European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET

Number : IM.E.039
Issue : 02
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Type : Pratt & Whitney Canada
PT6B-36 series engines

Variants
PT6B-36
PT6B-36A
PT6B-36B
PT6B-37
PT6B-37A

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I - General

1. Type / Variants : PT6B-36 / PT6B-36, PT6B-36A, PT6B-36B, PT6B-37, PT6B-37A

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

3. Manufacturer: Pratt and Whitney Canada Corp.

4. Certification Application Date for EASA Certification:

PT6B-36	PT6B-36A	PT6B-36B	PT6B-37	PT6B-37A
6 March 1986 [1])	12 March 1987 [1])	30 Oct. 2000 [2])	30 Oct. 2000 [2])	17 July 1998 [3])

5. EASA Certification Reference Date: 6 May 1983

6. EASA Certification Date:

PT6B-36	PT6B-36A	PT6B-36B	PT6B-37	PT6B-37A
30 May 1986 [1])	24 August 1987 [1])	10 May 2001 [2])	10 May 2001 [2])	23 Dec. 1999 [3])

Note: PT6B-36 series engine variants had been certified in several EU Member States before 28 September 2003. According to Article 2 paragraph 3(a)(I) of EU Commission Regulation EC 1702/2003 for these engines the European TC and associated TCDS have been issued based on the Certification Basis as established by the State of Design.
All PT6B-36 series engine variants had been certified to JAR-E in Austria based on the respective AustroControl validation letter issued following an Austrian approval prior to 28 September 2003.
[1]) Application to and cerification by LBA Germany before EASA has been established.
[2]) Application to and cerification by ACG Austria before EASA has been established
[3]) The PT6B-37A variant had been certified by ENAC Italy together with the Augusta 119 “Koala” helicopter (ENAC TC SO/A156) before EASA has been established.

II - Certification Basis

1. Transport Canada Certification Basis details: see Transport Canada TCDS E-20

2. EASA Certification Basis for the variants PT6B-36, PT6B-36A, PT6B-36B:

a) FAR Part 33, Amendment 1 effective 1 February 1965 and Amendments 33-1 to 33-9 inclusive.
b) Requirements recorded in Transport Canada "Minutes of Initial Type Board Meeting" with covering letter to Pratt and Whitney dated March 5, 1984.

3. EASA Certification Basis for the variant PT36B-37:

a) FAR Part 33, Amendment 1 effective 1 February 1965 and Amendments 33-1 to 33-9 inclusive.
b) Requirements recorded in “Minutes of Meeting, PT6B-37 Engine Type Board Meeting, held at Transport Canada, Ottawa, 16 October, 1996” and Transport Canada Issue Paper No. P-1 dated December 11, 1996.

4. EASA Certification Basis for the variant PT6B-37A:

a) FAR Part 33, Amendment 1 effective 1 February 1965 and Amendments 33-1 to 33-9 inclusive.
b) Requirements recorded in “Minutes of Meeting, PT6B-37 Engine Type Board Meeting, held at Transport Canada, Ottawa, 16 October, 1996” and Transport Canada Issue Paper No. P-1 dated December 11, 1996.
c) FAR Part 33, paragraph 33.28 of Amendment 15 for the Digital Electronic Control.

Note: Also compliance to JAR-E Change 6 and Equivalent Safety Findings for the JAR-E Change 10 paragraphs JAR-E 640b(1) »Static Pressure Tests«, JAR-E 840 »Compressor and Turbine Rotor Integrity Tests« and JAR-E 850 »Compressor/Fan and Turbine Shafts« had been demonstrated for all variants in a national certification by Austro Control (before EASA has been established).

III - Technical Characteristics

1. Type Design Definition: (see Note 1)

As defined by the applicable PT6B-36, PT6B-36A, PT6B-36B, PT6B-37, PT6B-37A Engine Parts Lists:

PT6B-36	PT6B-36A	PT6B-36B	PT6B-37	PT6B-37A
BS 634 #036001	BS 694 #036042	BS 795 #36201	P/N 3122578	P/N 3049755

2. Description:

Free turbine turboshaft engines. Three axial stages and single stage centrifugal compressor, reverse flow annular combustor, single stage high pressure turbine, single stage free power turbine. PT6B-36, PT6B-36A, PT6B-36B, PT6B-37A models include an Engine Electronic Control System (EEC) with manual back-up. PT6B-37 includes a hydromechanical fuel control sysem. The starter and engine mounts are not part of the engine definition.

