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# **Type Acceptance Report**

**TAR 13/21B/3 – Revision 1**

**Pratt & Whitney Canada PW535 Series**

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## Executive Summary

New Zealand Type Acceptance has been granted to the Pratt & Whitney Canada (PWC), PW535E Series turbofan engine based on validation of Transport Canada Type Certificate number E-27. There are no special requirements for import.

Applicability is limited to the Models and/or serial numbers detailed in Section 2, 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(c).

NOTE: The information in this report was correct as at the date of issue. The report is generally only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

## 1. Introduction

This report details the basis on which Type Acceptance Certificate No. 13/21B/3 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.

The report also notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. Appendix 1 lists the New Zealand type acceptance history.

## 2. Product Certification Details

### (a) State-of-Design Type and Production Certificates:

Manufacturer: Pratt & Whitney Canada Inc.  
Type Certificate: E-27  
Issued by: Transport Canada  
Production Approval: Certificate of Approval Number 4-58

### (b) Models Covered by the Part 21B Type Acceptance Certificate:

- (i) **Model:** PW535E
  - Max. Take-off Thrust: 3360 lb.
  - Max. Continuous: 3360 lb.
  
- (ii) **Model:** PW535E-1
  - Max. Take-off Thrust: 3478 lb.
  - Max. Continuous: 3478 lb.

### 3. Application Details and Background Information

The application for New Zealand type acceptance of the PW535E was from the manufacturer, dated 9 August 2012. The PW535E is a full-length annular bypass duct two-spool FADEC-controlled turbofan engine with a maximum take-off thrust of 3360 lb and is used to power the Embraer Phenom 300 aircraft.

Type Acceptance Certificate No. 13/21B/3 was granted on 1 May 2013 based on validation of Transport Canada Type Certificate number E-27. There are no special requirements for import into New Zealand. As part of the validation process a CAA certification team visited the PWC engineering and manufacturing facility in Toronto.

This report was raised to Revision 1 to add the PW535E-1, after application from the manufacturer dated 4 February 2021. Type Acceptance of the Model PW535E-1 was granted on 24 February 2021.

The PW535E engine has a three-stage High Pressure (HP) compressor (two axial and one centrifugal) driven by a single stage HP turbine, and a two-stage Low Pressure (LP) turbine driving an integrally bladed fan and axial boost compressor stage. The two rotor spools are not mechanically connected and rotate at different speeds.

The PW535E is a derivative of the PW535B with the significant differences being an aircraft mounted Electronic Engine Control box, full span fan stator and modifications to the HP blade material. The PW535E-1 is a higher thrust version with no changes to the basic engine. The thrust bump is achieved by a software power setting change.

#### 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) State-of-Design Type certificate:

Transport Canada Type Certificate Number E-27

Transport Canada TCDS Number E-27 at Issue 11 dated 13 May 2019

– Model PW535E approved 2 November 2009

– Model PW535E-1 approved 13 May 2019

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the PW535E series is Canadian Airworthiness Manual, Chapter 533 at Change 533-9 dated 30 December 2008. This is equivalent to FAR Part 33 up to Amendment 24, except for Amendment 21. This is an acceptable standard as FAR 33 is the basic standard for aircraft engines called up under Part 21 Appendix C. There are no non-compliances and no special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

Nil

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Airworthiness Limitations:*

Service life values for life limited parts are defined in the Airworthiness Limitations Section (ALS) of the Engine Maintenance Manual P/N 3072702.

(3) Environmental Certification:

(i) Certification Standard

The PW535E complies with Canadian Airworthiness Manual, Subchapter 516 B at Change 516-06 "Aircraft Engine Emissions" which refers to ICAO Annex 16 Volume II, Second Edition, July 1993. This was updated to Change 516-12 for the PW535E-1, which refers to ICAO Annex 16 Volume II, Third Edition, July 2008, as amended by and including Amendment 8.

(ii) Compliance Listing

PWC Engineering Report No. 7101 – PW535E & PW535E1 Engine Certification Smoke and Gaseous Emissions Test Report – Revision B. (Report not held by CAA – extracts are contained in Reports ER8264 and ER10938.)

(4) Certification Compliance Listing:

PWC Engineering Report No. 8264 – PW535E Engine Description and Certification Compliance for New Zealand – dated April 2013.

PWC Engineering Report No. 10938 – PW535E1 Engine Description and Certification Compliance for the Civil Aviation Authority (CAA) of New Zealand – dated January 2021. Includes:  
Appendix A: PW535E1 Method of Compliance Summary

(5) Flight Manual: N/A

(6) Operating Data for Engine:

(i) *Maintenance Manuals:*

PW535E/PW535E1 Engine Maintenance Manual – P/N 3072702

PW535E/PW535E1 Engine Overhaul Manual – P/N 3072703

(ii) *Current service Information:*

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

(iii) *Illustrated Parts Catalogue:*

PW535E/PW535E1 IPC – P/N 3072704

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

Access is provided to the website *myP&WCPower* at [www.customer.pwc.ca](http://www.customer.pwc.ca)

## Attachments

The following documents form attachments to this report:

Copy of Transport Canada TCDS Number E-27

## Sign off



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David Gill  
Team Leader Aircraft Inspection



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Checked – Tim Dutton  
Flight Test Engineer

## Appendix 1

### List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
PW535E	Pratt & Whitney Canada Inc.	13/21B/3	1 May 2013
PW535E-1	Pratt & Whitney Canada Inc.	21/21B/14	24 February 2021