
Type Acceptance Report

TAR 5/21B/9

DHC-3 OTTER

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Executive Summary

New Zealand Type Acceptance has been granted to the DHC-3 Otter based on validation of Transport Canada Type Certificate number A-27. There are no special requirements for import. The DHC-3 is now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191(1), 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.)

1. Introduction

This report details the basis on which Type Acceptance Certificate No.5/21B/9 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 in New Zealand; and
- (b) Identify any special conditions for import applicable to any model 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.

2. Foreign Type Certificate Details

Type Certificate:	A-27
Issued by:	Transport Canada
Manufacturer:	The De Havilland Aircraft of Canada Limited
Current TC Holder:	Bombardier Inc.
Model(s):	DHC-3
Engine:	Pratt & Whitney S3H1-G, S1H1-G, R-1340-59 or 61
Propeller:	Hamilton Standard 3D40/6511A-9X, 6529A-9X or 6631A-9 Hamilton Standard 23D40/6511A-9, 6529A-9 or 7035A-9
MCTOW	8000 lb. (3629 kg.) (See TCDS for mandatory modifications.)
Max. Occupants:	16
Min. Flight Crew:	One Pilot
Noise Standard:	Not Applicable

3. Type Acceptance Certificate

The application for New Zealand type acceptance was from the importer, Volcanic Air Safaris, dated 14 September 2004. The first-of-type example was serial no.35, registered ZK-VAS. The DHC-3 is a large high-braced-wing STOL utility aircraft powered by a Pratt & Whitney “Wasp” nine-cylinder geared supercharged air-cooled radial piston engine.

Type Acceptance Certificate No. 5/21B/9 was granted on 9 February 2005 to the DHC-3 Otter based on validation of Transport Canada Type Certificate A-27. There are no special requirements for import into New Zealand.

The DHC-3 Otter was essentially a bigger version of the earlier DHC-2 Beaver (and was initially known as the King Beaver), with enlarged cabin, increased weight and a 600 hp engine. To maintain the STOL capability De Havilland introduced full-span double slotted flaps on the Otter, with the outboard trailing flaps also serving as ailerons. A total of 466 were produced, with 223 being delivered to the US Army under the designation U-1A.

One other Otter, serial number 126, was briefly on the NZ Register as ZK-CFH in 1963, after service with the RNZAF in the Antarctic and before sale and export to Canada.

4. Type Data

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents:

(1) Type certificate:

Transport Canada TCDS Number A-27, Issue No.9 dated February 19, 1998
FAA Aircraft Engine Specification No. E-129 – Pratt & Whitney Wasp S1H1-G
FAA Aircraft Engine Specification No. E-142 – Pratt & Whitney Wasp S3H1-G
FAA T.C. 249 – Hamilton Standard 3D Propeller
FAA TCDS No. P-719 – Hamilton Standard 23D – Revision 9 dated Sept.15, 1975

(2) Airworthiness design requirements:

The certification basis of the De Havilland Canada DHC-3 is ICAO Annex 8, 2nd Edition (Transport Category D), and CAR Part 3 as amended November 1, 1949. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as CAR 3 is 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 special conditions have been prescribed by the Director under §21.23.

(3) Certification compliance listing:

DHC Report AEROC 3.1.G.3 – List of Certification Aeroc Reports – Issue 45

(4) Flight manual: DoT-Approved DHC-3 Otter Flight Manual – Document PSM 1-3-1
July 1953 – CAA Accepted as AIR 2885

(5) Illustrated Parts Catalogue: DHC-3 Otter IPC – Document PSM 1-3-4

- (6) Maintenance manual and service data for aircraft, engine and propeller:
DHC-3 Otter Maintenance Manual – Document PSM 1-3-2
- (7) Agreement from manufacturer to supply updates of data in (4), (5) and (6):
email from Bombardier Technical Operations Centre dated 7 December 2004
- (8) Other information:
DHC Report AEROC 3.1.G.7. – DHC-3 List of Equipment

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance 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 Aircraft - More than 9 Pax

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
C.1	Doors and Exits	CAR 4b354(b) and (e); CAR 4b.362(g)
C.2.1	Additional Emergency Exits - per FAR 23.807(b) @ 10.5.93	DHC-3 has two rear fuselage exits, and two cockpit doors
C.2.2	Emergency Exit Evacuation Equipment – Descent means	Not Applicable – Exits less than 2m from the ground
C.2.3	Emergency Exit Interior Marking - Size/self-illuminating	Luminous Exit signs fitted in New Zealand
C.3.1	Landing Gear Aural Warning - Automatic Flap Linking	Not Applicable – Fixed Undercarriage

