
Type Acceptance Report

TAR 9/21B/19

KAVANAGH HOT AIR BALLOONS

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Executive Summary

New Zealand Type Acceptance has been granted to Kavanagh Hot Air Balloons based on validation of CASA Type Certificate number VL507 and its predecessors. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.177, 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).

1. Introduction

This report details the basis on which Type Acceptance Certificate No.9/21B/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 also notes the status of all models included under the foreign type certificate which have been granted type acceptance in New Zealand. Models covered by the type acceptance certificate issued under Part 21B are listed in Section 2 of this report. Models which were accepted prior to that under NZCAR Section B.9 are listed in Appendix 1.

2. ICAO Type Certificate Details

TC Holder	Kavanagh Investment Trust (after 11 April 2008) Kavanagh Balloons Pty Limited
Manufacturer:	Kavanagh Balloons Australia Pty Ltd (CASA PC-049101 – First issued 12 November 2003) Kavanagh Balloons Pty Limited
Type Certificate:	VL507
Issued by:	Civil Aviation Safety Authority
Model(s):	B, C, D, E, EX, G-Series

MCTOW: See later individual listings

Max. No. of Seats: No of occupants determined by weight and basket capacity

Noise Standard: Not Applicable

3. Type Acceptance Details

The application for New Zealand type acceptance was from the importer Mr N Aberhart, dated 17th June 2009. The first-of-type example was a Model D90 serial number D90-396, registered ZK-PEA. Kavanagh balloons are available in a range of different Types, which vary in the number of horizontally cut bulbous gores, and in sizes. (The model number indicates the size in cubic feet.)

Type Acceptance Certificate No. 9/21B/19 was granted on 17 July 2009 to the Kavanagh Hot Air Balloon Series based on validation of CASA Type Certificate number VL507, and the predecessors VL501 through VL506 and CTA 148-1 through 148-3. There are no special requirements for import into New Zealand.

Kavanagh balloons have been issued with a series of type certificates in Australia. The original Certificates of Type Approval were replaced by a new series of Type Certificates, which was required under the new Civil Aviation Safety Regulations. Subsequently all the type certificates were consolidated into a single new one under VL507. The driver for this was EASA validation, as their fees are based on the number of type certificates held.

The Type D balloon was first type accepted in New Zealand in 1989 (D-77 ZK-FBW.) The Type E balloon was added on 14 November 1991 (E-120 ZK-FBY) under the old NZCAR B9 provisions. The current application was required to cover balloons approved under the new VL Series type certificates, which call up a new suite of manuals.

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:

CAA Certificate of Type Approval Number 148-1 Issue 2 dated 31 March 1995

CAA Certificate of Type Approval Data Sheet No. 148-1

- Model D-77 approved 3 February 1989
- Model D-90 approved 15 June 1990
- Model D-84 approved 31 March 1995
- Model D-105 approved 31 March 1995

CAA Certificate of Type Approval Number 148-2 Issue 3 dated 1 July 1993

CAA Certificate of Type Approval Data Sheet No. 148-2 Rev.0 dated 1 July 1993

- Models E-120, 140, 160, 200, 210, 240, 260 approved 8 September 1989
- Model E-180 approved 24 November 1992
- Model E-300 approved 1 July 1993

CAA Certificate of Type Approval Number 148-3 issued 2 August 1994
 CAA Certificate of Type Approval Data Sheet 148-3 Rev.0 dated 2 August 1994
 – Model C-77 approved 2 August 1994

CASA Type Certificate Number VL501 Issue 5 dated 11 April 2008
 CASA Type Certificate Data Sheet No. VL501 Revision 6 dated 11 April 2008
 – Model B-400 approved 30 October 1998
 – Model B-105 approved 7 July 1999
 – Model B-350 approved 4 August 2000
 – Model B-77 approved 4 December 2003
 (Applicable to Type B serial numbers 253 to 287)

