

United States of America
Department of Transportation -- Federal Aviation Administration
Supplemental Type Certificate

Number SA4840NM

This certificate issued to Basler Turbo Conversions, Inc.
255 W. 35th Avenue
Oshkosh, WI 54903

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 4b of the Civil Air Regulations.

Dated September 1, 1953 (See page 6 of this STC for the complete certification basis)

Original Product--Type Certificate Number: A-669
Make: The Boeing Company
Model: See Page 3

Description of Type Design Change:

Installation of Pratt & Whitney of Canada PT6A-67R engines, Hartzell HC-B5MA-3/M11276 or HC-B5MA-3()/M11691N, K model propellers, modified fuel system, revised electrical system, and forward fuselage extension in accordance with FAA approved Basler Turbo Conversions, Inc., Master Drawing List Douglas DC3C Re-Engining Document No. BTC-1001, Revision N, dated February 1, 1992, or later FAA approved revision.

Limitations and Conditions:

This approval should not be extended to other specific airplanes of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworthiness of the aircraft.

(See continuation pages 3 through 10 for additional limitations and conditions)

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: April 18, 1988
Date of issuance: February 27, 1990

Date reissued:
Date amended: December 11, 1990;
March 27, 1992;
December 15, 2003;
November 20, 2012



By direction of the Administrator

(Signature)

Steven L. Lardinois
Manager, Systems and Flight Test Branch
Chicago Aircraft Certification Office

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Date of Amendment: November 20, 2012

Limitations and Conditions (Continued):

The limitations and conditions of Aircraft Specification No. A-669 apply except as noted herein.

A copy of this Supplemental Type Certificate Specification shall be maintained as part of the modified aircraft's permanent records.

Model: DC3C-SC3G, S1C3G, S4C4G, R-1830-43A, R-1830-49, R-1830-57, R-1830-65, R-1830-67, R-1830-75, R-1830-82, R-1830-90C, R-1830-90D, R-1830-92, R-1830-94, R-1830-96. R-2000-7M2, R-2000-D5 When modified by this STC (SA4840NM), the modified aircraft model is unofficially known as DC3-TP67.

Engine: 2 Pratt & Whitney of Canada PT6A-67R.

Fuel: (See NOTE 8 & 10).

Oil: (See NOTE 9).

Engine
 Rating &
 Limits:

OPERATING LIMITS
 (See NOTES 5 & 6)

	Shaft Horse - Power	Gas Generator RPM	%	Prop Speed RPM	%	Max. Inter- Turbine Temp °C
Take Off (5 Min.)	1281	39000	104	1700	100	825
Equivalent S.H.P.	1358					
Jet Thrust-1b	192					
Max continuous	1220	39000	104	1700	100	840
Starting (5 sec.)						1000
Transient Overpseed (5 sec.)		39000	104	1870	110	

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Limitations and Conditions (continued)

The engine ratings are based on static sea level conditions. No external accessory loads and no airbleed. The PT6A-67R maximum continuous rating is available to 119 °F Air Inlet Temperature and takeoff is available to 91 °F Air Inlet Temperature.

Fuel Pressure: Minimum pressure at inlet to the engine fuel system shall not be less than 5 p.s.i. above true vapor pressure of the fuel. For emergency operation, with airframe boost pump inoperative, it must be such that vapor liquid ratio does not exceed 0.1 for continuous operation and does not exceed 0.3 for more than 10 hours in a pump overhaul life.
 Maximum pressure at inlet to fuel system: 50 psig

Oil Pressure: (See Note 6) Maximum Normal Minimum 135 psig 90-135 psig 60 psig

Oil Inlet Temperature: (See Note 7) Maximum Minimum for takeoff Minimum for starting 110 °C 10 °C -40 °C

Propeller: 2 Hartzell HC-B5MA-3/M11276 Model Propellers
 Limits: Diameter 114.7 – 115.2 inches
 Pitch Setting @ 42 inch sta.)
 Low Pitch +14.5 degrees +-0.2 degrees
 Feather +83.5 degrees +-0.5 degrees
 Reverse -10.5 degrees + -0.5 degrees

OR

Propeller: 2 Hartzell HC-B5MA-3/M11691N, K Model Propellers
 Limits: Diameter 118.2 – 118.7 inches
 Pitch Settings @ 42 inch sta.)
 Low Pitch +16.9 degrees +-0.1 degrees
 Feather +84.0 degrees +-0.5 degrees
 Reverse -10.0 degrees +-0.5 degrees

Propeller: Propeller Governor – Supplied with engine.
 Controls: Overseer Governor – 210963 (Woodward Governor Co.)

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Limitations and Conditions (continued)

Airspeed Limits:

	<u>CAS</u>		<u>IAS</u>	
	<u>KTS</u>	<u>MPH</u>	<u>KTS</u>	<u>MPH</u>
V _{MO} (maximum operating)	174	200	170	195.8
V _A (maneuvering)	111	127.5	107	123
V _{LO} (landing gear operation)	144	165.5	141	162.5
V _{LE} (landing gear extended)	144	165.5	141	162.5
V _{FE} (flaps extended ¼)	135	155.5	133	153
V _{FE} (flaps extended ½)	99	114	97	111.5
V _{FE} (flaps extended ¾ to full)	97	111.5	95	109.5

Maximum Operating

Altitude: 25,000 feet pressure altitude

C.G. Range: Fuselage Sta. 242.35 inches (13% MAC)
 Fuselage Sta. 263.1 inches (28% MAC)

Maximum Weight: Takeoff 28,750 lbs.
 Landing 28,750 lbs

Minimum Crew: 2 (pilot and copilot)

Maximum Passengers: See NOTE 12

Maximum Baggage: See NOTE 12

Fuel Capacity:

<u>TANK</u>	<u>USABLE CAPACITY</u>		<u>TOTAL CAPACITY</u>	
	<u>U.S. GALLON</u>	<u>POUNDS</u>	<u>U.S. GALLONS</u>	<u>POUNDS</u>
Main-Left	189.7	1,271	195.0	1,320
Main-Right	189.7	1,271	195.0	1,320
Aux-Inboard Left	186.6	1,250	189.0	1,266
Aux-Inboard Right	<u>186.6</u>	<u>1,250</u>	<u>189.0</u>	<u>1,266</u>
TOTAL	752.6	5,042	768.0	5,172 lbs.

