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# **Type Acceptance Report**

**TAR 16/21B/17**

**DOUGLAS DC3-S1C3G**

[Limited by Serial Number]



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## Executive Summary

New Zealand Type Acceptance has been granted to individual examples of the Douglas DC-3-S1C3G based on validation of FAA Type Certificate number A-669. There are no special requirements for import.

NOTE: Type Acceptance is granted to specific serial numbers based on the need to assess the individual flight manual for each aircraft.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are 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). In the case of the Douglas DC-3 the only documentation requirement for additional serial numbers will be an FAA-Approved Flight Manual acceptable to the Director.

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/27 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 covers all models included on the State-of-Design type certificate which have been granted type acceptance in New Zealand. Appendix 1 details which models have been type accepted in accordance with the provisions of 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 Certificate:

Manufacturer: Douglas Aircraft Company Inc.  
Type Certificate Holder: The Boeing Company (since September 27, 2010)  
Type Certificate: A-669  
Issued by: Federal Aviation Administration

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

(i) **Model:** DC3C-S1C3G

**MCTOW:** 26,900 lb. [12,200 kg] – See TCDS Notes 10 and 13.  
26,200 lb. [11,884 kg] – See TCDS Note 12.  
25,200 lb. [11,430 kg]

**Max. No. of Seats:** 35 (per FAR §91.607 with 4 exits)

**Noise Standard:** Not Applicable

**Engine:** Pratt & Whitney Twin Wasp S1CG or S1C3G  
Type Certificate: E-186  
Issued by: Federal Aviation Administration

Pratt & Whitney R-1830-49/57/75/82/92/94/96  
Type Certificate: 5E-4  
Issued by: Federal Aviation Administration

**Propeller:** Hamilton Standard 23E50/6153A-18  
23E50/6353A-18 or 23E50/6565A-18  
Type Certificate: P-603  
Issued by: Federal Aviation Administration

### 3. Application Details and Background Information

Although the Douglas DC-3 has been in continual use in New Zealand in civil operations since 1947 (ZK-AOD), this is the first new entry of an individual example onto the NZ Civil Aircraft Register since the introduction of type acceptance under CAR Part 21 in July 1995. While there are standard civil conversion processes defined on the type certificate (See Notes 7, 8 and 9 on the TCDS), in practice this has been carried out by a range of organisations for different operators, with differing standards of traceability. (In New Zealand this includes ex-topdressing aircraft.) There is no standard operating data called up under the type certificate, and each aircraft in recent times has been approved by individual serial number applicability to the documentation, in particular the Flight Manual.

The application for New Zealand type acceptance of the DC-3 under CAR Part 21B was for serial number 4363 registered ZK-JGB, from the importer Airscapade Affairs Limited dated 9 November 2015. The DC-3 is a low-wing all-metal unpressurised Transport Category aircraft with retractable tailwheel undercarriage and two radial piston engines.

Type Acceptance Certificate No. 16/21B/17 was granted on 30 May 2018 to the Douglas DC-3-S1C3G serial number 4363 based on validation of FAA Type Certificate A-669. Specific applicability is limited to the serial numbers covered by the operating documentation supplied. There are no special requirements for import into New Zealand.

The Douglas DC3 Series, and the corresponding DST Series, were first type certificated in 1936 under the prevailing airworthiness standards of Aeronautics Bulletin 7-A. (The DST was the Douglas Sleeper Transport version). Originally there were a number of different FAA type certificates for the DC-3/DST Series, but they were later consolidated into just two: The Wright-powered DC-3, DC-3B and DST Series are covered by TC 618; while the Pratt & Whitney powered DC-3A, DC-3C, DC-3D and DSTA Series are covered by TC 669. Since this was before separate standards for air carrier and general aviation aircraft was adopted, the DC-3/DST Series was certificated by the FAA in the “standard category”.

After World War Two it was recognised that the standards under which the DC-3s were originally type certificated did not provide an adequate level of safety. Therefore a number of improvements were required by Airworthiness Directives. In 1954 when DC-3 aircraft were being extensively modified, the FAA issued Special Federal Regulation SR-398. This required DC-3 (and Lockheed 18 Lodestar) aircraft with certain weight or power increases to comply with portions of CAR 4a or 4b in effect on September 1, 1953. SR-398 was superseded by SR-407, which was subsequently incorporated into the FAR as SFAR13. (SFAR 13 is still a current requirement under FAR Part 25.) DC-3 aircraft modified under SR-407 must meet the Transport Category performance requirements of FAR Part 121, but are not considered Transport Category aircraft in general and the FAA has stated they would not meet CAR 4a or 4b in many areas, particularly stability and controllability. (See the Transport Airplane Directorate Designee Newsletter dated August 1, 1991.)

