Type Certificate Data Sheet

Number: A-22
Issue No.: 26
Approval Date: Refer Below
Issue Date: January 31, 2006

This Data Sheet which is part of Type Certificate No. A-22 prescribes the conditions and limitations under which the product(s) for which the Type Certificate was granted meet(s) the standards of airworthiness required by the Canadian Aviation Regulations.

Type Certificate Holder:
Viking Air Limited
9574 Hampden Road
Sidney, British Columbia
V8L 5V5

Models

DHC-2 Mk. I
DHC-2 Mk. II
DHC-2 Mk. III

1. MODEL DHC-2 Mk. I (Normal Category) Approved March 12, 1948

Engines	Pratt & Whitney Wasp Junior R-985 SB-3 See Item 301(a) through (k) for optional engines.
Fuel	80/87 Octane - minimum grade.
Engine Limits	Maximum Continuous 34.5 in. Hg. 2200 RPM 400 HP Sea Level 33.5 in. Hg. 2200 RPM 400 HP 5,000 ft. Straight line manifold pressure variation with altitude to 5,000 ft. Take-off (One Minute) 36.5 in. Hg. 2300 RPM 450 HP Sea Level
Propeller and Propeller Limits	Propeller - Hamilton Standard, Counterweight, Hub Model 2D30. Blade Model 6101A-12 to -18. Pitch Setting at 42 inch station: Low 10.5° High 24° Propeller - Hamilton Standard, Hydromatic, Hub Model 22D30. Blade Model 6533A-12 to -18. (Eligible on P&W R-985-AN-14B) Pitch Setting at 42 inch station: Low 10.5° High 24° Constant speed governor Hamilton Standard Type 1A2-G5 or -A5. Hydromatic propeller governor Hamilton Standard Type 4B2-2.

Airspeed Limits (IAS)

		Landplane 2313 kg (5100 lb)	Skiplane 2313 kg (5100 lb)	Floatplane 2309 kg (5090 lb)
V_{NE}	(Never Exceed)	180 mph	180 mph	180 mph
V_{NO}	(Maximum Structural Cruising)	145 mph	145 mph	145 mph
V_{FE}	(Flaps Extended)	105 mph	105 mph	105 mph

Maximum Weight

kg	lb	
		Landplane
2109	4650	(with Item 201(a))
2186	4820	(with Items 205(d) and 201(b))
2313	5100	(with Item 201(b) or 101(a)(i))
		Skiplane
2109	4650	(with Items 205(d) and 201(a))
2186	4820	(with Items 202(a), (b) or (c)(i), and with Items 205(d) and 201(b))
2313	5100	(with Items 202(c)(ii), (d), (e), (f), (g), (h), or (i))
		Floatplane
2186	4820	(with Items 205 or 206)
2268	5000	(with Item 101(a)(i)) (See NOTE 6)
2309	5090	(with Items 207 or 101(d)).

See NOTE 5 for additional information.

C.G. Limits (See NOTE 10)

Configuration	Aircraft kg	Weight lb	Limits (in) Fwd. of datum	Aft of datum
Landplane & Skiplane	2313	5100	-1.25	-8.8
	1724 or less	3800	+6.60	-8.8
Landplane & Skiplane with Items 203 or 204	2313	5100	-1.25	-4.4
	1724 or less	3800	+6.60	-4.4
Landplane & Skiplane with Item 205(d)	2186	4820	-1.25	-7.8
	1724 or less	3800	+6.60	-7.8

C.G. Limits (See NOTE 10) (Cont'd)	Amphibian on Wheels (Item 101(a)(i))	2313	5100	-1.25	-6.1
		1724 or less	3800	+6.60	-6.1
	Amphibian on Floats (Item 101(a)(i))	2268	5000	-1.25	-6.1
		1724 or less	3800	+6.60	-6.1
	Floatplane (Item 101(d)(i))	2309	5090	-1.25	-6.1
		1724 or less	3800	+6.60	-6.1
	Floatplane (Item 101(d)(i)) with Item 205 or 206	2186	4820	+0.44	-1.5
		1724 or less	3800	+6.60	-1.5
	Floatplane (Item 101(d)(i)) or Amphibian (Item 101(a)(i)) with Item 207	All Weights		+0.44	-3.50

Straight line variation between points.

