
Type Acceptance Report

TAR 22/21B/19

WACO UPF-7

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Executive Summary

New Zealand Type Acceptance has been granted to the Waco UPF-7 Series based on validation of FAA Type Certificate number A-642. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Section 2, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.) 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. 22/21B/19 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; and
- (c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

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. The history of the UPF-7 Series type acceptance in New Zealand under FAA type certificate A-642 is listed in Appendix 1.

2. Aircraft Certification Details

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

Manufacturer: The Waco Aircraft Company
Type Certificate: A-642
Issued by: Civil Aeronautics Administration

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

(i) **Model:** UPF-7
MCTOW: 2650 lb. [1202 kg]
Max. No. of Seats: 2 (3 with Waco Drawing. No.s 23702 to 23718)
Noise Standard: Not Applicable
Engine: Continental W670K or W670K1
Continental W670-6A or W670-6N
Type Certificate: E-162
Issued by: Federal Aviation Administration
Propeller: Fixed-pitch Wooden
Adjustable Metal

Notes: 1. Refer to FAA Aircraft Specification A-642 for specific applicability of engine and propeller combinations to individual aircraft models.

2. Refer to Advisory Circular 21-1 Appendix 2 for the New Zealand type acceptance status of any engines and propellers listed above.

3. Application Details and Background Information

The application for New Zealand type acceptance was from the aircraft owner Flying Circus Ltd, dated 5 April 2022. The first-of-type example was serial number 5593, registered ZK-UPF. The Waco UPF-7 is a tandem two-seat biplane trainer with fixed undercarriage, radial engine and traditional fabric-covered steel-tube construction.

Type Acceptance Certificate No. 22/21B/19 was granted on 30 June 2022 to the Waco UPF-7 based on validation of FAA Type Certificate A-642. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The UPF-7 was one of the many different models produced by the Waco Aircraft Company in the 1930s, which were approved under a number of type certificates. It was produced in the largest numbers due to its use as a primary trainer for military flying schools. Essentially a state-of-the-art refinement of the first 1930 model F, the UPF-7 retained its major features, particularly the staggered wings with strut-connected ailerons in the upper and lower panels. The Waco Aircraft Company used a three-letter designation system for their various different models. In the case of the UPF-7, the U stands for the 220-hp Continental engine, the P stands for the Waco wing that was used, the F indicates the 1930 model with twin open cockpits and seating for three, and the 7 means it is the seventh in the series of this basic type.

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:

FAA Type Certificate Number A-642

FAA Aircraft Specification number A-642 dated 30 June 1949
– Model UPF-7 approved 5 June 1937

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Waco UPF-7 Series is Aero Bulletin 7A. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, because Aero Bulletin 7A is the predecessor of CAR 3, which was the predecessor of FAR Part 23, the basic design standard for Normal Category Airplanes 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) *Airworthiness Limitations:*

Nil

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

Not Applicable

(4) Certification Compliance Listing:

The technical records of the Waco Aircraft Company are now held by the Smithsonian Institution. This includes the following Engineering Reports:

Model F, Analysis of Landing Gear

Model F, Approved Type Certificate

Model F, Drop Tests of Landing Gear

Model F, Drop Test of Tail Skid

Model F, Flight Tests

Model F, List of Standard Equipment

Model F, Operating Installations

Model F, Static Tests

Model F, Static Test of Ailerons

Model F, Static Test of Channel Elevator Rod
Model F, Static Test of Control Surfaces
Model F, Static Test of Empennage Surfaces
Model F, Static Test of Torque Tube
Model F, Stress Analysis of Engine Mount
Model F, Stress Analysis of Wing Strut
Model UPF-7, Aircraft Specifications
Model UPF-7, Carburettor Heat Rise Tests
Model UPF-7, Engine Temperature Tests
Model UPF-7, Engineer Notes
Model UPF-7, Flight Tests
Model UPF-7, Oil Temperature Tests
Model UPF-7, Performance Tests
Model UPF-7, Technical Data, 22 pages
Model UPF-7, Type Certificate, 59 pages
Model UPF-7, Weight & Balance
Model UPF-7, Weight & Balance, 5502-5599 Serial Nos.
Model UPF-7, Weights & Balance, 5600 Series Aircraft
Model UPF-7, Weights & Balance, 5700 Series Aircraft
Model UPF-7, Weights & Balance, 5800 Series Aircraft

