TYPE-CERTIFICATE DATA SHEET

No. EASA IM.E.038

for
Engines

Type Certificate Holder:
Pratt and Whitney Canada Corp.

1000 Marie Victorin
Longueuil, Québec, J4G 1A1
Canada

For Models: PT6A-68
PT6A-68B
PT6A-68C
PT6A-68D
PT6A-68T

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I. General

1. **Type / Models:**
   PT6A-68 series / PT6A-68, PT6A-68B, PT6A-68C, PT6A-68D, PT6A-68T

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

3. **Manufacturer:**
   Pratt and Whitney Canada Corp.

4. **Date of Application for EASA Certification:**
   19 March 2014

5. **EASA Type Certification Date:**
   20 April 2016

II. Certification Basis

1. **State of Design Authority Certification Basis:**
   see Transport Canada TCDS E-24

2. Reference Date for determining the applicable airworthiness requirements:

29 January 1992 (PT6A-68, PT6A-68B, PT6A-68C)
30 December 2006 (PT6A-68D, PT6A-68T)

3. EASA Certification Basis

3.1. Airworthiness Standards

JAR-E Change 8 incl. Amendt. E/91/1 (PT6A-68, PT6A-68B, PT6A-68C)
CS-E, initial issue (PT6A-68D, PT6A-68T)

3.2. Special Conditions (SC)

none

3.3. Equivalent Safety Findings (ESF)

none

3.4. Deviations

none

3.5. Environmental Protection

CS-34.1 "Fuel Venting"

III. Technical Characteristics

1. Type Design Definition:

PT6A-68: Engine Assembly Drawing No. 3118830 and subsequent revisions
PT6A-68B: Engine Assembly Drawing No. 3055340 Change B and subsequent revisions
PT6A-68C: Engine Assembly Drawing No. 3055973 Change A and subsequent revisions
PT6A-68D: Engine Assembly Drawing No. 3075880 Change A and subsequent revisions
PT6A-68T: Engine Assembly Drawing No. 3077540 Change B and subsequent revisions

2. Description:

The PT6A-68 series turboprop engine comprises a 2-stage reduction gearbox, five stage gas generator compressor (4 axial, 1 centrifugal), a single annular combustion chamber, a single stage gas generator turbine and a two stage axial power turbine. The fuel control is by single channel ECU with mechanical backup. The engine also features a lubricating system capable of aerobatic manoeuvres.

3. Equipment

Approved equipment is defined in the applicable Engine Assembly Drawing.

4. Dimensions and
5. Dry Weight

	Overall Length (mm)	Overall Diameter (mm)	Dry Spec. Weight (kg)
PT6A-68	1811	564	260
PT6A-68B	1813	565	269
PT6A-68C, PT6A-68T	1823	570	272
PT6A-68D	1820	570	272

6. Ratings

		Shaft Power (kW)	Jet Thrust (N)
PT6A-68	Maximum Continuous and Take-off	932	823
PT6A-68B, PT6A-68C, PT6A-68D PT6A-68T	Maximum Continuous and Take-off	1194	1014

7. Control System

The PT6A-68 series engines are controlled by a single channel ECU with mechanical backup. Refer to model specific Installation Manuals for unit part numbers.

8. Fluids (Fuel, Oil, Coolant, Additives)

The approved fuels and additives must conform to the latest revision of the P&WC Service Bulletins SB 18004 (PT6A-68) and SB 18104 (PT6A-68B and PT6A-68C, PT6A-68D and PT6A-68T).

The approved oils must conform to the latest revision of the P&WC Service Bulletins SB 18001 (PT6A-68) and SB 18101 (PT6A-68B, PT6A-68C, PT6A-68D and PT6A-68T).

9. Aircraft Accessory Drives

For accessory drives specifications, including direction of rotation, drive speed ratio to engine speed, torque continuous pad rating and maximum overhung moment, refer to model specific Installation Manual.

10. Maximum Permissible Air Bleed Extraction

For all engine models, the bleed extraction is as follows:

Maximum External (% of inlet flow): 5.25
Maximum during Start (kg/min): 0.68

IV. Operating Limitations

1. Temperature Limits

1.1 Maximum Interstage Turbine Temperature (ITT), °C :

Rating	Maximum Continuous and Take-off (°C)	Starting (Ground and Air, 5 sec.) (°C)
PT6A-68	820	1000
PT6A-68B, PT6A-68C, PT6A-68D, PT6A-68T	860	1000

1.2 Maximum Air Inlet Temperature, °C for Flat-rating:

Rating	Maximum Continuous (°C)
PT6A-68	42.4
PT6A-68B	30.8
PT6A-68C, PT6A-68D, PT6A-68T	31.2

1.3 Oil Temperature, °C :

Maximum continuous and ground operation:	105 °C
Maximum (10 Minutes)	110 °C
Minimum:	-40 °C

1.4 Fuel Temperature

For starting:
Minimum at pump inlet connections is:

a) that equivalent to 12 centistokes or

b) JP4, Jet B, Avgas: -54 °C
Jet A, A-1: -29 °C (PT6A-68)
Jet A, A-1: -34 °C (PT6A-68B, PT6A-68C, PT6A-68D, PT6A-68T)
JP5: -26 °C

Maximum at the pump inlet connection is +57 °C
(Note: Starts may be attempted with fuel at higher or lower temperatures providing other specified engine limitations are observed. The starting temperature applies to ground and air starts.)

For operation:
Minimum at pump inlet is -54 °C or 12 centistokes.
Maximum at pump inlet is that corresponding to a vapour-liquid ratio of 0.3.

