AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL - BRASIL

TYPE CERTIFICATE DATA SHEET Nº EM-2007T13

Type Certificate Holder:

PRATT & WHITNEY CORP.
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East Hartford, Connecticut - CT 06108
USA

EM-2007T13

Sheet 01

PRATT & WHITNEY

JT8D-209
JT8D-217
JT8D-217A
JT8D-217C
JT8D-219

October 2007

Engines of models described herein conforming with this data sheet, which is part of Type Certificate No. 2007T13, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

I - MODEL JT8D-209, JT8D-217, JT8D-217A, JT8D-217C

TYPE Turbofan, dual axial fourteen-stage compressor, four-stage turbine, nine can-annular combustion chambers, exhaust mixer.

		JT8D-209	JT8D-217	JT8D-217A	JT8D-217C
RATINGS (See Note 5)					
	Maximum continuous at sea level, static thrust – daN (lb)	7 112 (16 000)	8 001 (18 000)	--	--
	Normal takeoff (5 min) at sea level, static thrust – daN (lb) (See Notes 13 and 15)	8 223 (18 500)	8 890 (20 000)	--	--
	Maximum takeoff (5 min) at sea level, static thrust – daN (lb) (See Notes 13, 14 and 15)	8 557 (19 250)	9 268 (20 850)	--	--
COMPONENTS					
	Fuel Control	Hamilton Std. JFC60-6	--	--	--
	Fuel Pump	Argo-Tech Corp. p/n 384300	--	--	--
	Pressure Ratio Bleed Control	P&W p/n 777537	--	P&W p/n 790312	
	Ignition	Bendix Type TCFN-2 of Simmonds Type 49988 exciter with two igniters; Champion AA-72S, AC JB-3.			
FUEL TYPE		See Note 10	--	--	--
OIL, LUBRICATION		See Note 11	--	--	--
TEMPERATURE LIMITS		See Note 2	--	--	--
PRESSURE LIMITS		See Note 3	--	--	--

		JT8D-209	JT8D-217	JT8D-217A	JT8D-217C
PRINCIPAL DIMENSIONS	Maximum length, cm (in) (including Spinner)	391.7 (154.2)	--	--	--
	Width, cm (in)	150.4 (59.2)	--	--	--
	Weight (dry), kg (lb)				
	- Basic engine with all essential accessories; with fuel heater, oil tank, fuel oil cooler, and CSD fuel oil cooler; but excluding starter, exhaust nozzle and power source for the ignition systems. Reflects engines which incorporate the high pressure containment shield through SB 6053 [29.5 kg (65 lb)] and the 6° stage bleed system identified in EC 86HA037 [14.5 kg (32 lb)].	2 055.7 (4 532)	2 071.5 (4 567)	--	2 092 (4 612)
	- Airframe brackets, kg (lb)	9.1 (20)	--	--	--
	- Transition Duct, kg (lb)	38.5 (85)	--	--	--
CENTER OF GRAVITY	Aft of front mount area centerline, cm (in)	56.9 (22.4)	58.4 (23.0)	--	58.9 (23.2)
	Below engine centerline, cm (in)	5.3 (2.1)	--	--	--

II - MODEL JT8D-219

TYPE Turbofan, dual axial fourteen-stage compressor, four-stage turbine, nine can-annular combustion chambers, exhaust mixer.