#### 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 Aircraft Specification No. A-669 at Revision 32 dated September 27, 2010  
– Model DC3C-S1C3G approved 10 July 1944

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Douglas DC-3 Series is Aero Bulletin 7A. This is an acceptable certification basis for an aircraft type certificated in 1944, in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, because Aero Bulletin 7A is the predecessor of CAR.04, which was the predecessor of FAR 25, which is the basic standard for Transport Category Airplanes called up under Part 21 Appendix C. This is based on the principle that the aircraft complied with the design standards of the day, which are the same as would have been required in New Zealand. Note this only applies to operations under Part 91, and for any Air Transport operations the aircraft would have to comply with the additional airworthiness requirements of CAR Part 26 and the instruments and equipment requirements of CAR Part 125 or 121 Subpart F.

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 (See FAA ADs for some required structural inspections.)

(3) Aircraft Noise and Engine Emission Standards:

Not Applicable.

(4) Certification Compliance Listing:

Type Design documentation has been accepted as available based on previous issue of airworthiness certificates for the DC-3.

The following CAA technical reports are also available:

- Technical Assessment – DC3 Exit Requirements – Doc. 1726 dated 21 July 93.
- Technical Assessment – DC3 Emergency Lighting Requirements – CAA Doc. 1733 dated 27 July 1993.



- Technical Assessment – DC3 Civil Conversion Requirements – CAA Doc. 1734 dated 27 July 1993.

(5) Flight Manual:

No document is specified on the TCDS. Under Notes 12 and 13 on the TCDS, an FAA-Approved Flight Manual is required for operation at a MCTOW of 26,200 lb. The following manuals have been accepted in New Zealand to date:

Douglas DC3 Operating Manual – issued by Operations Department New Zealand National Airways Corporation (12 June, 1961) – CAA Approved as AIR 2288

Flight Operations Manual: Subpart G – DC-3 Technical Manual – Classic Air Limited 1993 – CAA Approved as AIR 2496

FAA-Approved DC-3 Airplane Flight Manual S/N 4363 – Airesearch Aviation Company (only for Douglas DC-3 airplanes powered with Pratt & Whitney R-1830-75 or -94) – CAA Accepted as AIR 3368

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Not specified on the TCDS. Under CAR §91.605 an aircraft must be maintained under either a CAA-approved maintenance program or the manufacturer's maintenance schedule. One of the most commonly used and comprehensive documents is the military publication:

Technical Manual – Maintenance Instructions USAF Series C-47, C-47A, C-47B, C-47D, C-117A, C-117B, C-117C Aircraft – T.O. 1C-47-2

Douglas Aircraft Company Report No. L26-013 – DC-3 All Series – Structural Inspection Document (SID)

(ii) *Current service Information:*

Douglas Service Bulletins for DST and DC3 Series

Douglas Service Bulletins for C-47, C-47A, C-47B Series

(iii) *Illustrated Parts Catalogue:*

Illustrated Parts Catalog (Military) – T.O. 1C-47-4

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

Not applicable

## 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

##### Appendix C – Air Transport Aeroplanes – More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
C.2.1	Additional Emergency Exits – per FAR 23.807(b) @ 10.5.93	Not Applicable – Superseded by D.1.1 below
C.2.2	Emergency Exit Evacuation Equipment – Descent means	Not Applicable – Less than 6 feet from the ground
C.2.3	Emergency Exit Interior Marking – Size/self-illuminating	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
C.3.1	Landing Gear Aural Warning – Automatic Flap Linking	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>