CASA Type Certificate Number VL502 Issue 2 dated 11 April 2008
 CASA Type Certificate Data Sheet No. VL502 Revision 1 dated 18 March 2008
 – Model EX-65 approved 9 August 2002 (Applicable to s/n 238 to 341)

CASA Type Certificate Number VL503 Issue 2 dated 11 April 2008
 CASA Type Certificate Data Sheet No. VL503 Revision 1 dated 11 April 2008
 – Model G-450 approved 6 October 2004 (Applicable to s/n 299 to 343)

CASA Type Certificate Number VL504 Issued 20 May 2005
 CASA Type Certificate Data Sheet No. VL504 Original Issue dated 20 May 2005
 – Models E-120, 140, 160, 180, 200, 210, 240, 260, 300 approved 20 May 2005
 (Superseded CTA 148-2. Applicable to Type E serial numbers 318 to 370)

CASA Type Certificate Number VL505 Issued 20 May 2005
 CASA Type Certificate Data Sheet No. VL505 Revision 1 dated 18 March 2008
 – Models C-56, C-65, C-77 approved 20 May 2005
 (Superseded CTA 148-3. Applicable to Type C serial numbers 164 to 335)

CASA Type Certificate Number VL506 Issued 12 January 2006
 CASA Type Certificate Data Sheet No. VL506 Revision 1 dated 11 April 2008
 – Models D-77, D-84, D-90, D-105 approved 12 January 2006
 (Superseded CTA 148-1. Applicable to Type D serial numbers 322 to 376)

CASA Type Certificate Number VL507 Issued 11 April 2008
 CASA Type Certificate Data Sheet No. VL507 Revision 2 dated 7 January 2009
 The individual balloon models, their maximum certificated weight, and the applicable serial numbers under this TC are listed in the Table below:

MODEL:	MCW:	Applicable S/N:	MODEL:	MCW:	Applicable S/N:
B-77	760 kg	higher than Bxx-368	E-120	1175 kg	higher than Exx-370
B-105	1030 kg		E-140	1300 kg	
B-350	2800 kg		E-160	1400 kg	
B-400	3100 kg		E-180	1450 kg	
C-56	550 kg	higher than Cxx-335	E-210	1900 kg	
C-65	635 kg		E-240	2000 kg	
C-77	760 kg		E-260	2200 kg	
D-77	760 kg	higher than Dxx-376	E-300	2500 kg	
D-84	824 kg				
D-90	902 kg		EX-65	638 kg	
D-105	1030 kg		G-450	3700 kg	higher than -343

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Kavanagh balloons under VL507 is BCAR31, Issue 2, dated 12th May 2003. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as BCAR 31 is an acceptable alternative for Hot Air Balloons called up under Part 21 Appendix C and Advisory Circular 21-1A. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

Note the original CTA and re-issued VL Type Certificates used a mix of Design Standards. The CTA referenced CAO 101.54 Issue 1 or BCAR 31 Issue 1. The later VL501-506 specified CAO 101.54 at amendment 102 with the applicant electing to use BCAR 31 Issue 2. In some cases the design standard was updated from BCAR 31 Issue 1 to Issue 2 at specific serial numbers. CASA advised BCAR 31 Issue 2 has been standardised as the certification basis for all future balloons under VL507.

(ii) *Special Conditions:*

Nil

(iii) *Equivalent Level of Safety Findings:*

The TCDS state that “Equivalent safety accepted against paragraph 3.3, Heater endurance test, on grounds of safe history of operation. File F86/253 refers.” CASA were unable to provide a copy but advised it is a general ESD for all balloon types.