RATINGS (See Note 5)	JT8D-219
Maximum continuous at sea level, static thrust – daN (lb)	8 401 (18 900)
Normal takeoff (5 min) at sea level, static thrust – daN (lb) (See Notes 13 and 15)	9 335 (21 000)
Maximum takeoff (5 min) at sea level, static thrust – daN (lb) (See Notes 13, 14 and 15)	9 646 (21 700)

COMPONENTS		
	Fuel Control	Hamilton Std. JFC60-6
	Fuel Pump	Argo-Tech Corp. p/n 384300
	Pressure Ratio Bleed Control	P&W p/n 790312
	Ignition	Bendix Type TCFN-2 of Simmonds Type 49988 exciter with two igniters; Champion AA-72S, AC JB-3.
FUEL TYPE		See Note 10
OIL, LUBRICATION		See Note 11
TEMPERATURE LIMITS		See Note 2
PRESSURE LIMITS		See Note 3
PRINCIPAL DIMENSIONS	Maximum length, cm (in) (including Spinner)	391.7 (154.2)
	Width, cm (in)	150.4 (59.2)

		JT8D-219
PRINCIPAL DIMENSIONS (Cont.)	Weight (dry), kg (lb)	
	- Basic engine with all essential accessories; with fuel heater, oil tank, fuel oil cooler, and CSD fuel oil cooler; but excluding starter, exhaust nozzle and power source for the ignition systems. Reflects engines which incorporate the high pressure containment shield through SB 6053 [29.5 kg (65 lb)] and the 6th stage bleed system identified in EC 86HA037 [14.5 kg (32 lb)].	2 092 (4 612)
	- Airframe brackets, kg (lb)	9.1 (20)
	- Transition Duct, kg (lb)	38.5 (85)
CENTER OF GRAVITY	Aft of front mount area centerline, cm (in)	58.9 (23.2)
	Below engine centerline, cm (in)	5.3 (2.1)

IMPORT REQUIREMENTS Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approval issued by FAA (or a third country authority, in case of used engine imported from such country) attesting that the particular engine and/or parts were submitted to the governmental quality control before delivery and are in conformity with the ANAC approved type design. The ANAC type design corresponds to the FAA approved type design, as stated in ANAC Report V33-0990-00 dated 17 October 2007 or further revisions.

CERTIFICATION BASIS RBHA 33 (Brazilian Requirements for Aeronautical Certification), which endorses the FAR 33 effective 01 February 1965, as amended by 33-1, 33-2, 33-3, 33-4, 33-5, 33-6 and FAA Exemption No. 2479, 2743 (JT8D-209), 2897 (JT8D-217, -217A) and 2897-1 (JT8D-217C, -219).

Model	Application	Issued TC
JT8D-209	07 June 2007	17 October 2007
JT8D-217	07 June 2007	17 October 2007
JT8D-217A	07 June 2007	17 October 2007
JT8D-217C	07 June 2007	17 October 2007
JT8D-219	07 June 2007	17 October 2007

PRODUCTION BASIS Production Certificate No. 2.

NOTES:

NOTE 1 Maximum permissible engine operating speeds for the engine rotors are as follows:

Low pressure rotor (N1), rpm	JT8D-209	JT8D-217	JT8D-217A	JT8D-217C	JT8D-219
- Normal Takeoff (ARTS armed)	7 850	7 770	8 080	--	8 120
- All other operating conditions	8 150	--	8 350	--	--
High pressure rotor (N2), rpm					
- Normal Takeoff (ARTS armed)	12 150	12 285	12 350	--	--
- All other operating conditions	12 370	12 550	--	--	--

For inadvertent exceeding of certified over-speed limits, see Chapter 72-00-00 of the appropriate Maintenance Manual.

NOTE 2 Maximum permissible temperatures are as follows:

- Turbine outlet gas temperature, °C (°F):	JT8D-209	JT8D-217	JT8D-217A	JT8D-217C	JT8D-219
Maximum Takeoff (5 min.)	570 (1 058)	625 (1 157)	--	--	--
Normal Takeoff (5 min.)	550 (1 022)	590 (1 094)	--	--	--
Maximum continuous	530 (986)	580 (1 076)	--	--	--
Maximum acceleration:					
Maximum Takeoff (2 min.)	#	630 (1 166)	--	--	--
Normal Takeoff (2 min.)	#	595 (1 103)	--	--	--
- Turbine outlet gas temperature at start-up, °C (°F):					
Ground	500 (932)	--	--	--	--
In-Flight	570 (1 058)	625 (1 157)	--	--	--

Oil Inlet: Maximum oil inlet temperature is not to exceed 135°C (275°F).
During idle descent (transient operation), a 163°C (325°F) limit is permissible for up to 15 minutes.