The C.G. sign convention is the reverse of that normally used i.e., (+) distance is forward, while (-) distance is aft of datum.

Serial Numbers Eligible	1 to 79 inclusive, 81 and subsequent. See NOTES 3 and 4.

2. MODEL DHC-2 Mk. II (Normal Category) Approved May 6, 1953

Same as DHC-2 Mk. I, except for engine installation and larger fin and rudder in accordance with de Havilland Modification No. 2/950, dated May 20, 1953. (Ref. NOTE 3.).

Engines	Alvis "Leonides" 502/4.
Fuel	100/130 Octane - minimum grade. Maximum lead content 5.5 mls. T.E.L./Imp. Gal.

Engine Limits

	H.P.	RPM	MP IN. HG.	ALT.
Take-off	540/560	3000	46.2	S.L.
(5 min.)	570	3000	46.2	1750 ft.
Maximum	425	2900	37.1	S.L.
Continuous	455	2900	37.1	7250 ft.

Maximum Overspeed Condition: Overspeeds of up to 3150 RPM are permissible for periods not exceeding 20 seconds.

Propeller and Propeller Limits: Propeller three-blade de Havilland Type PD184/313/1 Hydromatic Constant Speed Dia. 9'-0".
Low Pitch 19°; High Pitch 41°.

Airspeed Limits (IAS)

V_{NE}	(Never Exceed)	175 mph
V_{NO}	(Maximum Structural Cruising)	140 mph
V_{FE}	(Flaps Extended)	105 mph

Maximum Weight: 2313 kg (5100 lb.) landplane (with Item 201(b)).

C.G. Limits (See NOTE 10)

Weight kg	Weight lb	Forward (in)	Aft (in)
1844	4066	+ 6.3	- 7.7
1962	4325	+ 5.0	- 7.7
2313	5100	+ 1.2	- 7.7

Serial Numbers Eligible: 80

DATA PERTINENT TO MODELS DHC-2 MK. I AND DHC-2 MK. II

Datum (See NOTE 10): 17.5 inches aft of the wing leading edge.

Values in inches shown in parenthesis after each item represent horizontal arms to the C.G. of the item measured minus (-) aft and plus (+) forward of the datum.

Levelling Means: Cabin floor level laterally and longitudinally.

Mean Aerodynamic Chord	62.5 inches.
Maximum Occupants	Eight as follows: 2 front (+7), 3 centre (-29), 3 rear (-62). See approved loading instructions for alternate arrangements.
Maximum Baggage	See approved loading instructions.
Fuel Capacity	359 Litres (79 Imperial Gallons) See Item 200 for external long range and wing tip fuel tanks.
Oil Capacity	23.6 Litres (5.2 Imperial Gallons)
Control Surface Movements	See DHC-2 Beaver Maintenance Manual, PSM1-2-2, dated February 1, 1959, Part-2, Table VI, or later approved revision.
Basis of Certification	British Civil Airworthiness Requirements as amended to 1 June 1947, Normal Category and Information Circular T/4/48 dated March 3, 1948.
Required Equipment	The following items of equipment must be in each aircraft at all times: 1) DHC-2 Beaver Flight Manual, PSM1-2-1, dated March 31, 1956, or later approved revision or DHC-2 Mark II Flight Manual, dated April 1953, or later approved revision; 2) Current Weight and Balance Report, including List of Equipment in Approved Empty Weight. Items listed as required equipment must not be removed unless replaced by approved equipment items.

3. MODEL DHC-2 Mk. III Turbo Beaver (Normal Category) Approved January 18, 1965

This aircraft is identical to the DHC-2 Mk. I, with the exception of DHC Modification 2T/2000 (Ref. NOTE 8).

Engines	United Aircraft of Canada Ltd. Model PT6A-6. See Item 301(1) and (m) for optional engines.