2. Speed Limits

Engine Model	Gas Generator (N1) (rpm)	Gas Generator (N1) Transient (rpm)	Power Turbine Module Output (N2) (rpm)	Power Turbine Module Output (N2) Transient 20 sec (rpm)
All models	39000 (104 %)	39000	2000 (100.25%)	2200 (110.3)

100% gas generator speed is defined as 37468 rpm. Propeller speed of 100% of 1995 rpm corresponds to power turbine speed 29906 rpm.

3. Pressure Limits

3.1 Fuel Pressure

Minimum absolute pressure:

34.47 kPa (5 psi) absolute above the true vapour fuel pressure (PT6A-68)
49.99 kPa (7.25 psi) absolute above the true vapour fuel pressure (PT6A-68B, PT6A-68C, PT6A-68D, PT6A-68T).

Maximum gauge pressure:
344.7 kPa (50 psi) with vapour/liquid ratio of zero at all conditions

3.2 Oil Pressure

PT6A-68:
Pressure range (gauge) 620.4 – 827.4 kPa (90-120 psi)
At idle power the minimum allowable transient oil pressure is 103.42 kpa (15 psi) for a maximum of 5 seconds.

PT6A-68B, PT6A-68C, PT6A-68T:
Pressure range (gauge) 620.4 – 861.8 kPa (90-125 psi)
Transient range (gauge) 482.6 kPa to 896.3 kPa (70 to 130 psi); during aerobatic maneuvers the minimum oil pressure may be as low as 275.8 (40 psi) at flight idle condition.

PT6A-68D:
Pressure range (gauge) 620.4 – 861.8 kPa (90-125 psi)
Transient range (gauge) 482.6 kPa to 896.3 kPa (70 to 130 psi) time limited to 20 seconds;
During aerobatic maneuvers at the flight idle power condition, the minimum oil pressure may be as low as 275.8 kPa (40 psi) for durations limited to 20 seconds.
During aerobatic maneuvers at powers above the flight idle condition, the minimum oil pressure is 482.6 kPa (70 psi) for durations limited to 60 seconds.

4. Time Limited Dispatch (TLD)

The engine is not approved for Time Limited Dispatch in accordance with CS-E 1030.

5. ETOPS Capability

The engine is not approved for ETOPS capability in accordance with CS-E 1040.

V. Operating and Service Instructions

Manuals

Engine Model	Engine Operating Instructions	Engine Installation Manual
PT6A-68	3040871	PT6A-68
PT6A-68B	See Installation Manual	PT6A-68B and C
PT6A-68C	See Installation Manual	PT6A-68B and C
PT6A-68D	See Installation Manual	PT6A-68D
PT6A-68T	See Installation Manual	PT6A-68T

Instructions for Continued Airworthiness (ICA)

Engine Model	Engine Maintenance Manual	Engine Overhaul Manual	Service Bulletins
PT6A-68	3040872	3040873	as issued for each engine model
PT6A-68B	3054922	3054923	
PT6A-68C	3058462	3058463	
PT6A-68D	3077192	3077193, Not published yet	
PT6A-68T	3077172	3077174, Not published yet	

VI. Notes

1. The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in the PT6A-68D and PT6A-68T maintenance manual, chapter "Airworthiness Limitations Section".
   For the other models, the EASA approved airworthiness limitations are published in P&WC Engine Service Bulletin Nos. 18002 (PT6A-68), 18102 (PT6A-68B) and 18202 (PT6A-68C) as revised.

2. The engine ratings are based on dry sea level static ICAO Standard Atmospheric conditions. No external accessory loads and no airbleed. The quoted ratings are obtainable on a test stand with the specified fuel and oil without intake ducting and using exhaust stubs as specified in the Installation Manual.

3. The engine meets the TCCA (AWM 533.68) and EASA (JAR-E 780/CS-E 780) requirements of for operation in icing conditions when the intake system conforms with the PWC Installation Manual Instructions for inertial separation of snow and icing particles. The engine also meets the TCCA (AWM 533.27) and EASA (JAR-E 840/CS-E 840) requirements for adequate disc integrity and rotor blade containment and does not require external armouring.

4. 4. The engine may be maintained as two modules, the separation point is the "C" flange:

	Gas Generator Module P/N	Power Section Module P/N
PT6A-68	3047000	3047200
PT6A-68B	3055342	3055341
PT6A-68C	3055972	3055970
PT6A-68D	3075885	3075882
PT6A-68T	3077544	3077541

5. The PT6A-68, PT6A-68B, PT6A-68C, PT6A-68D and PT6A-68T Power Management Units have not been fire tested and therefore, may only be mounted in a designated fire zone if

there are instructions to select manual mode operation in the event of a fire indication in that zone.

5. The software contained in the PT6A-68B, PT6A-68C, PT6A-68D and PT6A-68T Power Management Unit has been designed and developed in accordance with the provisions of RTCA/DO-178B Level A.
The software contained in the PT6A-68 Power Management Unit has been designed and developed in accordance with the provisions of RTCA/DO-178A Level 1.
Software version of the PT6A-68T: 68TA0301 or later approved version

7. The PT6A-68, PT6A-68B, PT6A-68C, PT6A-68D and PT6A-68T lightning and HIRF protection requirements and electromagnetic interference emitted by the electronic engine control system, including cables, are specified in the Installation Manual.

8. The recommended Operating Time Between Overhaul (TBO) and Hot Section Inspection (HSI) frequency is defined in the following Service Bulletins:
SB 18003 for the PT6A-68
SB 18103 for the PT6A-68B
SB 18203 for the PT6A-68C, PT6A-68D, PT6A-68T

9. Overhauls of the PT6A-68D and PT6A-68T are not permitted until publication of an accepted Overhaul Manual.

SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

n/a

II. Type Certificate Holder Record

n/a

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	20 April 2016	Initial Issue	Initial Issue, 20 April 2016

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