



TYPE CERTIFICATE DATA SHEET Nº EM-2021T01

Type Certificate Holder:

Pratt & Whitney Canada Corp.
1000 Marie-Victorin
Longueuil, Quebec – JAG 1A1
CANADA

EM-2021T01-00
Sheet 01
PRATT & WHITNEY
CANADA CORP.
PW814GA
PW815GA
07 April 2021

Engines of models described herein conforming with this data sheet, which is part of Type Certificate No. 2021T01 meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

MODEL PW814GA and PW815GA

TYPE 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 five-stage low pressure turbine that directly drives a two-stage low pressure compressor, and a single stage high bypass ratio fan. The high pressure compressor has eight axial stages driven by a two-stage cooled high pressure turbine.

Texts in **red colour** indicate the latest alterations performed in this revision
-- indicate "same as preceding model"

RATINGS		PW814GA	PW815GA
Thrust	Max. continuous, daN (lb)	6 296 (14 155)	6 925 (15 568)
	Takeoff, daN (lb)	6 863 (15 429)	7 122 (16 011)
Ambient Limit	Max. continuous, °C (°F)	28 (82)	28 (82)
	Takeoff, °C (°F)	33 (91)	33 (91)
Indicated Turbine Temperature	Max. continuous, °C	956	956
	Takeoff, °C	965	965

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FUEL TYPE

Agency	Specification	Revision	Fuel Type	Designation
ASTM	D1655 (including D7566 produced fuels re-certified to D1655)	Latest	Kerosene	Jet A Jet A-1
U.S. Military	MIL-DTL-83133	Latest	Kerosene	JP-8 (F-34) (1)(2) JP-8+100 (F-37) (1)(2)(3)
U.S. Military	MIL-DTL-5624	Latest	High Flash Kerosene	JP-5 (F-44) (1)
Canadian General Standards Board	CAN/CGSB-3.23	Latest	Kerosene	Jet A Jet A-1
Canadian General Standards Board	CAN/CGSB-3.24	Latest	High Flash Kerosene	F-44
U.K. Ministry of Defence	DEF STAN 91-86	Latest	High Flash Kerosene	F-44 / AVCAT/FSII
U.K. Ministry of Defence	DEF STAN 91-87	Latest	Kerosene	F-34 / AVTUR/FSII
U.K. Ministry of Defence	DEF STAN 91-091	Latest	Kerosene	Jet A-1 / F-35/ AVTUR
French Ministère de la Défense	DCSEA 134	D	Kerosene	F-34 F-35
French Ministère de la Défense	DCSEA 144	D	High Flash Kerosene	XF-43 F-44
Russian State Standard Committee	GOST 52050	2006	Kerosene	Jet A-1
Peoples Republic of China National Technology Supervisory Bureau	GB 6537	2018	Kerosene	#3 Jet Fuel

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Brazil – Agência Nacional do Petróleo, Gás Natural e Biocombustíveis	RANP 37	2009	Kerosene	QAV-1
ASTM / U.K. Ministry of Defence	ASTM D1655 / DEF STAN 91-091	Latest	Kerosene	Sasol Synthetic Jet Fuel
ASTM / U.K. Ministry of Defence	ASTM D1655 / DEF STAN 91-091	Latest	Kerosene	Sasol Fully Synthetic Jet Fuel

1 Contains Fuel System Icing Inhibitor (FSII) Diethylene Glycol Monomethyl Ether (DiEGME) per MIL-DTL-85470 or NATO code S-1745 for NATO fuel.

2 Contains static dissipator (electrical conductivity) additive.

3 Contains a thermal stability improver additive.

OIL, LUBRICATION

Mobil Jet Oil II, Eastman Turbo Oil 2380 / BP Turbo Oil 238, TurboNycoil 600

TEMPERATURE LIMITS

Indicate Turbine Temperature ITT °C

PW814GA	PW815GA
975	975

PRINCIPAL DIMENSIONS

(Room temperature)

Length (flange to flange, cm (in.))	268.50 (105.71)	--
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	331.29 (130.43)	
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Length (fan spinner face to aft tail cone, cm (in.))	125.45 (49.39)	--
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Nominal diameter (fan case, cm (in.))	138.43 (54.50)	--
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Maximum radial projection cm (in.) (at drain mast)		--
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WEIGHT DRY

