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I. General

1. Type/Variants: PW530A, PW535A, PW535B, PW535E

2. Type Certificate Holder:

Pratt and Whitney Canada Corp.
1000 Marie-Victorin
Longueuil, Quebec
Canada J4G 1A1

3. Manufacturer: Pratt and Whitney Canada Corp.

4. EASA Certification/JAA Validation Application Date:

PW530A	PW535A	PW535B	PW535E
11 August 1995	11 March 1997	23 September 2005	28 February 2007

5. EASA Certification Reference Date:

PW530A	PW 535A	PW535B	PW535E
31 August 1993	31 August 1993	13 May 2005	30 December 2006

6. EASA Certification Date:

PW530A	PW535A	PW535B	PW535E
15 April 1997	6 March 2000	14 August 2007	28 April 2010

EASA Type Certification for the PW530A and PW535A engine models is granted, in accordance with article 2 paragraph 3 (a)(i) of EU Commission Regulation (EC) 1702/2003, based on previous EASA Member State validations granted following the JAA Validation Recommendation.

II. Certification Basis

1. Transport Canada Certification Basis: See Transport Canada TCDS E-27

2. EASA Certification Basis:

The EASA Certification Basis for the PW530A and PW535A models is described in the Joint Validation Basis in paragraph 2.1.

2.1. JAA Joint Validation Basis:

2.1.1 JAA Airworthiness Requirements:

2.1.1.1 PW530A

- JAR-E change 8 dated 4 May 1990 plus Orange Paper E/91/1 dated 27 May 1991 and Orange Paper E/93/1 dated 17 May 1993 and NPA-E-20 for Medium Bird Ingestion.

2.1.1.2 PW535A

- JAR-E Change 9 dated 21 October 1994 plus Orange Papers E/96/1 dated 8 August 1996 and E/97/1 dated 30 December 1997 and NPA-E-20 for Medium Bird Ingestion.

2.1.2 JAA Special Conditions:

2.1.2.1 PW530A

- SC1 - Ingestion of Rain
- SC2 – Ingestion of Hail

2.1.2.2 PW535A

- SC1 - Inclement Weather in accordance with NPA-E-27 dated 16 September 1997

2.1.3 JAA Exemptions:

3.1.3.1 PW530A and PW535A

- JAR-E 570(a)(3) Oil System - oil pump inlet strainers
- JAR-E 800 Bird Strike/Ingestion - medium birds – Compliance shown with NPA-E-20

2.1.4 JAA Equivalent Safety Findings:

2.1.4.1 PW530A

- JAR-E 840(a)(2) Rotor Integrity tests

2.1.4.2 PW530A and PW535A

- JAR-E 890 Thrust Reverser Tests

2.1.5 JAA Environmental Standards:

2.1.5.1 PW530A and PW535A

- Emissions and Fuel Venting : ICAO Annex 16, Volume II, 2nd Edition, 1993.

2.2 EASA Certification Basis for PW535B Model:

2.2.1 Applicable Certification Specification: CS-E dated October 24, 2003

2.2.2 Environmental Protection Requirements: ICAO Annex 16, Volume II, Part III, Chapter 2 - Emissions at Amendment 5

ICAO Annex 16, Volume II, Part II, Chapter 2 - Fuel Venting

2.3 EASA Certification Basis for PW535E Model:

2.3.1 Applicable Certification Specification: CS-E, Amendment 1 dated 10 December 2007

2.3.2 Environmental Protection Requirements: ICAO Annex 16, Volume II, Part III, Chapter 2 - Emissions at Amendment 5

ICAO Annex 16, Volume II, Part II, Chapter 2 - Fuel Venting

III. Technical Characteristics

1. Type Design Definition:

PW530A: parts list EAPL A31J1400-01

PW545B: parts list EAPL A3041960-01

PW535B: parts list EAPL A3071463-01

PW535E: parts list EAPL A3072913-01

2. Description:

Dual Spool, axial flow, medium bypass turbofan. The 2-stage axial and single stage centrifugal high pressure compressor is driven by a single stage high pressure turbine. The integrally bladed fan and single boost stage (for PW535A and PW535B) low pressure compressor is driven by a 2-stage low pressure turbine. Reverse flow annular combustion chamber. The PW530A and PW535A models are controlled by a hydromechanical system the PW535B, PW535E are controlled by a dual channel FADEC.

3. Equipment:

Approved Equipment is included in the type design definition.

4. Dimensions:

	PW530A	PW535A	PW535B	PW535E
Overall Length	1.532m	1.646	1.646	1.679
Diameter	0.814m	0.953	0.953	1.082

5. Dry Weight (excluding all fluids and buyer furnished equipment):

PW530A: 279.6kg

PW535A: 317kg

PW535B: 318.4kg

PW535E: 317kg

6. Ratings:

Rating		PW530A	PW535A	PW535B	PW535E
Thrust, daN	Take-off (5 minutes)	1284.2	1512.4	1512.4	1494.6
	Maximum Continuous	1264.6	1512.4	1512.4	1494.6

Take off ratings quoted valid up to 22.8°C (PW530A), 27.2°C (PW535A and PW535B), 33°C (PW535E); maximum continuous ratings to 15°C (PW530A), 19.6°C (PW535A and PW535B), 24°C (PW535E)

7. Control System:

Engine control system comprises a hydro-mechanical control (PW530A and PW535A) and a dual channel FADEC for PW535B, PW535E.

