-100 LR, except for the following item:

Maximum Passenger Seating Capacity 70

## V. Model ERJ 170-200 STD (Transport Category Airplane) approved August 31st, 2006

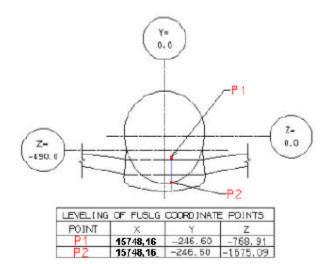
Same as model ERJ 170-100 LR, except for the following items:

<u>Datum</u> A perpendicular plane to the fuselage centerline, located at 12488 mm ahead of the wing stub

front spar. This spar is located 373 mm ahead of the wing jack points.

<u>Leveling Means</u> Plumb line between the points P1 and P2 located inside of the landing gear compartment on the

left side, as illustrated below.



Maximum Weights Max Ramp Weight: 83,026 lb (37,660 kg)

(40,530 kg)\*\*\* 89,352 lb

Max Takeoff Weight: 82,673 lb (37,500 kg)

77,157 lb (34,998 kg)\* 79,362 lb (35,998 kg)\*\*

(40,370 kg)\*\*\* Max Landing Weight: 74,957 lb (34,000 kg)

89,000 lb

75,177 lb (34,100 kg)\*\*\*

Max Zero Fuel Weight: 69,886 lb (31,700 kg) 70,547 lb (32,000 kg)\*\*\*

\* post-mod SB 170-00-0039

\*\* post-mod SB 170-00-0037 \*\*\* post-mod SB 170-00-0016

Maximum Baggage Forward Cargo Compartment 3,307 lb (1,500 kg)

Aft Cargo Compartment 2,535 lb (1,150 kg)

Maximum Passenger Seating Capacity 88

Serial Numbers 17000014 and subsequent.

#### VI. Model ERJ 170-200 LR (Transport Category Airplane) approved August 31st, 2006

Same as model ERJ 170-200 STD, except for the following item:

Maximum Weights Max Ramp Weight: 85,870 lb (38,950 kg)

89,352 lb (40,530 kg)\*

Max Takeoff Weight: 85,517 lb (38,790 kg)

89,000 lb (40,370 kg)\*

\* post-mod SB 170-00-0016

# VII. Model ERJ 170-200 SU (Transport Category Airplane) approved August 31st, 2006

Same as model ERJ 170-200 LR, except for the following item:

Maximum Passenger Seating Capacity 76

#### VIII. Model ERJ 170-200 LL (Transport Category Airplane) approved February 5th, 2018

Same as model ERJ 170-200 LR, except for the following item:

Maximum Weights Max Ramp Weight: 85,450 lb (38,760 kg)

Max Takeoff Weight: 85,098 lb (38,600 kg) Max Landing Weight: 74,957 lb (34,000 kg) Max Zero Fuel Weight: 69,467 lb (31,510 kg)

Maximum Passenger Seating Capacity 70

# DATA PERTINENT TO ALL MODELS EXCEPT AS INDICATED

# **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."

NOTE: In order for the FAA to determine that a Model ERJ 170-200 LL aircraft is in a condition for safe operation under the provisions of 14 CFR 21.183, prior to issuance of the U.S. airworthiness certificate the FAA certificating inspector or other authorized person must ensure the aircraft complies with the FAA Required Airworthiness Action List (RAAL) for the ERJ 170-200 LL.

The RAAL contains a list of type design modifications and inspections that have been determined by the Agência Nacional de Aviação Civil (ANAC), which is the state of

design authority for the Embraer ERJ 170, to be required to correct unsafe conditions discovered on the original type design of the ERJ 170. ANAC has issued Airworthiness Directives – MCAI - that require the accomplishment of these modifications and inspections to correct the identified unsafe conditions, and has advised the FAA of this MCAI. Based on these MCAI the FAA has determined that certain FAA ADs applicable to the Model ERJ 170-200 LR are also applicable to the Model ERJ 170-200 LL and have been added to the RAAL. The FAA has determined that the airworthiness actions identified in the FAA ADs listed in ERJ 170-200 LL RAAL are required in the interest of safety and are necessary for this airplane to be in a condition for safe operation.