Fuel

MIL-J-5624E, JP-1, JP-4 or JP-5.
(MIL-G-5572 AVGAS, all grades, Emergency only - limited to 150 hours use in any one overhaul cycle).

Oil

United Aircraft of Canada Ltd.
Specification CPW 202.

Engine Limits

Rating	ESHP	SHP	Time Limit Minutes
Take-off	578	550*	5
Max. Continuous	525	500**	Unlimited
Max. Climb	525	500**	Unlimited

* Available to 21°C (70°F) Ambient Temp.
** Available to 18°C (65°F) Ambient Temp.

Propeller and Propeller Limits

Propeller - Hartzell, Reversing Hub Models HC-B3TN-3, -3B, or -3BY Blade Model T10173C+1 Diameter 8 ft. 6 in.
Pitch Settings at 30 in. blade station:

+11°	±1/2° Low pitch (effective) (pre-mod. T2/2035, PT6A-6 engine)
+15°	±1/2° Low pitch (effective) (PT6A-20 engine and post mod. T2/2035, PT6A-6 engine)
+87°	±1/2° High pitch
-14-1/2°	+1-1/2°, -0° Reverse pitch
+1°	±1° Zero thrust pitch (blade latch propeller).

Constant Speed Governor - Woodward Type 210508 (PT6A-6 Engine) or Type 210574 (PT6A-20 engine)

Overspeed Governor - Woodward Types 210507, 210536, A210507, or A210536.

Airspeed Limits (CAS)

		Landplane, Skiplane and Floatplane at 2436 kg (5370 lb.)	
V_{NE}	(Never Exceed)	175 mph	152 knots
V_{NO}	(Maximum Structural Cruising)	140 mph	122 knots
V_{FE}	(Flaps Extended)	105 mph	91 knots

Maximum Weight

	Take-off Kg (lb)	Landing Kg (lb)
Landplane (with Item 201(b))	2436* (5370)	2313 (5100)
Skiplane (with Item 202(f))	2313 (5100)	2313 (5100)
Skiplane (with Item 202(e) or 202(j))	2436* (5370)	2313 (5100)
Floatplane (with Item 101(c))	2436* (5370)	2436* (5370)
Floatplane (with Item 101(d)(ii))	2309 (5090)	2309 (5090)
Amphibian on Wheels (with Item 101(a)(ii))	2313 (5100)	2313 (5100)
Amphibian on Floats (with Item 101(a)(ii))	2268 (5000)	2268 (5000)
Amphibian on Wheels (with Item 101(b))	2436* (5370)	2313 (5100)
Amphibian on Floats (with Item 101(b))	2436* (5370)	2436* (5370)

* For structural reasons all aircraft weight above 2313 kg (5100 lb.) must be fuel in tip tanks.

C.G. Limits — See Aircraft Flight Manual as listed in Required Equipment.

Datum — 17.5 inches aft of the wing leading edge. For weight and balance purposes, due to the longer nose of the DHC-2 Mk. III aircraft, this point has been designated as Horizontal Arm 200 inches.

Levelling Means — Cabin floor level laterally and longitudinally.

Mean Aerodynamic Chord — 62.5 inches. The leading edge of M.A.C. coincides with the leading edge of the wing and is located at Arm 182.5 inches.

Maximum Occupants

Eleven	2 (+163 in.)	3 (+196 in.)
	3 (+229 in.)	3 (+262 in.)

See approved loading instructions for alternate arrangements.

Maximum Baggage	See approved loading instructions.
Fuel Capacity	723 L (159 imp. gal.) (Usable)

	Litres	Imp. gal.
Front Tank	200	44
Centre Tank	264.7	58
Rear Tank	95.4	21
Tip Tanks	163.6	36

Oil Capacity

	Litres	Imp. gal.
Total	10.9	2.4

Control Surface Movements: See DHC-2 Mark III Turbo Beaver Maintenance Manual, PSM1-2T-2, Supplement No. 6, Table III.

Basis of Certification: The DHC-2 Mk. III Turbo-Beaver, powered by a United Aircraft of Canada Limited PT6A-6 engine, has been developed as a modification to the basic DHC-2 Beaver Mk. I airplane.