8. Fluids

8.1 Fuel:

For approved fuel types and additives refer to relevant Maintenance Manual Chapter 72.

8.2 Oil:

For approved oil types and additives refer to relevant Maintenance Manual Chapter 72.

9. Aircraft Accessory Drives: see Installation Manual

10. Maximum Permissible Air Bleed Extraction:

The maximum permissible bypass air bleed is 3% of the bypass mass flow throughout the flight envelope. For high pressure compressor air bleed information refer to the relevant Installation Manual, Section 2.

IV. Operational Limits:

1. Temperature Limits:

1.1 Interturbine Temperature (ITT), °C

	PW530A	PW535A/PW535B	PW535E
Maximum Take-off	-	-	725
Take-off (5 Minutes)	700	700	700
Maximum Continuous	700	700	680
Starting (5 seconds)	740	740	740
Transient (20 seconds maximum)	740	740	765

1.2 Oil Temperature

Refer to relevant Installation Manual Section 2.

1.3 Fuel Temperature

Refer to relevant Installation Manual Section 6.

2. Maximum Permissible rotor Speeds:

2.1 PW530A

	Take Off / Maximum Continuous	Transient (20s)	Minimum Flight Idle
Low Pressure Rotor N1 rpm (%)	15750 (100)	16065 (102)	--
High Pressure Rotor N2 rpm (%)	32150 (100)	32793 (102)	15880 (49.4)

2.2 PW535A/PW535B

	Take Off / Maximum Continuous	Transient (20s)	Minimum Flight Idle
Low Pressure Rotor N1 rpm (%)	15850 (100)	16167 (102)	--
High Pressure Rotor N2 rpm (%)	33970 (100)	34649 (102)	17975 (52.9) for PW535A 18140 (53.4) for PW535B

2.3 PW535E

	Take Off / Maximum Continuous	Transient (20s)	Minimum Flight Idle
Low Pressure Rotor N1 rpm (%)	15850 (100)	16167 (102)	--
High Pressure Rotor N2 rpm (%)	34310 (101)	34989 (103)	18717 (55.1)

3. Pressure limits:

3.1 Oil Pressure

Refer to relevant Installation Manual Section 2.

3.2 Fuel Pressure

Refer to relevant Installation Manual Section 6.

4. Installation Assumptions:

The installation assumptions are quoted in the relevant Engine Installation manual.

5. Time Limited Dispatch:

The PW535E engine has been approved for Time Limited Dispatch. The maximum rectification period for each dispatchable state is specified in the Maintenance Manual, Airworthiness Limitations Section. See Note 10.

V. Operating and Service Instructions

	PW530A	PW535A	PW535B	PW535E
Engine Installation Manual	ER3562	ER3660	ER6336	ER6639
Engine Maintenance Manual	30J1112	3044952	3071822	3072702
Engine Manual (Overhaul)	30J1113	3044953	3071823	3072703
Service Bulletins	As required	As required	As required	As required

VI. Notes

- Note 1:** The engine ratings are based on dry sea-level static ICAO Standard Atmospheric Conditions, no airbled and no external accessory loads. The engine ratings specified are obtainable on a test stand with the specified fuel and oil, without intake ducting and using exhaust duct and intake specified in the Installation Manual.
- Note 2:** Life limited parts are listed in the relevant Maintenance Manual, Airworthiness Limitations Section
- Note 3:** The software for the PW535B and PW535E Electronic Engine Control has been developed and tested in accordance with provisions of level A as defined in RTCA DO 178B.
- Note 4:** For the PW535A take off rating may be used for up to 10 minutes during One Engine Inoperative operations without adverse effect upon engine airworthiness. Such operations are anticipated on an infrequent basis (as engine failure at take-off events are uncommon) and no limits or special inspections have been imposed..
- Note 5:** The engine definition does not include a thrust reverser. Considerations for the installation of a thrust reverser (except the PW535E) are contained in the relevant Installation manual.
- Note 6:** HIRF and Lightning conformance and installation requirements are provided in the PW535B and PW535E Installation Manual.
- Note 7:** PW535B engines incorporating SB PW500-72-30341 are equipped with a FADEC which is approved for Time Limited Dispatch (TLD). The dispatch criteria is defined in the Airworthiness Limitation Section of the Maintenance Manual P/N 3071822. The TLD dispatchable fault configuration is defined in ER 6338-05 Part A – Interface Control Document.
PW535B engines not incorporating SB PW500-72-30341 are equipped with a FADEC which is not approved for Time Limited Dispatch.
- Note 8:** For PW535B and PW535E models, Flight Idle is a function of Ambient Pressure.
- Note 9:** For PW535E, Normal Take-Off is equal to Maximum Take-Off in conditions where wing anti-ice bleed is OFF and may be used for 10 minutes in emergency or OEI conditions. Maximum Take-Off exists for wing anti-ice bleed ON conditions and is for use in emergency, OEI or mono bleed situations.
- Note 10:** The PW535E model is equipped with a FADEC which is approved for Time Limited Dispatch (TLD). The dispatch criteria are defined in the Airworthiness Limitations Section of the Maintenance Manual. The TLD dispatchable fault configuration is defined in ER6677-01 Part A Control System Interface Control Document.
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