(5) Flight Manual: Aircraft Operation Record Waco UPF-7
CAA Accepted as AIR 3495

(6) Operating Data for Aircraft:

- (i) *Maintenance Manual:*
Instruction Manual Waco Model UPF (Air Corps Designation YPT-14)
- (ii) *Current service Information:*
Complete Set Service Bulletins for Waco UPF-7 Trainer (PT-14A)
- (iii) *Illustrated Parts Catalogue:*
Waco UPF-7 (PT-14A) Parts Price List

(7) Agreement from manufacturer to supply updates of data in (5), and (6):
No revisions issued since 1947

(8) Other information:

Statement of Conformity Waco UPF-7 MSN 5593 dated Jan. 7, 1941
Certificate of Acceptance Waco UPF-7 MSN 5593 dated 9/1/1941

5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed as they are a prerequisite for the grant of an airworthiness certificate.

Civil Aviation Rules Part 26

Subpart B – Additional Airworthiness Requirements

Appendix B – All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Seating and Restraints – Safety belt/Shoulder Harness	<i>Operating Requirement – Compliance as applicable</i>
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – Less than ten passenger seats
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	Aero Bulletin 7A §72 (A) N/A – No mach limitations Aero Bulletin 7A §72 (B)(4) Aero Bulletin 7A §72 (C) Aero Bulletin 7A §67 (D) Aero Bulletin 7A §72 (B)(1) Aero Bulletin 7A §72 (B)(2)
91.511	Night VFR Instruments and Equipment	<i>Operating Requirement – Compliance as applicable</i>
91.513	VFR Communication Equipment	<i>Operating Requirement – Compliance as applicable</i>
91.517	IFR Instruments and Equipment	Not Applicable – Not approved for IFR flight
91.519	IFR Communication and Navigation Equipment	Not Applicable – Not approved for IFR flight
91.523	Emergency Equipment: (a) More Than 9 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily accessible to crew (c) More than 61 pax – Portable Megaphones per Table 9	Not Applicable – Less than ten passenger seats Not Applicable – Less than ten passenger seats Not Applicable – Less than twenty passenger seats Not Applicable – Less than sixty-one passenger seats
91.529	ELT – TSO C126 406 MHz after 22/11/2007	<i>Operating Requirement – Compliance as applicable</i>
91.531	Oxygen Indicators – Volume/Pressure/Delivery	<i>Operating Requirement – Compliance as applicable</i>
91.533	Oxygen for non-Pressurised Aircraft:	Not fitted as standard
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operating Requirement – Compliance as applicable</i>
91.543	Altitude Alerting Device – Turbojet or Turbofan	Not Applicable – Not approved for IFR flight
91.545	Assigned Altitude Indicator	Not Applicable – Not approved for IFR flight
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was directly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

Attachments

The following documents form attachments to this report:

Copy of CAA Aircraft Specification Number 642

Sign off

A blue ink signature of David Gill is written over a circular blue stamp. The stamp contains the text 'CAA AVIATION AUTHORITY OF NEW ZEALAND' around the perimeter, the CAA logo in the center, and the number '0053' below the logo.

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David Gill
Team Leader Aircraft Inspection

A blue ink signature of Phillip Scanlan is written over a circular blue stamp. The stamp contains the text 'CAA AVIATION AUTHORITY OF NEW ZEALAND' around the perimeter, the CAA logo in the center, and the number '5750' below the logo.

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Checked – Phillip Scanlan
Certification Engineer

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
UPF-7	Flying Circus Limited	22/21B/19	30 June 2022

Appendix 2

Three-view drawing Waco Model UPF-7:

