
Type Acceptance Report

TAR 16/21B/20 – Revision 1

LAKE LA-4 Series

TABLE OF CONTENTS

| | |
|--|----------|
| EXECUTIVE SUMMARY | 1 |
| 1. INTRODUCTION | 1 |
| 2. AIRCRAFT CERTIFICATION DETAILS | 2 |
| 3. APPLICATION DETAILS AND BACKGROUND INFORMATION | 4 |
| 4. NZCAR §21.43 DATA REQUIREMENTS | 5 |
| 5. NEW ZEALAND OPERATIONAL RULE COMPLIANCE | 6 |
| ATTACHMENTS | 8 |
| APPENDIX 1 – NZ TYPE ACCEPTANCE HISTORY | 8 |
| APPENDIX 2 – THREE-VIEW DRAWING | 9 |

Executive Summary

New Zealand Type Acceptance has been granted to the Lake LA-4 Series based on validation of FAA Type Certificate number 1A13. 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. 16/21B/20 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 also notes the status of all models included under the foreign type certificate which have been granted type acceptance in New Zealand. Appendix 1 details the type acceptance history under CAR Part 21B and which models were certificated prior to that under NZCAR Section B.9 and are now type accepted under the transitional arrangements of Part 21 Appendix A(c).

2. Aircraft Certification Details

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

Manufacturer: Aerofab, Incorporated

Type Certificate Holder: Revo, Incorporated (from October 29, 1986)
Consolidated Aeronautics, Inc. (from May 7, 1963)
Lake Aircraft Corporation (from December 23, 1959)
Colonial Aircraft Company (from 19 September 1955)

Type Certificate: 1A13
Issued by: Federal Aviation Administration
Production Approval: Not Applicable

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

(i) **Model:** LA-4

MCTOW: 2400 lb. [1088 kg]

Max. No. of Seats: 4

Noise Standard: Not Applicable

Engine: Lycoming O-360-A1A or O-360-A1D
Type Certificate: E-286
Issued by: Federal Aviation Administration

Propeller: Hartzell HC92ZK-8/L8447-12A
Type Certificate: P-892
Issued by: Federal Aviation Administration

Hartzell HC92WK-8L/LW8447-12A
Type Certificate: P16EA
Issued by: Federal Aviation Administration

(ii) **Model:** LA-4-200

MCTOW: 2600 lb. [1179 kg]

Max. No. of Seats: 4

Noise Standard: Not Applicable

Engine: Lycoming IO-360-A1B or IO-360-A1B6
Type Certificate: 1E10
Issued by: Federal Aviation Administration

Propeller: Hartzell HC-C2YK-1BL/L7666A-2 or L7666-2 or
Hartzell HC-C2YK-1BLF/FL7666A-2
Type Certificate: P-920
Issued by: Federal Aviation Administration

(iii) **Model:** Lake Model 250

MCTOW: 3140 lb. [1424 kg]

Max. No. of Seats: 4 (s/n 1 through 4)
6 (s/n 5 and up with STC SA745NE)

Noise Standard: FAR Part 36

Engine: Lycoming IO-540-C4B5
Type Certificate: 1E4
Issued by: Federal Aviation Administration

Propeller: Hartzell HC-E3YR-1RLF/FL7663D-2Q
Type Certificate: P33EA
Issued by: Federal Aviation Administration

- Notes: 1. Refer to FAA TCDS 1A13 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

There have been examples of the Lake Series in New Zealand prior to 1995 when Part 21 was introduced, and those particular model years or serial number ranges were therefore deemed to have a type acceptance certificate under the transitional arrangements of Part 21 Appendix A(c). The first application for New Zealand type acceptance under Part 21B was for the Lake Model 250 from the importer, dated 18 December 2015. The first-of-type example was serial number 77, registered ZK-RFH. The Lake is a mid-wing boat-hulled amphibian with a single pylon-mounted piston-engine in a pusher configuration, of conventional aluminium riveted construction except for some non-structural items of fibreglass laminate.

Type Acceptance Certificate No. 16/21B/20 was granted on 15 February 2016 to the Lake Model 250 based on validation of FAA Type Certificate 1A13. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

Revision 1 of this report was issued to update the format and add the other two main Lake models that have been type accepted under the FAA type certificate. (The LA-4P was the single prototype, and the LA-4A was the designation of the first two production examples which still used the C-2 bow.)

Type History:

The first of the series was the Colonial C-1 Skimmer, which was designed by the same people who were involved with the Grumman G-65 Tadpole. Colonial produced 23 of the 150hp C-1 and 117 of the 180hp C-2 design before being sold in 1959. The new owner renamed the company Lake Aircraft and developed the LA-4, which had four feet added to each wingspan, seventeen inch longer bow and strengthened structure. The LA-4-200 "Buccaneer" introduced in 1970 was the same except for the use of a 200hp engine, with a gross weight increase and optional auxiliary fuel tanks.

The Model 250 "Renegade" was a development of the LA-4-200 using the six-cylinder IO-540 engine and new 3-bladed Hartzell propeller with Q-tip; an increase in MCTOW and an 18" increase in fuselage length in the cabin area. The vertical tail is swept aft 15 degrees and the horizontal tail is mounted slightly higher on the vertical fin.

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 1A13

FAA Type Certificate Data Sheet no. 1A13 at Revision 28 dated Dec 12, 2013

- Model LA-4 approved 26 July, 1960
- Model LA-4-200 approved 26 May, 1970
- Lake Model 250 approved 30 June 1983

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the C-1/LA-4 Series is CAR 3 dated 15 December 1946, including Amendments 3-1 and 3-2. For the Model 250 this was updated to FAR Part 23, including Amendments 23-1 through 23-23 for Subparts A, B, D, E, F, and G, and specified paragraphs of CAR 3 as noted on the TCDS.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as CAR 3 was the predecessor of FAR 23, which is the basic 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:*

See Maintenance Manual Section 3.2 – Life-Limited Parts

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

Only the Model 250 has been certificated for noise under FAR Part 36, including Amendments 36-1 through 36-10.