Prior to issuance of a Standard Airworthiness Certificate on a Model ERJ 170-200 LL aircraft, all airworthiness actions applicable to the Model 170-200 LR in the ADs listed in the ERJ 170-200 LL RAAL must be accomplished in accordance with the compliance times listed in each AD. The ADs listed in the RAAL are airworthiness limitations in addition to those listed in note 3 of this TCDS, and must be included in the operator's airplane maintenance or inspection program. All inspections or modifications, required by the ADs listed in the RAAL, which have surpassed the initial compliance time, must be accomplished prior to issuance of the Standard Airworthiness Certificate.

#### ERJ 170-200 LL RAAL:

- FAA AD 2013-11-17 (Actions applicable to Model 170-200 LR)
- FAA AD 2013-25-04 (Actions applicable to Model 170-200 LR)
- FAA AD 2016-12-14 (Actions applicable to Model 170-200 LR)

Any deviation from the requirements of the ADs listed in the RAAL must be approved by the Manager, International Section, AIR-676, FAA Transport Standards Staff; 2200 South 216<sup>th</sup> Street, Des Moines, WA 98198; telephone (206) 231-3154.

Certification Basis 14 CFR part 25, effective February 1, 1965, including the following amendments:

Amendments 25-1 through 25-101 in entirety
Amendment 25-102, §§ 25.981(a) and (b), H25.4 only
Amendments 25-103 through 25-105 in entirety
Amendment 25-106, §§ 25.795(a)(1) and (a)(2) only
Amendment 25-107, § 25.731(d) and (e); § 25.735(a) through (g), and (i) through (k) only
Amendments 25-108 and 25-109 in entirety

For 170-200(), airplane serial numbers 17000388, 17000390, 17000376 thru 17000378, 17000381 thru 17000387, 17000392 and on, post-mod SB 170-57-0058 or with the equivalent modifications factory-incorporated, the following additional regulations apply at the listed amendment level in the areas described:

Amendment 25-112, § 25.613 (structure of center fuselage 2, wing stub, wing and wingtip);

Amendment 25-113, §§ 25.1353 and 25.1431 (both for the position and anticollision lights and associated EWIS installed in wingtip);

Amendment 25-115, §§ 25.147, 25.161 and 25.175;

Amendment 25-121, §§ 25.103, 25.105, 25.111, 25.119, 25.121, 25.123, 25.125 and 25.237;

Amendment 25-129, §§ 25.143, 25.207 and 25.1419 (wing); Amendment 25-135, §§ 25.21, 25.107, 25.177 and 25.253.

#### **Special Conditions:**

No. 25-231-SC, consisting of the following subject:

- Engine Torque Loads for Sudden Engine Stoppage
- Operation without Normal electrical Power
- Interaction of Systems and Structure

No. 25-223-SC, consisting of the following subject:

- High Intensity Radiated Fields

No. 25-241-SC, consisting of the following subjects:

- Electronic Flight Controls; Control Surface Position Awareness
- Performance Credit for Automatic takeoff Thrust Control System during Go-Around

No. 25-250-SC, consisting of the following subject:

- Electronic Flight Controls; Command Signal Integrity

No. 25-543-SC, consisting of the following subject:

- Seats with Large, Non-Traditional, Non-Metallic Panels No. 25-684-SC, consisting of the following subject:

 Non-Rechargeable Lithium Batteries (Effective to design changes applied for after May 31, 2017. See the applicability section of this special condition for more information on which design changes must meet it.)

NOTE: The FAA Special Conditions referenced above may be accessed at the FAA's Regulatory and Guidance Library website.

