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# **Type Acceptance Report**

**TAR 20/21B/7**

**GENERAL ELECTRIC CF34-1/3 Series**



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## Executive Summary

New Zealand Type Acceptance has been granted to the General Electric CF34-1A and CF34-3 Series turbofan engines based on validation of FAA Type Certificate number E15NE. There are no special requirements for import.

This report covers all the engine Models currently listed on the FAA Type Certificate, which are now eligible for installation on a NZ-registered aircraft. Subsequent models approved under the FAA 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. 20/21B/7 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 product in New Zealand; and
- (b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate.

The report 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.

## 2. Product Certification Details

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

Manufacturer: General Electric Company  
Type Certificate: E15NE  
Issued by: Federal Aviation Administration  
Production Approval: FAA PC107

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

(i) Models: CF34-1A  
CF34-3A, CF34-3A1, CF34-3A2  
CF34-3B, CF34-3B1

### 3. Application Details and Background Information

The application for New Zealand type acceptance of the General Electric CF34-1/3 Series was from GCH Jet Operations Ltd dated 31 October 2019. The CF34-1/3 Series is a single-stage turbofan in the 9000 lb thrust class with a fourteen-stage compressor, annular combustion chamber, two-stage high pressure turbine and four-stage low pressure turbine. The CF34-1/3 Series is used on the Bombardier Challenger/CRJ family.

Type Acceptance Certificate Number 20/21B/7 was granted on 24 March 2020 to the General Electric CF34-1A and CF34-3 Series engines based on validation of FAA Type Certificate E15NE. There are no special requirements for import into New Zealand.

The CF34 is a civilian high-bypass turbofan developed by GE Aircraft Engines from its TF34 military engine, which was first produced for the Fairchild A-10 and Lockheed S-3A Viking. The first Model was the CF34-1A used on the Canadair Challenger 601-1A business jet, and later versions were developed with improved thrust or lower SFC.

The next Model was the CF34-3A fitted to the Challenger 601-3A. This is the same as the -1A except for increased interturbine temperature and rating. Thrust was flat rated to 70° F ambient temperature sea level for better climb and hot day performance. The CF34-3A1 was developed for the first of the Canadair RJ Series, and is the same as the -3A except for improved maintainability and durability features, compatible with airline service needs. The CF34-3A2 has the same improved combustor, ignition system, and fuel control 3-D cam as the -3A1, with modified fuel distribution system and revised starting procedures.

The CF34-3B was designed for a 7% increase in thrust, better hot and high performance and 3% lower fuel consumption, intended for the Challenger 604 long range jet. It uses a higher efficiency stage 1 compressor and HPT and LPT stator cooling and clearance control modifications, to improve airflow through the engine. The CF34-3B and -3B1 configurations are identical except for different flat rating points for airline use for the latter.

#### 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:

FAA Type Certificate Number E15NE

FAA Type Certificate Data Sheet no. E15NE at Revision 13 dated June 18, 2014

- Model CF34-1A approved August 18, 1982
- Model CF34-3A approved September 26, 1986
- Model CF34-3A1 approved July 24, 1991
- Model CF34-3A2 approved October 9, 1992
- Models CF34-3B and CF34-3B1 approved May 31, 1995

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the General Electric CF34-1 and CF34-3 Series is FAR Part 33, effective February 1, 1965, including amendments 33-1 through 33-9, plus amendment 33-10 for Section 33.14 and one Exemption. This has been reviewed and accepted by CAANZ.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as FAR 33 is the basic standard for aircraft engines called up under Part 21 Appendix C. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

Nil

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Exemptions:*

Exemption 3473 – This allowed some alternative procedures for the Model CF34 series turbofan engines without complying with the specific requirements of §33.7(c)(17) [first overhaul period], §33.14 [service life extension], §33.23 [engine mount loads], §33.27 [overspeed rotor strength], and §33.88 [overtemperature test]. Justification included military TF34 service experience and other test and development data to establish an initial recommended scheduled or on-condition maintenance program to allow some flexibility at entry into service. Further GE states that its current overspeed design and test methods are supported by 42 million flight hours on engines of similar design, while the components critical to flight safety, disks, shafts, and spacers, reach their maximum stress in less than 5 minutes at the overtemperature condition specified so this endurance test time is sufficient.

(v) *Airworthiness Limitations:*

CF34-1A/-3A/-3A2 – See MM SEI-580 and Overhaul Manual SEI-582

CF34-3A1/-3B1 – See GE Engine Manual SEI-756

CF34-3A1/-3B – See GE Service Manual SEI-780



(3) Environmental Certification:

All the CF34-3 models comply with FAR Part 34, amendment 5, effective December 31, 2012, for fuel venting and smoke emission.

See TCDS Note 18 for details of compliance with emission standards.

(4) Certification Compliance Listing:

CF34-1A FAA Certification Program Summary Substantiation

CF34-3A FAA Certification Program Checklist

CF34-3B/-3B1 FAA Certification Compliance Checklist

(5) Flight Manual: N/A

(6) Operating Data for Engine:

(i) *Maintenance Manual:*

CF34-1A, CF34-3A, CF34-3A2 Maintenance Manual – Publication SEI-580

CF34-1A, CF34-3A, CF34-3A2 Shop Manual – Publication SEI-582

CF34 Turbofan – CF34-3A1, CF34-3B1 Engine Manual – Publication SEI-756

CF34 Turbofan – CF34-3A1, CF34-3B Service Manual – Publication SEI-780

CF34-3A1, CF34-3B Heavy Maintenance Manual – Publication SEI-782

CF34 Turbofan Illustrated Tool and Equipment Manual – Publication SEI-584

GE Commercial Engine Standard Practices Manual – Publication GEK9250

(ii) *Current service Information:*

Service Bulletins (SB)

CF34BJ Commercial Engine Service Memorandum (CESM)

CF34RJ Commercial Engine Service Memorandum (CESM)

(iii) *Illustrated Parts Catalogue:*

CF34-1A, CF34-3A, CF34-3A2 Illustrated Parts Catalog – Publication SEI-581

CF34-3A1, CF34-3B1 Illustrated Parts Catalog – Publication SEI-755

CF34-3A1, CF34-3B Illustrated Parts Catalog – Publication SEI-779

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

GE provides access through the Customer Portal [www.myGEAviation.com](http://www.myGEAviation.com)

## Attachments

The following documents form attachments to this report:

Copy of FAA Type Certificate Data Sheet Number E15NE

## Sign off



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David Gill  
Team Leader Airworthiness



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Checked – Gaetano Settineri  
Airworthiness Engineer

## Appendix 1

### Type Acceptance Application History:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
CF34-1/-3 Series	GCH Jet Operations Limited	20/21B/7	24 March 2020