AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL - BRASIL

TYPE CERTIFICATE DATA SHEET Nº EM-2002T02

EM-2002T02-01

Sheet 01

PRATT & WHITNEY

PW 530A
PW 535A
PW 535B

May 2007

Type Certificate Holder:

PRATT & WHITNEY CANADA, INC.
1000 Marie Victorin
Longueuil, Quebec – J4G 1A1
CANADA

Engines of models described herein conforming with this data sheet, which is part of Type Certificate No. 2002T02, 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.

MODELS PW 530A, PW535A, PW535B.

TYPE Twin spool turbofan with single stage integrally bladed fan, one axial low compressor stage (PW535A and PW535B), two axial high compressor stages and one centrifugal compressor stage, one stage high pressure turbine, two stage low pressure turbine, annular reverse-flow combustor and full length annular bypass duct.

RATINGS (See Note 1)

	PW530A	PW535A	PW535B
Maximum continuous at sea level, daN (lb)	1 264.6 (2 843)	1 512.4 (3 400)	--
Takeoff (5 min. at sea level), daN (lb)	1 284.2 (2 887)	1 512.4 (3 400)	--

Legend: "--" = same as preceding "#" = does not apply

		PW530A	PW535A	PW535B
DIMENSIONS	Refer to Installation Manual.			
CENTER OF GRAVITY	Forward of gearbox mount plane, cm (in)	30.76 (12.11)	29.90 (11.77)	--
	Below engine centerline, cm (in)	4.65 (1.83)	4.44 (1.75)	--
	Right side of engine centerline, cm (in)	#	0.25 (0.10)	--
	Left side of engine centerline, cm (in)	1.52 (0.60)	#	#
	Forward - direction from combining gearbox toward power section intake			
WEIGHT (DRY)	Specification weight – dry, kg (lb)	279.6 (616.5)	316.4 (697.5)	--
FUEL	Fuel conforming to CPW204. Approved fuels and additives are listed in Pratt & Whitney Canada Maintenance Manual P/N 30J1112 (PW530A) or P/N 3044952 (PW535A) or P/N 3071822 (PW535B).			
OIL	Synthetic type conforming to the current PWA 521 (Type II) Specification. Approved oil brands are listed in Pratt & Whitney Canada Maintenance Manual P/N 30J1112 (PW530A) or P/N 3044952 (PW535A) or P/N 3071822 (PW535B)			
OIL CAPACITY	Total capacity, liters (U.S.gal)	4.76 (1.26)	10.04 (2.65)	--
	Usable, liters (U.S.gal)	1.76 (0.46)	01.00 (0.26)	--
TEMPERATURE LIMITS		See Note 2	--	--
PRESSURE LIMITS		See Note 5	--	--
OUTPUT TORQUE		See Note 4	--	--
IGNITION				
	Exciter	PWC P/N 31J2807-01A	PWC P/N 3052328-01	PWC P/N 31J2807-07
	Igniter plug	PWC P/N 31J1552-01	PWC P/N 3052582-01	--

AIR BLEED
(See Note 10)

High compressor bleed, kg/h (lb/h)
Maximum external bleed air available:

PW530A 20.4 kg/h (45 lb/h) at sea level, decreasing linearly to 16.3 kg/h (36 lb/h) at 6 096 m (20 000 ft) altitude, then decreasing linearly to 12.6 kg/h (28 lb/h) at 12 192 m (40 000 ft), then decreasing linearly to 12.2 kg/h (27 lb/h) at 13 716 m (45 000 ft).

PW535A 32.2 kg/h (71 lb/h) at sea level, decreasing linearly to 24.5 kg/h (54 lb/h) at 9 754 m (32 000 ft) altitude, then decreasing linearly to 12.7 kg/h (28 lb/h) at 13 716 m (45 000 ft) altitude.

PW535B Refer to Installation Manual.

IMPORT REQUIREMENTS

Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approvals issued by a foreign primary authority approval 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.

CERTIFICATION BASIS

The Certification Basis for the engine model PW 530A is the RBHA 33, which endorses the FAR 33, Amendments 1 through 15 inclusive, effective 16 August 1993, and RBHA/FAR 34 effective 10 September 1990.

For the engine model PW 535A is the RBHA 33, which endorses the FAR 33, Amendments 1 through 17 inclusive, effective 05 July 1996 including Federal Aviation Administration Exemption Number 7074, and RBHA/FAR 34 effective 10 September 1990.

For the engine model PW 535B is the RBHA 33, which endorses the FAR 33, Amendments 1 through 20 inclusive, effective 14 September 2000, including RBHA/FAR 34-3 and Federal Aviation Administration Equivalent Level of Safety (ELOS) finding. Bird Ingestion paragraph (c), Amendment 20. ELOS No. 8040-ELOS-06-NE-01.

Model	Application	Issued TC
PW530A	28 January 1997	15 April 1997
PW535A	17 September 2001	19 March 2002
PW535B	19 February 2007	18 May 2007

NOTES:

NOTE 1

The engine ratings are based on static sea level conditions, 3.99 kPa (29.92 in. Hg.):
- PW530A: Compressor inlet air (dry) 22.8° C (73° F), at takeoff and 15° C (59 ° F) at max. Continuous.
- PW535A: Compressor inlet air (dry) 27.2°C (81° F) at takeoff, and 17.6° C (67.3° F) at max. Continuous.
- PW535B: Compressor inlet air (dry) 27.2°C (81° F) at takeoff, and 17.6° C (67.3° F) at max. Continuous.