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	Shoulder Harness if Aerobatic; >10 pax; Flight Training	DHC P/N C3FF118 Safety Belt Fitted as Standard
91.507	Pax Information Signs - Smoking, safety belts fastened	Operational requirement – Compliance as applicable
91.509 Min. VFR	(1) ASI CAR §3.655(a)(1) Fitted as Std – See FM Section §1.13.1 N/A (2) Machmeter CAR §3.655(a)(2) Fitted as Std – See FM Section §1.13.1 (4) Magnetic Compass CAR §3.655(a)(3) See FM §1.13 (5) Fuel Contents CAR §3.655(b)(1)(i) Triple Gauge Fitted as Standard - See FM §1.8.4 (6) Engine RPM CAR §3.655(b)(1)(v) Fitted as Std – See FM Section §1.5.3 (7) Oil Pressure CAR §3.655(b)(1)(ii) Fitted as Std – See FM Section §1.5.3	(8) Coolant Temp N/A – Air cooled engine (9) Oil Temperature CAR §3.655(b)(1)(iii) Fitted as Std – See FM Section §1.5.3 (10) Manifold Pressure CAR §3.655(b)(2)(iii) Fitted as Std – See FM Section §1.5.3 (11) Cylinder Head Temp. CAR §3.655(b)(2)(i) Fitted as Std – See FM Section §1.5.3 (12) Flap Position Fitted as Standard - See FM Section §1.11.3 (13) U/C Position N/A – Fixed Landing Gear (14) Ammeter/Voltmeter CAR §3.687 – Fitted as Standard See FM Section §1.9.4
91.511 Night	(1) Turn and Slip Turn and Bank Fitted as Standard – See FM Section §1.13.2 (2) Position Lights Fitted as Std – See FM §1.9.1	(3) Anti-collision Lights <i>Compliance as Applicable</i> (4) Instrument Lighting Fitted as Standard – See FM Section §1.9.1
91.513	VFR Communication Equipment	Operational requirement – Compliance as applicable

91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	Artificial Horizon Fitted as Standard – See FM §1.13.3 Directional Gyro Fitted as Standard – See FM §1.13.2 Suction Gauge Fitted as Standard – See FM §1.13.4 <i>Compliance as Applicable</i>	(5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent	Fitted as Standard – See FM Section §1.13.5 Clock and Pitot Heat Required Equipment – See AEROC 3.1.G.7 Section §1.1 Fitted as Standard – See FM Section §1.13.5
91.519	IFR Communication and Navigation Equipment		Operational requirement – Compliance as applicable	
91.523	Emergency Equipment (a) More Than 10 pax - First Aid Kits per Table 7 - Fire Extinguishers per Table 8 (b) More than 20 pax - Axe readily acceptable to crew (c) More than 61 pax - Portable Megaphones per Table 9		<i>To be determined on an individual aircraft basis if used on Air Transport operations</i> Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats	
91.529	ELT - TSO C91a after 1/4/97 (or replacement)		<i>To be determined on an individual aircraft basis</i>	
91.531	Oxygen Indicators - Volume/Pressure/Delivery		Operational requirement – Compliance as applicable	
91.533	Oxygen Equipment for Unpressurized 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% Pax, 120l pbe for each crew member		Not fitted as Standard Service Ceiling given in Flight Manual is 18,800 feet with the S1H1-G engine, and 17,400 with the S3H1-G engine. (The engines are the same except the S1H1 has a 12:1 supercharger ratio, while the S3H1 ratio is 10:1.)	
91.541	SSR Transponder and Altitude Reporting Equipment		Operational requirement – Compliance as applicable	
91.543	Altitude Alerting Device - Turbojet or Turbofan		Not Applicable – Not turbojet or turbofan powered	
91.545	Assigned Altitude Indicator		Operational requirement – Compliance as applicable	
A.15	ELT Installation Requirements		<i>To be determined on an individual aircraft basis</i>	

Civil Aviation Rules Part 125

Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
125.355	Seating and Restraints	Operational requirement – Compliance as applicable
125.357	Additional Instruments (Powerplant and Propeller)	Has all instruments required by FAR §23.1305
125.359	Night Flight	Landing light, Pax compartment
125.361	IFR Operations	Speed, Alt, spare bulbs/fuses
125.361	SE IFR Requirements – If Applicable	<i>Operational requirement – Compliance as applicable</i>
125.363	Emergency Equipment (Part 91.523 (a) and (b))	Not Applicable – Not SEIFR
125.365	Public Address and Crew Member Intercom System	<i>Operational requirement – Compliance as applicable</i>
125.367	Cockpit Voice Recorder	<i>Operational requirement – Compliance as applicable</i>
125.369	Flight Data Recorder	Not Applicable – Minimum flight crew per AFM is one pilot
125.371	Additional Attitude Indicator	Not Applicable – Not multi-engine turbine powered
125.373	Weather Radar	Not Applicable – Not turbojet or turbofan powered
125.375	Ground Proximity Warning System	Not Applicable – Not turbine-powered, MCTOW < 5700 kg.
125.377	HUMS	Not Applicable – Not turbine-powered, MCTOW < 5700 kg.
125.379	Terrain Awareness and Warning System (TAWS)	Not Applicable – Not SEIFR
		Not Applicable - TAWS B only required for IFR Operations

Attachments

The following documents form attachments to this report:

- Photographs first-of-type example DHC-3 serial no.35 ZK-VAS
- Three-view drawing De Havilland Canada Model DHC-3 Otter
- Copy of Transport Canada Type Certificate Data Sheet Number A-27

Sign off

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David Gill
Team Leader Airworthiness

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Checked – AWE3
Date: 9 February 2005