3. Equipment:

The engine equipment list is included in the Type Design Definition.

4. Dimensions and Weight:

Variant	Overall Length (mm)	Overall Width (mm)	Overall Height (mm)	Dry Spec. Weight (kg)
PT6B-36	1502	483	826	174.2
PT6B-36A	1502	483	826	179.6
PT6B-36B	1502	483	826	181.4
PT6B-37	1674	574	894	182.6
PT6B-37A	1502	483	904	184.8

5. Ratings:

Variant	2½-Minutes OEI (kW)	30 Minutes OEI (kW)	Take-off (5 min.) (kW)	Max. Continuous (kW)	Output Shaft Speed (rpm)
PT6B-36	761	716	716	649	6409
PT6B-36A, -36B	771	771	732	662	6409
PT6B-37	-	-	671	619	4373
PT6B-37A	-	-	684	631	4460

Note : The engine ratings are based on dry sea level static ICAO standard atmospheric conditions, with 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 the exhaust port defined in the Installation Manual.

6. Control System

The PT6B-36, PT6B-36A, PT6B-36B and PT6B-37A engines are controlled by an electronic engine control system with a manual back-up system. The PT6B-37 engine is controlled by a hydromechanical fuel control system. Refer to Type specific Installation Manuals for unit part numbers.
The hardware and software configuration of these systems and the associated engine fuel pump and hydromechanical unit are controlled by the approved engine equipment list for the specific engine model and aircaft application.

7. Fluids (Fuel/Oil/Additives):

7.1 Fuel:

Fuel conforming to the current PWC Specification No. CPW204 and later revisions.
PT6B-36, -36A and -36B: Refer to Service Bulletin No. 11044 for further details.
PT6B-37: Refer to Service Bulletin No. 32004 for further details.
PT6B-37A: Refer to Maintenance Manual for further details.

7.2 Oil:

For the PT6B-36, -36A and -36B synthetic type conforming to the current PWA Specification numbers PWA521 Type I or Type II. Refer to Service Bulletin No. 11001 for approved brands.
For PT6B-37 synthetic type conforming to the current PWA specification number PWA521 Type II. Refer to Service Bulletin No. 32001 for approved brands.
For PT6B-37A refer to Maintenance Manual for approved brands.

8. 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 Type specific Installation Manual.

9. Maximum Permissible Air Bleed Extraction:

For all engine models, the maximum air bleed extraction is 5.25% of inlet airflow. During starting no air bleed extraction is permitted.

IV - Operational Limitations

1. Temperature limits:

1.1. Maximum Interstage Turbine Temperature (ITT):

Variant	2½-Minutes OEI (°C)	30 Minutes OEI (°C)	Take-off (5 min) (°C)	Max. Continuous (°C)	Starting (5 sec. max.) (°C)
PT6B-36	850	816	816	776	940
PT6B-36A, -36B	844	844	816	776	940
PT6B-37, -37A	-	-	810	755	940

1.2. Oil Temperature:

Normal Operation:	0 … 115 °C (PT6B-36, -36A and -36B)
Normal Operation	10…115 °C (PT6B-37 and -37A)
Minimum for starting:	-54 °C (PT6B-36, -36A and -36B)
Minimum for starting:	-40 °C (PT6B-37 and -37A)

1.3. Fuel Temperature:

Refer to the applicable Engine Installation Manual.

