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# **Type Acceptance Report**

**TAR 99/4**

**Diamond DA20-C1**



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## Executive Summary

New Zealand Type Acceptance was originally granted to the Diamond DA20C-1 based on validation of Transport Canada Type Certificate number A-191. Subsequently type acceptance has also been granted based on validation of FAA Type Certificate number TA4CH. There are no special requirements for import. The DA20C-1 is now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with CAR §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.) As a VLA-certificated aircraft the Katana is only eligible for day and night VFR non-Air Transport operations per AC 21-1A.

## 1. Introduction

This report details the basis on which New Zealand Type Acceptance Certificate No.99/4 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-191	Issued by:	Transport Canada
Type Certificate:	TA4CH	Issued by:	Federal Aviation Administration
Manufacturer:	Diamond Aircraft Industries		
Model:	DA20-C1		
Engines:	Teledyne Continental IO-240-B		
Propellers:	Hoffman HO-14HM-175-157 Sensenich W69EK-63 (up to s/n 10149) or W69EK7-63		
MCTOW	750 kg (1653 lb.) – Under Canadian TC A-191 800 kg (1764 lb.) – Under FAA TC TA4CH		
Noise Category:	ICAO Annex 16 Chapter 10/FAR 36 Appendix G		

The Canadian certification basis of the DA20-C1 is Canadian Airworthiness Manual (AWM) Chapter 523-VLA first Edition dated 30 June, 1993 (Specifically AWM Subchapters B and C, excluding items 523-VLA.203 (b)(1) through (b)(3) which are

applicable to IFR operations only; ref. DOT Issue Paper No. G-1, dated 25 April, 1994. [AWM 523-VLA incorporates the requirements of JAR-VLA effective 26 April 1990, through Amendment VLA/91/1 effective 1 January 1991, by direct reference.] plus Canadian AWM Chapter 516, Edition 2 dated November 1, 1991 (noise).

The FAA certification basis is FAR 21.29 and FAR 23 effective February 1, 1965, as amended by 23-1 through 23-42, and JAR-VLA effective April 26, 1990, through Amendment VLA/92/1 effective January 1, 1992, used as a safety equivalence to FAR 23 as provided by AC 23-11. The FAA type certificate permits a MAUW over the limit contained in JAR-VLA, and this has been accepted in New Zealand as the referenced certification basis is an acceptable option under Part 21 Appendix C. This does not change the types of operations the aircraft may be used for.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as JAR-VLA is accepted as an equivalent standard for day-VFR non-Air Transport operations per Advisory Circular 21-1A. FAA type certification for night operations in accordance with FAA AC 23-11 has also been accepted by the CAA, on the basis of compliance with the equivalent requirements of Part 23. There are no non-compliances and no special conditions have been prescribed by the Director under §21.23. Per AC 21-1A with an engine and propeller type certificated under FAR Parts 33 and 35 respectively, it is eligible for all types of operations except for Air Transport under Part 135.

### 3. Type Acceptance Application

The application for New Zealand type acceptance was from the NZ agent for the aircraft and importer, Flight Safety New Zealand, dated 9 July 1998. An application was later received from Simuflight (NZ) Ltd dated 21 February 2003 to include the FAA type certificate, under WR 3/21B/29. The DA20C-1 is a two-seat low wing T-tail light training aircraft with a single injected 4-stroke engine and an all-composite basic structure.

Type Acceptance Certificate No. 99/4 was granted on 22 October 1998 to the DA20C-1 based on validation of Transport Canada type certificate number A-191 and extended to include the FAA type certificate number TA4CH on 24 April 2003. There are no special requirements for import into New Zealand.