(iv) *Airworthiness Limitations:*

Nil

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

Not Applicable

(ii) *Compliance Listing:*

Not Applicable

(4) Certification Compliance Listing:

Airship Developments Australia Report AD-10-86 – Type Report and Document List for Kavanagh Type D Hot Air Balloon Design

ADA Report AD-11-86 – Summary Report and Compliance Statement – Type D

Airship Developments Australia Report AD-35-87 – Type Report and Document List for Kavanagh Type E Hot Air Balloon Design

ADA Report AD-36-87 – Summary Report and Compliance Statement – Type E

Summary Report and Compliance Statement for Kavanagh Hot Air Balloons – All Models: Type B, C D, E, EX & G – Kavanagh Report KAV-03-2008 Issue 1

(5) Flight Manual: CASA-Approved Kavanagh Model C-56, C-65, C-77, D-77, D-84, D-105, E-120, E-140, E-160, E-180, E-200, E-210, E-240, E-260, E-300 Hot Air Balloon Flight Manual – CAA Approved as AIR 2380

CASA-Approved Kavanagh Type C Hot Air Balloons Flight Manual
Applicable to s/n C56-164, C65-292, and C77-263 and higher – CAA
Accepted as AIR 3096

CASA-Approved Kavanagh Type D Hot Air Balloons Flight Manual
Applicable to s/n higher than 321 – CAA Accepted as AIR 3097

CASA-Approved Kavanagh Type E Hot Air Balloons Flight Manual
Applicable to s/n 306 and higher – CAA Accepted as AIR 3098

Kavanagh Balloons CASA-Approved Hot Air Balloon Flight Manual
Issue 1 Revision 0 March 2008 (All Models) – Applicable to Serial
Numbers as shown in Section 1.2 – CAA Accepted as AIR 3095

(6) Operating Data for Balloon:

(i) *Maintenance Manual:*

Kavanagh Balloons Australia Pty Limited – Hot Air Balloon Maintenance Manual –
Issue 4 (Applicable to all models and components manufactured after 1980.)

(ii) *Current service Information:*

Service Bulletins are available on the manufacturer's website

(iii) *Illustrated Parts Catalogue:*

Not Applicable

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

All publications are available on the website at www.kavanaghballoons.com.au

(8) Other information:

Kavanagh Letter dated 17 August 2004 – “Use of Other Manufacturers’ Bottom
Ends (Burner and Baskets) with Kavanagh Envelopes” (This specifies alternative
baskets and burners from other hot air balloon manufacturers may be used without
modification, subject to compliance with any applicable maximum certified weight
limitations and to specific approval from the responsible National Airworthiness
Authority.)

5. Additional New Zealand Requirements

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:

Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	Not Applicable – Balloons excluded from the requirement
91.507	Pax Information Signs - Smoking, safety belts fastened	Not Applicable – Balloons excluded from the requirement
91.509	Minimum Instruments and Equipment	Not Applicable – Unpowered aircraft
91.511	Night VFR Instruments and equipment	Not Applicable – Unpowered aircraft
91.513	VFR Communication Equipment	<i>Operational 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	Not Applicable – No certificated seating capacity
91.529	ELT – TSO C91a after 1/4/97 (or replacement)	Not Applicable – Balloons excluded from the requirement
91.531	Oxygen Indicators – Volume/Pressure/Delivery	<i>Operational requirement – Compliance as applicable</i>
91.533	Oxygen for non-Pressurised Aircraft	<i>Operational requirement – Compliance as applicable</i> Max. Takeoff Altitude is 18,000 feet MSL – See FM §2.11
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operational requirement – Compliance as applicable</i>
91.543	Altitude Alerting Device – Turbojet or Turbofan	Not Applicable – Not turbojet or turbofan
91.545	Assigned Altitude Indicator	Not Applicable – Not approved for IFR Flight
A.15	ELT Installation Requirements	Not Applicable – Balloons excluded from the requirement

Attachments

The following documents form attachments to this report:

Photographs first-of-type example Kavanagh D90 serial no. D90-396 ZK-PEA
 Kavanagh Hot Air Balloons Type D Design D-Chart
 Copy of CASA Type Certificate Data Sheet Numbers VL501 through VL507

Sign off

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 David Gill
 Team Leader Airworthiness

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 Checked – Peter Gill
 Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

Model:	Applicant:	CAA Work Request:	Date Granted:
C, D, E Series (CTA 148-1,2,3)	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
All Series (VL501-7)	N A Aberhart	9/21B/19	17 July 2009