



TYPE-CERTIFICATE DATA SHEET

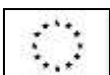
EASA.IM.E.048

for
PW530 Series Engines

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

For Models:

PW530A
PW535A
PW535B
PW535E
PW535E1



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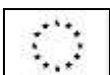
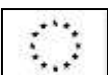


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I. General

1. Type/ Model

PW530A, PW535A, PW535B, PW535E, PW535E1

2. Type Certificate Holder

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

3. Manufacturer

Pratt and Whitney Canada Inc.

4. Date of Application

PW530A	PW535A	PW535B	PW535E	PW535E1
11 August 1995	11 March 1997	23 September 2005	28 February 2007	1 October 2018

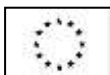
5. Certification Reference Date

PW530A	PW 535A	PW535B	PW535E	PW535E1
31 August 1993	31 August 1993	13 May 2005	30 December 2006	30 December 2006

6. EASA Type Certification Date

PW530A	PW535A	PW535B	PW535E	PW535E1
15 April 1997	6 March 2000	14 August 2007	28 April 2010	10 January 2020

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. EASA Certification Basis

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

PW535B

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

PW535E and PW535E1

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

1.1. Airworthiness Standards

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.

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.

1.2. Special Conditions (SC)

PW530A

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

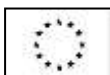
PW535A

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

1.3. Equivalent Safety Findings (ESF)

PW530A

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



PW530A and PW535A

- JAR-E 890 Thrust Reverser Tests

1.4 Deviations

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

1.5. Environmental Protection

PW530A and PW535A

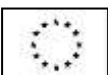
- Emissions and Fuel Venting: ICAO Annex 16, Volume II, 2nd Edition, 1993.

PW535B

- ICAO Annex 16, Volume II, Part III, Chapter 2 - Emissions at Amendment 5
- ICAO Annex 16, Volume II, Part II, Chapter 2 - Fuel Venting

PW535E and PW535E1

- ICAO Annex 16, Volume II, Part III, Chapter 2 - Emissions at Amendment 5 (PW535E) and at Amendment 8 (PW535E1)
- ICAO Annex 16, Volume II, Part II, Chapter 2 - Fuel Venting



III. Technical Characteristics

1. Type Design Definition

The build standards are defined in the following Parts Lists or later approved issues:

Models	Type Design Definition
PW530A	parts list EAPL A31J1400-01
PW535A	parts list EAPL A3041960-01
PW535B	parts list EAPL A3071463-01
PW535E	parts list EAPL A3072913-01
PW535E1	parts list EAPL A3135603

2. Description

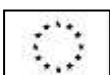
Dual Spool, axial flow, medium bypass turbofan. The 2-stage axial and single stage centrifugal high pressure compressor is driven by a single stage high pressure turbine. The integrally bladed fan and single boost stage (for PW535A and PW535B) low pressure compressor is driven by a 2-stage low pressure turbine. Reverse flow annular combustion chamber. The PW530A and PW535A models are controlled by a hydromechanical system the PW535B, PW535E and PW535E1 are controlled by a dual channel FADEC.

3. Equipment

Approved Equipment is included in the type design definition.

4. Dimensions

	PW530A	PW535A	PW535B	PW535E/ PW535E1
Overall Length [m]	1.532	1.646	1.646	1.679
Diameter [m]	0.814	0.953	0.953	1.082



5. Dry Weight

Models	Dry Weight* (kg)
PW530A	279.6
PW535A	317
PW535B	318.4
PW535E	317
PW535E1	317

* excluding all fluids and buyer furnished equipment

6. Ratings

Rating		PW530A	PW535A	PW535B	PW535E	PW535E1
Thrust, daN	Take-off (5 minutes)	1284.2	1512.4	1512.4	1494.6	1547,1
	Maximum Continuous	1264.6	1512.4	1512.4	1494.6	1547,1

Take off ratings quoted valid up to 22.8°C (PW530A), 27.2°C (PW535A and PW535B), 33°C (PW535E and PW535E1); maximum continuous ratings to 15°C (PW530A), 19.6°C (PW535A and PW535B), 24°C (PW535E and PW535E1)

7. Control System

Engine control system comprises a hydro-mechanical control (PW530A and PW535A) and a dual channel FADEC for PW535B, PW535E and PW535E1.