For inadvertent exceeding of certified temperature limits, see Chapter 72-00-00 of the Maintenance Manual P/N 773127. External engine limiting temperatures for specific components are specified in the engine Installation Handbook, Part A.

NOTE 3 Fuel and oil pressure limits are as follows:

Fuel pressure: At inlet to engine system pump, not less than 5 psi above the true vapor pressure of the fuel and not greater than 50 psig with a vapor/liquid ratio of zero.

Oil pressure: Minimum 35 psig (normal range 40-60 psig)

Note: During cold weather starting, oil pressure in excess of 55 psig may be evidenced until oil viscosities are reduced by increasing oil temperature. Engine operation is limited to idle power when oil pressure is in excess of 55 psig during cold weather starts.

NOTE 4 Maximum permissible air bleed extraction is as follows (all models):

	Percentage of Primary Engine Airflow	
	Normal Bleed	Maximum Bleed
- High-Pressure Bleed:		
a. Below 90% max. cont. thrust	8.0	8.0
b. Above 90% max. cont. thrust	3.5	5.5*
- Eight-Stage Bleed:		
a. Below max. cont. thrust	4.0	4.0
b. Above max. cont. thrust	2.75	3.25*
- Low-Pressure Bleed:		
a. Above 20% max. cont. thrust	3.5	3.5
b. Below 20% max. cont. thrust	2.8	2.8
- Fan Air Bleed:		
a. Below max. cont. thrust	3.0	3.0
b. Above max. cont. thrust	2.0	2.0

* Usable only when required by a malfunction and only until the next landing.

Note: The above limits apply when the bleed is taken from all available bleed ports of any one bleed station.

NOTE 5 The ratings are based on static test stand operation under the following conditions:

Compressor inlet air at 15 °C (59°F) and 29.92 in Hg;
Nozzle exhaust pipe per P&WA P/N 46701;
P&WA bellmouth on air inlet;
No aircraft accessory loads or air extraction;
No anti-icing airflow;
Turbine outlet gas temperature limits and engine rotor speed limits not exceeded.

NOTE 6 The following accessory drive provisions are incorporated:

Drive	Rotation (facing pad)	Speed Ratio to Turbine Shatf	Torque, N.m (lb-in) Continuous	Torque, N.m (lb-in) Static	Overhang N.m (lb-in)
Low-Pressure Rotor N1:					
Tachometer	C	0.511:1	0.8 (7)	5.76 (50)	#
High-Pressure Rotor N2:					
Starter	C	0.597:1	(*)	(*)	72 (625)
Generator	C	0.700:1	172.8 (1 500)	760.3 (6 600)**	288 (2 500)
Fluid Power Pump	C	0.292:1	115.2 (1 000)	506.9 (4 400)	46.1 (400)
Tachometer	CC	0.343:1	0.8 (7)	5.76 (50)	#

C" – Clockwise; "CC" - Counter Clockwise
(*) Maximum starter torque: 550 lb-ft. The shear section will fail at 850 (-0/+100) lb-ft.
(**) Maximum torque when used as a starter: 410 lb-ft.
"#" indicates "does not apply"

NOTE 7 Power setting, power checks, and control of engine output in all operations is to be used based upon P&WA engine charts referring to turbine discharge section gas pressure. Pressure probes are included in the engine assembly for this purpose.

NOTE 8 These engines have demonstrated satisfactory operation in icing conditions as defined in RBHA 33.68 (Brazilian Requirements for Aeronautical Certification), which endorses the Federal Aviation Regulation 33.68.