Basic Engine kg (lb)	1415.4 (3120.4)	--
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CENTER OF GRAVITY	Axial engine station, relative to A-flange cm (in.):	140.21 (55.2)	--
	Vertical, relative to engine centerline cm (in.):	-4.83 (-1.9)	--
	Lateral, relative to centerline cm (in.):	1.27 (0.5) starboard	--

IMPORT REQUIREMENTS Each engine imported separately, and/or spare parts must be accompanied by a TCCA Export Airworthiness Approval through the TCCA Form one, Authorized Release Certificate, certifying that the engine conforms to a type design approved by the ANAC, as specified in the ANAC's type certificate data sheet No. 2021T01-00, is in condition for safe operation and has undergone a final operational check. The original Authorized Released Certificate should be sent with the engine and a copy remains with the issuing organization.
For each engine it is required a list of exceptions (if any) in respect to the ANAC approved Type Design, listed in the TCCA Authorized Release Certificate above mentioned.

CERTIFICATION BASIS

Brazilian Type Certificate No.2021T01 is based on the RBAC 21.29 and RBAC 33, which correspond to 14 CFR 21.29 and 14 CFR Part 33, Amendments 33-1 through 33-28, effective

<u>Model</u>	<u>Application</u>	<u>Issued TC</u>
PW814GA	28/09/2020	07/04/2021
PW815GA	28/09/2020	07/04/2021

Additionally, based on RBAC 21.29(1)(a)(ii) the following requirements are applicable:

14 CFR Part 33, as amended by amendment 36-33, effective September 20, 2012

And

The following models comply with 14 CFR part 34, amendment 5a, effective October 23, 2013. See NOTE 11 for detailed summary of the certification basis for fuel venting and exhaust emissions:

the true vapor pressure of the fuel or ambient pressure plus 1 psi, whichever limit is reached first with a vapor/liquid ratio of zero, but not greater than 141 psi above the ambient pressure. The maximum allowable pressure at the fuel pump inlet after shutdown is 185 psig.

Oil pressure limits:

Minimum: 35 psig at idle. Variable by N2 Speed off idle. See Installation and Operating Manual, 33B1410.

Maximum: 275 psig Otherwise, 185 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 6

Accessory	Rotation facing Drive Pad	Speed Ratio to N2	Maximum Power (HP)/Torque (IN-LB)			Max. Overhang Moment (in.-lb.)
			Cont	Overload	Static	
Hydraulic Pump	CW	0..1777 : 1	66 HP	104.2 HP	3600 IN-LB	450
Integrated Drive Generator (IDG)	CW	0. 3292: 1	74 HP	123.7 HP* 300 IN-LB *	3650 IN-LB	500

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 Power/Torque for a duration of 5 seconds maximum.

NOTE 7

MODEL DESCRIPTION:

The PW800GA engine series consist of the following engine models:

PW814GA	Gulfstream G500 reduced thrust model
PW815GA	Gulfstream G600 basic thrust model

NOTE 8

TYPICAL AIRCRAFT ACCESSORIES, COMPONENTS, OR SYSTEM ASSEMBLIES, WITH AIRCRAFT LEVEL REQUIREMENTS, PROVIDED AS PART OF ENGINE TYPE DESIGN:

Not Applicable.

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NOTE 9 ROTOR SPEEDS:

Maximum permissible Low Pressure Rotor (N1): 6,315 rpm

Maximum permissible High Pressure Rotor (N2): 24,043 rpm

Power setting, power checks, and control of engine thrust output in all operations are based on Low Rotor Speed (N1).

NOTE 10 MAXIMUM PERMISSIBLE COMPRESSOR AIR BLEEDS:

Maximum Permissible Bleed Air Extraction limits are specified in the Installation and Operating Manual, 33B1410.

NOTE 11 Reserved**NOTE 12** Reserved**NOTE 13** SPECIAL ANTI-ICING OR DE-ICING REQUIREMENTS:

Not Applicable

NOTE 14 Reserved**NOTE 15** ROTOR DISK INTEGRITY AND ROTOR BLADE CONTAINMENT (where special requirements apply):

Not Applicable.

NOTE 16 Reserved**NOTE 17** ENGINE MOUNT SYSTEM PROVISIONS:

Engine mount system provisions are specified in Installation Drawing 33B1172 and Installation and Operating Manual 33B1410.

NOTE 18 POWER BOOST, INJECTION OR AUGMENTATION SYSTEMS:

Not Applicable

NOTE 19 SPECIAL INSTALLATION REQUIREMENTS:

- 1) Engine design and operating limitations are defined in the Installation and Operating Manual, 33B1410.
- 2) The PW814GA and PW815GA not eligible for Extended Twin Engine Operations, (ETOPS) Operation.
- 3) The minimum N1 certified for in-flight operation in icing conditions is controlled by the Electronic Engine Control.
- 4) The engines are approved with Time Limited Dispatch (TLD) Limitations. Criteria pertaining to the engine control systems' dispatch and maintenance requirements for the PW814GA and PW815GA engine models are specified in Control System Interface Control Document (CSICD), and the Airworthiness Limitations Manual (ALM) which define the various configurations and maximum operating intervals. (See NOTE 22 for identification of the CSICD and ALS).
- 5) Lightning protection requirements and electromagnetic interference emitted by the electronic engine control system, including cables, are specified in the Installation and Operating Manual, 33B1410.
- 6) The thrust reverser is not part of the engine type design and is certified as part of the aircraft. Information and part number for installation of a thrust reverser is contained in the Installation and Operating Manual, 33B1410.
- 7) 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 PW814GA and PW815GA 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.

- NOTE 20** MANUFACTURER'S SERVICE BULLETINS OR OTHER INSTRUCTIONS COVERING MATTERS OF INTEREST:
Service Bulletins, structural repair manuals, vendor manuals, AFMs, and overhaul and maintenance manuals, which contain a statement that the document is approved by the TCCA, are accepted by the FAA and are considered FAA approved. (These approvals pertain to the design data only).
- NOTE 21** SPECIAL OPERATING PROCEDURES:
Requirements and limitations for ground operation in icing conditions are specified in the Installation and Operating Manual, 33B1410.
- NOTE 22** APPLICABLE INSTALLATION, MAINTENANCE & OVERHAUL MANUALS:
The following Instructions for Continued Airworthiness (ICA) have been accepted under the requirements of 14 CFR § 33.4
- 1) Engine Maintenance Manual (EMM), 33B1390
 - 2) Airworthiness Limitation Manual (ALM), 33B1391 (approved)
 - 3) Engine Shop Manual (ESM), 33B1393
 - 4) Cleaning, Inspection & Repair Manual (CIR), 33B1401
 - 5) Standard Practices Manual, 585005
- The following manuals have been approved under the requirements of 14 CFR § 33.5:
- 6) Installation and Operating Manual, 33B1410
- Other approved documents:
- 7) Control System Interface Control Document, 33B1286
- NOTE 23** LIFE LIMITED PART INFORMATION:
Life limits for critical components and mandatory inspection requirements are specified in the PW814GA/PW815GA Airworthiness Limitation Manual PN 33B1391.
- NOTE 24** The engine bill of material does not include a thrust reverser. Considerations for the installation of a thrust reverser are contained in the Installation and Operating Manual.

NOTE 25 For non-volatile particulate matter emissions (nvPM), the PW814GA/PW815GA engine models have been shown to comply with AWM Chapter 516 at Change 516-13 for AWM 516.107(c) using the evaluation methods noted in AWM 516.109, which refer to ICAO Annex 16 Volume II, amendment 9 (CAEP /10).

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MARIO IGAWA
Gerente de Certificação de Projeto de Produto Aeronáutico
(Aeronautical Product Design Certification Branch, Manager)



AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL

Rua Dr. Orlando Feirabend Filho, 230, Centro Empresarial Aquarius - Torre B - Andares 14 a 18 - Bairro
Parque Residencial Aquarius, São José dos Campos/SP, CEP 12246-190
- www.anac.gov.br

Ofício nº 333/2021/GTPR/GCPP/SAR-ANAC

São José dos Campos, 07 April 2021.

Pratt & Whitney Canada Corp.

1000 Marie-Victorin
Longueuil, Quebec – JAG 1A1
CANADA

Subject: PW814GA and PW815GA – TCDS Issuance.

Ref.: EM-2021T01-00, SEI no. 5562398.

1. In attention to the document referred above, ANAC hereby issues Initial Revision of TCDS no. EM-2021T01.
2. This TCDS revision is available at ANAC website: <https://sistemas.anac.gov.br/certificacao/Produtos/EspecificacaoOrgE.asp>

Mario Igawa

Aeronautical Product Design Certification Branch, Manager

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Documento assinado eletronicamente por **Mário Igawa, Gerente de Certificação de Projeto de Produto Aeronáutico**, em 08/04/2021, às 10:16, conforme horário oficial de Brasília, com fundamento no art. 6º, § 1º, do [Decreto nº 8.539, de 8 de outubro de 2015](#).



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