As such, the basis of certification of the Mk. III airplane is British Civil Airworthiness Requirements as amended to June 1st, 1947, Normal Category, and Information Circular T/4/48 dated March 3rd, 1948, (this is equivalent to CAR Part 3 dated November 13, 1945), plus Special Conditions for single engine turbine powered airplanes in accordance with FAA Civil Air Regulations Part 3 dated March 1964.

Serial Numbers Eligible: 1 to 79 inclusive, 81 and subsequent. New Turbo-Beavers (i.e., Turbo-Beavers not originating from modified standard Beavers), are identified by double serial numbers. For example, 1649-TB23 identifies the aircraft as Beaver 1649 and Turbo-Beaver number 23. When De Havilland Modification 2T/2000 is incorporated on a Mk. I, however, the serial number remains unchanged.

See NOTE 8 for additional information.

Required Equipment

The following items of equipment must be carried in each aircraft at all times:

1) Approved DHC-2 Mark III Turbo Beaver Airplane Flight Manual, PSM1-2T-1A;
2) Current DHC-2 Mark III Turbo Beaver Weight and Balance Handbook, PSM1-2T-8; and
3) Equipment so designated in the Weight and Balance Handbook equipment check list.

DATA PERTINENT TO ALL MODELS EXCEPT AS INDICATED

Approved Equipment and Installations

Item 100

Auxiliary ventral fin installation according to De Havilland Drawing No. C2-UF-235A or C2UF-631A or C2UF-2557A.

See NOTE 5 for additional information.

Item 101 - Float Installations

See NOTE 9 for DHC-2 Mk. III Mandatory Mod.

(a) Bristol Amphibious Float Model 348-4580 installed to:

(i) De Havilland Modification 2/1192 on DHC-2 Mk. I aircraft by Drawing C2UF2455; or,

(ii) De Havilland Modification S.O.O. 2044 on DHC-2 Mk. III Turbo-Beaver Aircraft by Drawing CT2-Z-1042-3.

(b) Bristol Amphibious Float Model 348-1-4930 installed to De Havilland Modification S.O.O. 2050 on DHC-2 Mk. III Turbo-Beaver Aircraft by Drawing CT2UF1002 Revision D.

(c) Bristol or Edo Float Model 679-4930 installed to De Havilland Modification S.O.O. 2052 on DHC-2 Mk. III Turbo-Beaver Aircraft by Drawing CT2UF1001. (See item 207(d) for Water Bombing.)

(d) Edo Float Model 58-4580 or Bristol Model 901 installed to:

(i) De Havilland Drawing C2UF3A on DHC-2 Mk. I aircraft; or,

(ii) De Havilland Modification S.O.O. 2044 on DHC-2 Mk. III Turbo-Beaver aircraft by Drawing CT2UF1000.

Approved Equipment and Installations (Cont'd)

Item 200

(a) 163.6 L (36 Imp. gal.) external long range fuel tank installation (under centre fuselage) to De Havilland Drawing C2-P-801A.

(b) Wing tip long range fuel tank to De Havilland Modification 2/743.

Item 201

(a) 7.50 x 10 main wheel tires and tubes, DHC-2 Mk. I aircraft;

(b) 8.50 x 10 main wheel tires and tubes, DHC-2 Mk. I, II or III aircraft.

Item 202 - Ski Installations

(a) De Havilland Drawing C2-US-201 Issue B, DHC-2 Mk. I aircraft;

(b) Northwest Industries Limited Drawing NWI 450001 Issue E, DHC-2 Mk. I aircraft;

(c) Saskatchewan Government Airways' Drawings:

(i) S.G.A. 49, DHC-2 Mk. I aircraft;
(ii) S.G.A. 50 or 121, DHC-2 Mk. I aircraft;

(d) Federal Aircraft Works Drawing 11R845 Issue N or 11F1078 Issue-E, DHC-2 Mk. I aircraft;

(e) De Havilland retractable installation to De Havilland Drawing C2-US-611A, DHC-2 Mk. I and III aircraft;

