European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET

Number : **EASA.(IM).E.049**
Issue : 01
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Type : Pratt & Whitney Canada PW150 series

Models
PW150A

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I. General

1. Type/Models: PW150A

2. Type Certificate Holder: Pratt and Whitney Canada Corp.
1000 Marie Victorin
Longueuil, Québec, J4G 1A1
Canada

3. Manufacturer: Pratt and Whitney Canada

4. JAA Validation Application Date: 23 October 1995

5. JAA Validation Reference Date: 15 September 1995

6. JAA Validation recommendation Date: 12 May 1999

EASA Type-Certification for the above mentioned engine model is granted in accordance with Article 3 paragraph 1.(a) of EU Commission Regulation (EU) No 748/2012 as amended by EU Commission Regulation (EU) No 69/2014.

II. Certification Basis

1. Transport Canada Certification Basis details: see Transport Canada TCDS E-29.

2. EASA Certification Basis:

2.1 Airworthiness Standards:

JAR-E Change 9 (dated 21 October 1994) plus Orange Paper E/97/1 (dated 30 December 1997, which embodied NPA-E-21 and E-22)

2.2 Special Conditions:

- SC 1: JAR-E 790 Ingestion of Rain and Hail: Special Condition based on the new identified rain and hail threats (NPA-E-27).
- SC 2: JAR-E 510(a) Special Condition addressing propeller feathering at high power.

2.3 Equivalent Safety Findings:

JAR-E 800 – Birds
JAR-E 840 – Rotor Integrity

2.4 Deviations:

None

2.5 Environmental Protection Requirements:

Fuel Venting : ICAO Annex 16, Volume II, Part II,(2nd Edition, July 1993).

III.Technical Characteristics

1. Type Design Definition:

Engine Model	Engine Parts List
PW150A	3121627

2. Description:

Three spool, free turbine-propeller engine. A three stage axial compressor and a centrifugal compressor are independently driven by single stage axial turbines. A two stage axial turbine drives an offset reduction gearbox. The combustor is a reversed flow annular type. The starter and the engine mounts are not part of the engine Type Design.

3. Equipment:

Approved equipment is identified in the Pratt & Whitney Illustrated Parts Catalog (P/N 3043524). For additional information refer to the Installation Manual.

4. Dimensions and Weight:

Engine Model	Overall Length (mm)	Overall Width (mm)	Overall Height (mm)	Dry Spec. Weight (kg)(*)
PW150A	2420	790	1100	716.9

(*) See Note 1

5. Ratings (See Notes 2, 3, 4 and 6):

	Maximum Take-off Power – 5 min.		**Normal Take-off Power – 5 min.**		**Maximum Continuous Power**	
Engine Model Ratings at Sea Level	Shaft Power (kW)	Jet Thrust (N)	Shaft Power (kW)	Jet Thrust (N)	Shaft Power (kW)	Jet Thrust (N)
PW150A	3781	3750	3415	3412	3781	3750

6. Control System:

The engine is equipped with a Full Authority Digital Engine Control (FADEC) system (See Note 10).

7. Fluids

7.1 Fuel type:

Type	**Specification**	
	Canada	**USA**
Kerosene Jet A, A-1 JP8	CGSB 3.23	ASTM D1655 MIL-T-83133
Wide Cut Jet B JP4	CGSB 3.22 CGSB 3.22	ASTM D1655 MIL-T-5624
High Flash JP5 JP1	3-GP-24	MIL-T-5624 MIL-T-5616

For additional information on approved fuel types and additives refer to the PW150A Maintenance Manual (Source Data) Chapter 72 (P/N 3043522).

7.2 Oil type:

Oil conforming to PWA 521 type II. For approved brands refer to PW150A Maintenance Manual (Source Data) Chapter 72 (P/N 3043522).

8. Aircraft Accessory Drives:

For output drive specification and accessory drives, refer to the Installation Manual (P/N 3049067), and installation Drawing (P/N 3046933).

9. Maximum Permissible Air Bleed Extraction:

Maximum External (HP):

10% of inlet airflow

Maximum External (LP):

6% of inlet airflow.

Maximum during start:

Bleed flow equivalent to that obtained from a 0.5 cm diameter orifice at the engine high pressure bleed port.

IV.Operational Limits:

1. Temperature Limits (see Note 5):

1.1 Maximum Inter-Turbine Temperature (ITT):

Rating	Maximum Take-off (^{o}C)	Normal Take-off (^{o}C)	Maximum Continuous (°C)	Transient 20 secs (^{o}C)
PW150A	880	(*)	880	920

(*) See Note 6

1.2 Oil Temperature:

Refer to Installation Manual (P/N 3049067).