## Equivalent Level of Safety Findings:

- § 25.331(c)(2): Pitch Maneuver Conditions (documented in FAA Memo TC0056IB-T-HES-13)
- $\S\S$  25.1301, 25.1309: Equipment, Systems, and Installations (documented in FAA Memo TC0056IB-T-HSI-15)
- § 25.933(a)(1)(ii): Flight Critical Thrust Reverser (documented in FAA Memo TC0056IB-T-HPR-06)
- 14 CFR part 25 subparts E, F, & G requirements applicable to APU installations: APU Certification Rules (documented in FAA Memo TC0056IB-T-P-4)
- 14 CFR part 25 Appendix I25.4(a): ATTCS Reduction in initial power setting to less than 90% of takeoff thrust (documented in FAA Memo TC0056IB-T-HDE-16)
- 14 CFR part 25 Appendix I25.5(b)(4): ATTCS Deactivation control (documented in FAA Memo TC0056IB-T-HPR-23)
- § 25.1305(c)(3): Digital Only Display of Turbine Engine High/Intermediate Pressure Rotor Speed (documented in FAA Memo TC0056IB-T-HPR-14)
- § 25.783: Adoption of Draft Harmonized Rules for Fuselage Doors Certification (documented in FAA Memo TC0056IB-T-A-6)
- §§ 25.1389(b), 25.1391, 25.1393, 25.1395: Position Light Intensities (documented in FAA Memo TC0056IB-T-S-34)
- §§ 25.1389(b), 25.1395: Position Light Intensities (documented in FAA Memo AT10314IB-T-S-63)
- §§ 25.1389(b), 25.1395: Position Light Intensities (documented in FAA Memo AT10160IB-T-S-62)\*
- § 25.1443(c): Determination of Minimum Oxygen Flow for the Lavatory Oxygen System (documented in TAD ELOS Memo AT10107IB-T-SM-1)
- § 25.1441(c): Crew Determination of Quantity of Oxygen in Lavatory Oxygen System Distributed Bottles (documented in TAD ELOS Memo AT10107IB-T-SM-2)
- 25.1389(b)(1) and (b)(2), 25.1391, 25.1393 Minimum Intensity of Position Lights System with Protective Tape (documented in ELOS Memorandum AT11187IB-T-25.1389-1)
- \* applicable to 170-200(), airplane serial numbers 17000388, 17000390, 17000376 thru 17000378, 17000381 thru 17000387, 17000392 and on, post-mod SB 170-57-0058 or with the equivalent modifications factory-incorporated

NOTE: The FAA Equivalent Level of Safety Memos referenced above may be accessed at the FAA's Regulatory and Guidance Library website.

#### Exemptions:

- Exemption No. 8072, 14 CFR part 25, Section 25.901(c) Uncontrollable High Thrust
- Exemption No. 8160, 14 CFR part 25, Section 25.841(a)(2)(ii) Pressurized Cabins
- Exemption No. 8151, 14 CFR part 25, Section 25.831(g) Ventilation (humidity requirement)

NOTE: The FAA Exemptions referenced above may be accessed at the FAA's Regulatory and Guidance Library website.

# Optional Requirements complied with:

Section 25.801 Ditching (170-100 SE not certified for

ditching)

Section 25.1403 Wing icing detection lights

Sections 25.1411, 25.1415 Safety equipment required for ditching

certification

Section 25.1419 Ice protection Section 25.1421 Megaphones

Part 26 of the Federal Aviation Regulations:

8

Based on § 21.29(a) for new 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.

Environmental Standards complied with:

- All Models: 14 CFR Part 36 effective December 1, 1969, including Amendments 36-1 through 36-24, Stage 3. See the appropriate FAA Approved Airplane Flight Manual listed for applicability of Silent Kit through amendment 36-28 or Stage 4 Noise Recertification through amendment 36-31.
- ERJ 170-200 LL Model: 14 CFR Part 36 effective December 1, 1969, including Amendments 36-1 through 36-28. See the appropriate FAA Approved Airplane Flight Manual listed for applicability of Silent Kit through amendment 36-28 or Stage 4 Noise Recertification through amendment 36-31.
- 14 CFR Part 34 effective September 10, 1990, including Amendment 34-1 through 34-3.

The basic required equipment as prescribed in the applicable airworthiness regulations (see the Certification Basis) must be installed in the aircraft. The lists of all equipment as well as optional approved equipment are contained in the Embraer documents:

Type Design Standard Document No. 170-100TDSD\_01 for the ERJ 170-100 models and Type Design Standard Document No. 170-200TDSD\_FAA for the ERJ 170-200 models.

ANAC approved Airplane Flight Manual AFM-1385.