No accessory loads or air bleed.
Engine intake and exhaust as described in the approved Installation Manual.

NOTE 2

Temperature Limitations	PW 530A	PW535A	PW535B
Maximum Interturbine Temperature (ITT), °C (°F)			
Maximum Continuous	700 (1292)	--	--
Starting (5 sec.)	740 (1364)	--	--
Transient (20 sec.)	740 (1364)	--	--
Take-off (5 min.)	700 (1292)	--	--
Oil Inlet Temperature °C (°F)			
Maximum	121 (250)	132.2 (270)	--
Minimum	-40 (-40)	--	--
Transient maximum	135 (275) (120 sec.)	140.5 (285) (200 sec.)	--

NOTE 3

Maximum Permissible Engine Rotor Speeds (see Note 1)	PW530A		PW535A		PW530B	
	N1	N2	N1	N2	N1	N2
Maximum Continuous, rpm	15 750	32 150	15 850	33 970	--	--
Takeoff (5 min.), rpm	15 750	32 150	15 850	33 970	--	--
Ground Idle Continuous, rpm	#	14 560	#	16 675	#	16849
Flight Idle Continuous, rpm	#	15 880	#	17 795	#	18140
Transient (20 sec.)	16 065	32 793	16 167	34 649	--	--

For PW 530A 15 750 rpm corresponds to 100 % N1 speed and 32 150 rpm corresponds to 100 % N2 speed.
For PW 535A 15 850 rpm corresponds to 100 % N1 speed and 33 970 rpm corresponds to 100 % N2 speed.
For PW 535B 15 850 rpm corresponds to 100 % N1 speed and 33 970 rpm corresponds to 100 % N2 speed.

NOTE 4 Reserved.

NOTE 5 Fuel and Oil Pressure Limits.

Fuel Pressure: Refer to Installation Manual	PW530A	PW535A	PW535B
Oil Pressure kPa (psid):			
Minimum at ground idle & above:	172 (25)	--	--
Maximum:	1102 (160)	--	--
Transient (20 sec.):	0	0	--
Transient (400 sec):	138-1722 (20-250)	138-1862 (20-270)	--

NOTE 6 Accessory Drives.

Driven by High Rotor	Rotation	Speed ratio to turbine Shaft	Maximum Torque, N.m (in-lb)		Maximum Overhang, N.m (in.lb)
			Continuous	Static	
Hydraulic pump (PW530A)	CW	0.1353:1	14.4 (125)	183.8 (1 600)	4.6 (40)
(PW535A, PW535B)		0.1279:1	25.3 (220)		
Starter generator (PW530A)	CW	0.3843:1	27.6 (240)	183.8 (1 600)	24.1 (210)
(PW535A, PW535B)		0.3634:1	22.4 (195)		

CW – Clockwise facing accessory pad.
Total accessory power limit is 16.8 kW (22.5 hp) at 50% N2, increasing linearly to 22.4 kW (30 hp) at 100% N2. Refer to Installation Manual for restriction above 6 096 m (20 000 ft) altitude and allowable 5 minute emergency accessory power extraction.

NOTE 7 Model Description.

Model	Characteristics
PW530A	Basic model
PW535A	Similar to PW530A but with increased thrust ratings, redesigned fan, added low compressor axial booster stage, and redesigned low pressure turbine.
PW535B	Similar to PW535A but with a dual channel Full Authority Digital Electronic Control.

NOTE 8 Reserved.

NOTE 9 Minimum permissible flight idle N2 is 15 880 rpm (49.4%)(PW530A) or 17 975 rpm (52.9%)(PW535A) or 18 140 rpm (53.4%) (PW535B).

NOTE 10 Air Bleed.
During starting, bleed shall not exceed that taken by a 7.62 mm (0.3 in) diameter orifice throat.
Bleed air contamination meets: See paragraph 3.18 of MIL-E-5007C (PW530A) or paragraph 3.1.2.11.3 of MIL-E-5007C (PW535A and PW535B).

NOTE 11 Reserved.

NOTE 12 Reserved.

NOTE 13 Reserved.

NOTE 14 For the PW535A and PW535B engine models, the take-off rating and its associated operating limitations may be used for up to 10 minutes in the event of engine out contingency without adverse effects upon the engine airworthiness. Their use is otherwise limited to not more than 5 minutes. Such operations are anticipated on an infrequent basis (as engine failures at take-off events are uncommon) and no limits or special inspections have been imposed.

NOTE 15 Reserved.

NOTE 16 The starter/generator pad may be overloaded in an emergency to a torque of 39.05 N.m (340 in.-lb) for periods up to 5 minutes, subject to total accessory power not exceeding 29.8 kW (40 hp). This can recur at 4-hour intervals. Refer to Installation Manual for restrictions above 3 048 m (10 000 ft) altitude.

NOTE 17 Reserved.

NOTE 18 Reserved.

NOTE 19 Certain engine parts are life limited. These limits are listed in Pratt & Whitney Canada Service Bulletin No. 5002 as revised.

NOTE 20 Permissible overhaul and inspection intervals are listed in P&WC Maintenance Manual P/N 30J1112 (PW530A), or P/N 3044952 (PW535A) or P/N 3071822 (PW535B).

NOTE 21 Overhauls are not permitted until issuance of the approved Overhaul Manual. Engines may be returned to Pratt & Whitney Canada for re-manufacture to new production standard.

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