

U. S. DEPARTMENT OF TRANSPORTATION  FEDERAL AVIATION ADMINISTRATION  TYPE CERTIFICATE DATA SHEET  E00090EN	TCDS NUMBER E00090EN  Pratt & Whitney Canada Corporation  MODELS: PW1519G, PW1521G, PW1524G, PW1525G  Date: January 22, 2016
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Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E00090EN) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations, provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE CERTIFICATE (TC) HOLDER: Pratt & Whitney Canada Corporation  
 1000 Boulevard Marie-Victorin  
 Longueuil, QC, Canada J4G 1A1

<b>TYPE</b>	High bypass ratio, axial-airflow, dual-spool, turbofan engine controlled by a Full Authority Digital Electronic Control (FADEC). The low pressure spool consists of a three-stage low pressure turbine that directly drives a three-stage low pressure compressor, and a single stage high bypass ratio fan through a fan drive gear speed reduction system. The high pressure compressor has eight axial stages driven by a two-stage cooled high pressure turbine.
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MODELS:	PW1519G	PW1521G	PW1524G PW1525G
RATINGS (See NOTE 1)			
SEA LEVEL STATIC THRUST (lb.)			
Takeoff (5 minutes) (See NOTE 2)	19,775	21,970	24,400
Maximum Continuous	18,685	20,760	23,050
FLAT RATING AMBIENT TEMPERATURE			
Takeoff	30°C / 86°F	30°C / 86°F	30°C / 86°F
Maximum Continuous	25°C / 77°F	25°C / 77°F	25°C / 77°F
FADEC Hardware PN	5321513	--	--
Data Storage Unit PN (Ratings Plug)	5323246	5323244	5323242 5323240

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REV.	0	0	0	0	0	0	0				

LEGEND: "--" INDICATES "SAME AS PRECEDING MODEL"  
 "---" NOT APPLICABLE  
 NOTE: SIGNIFICANT CHANGES ARE BLACK-LINED IN THE LEFT MARGIN.

COMPONENTS/CONFIGURATION	For information regarding components and engine configuration, refer to:  Installation Drawing 5310001
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MODELS: (cont.)	PW1519G	PW1521G	PW1524G PW1525G
PRINCIPAL DIMENSIONS (Room temperature)			
Length (flange to flange, in.)	119.9	--	--
Length (fan spinner face to aft flange, in.)	125.4	--	--
Nominal diameter (fan case, in.)	79.0	--	--
Maximum radial projection (in.) (at drain mast)	45.7	--	--
CENTER OF GRAVITY (in.)			
Axial engine station, relative to A-flange:	58.5	--	--
Vertical, relative to engine centerline:	-0.5	--	--
Lateral, relative to centerline:	-1.0	--	--
WEIGHT * (DRY) Basic engine (lbs.) (See Note 6)	4,800	--	--
FUEL	Service Bulletin PW1000G-1000-73-00-00-00AAA-030A-D defines the fuels requirements and provides a listing of approved fuels and fuel additives for use in the PW1500G series turbofan engine.		
LUBRICATING OILS	Service Bulletin PW1000G-1000-79-00-00-00AAA-030A-D provides a listing of approved turbine oils for use in the PW1500G series turbofan engine.		

CERTIFICATION BASIS	<p>14 CFR, Part 33, effective February 1, 1965, as amended by 33-1 through 33-33 with the following Equivalent level of safety findings:</p> <ul style="list-style-type: none"> <li>• 33.78, Rain and hail Ingestion par. (a)(1) ELOS No. TC3047EN-E-P-5</li> </ul> <p>The following models comply with 14 CFR part 34, amendment 5a, effective October 23, 2013. See NOTE 23 for detailed summary of the certification basis for fuel venting and exhaust emissions:</p> <p style="text-align: center;">PW1519G, PW1521G, PW1524G, PW1525G</p>
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TYPE CERTIFICATE NUMBER E00090EN				
<u>MODEL</u>	<u>APPLICATION</u>	<u>ISSUED/AMENDED</u>	<u>DELETED</u>	
PW1519G	February 3, 2013	January 22, 2016		
PW1521G	February 8, 2010	January 22, 2016		
PW1524G	February 8, 2010	January 22, 2016		
PW1525G	December 12, 2013	January 22, 2016		