Service bulletins, repair instructions (letters, drawings, specifications, forms used for transmitting repair descriptions, etc.), structural repair manuals, airplane flight manuals, vendor manuals, and overhaul and maintenance manuals that are published in the English language and indicate applicability to the U.S. approved type designs included in this Type Certificate and that include a statement "ANAC Approved" are accepted by the FAA and are considered "FAA Approved" (See Note 8). These approvals pertain to the type design only.

Additionally, changes to type design that are approved by ANAC designated engineering representatives via ANAC form F-200-06 are also considered FAA approved (See Note 8).

# NOTES

NOTE 3.

NOTE 1. Weight and balance. Current weight and balance report including a form of weight and list of

equipment included in certificated empty weight and loading instructions must be provided for each aircraft at the time of original certification.

The certificated basic empty weight and corresponding center of gravity location must include the total engine oil, hydraulic fluid and unusable fuel.

NOTE 2. All placards required by either FAA Approved Airplane Flight Manual, the applicable operating rules, or the Certification Basis must be installed in the airplane.

All the life limitations are provided in the "Appendix A Part 4 – Life - Limited Items (LLI)", of the document MRB-1621.

The mandatory structure certification maintenance requirements, raised from the damage tolerance analysis, are listed in the "Appendix A Part 2 - Airworthiness Limitation Items (ALI) Structures" of the document MRB-1621.

Equipment

Airplane Flight Manual

Service Information

The mandatory systems certification maintenance requirements, raised from the safety analysis, are listed in the "Appendix A Part 1 – Certification Maintenance Requirements (CMR)" of the document MRB-1621.

The mandatory fuel systems limitations items (FSL), raised from the Fuel Tanks safety requirement, are listed in the "Appendix A Part 3 – Fuel System Limitation Items (FSL)" of the document MRB-1621.

The Structures Repair Manual SRM 1583 is approved and controlled by ANAC, and all Service Bulletins issued by Embraer are approved by ANAC. An approval statement is stamped in each Service Bulletin.

#### NOTE 4.

The systems containing User Modifiable Software are:

- User Partition of the Owner Requirements Table (ORT) of the SATCOM (Satellite Communication System);
- Airline Modifiable Information (AMI) of the Communication Management Function (CMF);
- APM System Setting Data (Airline Operational Data);
- User Application of the Aircraft Condition Monitoring Function (ACMF); User Modifiable Software is not approved as part of the type design.

#### NOTE 5.

The CF34-8E5 and CF34-8E5A1 engines designation, as presented in the Engine Part List, must contain the suffix Gxx, which defines the specific engine configuration. For the ERJ 170-100 and ERJ 170-200 model, the following designations are approved for operation: CF34-8E5G01 and CF34-E5A1G01.

## NOTE 6.

Any new interior configuration affecting the cockpit door access area, including adjacent structures such as galleys and wardrobes, must be submitted for FAA Aircraft Certification Office (ACO) approval, specifically for compliance with 14 CFR 25.809(b). FAA ACO's should coordinate any such changes with the TC issuing office (ANM-116).

#### NOTE 7.

The Models ERJ 170-100 xx and ERJ 170-200 xx are often referred to in Embraer marketing literature as the "Embraer 170 xx and Embraer 175 xx", respectively, with the appropriate model (LR, STD, etc.) substituted for the "xx". This name is strictly a marketing designation and is not part of the official model designations.

# NOTE 8.

As stated in Exemption No. 8072 (ERJ 170) the FAA has concluded that the occurrence of any uncontrollable high thrust failure condition or any of the associated causal failures listed below, are reportable under §§ 121.703 (c), 125.409 (c), and 135.415(c):

- FADEC Full Authority Digital Engine Control
- TCQ Thrust Control Quadrant
- FMU Fuel Metering Unit

### NOTE 9.

The "Agência Nacional de Aviação Civil" - ANAC (National Agency of Civil Aviation) took over responsibility for Brazilian civil aircraft certification on 21 March 2006. Approvals made prior to that date will reference the CTA as the responsible Brazilian aviation authority.

# NOTE 10.

Initial airworthiness requirements for operation in Reduced Vertical Separation Minimum (RVSM) airspace have been met. Refer to AFM No. AFM-1385.

Each operator must obtain RVSM operating approval directly from the FAA.