1.3 Fuel Temperature:

Refer to Installation Manual (P/N 3049067).

2. Maximum Permissible Rotor Speeds:

2.1 Maximum Output Shaft Speed:

Rating	Maximum Take-off (RPM)	Normal Take-off (RPM)	Maximum Continuous (RPM)	Transient 20 secs (RPM)
PW150A	1020	1020	1020 (*)	1173

(*) See Note 7

2.2 Maximum HP Spool Speed:

Rating	Maximum Take-off (RPM)	Normal Take-off (RPM)	Maximum Continuous (RPM)	Transient 20 secs (RPM)
PW150A	31150	(*)	31150	31525

(*) See Note 6

2.3 Maximum LP Spool Speed:

Rating	Maximum Take-off (RPM)	Normal Take-off (RPM)	Maximum Continuous (RPM)	Transient 20 secs (RPM)
PW150A	27000	(*)	27000	27625

(*) see Note 6

3. Maximum Output Torque:

Rating	Maximum Take-off (Nm)	Normal Take-off (Nm)	Maximum Continuous (Nm)	Transient 20 secs (Nm)
PW150A	37529	35404	35404	47795

4. Pressure Limits:

4.1 Fuel Pressure Limit:

Refer to Installation Manual (P/N 3049067).

4.2 Oil Pressure Limit:

Refer to Installation Manual (P/N 3049067).

5. Installation Assumptions:

The installation assumptions are quoted in the Installation Manual (P/N 3049067).

6. Dispatch Limitations:

The PW150A engine is equipped with a FADEC which is approved with Time Limited Distpach limitations. The dispatch criteria is contained in the Airworthiness Limitations Manual (P/N 3043520).

V. Operating and Service Instructions

1. Manuals:

Engine Model	Engine Installation Manual	Engine Airworthiness Limitations Manual	Engine Manual	Engine Maintenance Manual (Source Data)
PW150A	3049067	3043520	3043523	3043522

VI. Notes

Note 1: Dry weight includes all basic engine accessories as listed in the manufacturer's engine specification but not the optional equipment.

Note 2: The engine ratings are based on dry sea level static ICAO Standard athmospheric conditions, with no external accessory loads and no airbleed. The quoted ratings are obtainable on a test stand with the specified fuel and oil, using the exhaust duct and intake defined in the Installation Manual.

Note 3: Take-off ratings that are nominally limited to 5 minutes duration may be used for up to 10 minutes for One Engine Inoperative operations without adverse effects 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 4: Take-off and Maximum Continuous power are flat-rated up to an ambient temperature of 37°C.

Note 5: Approval for the maximum defined Indicated Turbine Temperature (ITT) limits are based upon tests conducted with a maximum gas temperature at the high pressure turbine rotor entry of 1477°C.

Note 6: The engine is designed to be normally used at a take-off shaft power (called Normal Take-off power) of 3415 kW with a torque limit of 35404 Nm, associated to a system providing an automatic power increase to the certified Maximum Take-off power in a One Engine Inoperative event.

The engine Installation Manual contains curves defining ITT, HP and LP spool speed limits, variable with ambient temperature, for this Normal Take-off power which would ensure that the limitations of the certified Maximum Take-off power are not exceeded in the event of an automatic power increase to this Maximum Take-off power.

The basic engine mission profile assumes the use of the Normal Take-off poser and hence the infrequent use of the Maximum Take-off power. Operators making scheduled use of the Maximum Take-off power will be required to count each use with an appropriate flight count factor (penalty) as noted in the Airworthiness Limitations Manual.

Note 7: The engine is approved with a propeller overspeed "get-home" capability to cater for propeller control malfunctions. The engine Installation Manual operating limits define this overspeed limit.

Note 8: The engine meets the requirements of AWM 533.68 for operation in icing conditions as defined in AWM 525/FAR 25 Appendix C when the intake system conforms with the P&WC Installation Manual.

Note 9: Life limits established for critical rotating components are published in the Airworthiness Limitations Manual.

Note 10: The software contained in the Electronic Control Unit for the PW150A has been designed, developped, documented and tested in accordance with the provisions of the Critical Category, Level A, of RTCA/DO 178B.

Note 11: The engine may be maintained as two modules, when Transport-Canada-accepted manuals are available – the Turbomachine Module and the Reduction Gearbox as follows:

Engine Model	Turbomachine Module P/N	Reduction Gearbox Module P/N
PW150A	3121628	3121630