<b>NOTES</b>
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**NOTE 1.****ENGINE RATINGS**

Engine ratings are based on calibrated test stand performance under the following conditions:

1. Sea level static, standard pressure (14.696 psia), up to the flat rating ambient temperature °F
2. No customer bleed or customer horsepower extraction
3. Ideal inlet, 100% ram recovery
4. Production aircraft flight cowling
5. Production instrumentation
6. Fuel lower heating value of 18,400 BTU/lb.

**NOTE 2.****TEMPERATURES**

Maximum permissible Indicated Turbine Temperatures (ITT) are as follows:

Takeoff (5 minutes)*	1,054 degC / 1,929 degF
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Maximum Continuous	1,006 degC / 1,843 degF
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\*The normal 5 minute takeoff rating may be extended to 10 minutes for engine out contingency.

Indicated Turbine Temperatures (ITT)

at start-up	1,054 degC / 1,929 degF
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Oil outlet temperature:

Continuous operation: 325 degF / 163 degC. Maximum oil temperature 345 degF for up to 20 minutes. Total operation between 352deg and 345 degF cannot exceed 20 minutes. See Installation and Operating Manual, 5314000 for details.

Minimum oil temperature at idle, before takeoff power operation: 48 degC / 118 degF

Minimum oil temperature for ground operation is 70 degF / 21 degC.

Fuel Temperatures: See Installation and Operating Manual, P/N 5314000  
(All Models)

Component Temperatures: See Installation and Operating Manual, P/N 5314000  
(All Models)

**NOTE 3.****PRESSURES**

Fuel pressure limits: Fuel pressure at the engine fuel pump inlet during operation shall be maintained at not less than 5.0 psi above the true vapor pressure of the fuel but not greater than 100 psi above the absolute ambient pressure with a vapor/liquid ratio of zero. The maximum allowable pressure at the fuel pump inlet after shutdown is 121 psig.

Oil pressure limits:

Minimum: 50 psig at idle. Variable by N2 Speed off idle. See Installation and Operating Manual, 5314000.

Maximum: 235 psig cold high MOP limit for MOT < 49 degC

Otherwise, 175 psig.

Oil supply pressure is measured relative to main lube pressure.

Temporary interruption associated with negative “g” operation is limited to 7 seconds maximum. Normal oil pressure will be restored rapidly once the negative “g” effect has been eliminated.

**NOTE 4.** ACCESSORY DRIVE PROVISIONS

ACCESSORY DRIVES						
Drive Pad	Rotation	Speed Ratio to N2	Torque (lb.-in.)			Overhung Moment (lb.-in.)
			Continuous	Overload	Static	
Hydraulic Pump	CW	0.1835 : 1	810	1650	3600	175
Variable Frequency Generator (VFG)	CW	0.8595 : 1	560 *	1620 *	5500	925
CW = Clockwise (facing the drive pad) * Maximum allowable continuous torque values are at any engine speed unless otherwise specified provided no destructive forces resulting from accessory torsional vibration are present. Maximum allowable continuous overhung bending moments of accessories about drive face are as shown provided no destructive forces resulting from vibration are present.						

**NOTE 5.** MODEL DESCRIPTION:  
The PW1500G engine series consist of the following engine models:

PW1519G	Bombardier CS100 reduced thrust model
PW1521G	Bombardier CS100 reduced thrust model
PW1524G	Bombardier CS100 basic model
PW1525G	Bombardier CS100 alternate climb thrust model

**NOTE 6.** The engine weight is defined as the dry weight of the basic engine with P&W supplied Standard Equipment.

**NOTE 7.** Not Applicable

**NOTE 8.** Not Applicable

**NOTE 9.** Engine mount system provisions are specified in Installation Drawing 5310001 and Mount and Maneuver Load Drawing, 5310003.