8. Fluids

8.1. Fuel

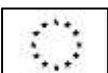
For approved fuel types and additives refer to relevant Maintenance Manual Chapter 72.

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. Operating Limitations

1. Temperature Limits

1.1 Interturbine Temperature (IIT), °C

	PW530A	PW535A/PW535B	PW535E/PW535E1
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 Fuel temperature

Min.: -41°C Max.: 99°C at FCU Inlet Refer to relevant Installation Manual Section 6.

1.4 Oil temperature

10°C to 132°C Refer to relevant Installation Manual Section 2.

2. Pressure Limits

2.1 Fuel pressure

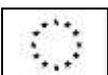
Min.: 36,2 kPa above true vapour pressure or 6,9 kPa above ambient pressure at FMU Inlet

Max.: 275,8 kPa (running engine) 586 kPa (engine shut down)

Refer to relevant Installation Manual Section 6.

2.2 Oil pressure

Min.: 310 kPa Max.: 1103 kPa Refer to relevant Installation Manual Section 2.



3. Maximum / Minimum Permissible Rotor Speeds

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)

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

PW535E/PW535E1

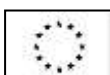
	Take Off / Maximum Continuous	Transient (20s)	Minimum Flight Idle
Low Pressure Rotor N1 rpm (%)	15850 (100)	16167 (102)	--
High Pressure Rotor N2 rpm (%)	34310 (101)	34989 (103)	18717 (55.1)

4. Installation Assumptions

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

5. Time Limited Dispatch

The PW535E and PW535E1 engines have 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.

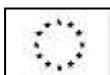


V. Operating and Service Instructions

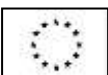
	PW530A	PW535A	PW535B	PW535E/PW535E1
Engine Installation Manual	ER3562	ER3660	ER6336	ER6639
Engine Maintenance Manual	30J1112	3044952	3071822	3072702
Engine Manual (Overhaul)	30J1113	3044953	3071823	3072703
Service Bulletins	As required	As required	As required	As required

VI. Notes

1. The engine ratings are based on dry sea-level static ICAO Standard Atmospheric Conditions, no airbleed 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.
2. Life limited parts are listed in the relevant Maintenance Manual, Airworthiness Limitations Section
3. The software for the PW535B, PW535E and PW535E1 Electronic Engine Control has been developed and tested in accordance with provisions of level A as defined in RTCA DO 178B, with portions of the PW535E1 software as Critical Category, Level A of RTCA DO178C.
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.
5. The engine definition does not include a thrust reverser. Considerations for the installation of a thrust reverser (except the PW535E/PW535E1) are contained in the relevant Installation manual.
6. HIRF and Lightning conformance and installation requirements are provided in the PW535B, PW535E and PW535E1 Installation Manual.
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.



8. For PW535B, PW535E and PW535E1 models, Flight Idle is a function of Ambient Pressure.
9. For PW535E and PW535E1, 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.
10. The PW535E and PW535E1 models are 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 (PW535E) and ER10106 (PW535E1) - Control System Interface Control Document.
11. The PW535E and PW535E1 electronic engine control has not been fire tested and therefore must not be installed in a designated fire zone.



SECTION: ADMINISTRATIVE**I. Acronyms and Abbreviations**

CS-E Certification Specifications for Engines
 EASA European Union Aviation Safety Agency
 ESF Equivalent Safety Finding
 FADEC Full Authority Digital Engine Control
 ICAO International Civil Aviation Organisation
 SC Special Condition
 TCDS Type Certificate Data Sheet

II. Type Certificate Holder Record

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

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	14 August 2007	Initial Issue	14 August 2007
Issue 02	13 November 2008	Introduction of FADEC with Time Limited Dispatch (EASA Major Change Approval P-EASA.IM.E.C.01048)	
Issue 03	28 April 2010	Addition of PW535E engine model	28 April 2010
Issue 04	10 January 2020	Addition of PW535E1 engine model	10 January 2020

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