(f) De Havilland leaf-spring installation to De Havilland Drawing C2-US-553A, DHC-2 Mk. I and III aircraft;

(g) Department of Lands and Forest Installation to Drawing 1488-B-2, DHC-2 Mk. I aircraft;

(h) Federal Ski and Engineering Drawing 11R-1472 Issue C, DHC-2 Mk. I aircraft;

(i) FluiDyne Engineering Corporation wheel ski to FluiDyne Drawing List 6300-3 dated May 14, 1963, for DHC-2 Mk. I aircraft;

(j) FluiDyne Engineering Corporation C5500 wheel ski to FluiDyne Installation Drawing 11R-1650 for DHC-2 Mk. III aircraft, and 11G-1472 for DHC-2 Mk. I aircraft.

Approved Equipment and Installations (Cont'd)

Item 203 - Spraying Installations

(a) Crop Spray to De Havilland Drawing C2-M-339 or C2-M-2507;

(b) Brush Spray to De Havilland Drawing C2-M-2505.

Item 204 - Dusting Installation

(a) De Havilland Drawing C2-M-1001A or C2-M-2503.

Item 205 - Canoe Carrying Installation on Left Side of Aircraft:

(a) De Havilland Drawing C2-UF-416, DHC-2 Mk. I aircraft. See NOTE 7(a);

(b) Ontario Provincial Air Services Universal Carrier Drawing 1561. See NOTE 7(a);

(c) A. Fecteau Transport Aerien Ltee. Drawing 1006, Revision 1. See NOTE 7(b);

(d) Saskair Drawings SGA 78 and 79-A revised March 1964, and 79-B revised March 1963. Saskair Flight Manual Supplement dated March 1964, required. For DHC-2 Mk. I aircraft. See NOTE 7(c).

Item 206 - Lumber or Freight Carrying Installations:

For DHC-2 Mk. I aircraft:

Ontario Provincial Air Services Drawing 1501. Lumber or freight must not exceed 16'-0" length, 12" width, 1'-8" height and 363 kg (800 lb). Lumber or freight carried must be symmetrically distributed by weight and dimensions on each side of aircraft. Fore and aft distribution midway between carrier struts.

Approved Equipment and Installations (Cont'd)

Item 207 - Water Dropping Tank Installations:

(a) Ontario Department of Lands and Forest Drawing No. 2492;

(b) De Havilland Drawing C2-M-5705A, Sheets 1 and 2;

(c) Manitoba Government Air Services Drawing AS-115;

(d) Bristol or Edo 679-4930 floats modified in accordance with Field Aviation Company Limited Report 4822 to provide water bombing capability of a maximum of 636.4 L (140 Imp. gal.) of water. Approved for DHC-2 Mk. III aircraft at a gross weight of 2436 kg (5370 lb). Aircraft to be operated in accordance with Field Aviation Flight Manual Supplement, Appendix 2 of Field Aviation Report 4822.

See NOTE 6 for additional information.

Item 301 - Engines:

(a) Military R-985-AN-2)
(b) Military R-985-AN-4)
(c) Military R-985-AN-6)
or -AN-6B)
(d) Military R-985-AN-8)Engine Limits are same as SB-3.
(e) Military R-985-AN-10)See DHC-2 Mk. I Engine Limit Data.
(f) Military R-985-AN-12)
or AN-12B)
(g) Military R-985-AN-14B)
(h) Military R-985-AN-1
(i) Military R-985-AN-3
(j) Military R-985-39 *
(k) Military R-985-39A *

* Provided that the alternator fitted to the engine is compatible with 2:1 drive ratio.

Approved Equipment and Installations (Cont'd)

Limits

	H.P.	RPM	MP IN.HG.	ALT.
Take-off (1 min)	450	2300	37.5	S.L.
Maximum Continuous	400	2300	34.5	S.L.
Maximum Continuous	400	2300	33.0	5000'

Straight-line manifold pressure variation with Alt. to 5000 ft.

(l) United Aircraft of Canada Ltd. PT6A-20 (DHC-2 Mk. III only) to De Havilland Modification T2/2035.