**NOTE 10.** Not Applicable

**NOTE 11.** SPECIAL INSTALLATION REQUIREMENTS:

- 1) Engine design and operating limitations are defined in the Installation and Operating Manual, 5314000.
- 2) The PW1500G Engine Series is not eligible for Extended Twin Engine Operations, (ETOPS) Operation.
- 3) The minimum N1 certified for in-flight operation in icing conditions is 1,991 rpm. The Electronic Engine Control will prevent rotor speeds below this value while in flight.
- 4) There are no approved criteria pertaining to the engine control systems' time limited dispatch and maintenance requirements.
- 5) Lightning protection requirements and electromagnetic interference emitted by the electronic engine control system, including cables, are specified in the Installation and Operating Manual, 5314000.
- 6) The thrust reverser is not part of the engine type design and is certified as part of the aircraft. Information for installation of a thrust reverser is contained in the Installation and Operating Manual, 5314000.

- NOTE 12.** Not Applicable
- NOTE 13.** SPECIAL OPERATING PROCEDURES:  
Requirements and limitations for ground operation in icing conditions are specified in the Installation and Operating Manual, 5314000.
- NOTE 14.** Not Applicable
- NOTE 15.** APPLICABLE INSTALLATION, MAINTENANCE & OVERHAUL MANUALS  
1) Installation and Operating Manual, 5314000  
2) Instructions for Continued Airworthiness are incomplete. The aircraft will be eligible for return to service when the ICA is complete and accepted.
- NOTE 16.** Not Applicable
- NOTE 17.** LIFE LIMITED PART INFORMATION  
Life limits for critical components and mandatory inspection requirements are specified in the PW1500G Airworthiness Limitation Manual PN 5305816.
- NOTE 18.** Not Applicable
- NOTE 19.** ROTOR SPEEDS  
Maximum permissible Low Pressure Rotor (N1): 10,600 rpm  
  
Minimum Low Pressure Rotor (N1),  
Ground Idle: 1,574 rpm  
Flight Idle: 1,991 rpm  
(See Note 11)  
  
Maximum permissible High Pressure Rotor (N2): 24,470 rpm  
  
Minimum High Pressure Rotor (N2),  
Ground Idle: 13,264 rpm  
Flight Idle: 13,264 rpm  
  
Power setting, power checks, and control of engine thrust output in all operations are based on Low Rotor Speed (N1). Fan Speed, (NFAN) is directly proportional to Low Rotor Speed (N1) by a gear ratio of 1: 3.0625.
- NOTE 20.** Not Applicable.
- NOTE 21.** Maximum Permissible Bleed Air Extraction limits are specified in the Installation and Operating Manual 5314000.
- NOTE 22** Not Applicable.

**NOTE 23.****EXHAUST EMISSIONS AND FUEL VENTING**

The following emissions standards promulgated in 14 CFR Part 34, Amendment 5a, effective October 23, 2013, and 40 CFR Part 87, effective October 31, 2012, have been complied with for the PW1519G, PW1521G, PW1524G, and PW1525G engine models.

Fuel Venting Emission Standards: 14 CFR §§ 34.10(a) and 34.11; in addition, 40 CFR §§ 87.10(a) and 87.11.

Smoke Number (SN) Emission Standards: 14 CFR § 34.21 (e)(2); in addition, 40 CFR § 87.23(c)(1).

Carbon Monoxide (CO) Emission Standards: 14 CFR § 34.21(d)(1)(ii); in addition, 40 CFR § 87.23(c)(1).

Hydrocarbons (HC) Emission Standards: 14 CFR § 34.21(d)(1)(i); in addition, 40 CFR § 87.23(c)(1).

Oxides of Nitrogen (NOx) Emission Standards: 14 CFR § 34.23(b)(1); in addition, 40 CFR § 87.23(c)(3).

In addition to the FAA's finding of compliance based on the certification requirements defined in this TCDS, the engine manufacturer has declared that the ICAO emissions standards identified in Annex 16, Volume II, Third Edition, Part III, Chapter 2, Section 2.2.2 for SN, Section 2.3.2 for CO and HC, Section 2.3.2.e. for NOx (also known as CAEP/8), and Part II Chapter 2 for fuel venting have also been demonstrated.

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