##### Appendix D – Air Transport Aeroplanes – More than 19 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
D.1.1	Exit Types – Shall be per FAR 25.807 @ 29.03.93	The standard DC-3 emergency exit configuration of one main entrance door and two overwing emergency exits is accepted for carriage of up to 27 Passengers. (See CAA Doc. 1726) 35 passengers may be carried with four exits. Note: FAA AD 58-04-01 applies to bottom-hinged doors
D.1.2	Floor Level Exits – Definition	
D.2.1	Additional Emergency Exits – Must meet requirements	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
D.2.2	Emergency Exit Access – All Required Exits must have: Aisle unobstructed 500mm wide between areas and leading to Type I/ II Exit; Crew assist space; Access to III /IV Exit is unobstructed – Internal doors can be latched open – placarded	
D.2.3	Emergency Exit Operating Handles – Markings/Lighting	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i> NOTE: Emergency exits must be openable from the inside and the outside of the aircraft.
D.2.4	Emergency Exit Evacuation Equipment – Descent means	Not required on the basis of service history and exit location close to ground
D.2.5	Emergency Exit Escape Route – Must be slip resistant	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
D.2.6	Emergency Lighting (a) Switch Provisions; Uninterrupted Power; Last 10 min. (b) Descent Illumination – Automatic and Independent	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
D.2.7	Emergency Interior Lighting – independent supply; min. Illumination; incl. Floor proximity escape path markings	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
D.2.8	Emergency Exterior Lighting – in effect 30.04.72 or later	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
D.2.9	Emergency Exit Interior Marking – Clear; instructions; Signs above routes, by exits, on bulkheads – Meet provisions in effect 30.04.72, or later. Min. brightness 250 microlamberts	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
D.2.10	Emergency Exit Exterior Markings – 2” contrasting band; opening instructions in red or bright chrome yellow;	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i>
D.3	Lavatory Fire Protection – Placards; Exterior ashtray; Waste Bin – Sealed door; built-in fire extinguisher; smoke detector system with external warning	<i>To be determined on an individual aircraft basis if aircraft to be used for Air Transport operations</i> Note: FAA AD 74-08-09R3 and DCA/GEN/7B apply
D.4	Materials for Compartment Interiors – T/C after 1.01.58:	Not Applicable – Type certificated prior to 1 Jan 1958.
D.5	Cargo and Baggage Compartments – T/C after 1.01.58:	Not Applicable – Type certificated prior to 1 Jan 1958.

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>To be determined on an individual aircraft basis</i>
91.507	Pax Information Signs – Smoking, safety belts fastened	<i>To be determined on an individual aircraft basis</i>
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	Fitted as Standard 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)
		(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 Aero Bulletin 7A §72 (B)(3) Aero Bulletin 7A §72 (B)(5) Fitted as Standard Fitted as Standard Aero Bulletin 7A §41 (C) Fitted as Standard
91.511	Night VFR Instruments and Equipment	<i>Operating Requirement – Compliance to be determined</i>
91.513	VFR Communication Equipment	<i>Operating Requirement – Compliance to be determined</i>
91.517	IFR Instruments and Equipment	<i>Operating Requirement – Compliance to be determined</i>
91.519	IFR Communication and Navigation Equipment	<i>Operating Requirement – 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	<i>Operating Rule – Compliance to be determined</i> <i>Operating Rule – Compliance to be determined</i> <i>Operating Rule – Compliance to be determined</i> Not Applicable – Less than 61 passenger seats
91.529	ELT – TSO C126 406 MHz after 22/11/2007	<i>Operating Requirement – Compliance to be determined</i>
91.531	Oxygen Indicators – Volume/Pressure/Delivery	<i>Operating Requirement – Compliance to be determined</i>
91.533	Oxygen for non-pressurised aircraft >30 min above FL100 – Supplemental for crew, 10% Pax – Therapeutic for 3% of Pax Above FL100 – Supplemental for all Crew, Pax – Therapeutic for 1% of Pax – 120l PBE for each crew member	Not fitted as standard
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operating Rule – Compliance to be determined</i>
91.543	Altitude Alerting Device – Turbojet or Turbofan	Not Applicable – Not turbo jet or turbofan powered
91.545	Assigned Altitude Indicator	<i>Operating Rule – Compliance to be determined</i>
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. Rules may have changed since that date and compliance should be checked individually.

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

4. The DC-3 has not been assessed under Part 119. (Part 121 or Part 125 Subpart F Instruments and Equipment requirements.) Any operator considering using the DC-3 for Air Transport operations is strongly advised to consult with the CAA early in the process, with a detailed proposal for showing compliance with the applicable operating rule(s).

## Attachments

The following documents form attachments to this report:

Three-view drawing Douglas Model DC3C-S1C3G  
Copy of FAA Aircraft Specification Number A-669

## Sign off

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David Gill  
Team Leader Airworthiness

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Checked – Jason Ashworth  
Team Leader Product Certification

## Appendix 1

### List of Type Accepted Variants or Examples:

<i>Serial Numbers:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
s/n 13506, 26480	Advisory Circular 21-1.2/NZCAR Part 21 Appendix A(c)		
s/n 4363 *	Airscapade Affairs Ltd	16/21B/17	25 September 2018

\* Additional serial numbers will require supply of an FAA-Approved Flight Manual