2. Maximum Permissible Rotor Speed Limits:
2.1. Gas Generator

Variant	2½-Minutes OEI (rpm)	30 Minutes OEI (rpm)	Take-off (5 min) (rpm)	Max. Continuous (rpm)	Transient (30 sec.) (rpm)
PT6B-36	39000	38400	38400	38400	39100
PT6B-36A	39000	39000	38400	38400	39100
PT6B-36B	40000	40000	39400	39400	40200
PT6B-37, -37A	-	-	39300	38100	39500

2.2. Output Shaft

Variant	2½-Minutes OEI (rpm)	30 Minutes OEI (rpm)	Take-off (5 min) (rpm)	Max. Continuous (rpm)	Transient (10 sec.) (rpm)
PT6B-36, -36A, -36B	6469	6469	6469	6469	6918
PT6B-37	-	-	4373	4373	4810
PT6B-37A	-	-	4505	4505	4810

3. Maximum Permissible Torque Limits:

Variant	2½-Minutes OEI (Nm)	30 Minutes OEI (Nm)	Take-off (5 min) (Nm)	Max. Continuous (Nm)
PT6B-36	1264	1189	1189	1078
PT6B-36A, -36B	1264	1264	1189	1078
PT6B-37, -37A	-	-	1463	1352

4. Pressure Limits:

4.1. Fuel Pump Inlet pressure:

Refer to the applicable Engine Installation Manual.

4.2 Oil Pressure Limits:

PT6B-36, PT6B-36A and PT6B-36B:
Normal operation: 482.6 … 724 kPa (70-105 psig)
Below 30000 rpm gas generator speed: min. 275.8 kPa (40 psig)

PT6B-37 and PT6B-37A:
Normal operation: 551.6 … 758.4 kPa (80-110 psig)
Below 27000 rpm gas generator speed: min. 275.8 kPa (40 psig)

5. Installation Assumptions:

The installation assumptions are quoted in the applicable Engine Installation Manual.

6. Dispatch Limitations:

There is no Time Limited Dispatch for the EEC of this engine.

V - Operational and Service Instructions

Variant	Engine Operating Instructions	Engine Maintenance Manual	Engine Overhaul Manual	Service Bulletins
PT6B-36	See applicable Engine Installation Manual	P/N 3034442	P/N 3034443	11000 series
PT6B-36A		P/N 3034442	P/N 3034443	11000 series
PT6B-36B		P/N 3034442	P/N 3034443	11000 series
PT6B-37		N/A	N/A	32000 series
PT6B-37A		P/N 3053102	P/N 3053103	32000 series

Note: The PT6B-37 engine variant did not go into service. Therefore, no Maintenance and Overhaul Manual have been released so far.

VI - Notes

Note 1: Certain engine models carry an additional designation in form of a Build Specification Number shown on the supplementary data plate. The Build Specifications approved for the PT6B-37A engine model are: BS 1017, BS 1142 and BS 1242.

Note 2: The engine meets the requirements of FAR 33.68 for Operation in icing conditions as defined in FAR 25 Appendix C when the intake system conforms with the P&WC Installation Manual requirements.

Note 3: For the PT6B-36, -36A and -36B, the Electronic Engine Control, EEC-132 (including sensor) has been tested to the requirements of "Environmental Conditions and Test Procedures for Airborne Equipment", RTCA/DO160A, including "voltage spike conducted tests". 600 volt peak 2 second rise time. (See Installation Manual).

Note 4: For the PT6B-36, -36A and -36B, the EEC-132 software has been developed, documented and tested in accordance with the provisions of "Flight Critical" category of RTCA/DO178.

Note 5: The PT6B-36, -36A and -36B engine models may be overhauled or maintained as two modules:

TURBOMACHINE	REDUCTION GEARBOX
MODULE P/N 3034600	MODULE P/N 3034700

Note 6: For the PT6B-36, -36A and -36B, Maximum and Intermediate Contingency Powers as defined in British Civil Airworthiness Requirements Section C may be obtained by operating within the limitations of the 2½ minute and 30 minute ratings respectively as shown herein.

Note 7: For the PT6B-37A the software for the Electronic Engine Control (EEC) has been developed and tested in accordance with the provisions of “Flight Critical” category (Level A of RTCA/DO-178B).

Note 8: For the PT6B-37A lightning protection requirements and electromagnetic interference emitted by the electronic engine control system, including cables, are specified in the Installation Manual, Section 7.