Because the aircraft can be operated under either type certificate in New Zealand, the manufacturer was queried as to whether there was any difference between them. Diamond Aircraft replied “*there are no physical differences between the DA20C-1s for the US and Canadian market. The same Flight Manual is used, although the Supplement covering operation at a gross weight in excess of 750 kg is applicable only to US-registered aircraft. No changes are required to move from US to Canadian certification.*”

The DA20 series is a license manufactured version of the Austrian HOAC DV20 Katana with some modifications, such as a redesigned instrument panel. The DV20, which was derived from an earlier powered glider, was type certificated in Austria in April 1993. Type Certificate No.A74EU was issued to the DV20 by the FAA on March 1, 1994, and Transport Canada followed with Certificate of Type Approval A-189 on March 9, 1994.

## 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 Type Certificate A-191 dated April 2, 1998  
Type Certificate Data Sheet A-191 Approved July 29, 1994, at Issue No.5 dated April 2, 1998 – Model DA20C-1 Approved Dec 19, 1997  
  
FAA Type Certificate TA4CH – DA20C-1 Approved April 6, 1998  
FAA TCDS TA4CH at Revision 10 dated October 24, 2002  
  
Transport Canada Type Certificate IE-32 dated September 26, 1997  
TCDS IE-32 for Continental IO-240-B at Issue No.1 dated Sept 26, 1997  
  
FAA Type Certificate E7SO – IO-240-B Approved April 21, 1995  
FAA TCDS E7SO at original issue dated September 29, 1995  
  
Transport Canada Type Certificate P-19 dated June 4, 1997  
TCDS P-19 covering Hoffman Models HO, HOCO F-H2, and HOCO F-HM2 at Issue 1 dated June 4, 1997  
  
Luftfahrt-Bundesamt Type Certificate Nr. 32.110/1 dated 09 April 1990  
Propeller Data Sheet No. 32.110/1 at Edition 6 dated 09 April 1990  
  
FAA TCDS P26NE for Hoffman HO at basic revision dated 10/16/91  
  
Transport Canada Type Certificate P-27 dated July 2, 1998  
TCDS P-27 for Sensenich W69EK at Issue 1 dated July 2, 1998  
  
FAA TCDS P00001NY for Sensenich W69EK Series dated May 14, 1998
- (2) Airworthiness design requirements: Already held by the CAA
- (3) Certification compliance listing:
  - Compliance Report CR-DA20-C1-001 Revision E  
DA20-C1 Continental Katana (Utility Category/VFR)
  - Compliance Report CR-DA20-C1-002 Revision A  
DA20-C1 Continental Katana (Type II Wing Structure)
  - Compliance Report CR-DA20-C1-005 Revision B  
Gross Weight Increase to 800 kg
- (4) Flight manual: Flight Manual DA20-C1 – Document DA202-1 Transport Canada Approved 19 December 1997 – CAA Accepted as AIR 2628  
Supplement 4 covers Gross Weight Increase (800 kg) – A note states this supplement is only applicable to US-registered aircraft. The NZ Flight Manual pages will add applicability to NZ-registered aircraft.

(5) Illustrated Parts Catalogue: DA20C-1 Document No. DA203-C1

(6) Maintenance manual and service data for aircraft, engine and propeller:

Maintenance Manual DA20C-1 Katana – Doc. No. DA201-C1 (Vol.s 1 and 2)

Teledyne Continental Maintenance Manual Models IO-240A/B - P/N X30621A

TCM Operator and Installation Manual Models IO-240A & B - P/N X30620

Teledyne Continental Overhaul Manual Models IO-240A/B - P/N X30622A

Teledyne Continental Parts Catalog Models IO-240A & B - P/N X30623A

Teledyne Continental Motors Aircraft Engine Service Bulletins - P/N X33000

Model Specification – Air Cooled Aircraft Engine Model IO-240-B 125 bhp

Installation Drawing 653910 – Teledyne Continental IO-240B

Hoffman Propeller Owner’s Manual No. E0110.74 fixed pitch models

Sensenich Wood Propellers: Installation, Operation and Maintenance Integral Flange Crankshafts – dated 21-7-97

Sensenich Wood Propeller Co. Inc. Specification No. SP-119 – Application of Urethane Synthetic Leading Edge – plus FAA Publication AC43.13-1a Chapter 12 (Used for all wood propeller repairs, except the urethane leading edge covered by SP119.)