(ii) *Compliance Listing:*

The flyover noise level for the Model 250 is 76.7 dBA (See AFM Section 2.5)

(4) Certification Compliance Listing:

Lake Engineering Report No. 46: LA-4 Control Systems Analysis

Lake Engineering Report No. 42: LA-4 Flap and Aileron Analysis

Lake Report 45: LA-4 Stress Analysis of Horizontal and Vertical Tail Surfaces

Lake Engineering Report No. 49: LA-4 Stress Analysis

Lake Engineering Report No. 33: LA-4 Report on Landing Gear Drop Tests
Lake Engineering Report No. 44: LA-4 Hull Stress Analysis

LA-4 and LA-4-200 Drawing List

FAA Flight Test Report for the Lake Aircraft C-2 (LA-4)

Flight Test Report: Lake LA-4 200 (2600lb Gross Weight)

Engineering Report 250-18 – Compliance Items, FAR 23 Subparts D, E & F

Engineering Report 250-1 – Basic Loads Lake Model 250

Certification Compliance Checklist FARs – Model 250 – June 25, 1983

FAA Type Inspection Report (Project CA506NE-D) – Model 250

- (5) Flight Manual: FAA-Approved Airplane Flight Manual – Models LA-4, LA-4A, LA-4P – Lake Aircraft Division, Consolidated Aeronautics Inc. CAA Accepted as AIR 2351

FAA-Approved Airplane Flight Manual – Model LA-4-200
Lake Aircraft Division, Consolidated Aeronautics Inc.
CAA Accepted as AIR 2107

FAA-Approved Airplane Flight Manual – Model 250
Lake Aircraft Division, Consolidated Aeronautics Inc.
CAA Accepted as AIR 3351

- (6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

LA-4, LA-4A, LA-4P – Illustrated Parts Catalog & Maintenance Repair Manual

Lake Aircraft Maintenance Manual – LA4 Series and Model 250

(ii) *Current service Information:*

Service Bulletins

(iii) *Illustrated Parts Catalogue:*

Not produced separately

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

See email from Type Certificate holder dated 28 January 2016

- (8) Other information:

Engineering Report ER250-31 – Electrical Load Analysis – Model 250 – 28 Volt, 50 Ampere Alternator

5. Additional New Zealand Requirements

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 | CAR §03.543 |
| 91.507 | Pax Information Signs – Smoking, safety belts fastened | Not Applicable – Less than 10 passenger seats |
| 91.509 Min. VFR | (1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure | CAR §03.51(a)(1) N/A CAR §03.51(a)(2) CAR §03.51(a)(3) CAR §03.51(b)(1)(i) CAR §03.51(b)(1)(iv) CAR §03.51(b)(1)(ii) |
| | | (8) Coolant Temp (9) Oil Temperature (10) Manifold Pressure (11) Cylinder Head Temp. (12) Flap Position (13) U/c Position (14) Ammeter/Voltmeter |
| | | N/A – Air-cooled engine CAR §03.51(b)(1)(iii) CAR §03.51(b)(2)(v) CAR §03.51(b)(2)(iii) CAR §03.353 N/A – Fixed undercarriage CAR §03.51(c)(2) |
| 91.511 | Night VFR Instruments and Equipment | <i>Operating Rule – Compliance to be determined</i> |
| 91.513 | VFR Communication Equipment | <i>Operating Rule – Compliance to be determined</i> |
| 91.517 | IFR Instruments and Equipment | <i>Operating Rule – Compliance to be determined</i> |
| 91.519 | IFR Communication and Navigation Equipment | <i>Operating Rule – Compliance to be determined</i> |
| 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 10 passenger seats Not Applicable – Less than 10 passenger seats Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats |
| 91.529 | ELT – TSO C126 406 MHz after 22/11/2007 | <i>Operating Rule – Compliance to be determined</i> |
| 91.531 | Oxygen Indicators – Volume/Pressure/Delivery | <i>Operating Rule – Compliance to be determined</i> |
| 91.533 | Oxygen for non-Pressurised Aircraft: | <i>Operating Rule – Compliance to be determined</i> |
| 91.541 | SSR Transponder and Altitude Reporting Equipment | <i>Operating Rule – Compliance to be determined</i> |
| 91.543 | Altitude Alerting Device – Turbojet or Turbofan | <i>Operating Rule – Compliance to be determined</i> |
| 91.545 | Assigned Altitude Indicator | Not Applicable – Not turbo jet or turbofan powered |
| 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 exactly 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.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

Attachments

The following documents form attachments to this report:

Copy of FAA Type Certificate Data Sheet Number 1A13

Sign off



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David Gill
Team Leader Aircraft Inspection



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Checked – John Marshall
Airworthiness Inspector

Appendix 1

List of Type Accepted Variants:

| <i>Model:</i> | <i>Applicant:</i> | <i>CAA Work Request:</i> | <i>Date Granted:</i> |
|----------------|---------------------------------------|--------------------------|----------------------|
| LA-4 | AC 21-1.2/NZCAR Part 21 Appendix A(c) | | |
| LA-4-200 | AC 21-1.2/NZCAR Part 21 Appendix A(c) | | |
| Lake Model 250 | C J Smith | 16/21B/20 | 15 February 2016 |

Appendix 2

Three-view drawing Lake Model 250:

