
Type Acceptance Report

TAR 8/21B/22

Pratt & Whitney Canada PW610F-A

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
2. ICAO TYPE CERTIFICATE DETAILS	1
3. TYPE ACCEPTANCE CERTIFICATE	1
4. NZCAR §21.43 DATA REQUIREMENTS	2
ATTACHMENTS	3
APPENDIX 1	4

Executive Summary

New Zealand Type Acceptance has been granted to the Pratt & Whitney Canada PW610F engine based on validation of Transport Canada Type Certificate number E-35. There are no special requirements for import.

Applicability is limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for installation on a NZ-registered aircraft. Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(b).

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 8/21B/22 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

- (a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model(s) in New Zealand; and
- (b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate.

2. ICAO Type Certificate Details

Manufacturer: Pratt & Whitney Canada Corporation

Type Certificate: E-35

Issued by: Transport Canada

Model(s): PW610F-A

3. Type Acceptance Certificate

The application for New Zealand type acceptance of the PW610F-A engine was from the manufacturer, dated 27 November 2007. The PW600 Series is a two spool medium bypass front-fan turbojet with mixed exhaust, available in a range of thrusts for the VLJ market. As part of the validation process a CAA certification specialist visited the PWC engineering and manufacturing facility in Longueuil, Quebec. This visit included detailed discussions of the engine's design and certification which is contained in visit report DW1167301-0. This document is commercial in confidence between CAA and PWC.

Type Acceptance Certificate No. 8/21B/22 was granted on 24 October 2008 to the Model PW610F-A based on validation of Transport Canada Type Certificate E-35. There are no special requirements for import into New Zealand.

The PW610F-A, flat rated at 950 lb. thrust for takeoff, was developed to power the Eclipse 500. The PW610F is a very small two-spool design, featuring a single-stage high-pressure

turbine driving a 2 stage high-pressure compressor (1st stage mixed 2nd stage centrifugal) and a low-pressure turbine driving a 14.4-inch diameter one-piece titanium fan. Engine control is provided by fuselage mounted FADEC (Full Authority Digital Engine Control) systems.

4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents, or were already held by the CAA:

(1) ICAO Type certificate:

Transport Canada Type Certificate Number E-35

Transport Canada Type Certificate Data Sheet No. E-35 at Issue 3 dated 09.03.07
– Model PW610F-A approved July 26, 2006

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the PW615F is Canadian Airworthiness Manual, Chapter 533 at Change 6, which is similar to FAR Part 33 up to amendment 33-20. This is the basic standard for aircraft engines called up under Part 21 Appendix C. One Special Condition was imposed, which has been reviewed and accepted by the CAA. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23. The engine meets Transport Canada and FAA requirements for operation in icing conditions.

(ii) *Special Conditions:*

SCA 2005-01 – Continued Engine Operation During Transient Loss of Engine Control System Activity – The PW610F-A engine control system is dependent upon aircraft electrical power, so special conditions were imposed to ensure automatic recovery of control function after interruptions with no unacceptable thrust change or damage to the engine. It was demonstrated that in the event of aircraft power interruption the engine fuel control valve remains in its last commanded position.

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Airworthiness Limitations:*

See the Airworthiness Limitations Manual P/N 3072697

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The PW615F-A complies with the Canadian Airworthiness Manual Chapter 516, subchapter B “Aircraft Engine Emissions” which refers to ICAO Annex 16 Volume II. Compliance with FAR 34 up to Amendment 34-3 has also been shown.

(ii) *Compliance Listing:*

PWC Engineering Report No. 5960 – PW610F-A Smoke and Emissions Report

Smoke Number: Smoke Number of 5.0 was derived from test data versus the ICAO Annex 16 [and FAR §34.21(e)(1)] limit of 50.0. The actual smoke number recorded was less than 1.0 which is considered to be '5.0 or less'.

Engine Emissions: Under FAR §34.21(d)(1) there are no gaseous exhaust emission requirements for engines less than 26.7 kilonewtons (6000 pounds) rated output.

(4) Certification Compliance Listing:

PW610F-A – Compliance Checklist and Reports

PWC Engineering Report No.7061 – PW610F-A Foreign Validation Engine Description and Certification Compliance – March 2008

(5) Flight Manual: N/A

(6) Operating Data for Engine:

(i) *Maintenance Manual:*

PW610F-A Line Maintenance Manual P/N 3070895

(ii) *Current service Information:*

PWC Service Bulletins, Spares Parts Bulletins and Service Information Letters are available on the Pratt and Whitney Canada website.

(iii) *Illustrated Parts Catalogue:*

IPC PW610F-A (Build Spec.1171) P/N 3059984

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

CAA 2171 from PW600 Senior Project Engineer dated 27 November 2007

Attachments

The following documents form attachments to this report:

Copy of Transport Canada Type Certificate Data Sheet Number E-35

Sign off

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Jack Stanton
Team Leader Continuing Airworthiness

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Checked – David Gill TLA
Date: 24 October 2008

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
PW610F-A	Pratt & Whitney Canada Corp.	8/21B/22	24 October 2008