(7) Agreement from manufacturer to supply updates of data in (4), (5) and (6):

CAA2171 from Director of Airworthiness, Diamond Aircraft dated 28-07-98.

CAA2171 from TCM Manager, Business Development dated Sept 29, 1998

Letter from Hoffman Propeller Technical Documentation dated July 31, 1998.

CAA2171 from Director of Product Development, Sensenich, dated 2-10-98.

## 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 - Agricultural Aircraft	CAM 8 Appendix B Section .35 - N/A

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 Aerobic; >10 pax; Flight Training	Four-point safety belt fitted as standard – See FM Page 7-10
91.507	Pax Information Signs - Smoking, safety belts fastened	N/A – Less than 10 passengers
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM	JAR-VLA 1303 (a) – See FM Page 7-6 Item 6 N/A JAR-VLA 1303 (b) – See FM Page 7-6 Item 8 JAR-VLA 1303 (c) – See FM Page 7-6 Item 3 JAR-VLA 1305 (a) – See FM Page 7-6 Item 37 JAR-VLA 1305 (d) – See FM Page 7-6 Item 9
		(7) Oil Pressure JAR-VLA 1305 (b) – See FM Page 7-6 Item 35 (8) Coolant Temp N/A – Air Cooled engine (9) Oil Temperature JAR-VLA 1305 (c) Fitted as standard – See FM Page 7-6 Item 34 (10) Manifold Pressure N/A – fixed-pitch propeller (11) Cylinder Head Temp. N/A – Less than 250 bhp (12) Flap Position – See FM Page 7-6 Item 19 (13) U/c Position N/A – Fixed undercarriage (14) Ammeter/Voltmeter JAR-VLA 1351 (d) Fitted as standard – See FM Page 7-6 Items 32/33
	NOTE: Minimum equipment fit is specified in Section 2.13 of the Flight Manual	
91511 Night	(1) Turn and Slip (2) Position Lights	– See FM Page 7-6 Item 11 Wingtip lamps have position lights and anti-collision lights (3) Anti-collision Lights (4) Instrument Lighting Maintenance Manual §33-40 Aircraft has 3 cockpit lighting systems – See MM §33-20
91.517	IFR Instruments and Equipment	N/A – Approved for VFR only
	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	Fitted as std - Page 7-6 Item 7 Fitted as std - Page 7-6 Item 12 Fitted as std - Page 7-6 Item 1 Fitted as std - Page 7-6 Item 8
		(5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent Fitted as std - Page 7-6 Item 30 Optional - Page 7-6 Item 2 Not fitted Fitted as std - Page 7-6 Item 13
91.523	(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	N/A – Not approved for Air Transport operations N/A as above N/A
91.529	ELT - TSO C91a after 1/4/97 (or replacement) Installation in accordance with Appendix A.15	TSO C91a ELT(AP) type Model EBC502 fitted as standard in rear luggage bay – EBC502 has aural warning of activation
91.531	Oxygen Indicators - Volume/Pressure/Delivery	Not fitted
91.541	SSR Transponder and Altitude Reporting Equipment	KT76A unit fitted as standard - See FM Page 7-6 Item 43
91.543	Altitude Alerting Device – Turbojet or Turbofan	N/A – Reciprocating engine
91.545	Assigned Altitude Indicator	N/A – Not approved for IFR flight

## Attachments

The following documents form attachments to this report:

- Photographs First-of-Type example DA20-C1 serial number C.0041 ZK-KTN
- Three-view drawing Diamond DA20-C1 Katana aircraft
- Copy of TC Type Certificate/Type Certificate Data Sheet A-191
- Copy of FAA Type Certificate/Type Certificate Data Sheet TA4CH

## Sign off

David Gill  
Airworthiness Engineer

Date: 24 April 2003