NOTE 9 The serial number suffixes "D" or "V" designate engines for McDonnell-Douglas Aircraft Company or Valsan Reengines Aircraft, respectively.

NOTE 10 The following fuels are approved for these engines:
Fuels and fuel additives conforming to the latest applicable issue of FAA approved P&W Turbojet Engine Service Bulletin No. 2016 may be used separately or mixed in any proportions without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.

NOTE 11 The following oils are eligible for these engines:
Synthetic type conforming to P&W Specification No. 521, or later revision. P&W Turbojet Engine Service Bulletin No. 238 lists approved brand name oils.

NOTE 12 Certain engine parts are life limited. These limits are listed in the Time Limit Section of the FAA approved Pratt & Whitney Aircraft JT8D-200 Series Turbofan Engine Manual P/N 773128. See Note 14 when using the for the JT8D-219 auxiliary maximum takeoff rating.

NOTE 13 A thrust setting limited to 8 557 daN (19 250 lb) (JT8D-209), 9 268 daN (20 850 lb) (JT8D-217, -217A, -217C) and 9 646 daN (21 700 lb) (JT8D-219), static thrust at sea level, flat rated to 28.9°C (84°F) ambient temperature has been established as maximum takeoff thrust rating. A thrust setting limited to 8 223 daN (18 500 lb) (JT8D-209), 8 890 daN (20 000 lb) (JT8D-217), static thrust at sea level, flat rated to 25°C (77°F) ambient temperature and 8 890 daN (20 000 lb) (JT8D-217A, -217C) and 9 335 daN (21 000 lb) (JT8D-219), static thrust at sea level, flat rated to 28.9°C (84°F) ambient temperature has been established as normal takeoff thrust rating for normal takeoff operation.
When the automatic reset mechanism in the fuel control is armed, operation to the Normal Takeoff Rating Operating Limits will prevent the engine from exceeding the Maximum Takeoff Rating Operating Limits when the reset mechanism is actuated.
The time limit at the Normal Takeoff rating is 5 minutes and shall include any time accumulated above the Normal Takeoff Rating.

NOTE 14 A thrust setting limited to 9 646 daN (21 700 lb), static thrust at sea level, flat rated to 32.4°C (90.4°F) ambient temperature has been established as auxiliary maximum takeoff for the JT8D-219 engine model.
The auxiliary maximum takeoff setting provides additional hot day performance on the JT8D-219 engine model only and is achieved by manual setting of the power lever only, with the automatic mechanism disarmed (off).

NOTE 15 The 5 minute takeoff time may be extended to 10 minutes for one engine inoperative or shutdown for engines which have incorporated all the features specified in Pratt & Whitney Aircraft Turbojet Engine Service Bulletin No. 5514 and 5643 and Alert Service Bulletin No. 6196.

NOTE 16 All these engines meet the Smoke and Gaseous Emission requirements of SFAR-27, dated 01 January 1984.

NOTE 17 All these engines meet the fuel venting emission requirements of SFAR-27, dated 01 January 1984.

NOTE 18 Maximum permissible inlet distortion limit for these engines is specified in the Installation Handbook , Part A.

NOTE 19 Information regarding transient rotor shaft over-speed rpm and number of over-speed occurrences, as well as transient gas over-temperature and number of over-temperature occurrences, is specified in the Maintenance Manual P/N 773127.

NOTE 20 Characteristics of the JT8D-200 Series models:

JT8D-217: is the same as JT8D-209 except for incorporation of a cooled high pressure turbine and improved engine parts;

JT8D-217A: is the same as JT8D-217 except for daN (20,000 lb) of static thrust at sea level, flat rated to 28.9 °C (84°F) ambient temperature and improved engine parts;

JT8D-219: is the same as JT8D-217A except for incorporation of improved parts including longer fan blades and an improved cooled high pressure turbine to permit increases in the thrust ratings.

JT8D-217C: is the same as JT8D-219 except that it has -217A ratings and operating limits.

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