Engine to be operated to same limits as PT6A-6.
(Ref. Page 6.)

(m) United Aircraft of Canada Ltd. PT6A-6A.

NOTE 1 The following must be in the aircraft at all times:

Approved De Havilland Beaver DHC-2 Flight Manual, Current Weight and Balance Report, including List of equipment in approved empty weight, and Loading Instructions.

NOTE 2 The following placards must be displayed in front and in clear view of the pilot:

"THIS AEROPLANE MUST BE OPERATED AS A NORMAL CATEGORY AEROPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS SPECIFIED IN THE APPROVED FLIGHT AND MAINTENANCE MANUAL."

For DHC-2 Mk. I with Item 201(b):

"NORMAL CATEGORY (G.W. - 5100 lb. AS LANDPLANE OR SKIPLANE, 5090 lb. AS FLOATPLANE). ACROBATIC MANOEUVRES, INCLUDING SPINS, NOT APPROVED."

For DHC-2 Mk. I with Item 201(a):

"NORMAL CATEGORY (G.W. - 4650 lb. AS LANDPLANE OR SKIPLANE, 5090 lb. AS FLOATPLANE). ACROBATIC MANOEUVRES, INCLUDING SPINS, NOT APPROVED."

NOTE 3 DHC-2 Mk. I eligible for conversion to DHC-2 Mk. II when modified in accordance with De Havilland Modification No. 2/950, dated May 20, 1953, and with Item 201(b).

NOTE 4 U.S. Military L-20A or U-6A aircraft converted to DHC-2 Mk. I in accordance with De Havilland Modification S.O.O. 2022 Issue 8 are eligible for certification in Canada. (See NOTE 11.)

NOTE 5 A DHC-2 Mk. I floatplane must have Item 100 installed or an equivalent, approved by the Director, Aircraft Certification Branch, Department of Transport.

NOTE 6 The maximum all-up weight for the aircraft equipped with amphibious floats (Item 101(a)(ii)), plus the water dropping tanks (Item 207) may be increased from 2268 kg (5000 lb.) to 2309 kg (5090 lb.) if the 41 kg (90 lb.) extra weight is entirely water picked up while the aircraft is taxiing on the step at speeds in excess of 40 mph.

NOTE 7

(a) Canoe not to exceed 16'-6" length, 3'-5" beam and 43 kg (95 lb.) (Ref. Item 205(a) and (b)).

Canoe bow to be between propeller disc and 18 in. forward of propeller disc.

(b) Canoe not to exceed 18'-0" length, 4'-2" beam and 68 kg (150 lb.) (Ref. Item 205(c)).

(c) Canoe not to exceed 18'-0" length, 36" beam and 68 kg (150 lb.) Saskair Flight Manual Supplement dated March 1964, required. (Ref. Item 205(d)).

NOTE 8 DHC-2 Mk. I aircraft may be converted to a DHC-2 Mk. III in accordance with De Havilland Modification 2T/2000.

NOTE 9 All DHC-2 Mk. III aircraft equipped with floats or amphibious gear must have De Havilland Modification 2T/2059 incorporated.

NOTE 10 DHC-2 Mk. I and Mk. II may have a later issue of Weight and Balance Handbook which uses a C.G. reference datum 100.0 inches ahead of the original datum. Refer to instructions contained in the Handbook for method of conversion.

NOTE 11 The installation of a fire extinguishing system (Firex) in the engine compartment as per modification kit C2MK2022-5, which is part of the conversion modification referred to in NOTE 4, is now optional on all Beaver aircraft. However, if installed, the system should be maintained in a serviceable state.

NOTE 12 The removal of the Firex system on any Canadian registered DHC-2 aircraft, including the blanking of the firewall and instrument panel, may be done under a Supplemental Type Certificate (STC), or a Limited Supplemental Type Certificate (LSTC).

NOTE 13 Effective 31 January 2006, Type Certificate A-22 and the design responsibility for all Models listed on this data sheet were transferred from Bombardier Inc. to Viking Air Limited.

- END -

J.D. Turnbull
Acting Chief, Project Management
Aircraft Certification
for Minister of Transport