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Limitations and Conditions (Continued)

OPTIONAL SYSTEM

Aux-Left Wing Tank	384.0	2,573	385.0	2,580
Aux-Right Wing Tan	<u>384.0</u>	<u>2,573</u>	<u>385.0</u>	<u>2,580</u>
TOTAL (Std. & Opt.)	1,520.6	10,188	1,538.0	10,332

NOTE; WEIGHTS BASED ON A FUEL DENSITY OF 6.7 POUNDS PER U.S. GALLON.

Oil capacity: 1 tank integral with each engine, 2.5 U.S. Gallons.
Total usable oil, 1.5 U.S. Gallons.

Required Equipment: In addition to the pertinent required basic equipment specified in CAR 4b and FAR 25 (for the turbopropeller installation) refer to "Required Equipment List" in the Aircraft Type Data Sheet A669. This turbo propeller installation requires:

- 1) Landing Gear per Douglas Drawing 5203619;
- 2) Brakes: B.F. Goodrich P/N H-2-445 or Goodyear P/Ns 9540385, 9540385-2;
- 3) Basler Turbo Conversion, Inc., FAA Approved Airplane Flight Manual for the Model DC3-TP67, Report No. ER 512-011, Revision A, dated November 28, 1990, or Later FAA approved revisions.

Control Surface Movements: Elevator up $12 \pm 1/8$ inches, down $8 \pm 1/8$ inches.
Aileron up $13 \pm 1/8$ inches, down $8 \pm 1/2$ inches.
Rudder left $26 \pm 1/4$ inches, right $26 \pm 1/4$ inches.

Production Basis: None. An inflight operational check must be conducted in accordance with FAR 91.401 for each aircraft modified. When original airworthiness certification has not previously been accomplished the applicant must also comply with FAR 21.130 and 21.183 (d).

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Certification

Basis:

- (1) SFAR 13 effective December 30, 1964
 - (2) CAR 4b effective September 1, 1953, except where superseded by FAR 25 requirements.
 - (3) FAR 25 sections as amended by Amendments 25-1 through 25-63. Regulations: 25.33, 25.101 thru 25.105, 25.107 thru 25.111, 25.113 thru 25.125, 25.149, 25.251, 25.253, 25.361, 25.363, 25.367, 25.371, 25.613 thru 25.619, 25.629, 25.279(e), 25.777 thru 25.781, 25.863 thru 25.867, 25.901, 25.903, 25.905 thru 25.933(a), 25.937 thru 25.977, 25.981 thru 25.999, 25.1011 thru 25.1041, 25.1043, 25.1045 thru 25.1093, 25.1103 thru 25.1123, 25.1141 thru 25.1145, 25.1149 thru 25.1155, 25.1163, 25.1165, 25.1181 thru 25.1191, 25.1193 thru 25.1203, 25.1301 thru 25.1321, 25.1337 thru 25.1351, 25.1353, 25.1355 thru 25.1363, 25.1501, 25.1505, 25.1521, 25.1527 thru 25.1533, 25.1549 thru 25.1557, 25.1563, 25.1581 thru 25.1587.
 - (4) FAR 36, See Amendment 36-17
 - (5) FAR 34, Unamended.
- (a) Current weight and balance report and loading instructions must be in each aircraft at the time of original certification and at all times thereafter.
 - (b) System fuel must be included in the empty weight of the airplane. System fuel is defined as the fuel required to fill the fuel system up to the fuel tank outlet plus the fuel tank unusable fuel quantity. Full oil tank and full hydraulic tank fluids must also be included in the empty weight of the airplane.
 - (c) The "unusable fuel" is that amount of fuel in the tanks which is unavailable to the engine under critical flight conditions as defined in FAR 25.959 and may be obtained by taking the difference between the total fuel capacities and "usable" tank capacities shown in this specification. The "unusable fuel" must be included in the empty weight or be suitably accounted for in the airplane weight and balance report.
 - (d) The engines utilize fuel from the center wing main (forward) tanks only.
 - (e) A crossfeed system is provided to feed fuel from the opposite center wing main (forward) tank to engine.

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- (f) Fuel must be loaded in the following manner:
Fill left and right main tanks first. Additional fuel may then be loaded in either the center wing auxiliary tanks, or if installed the optional auxiliary tanks located in the outer wing.
NOTE: Fuel loaded in the outer wing auxiliary tanks must be loaded symmetrically.

NOTE 2 All Airworthiness Directives applicable to FAA Aircraft Specification A-669 also are effective for the DC3C as modified by this STC. The following Airworthiness Directive do not apply to DC3C aircraft modified according to this STC SA4840NM

47-06-07 - Fire extinguisher trigger
47-33-02 - Cowl flap liner
47-51-12 - Carburetor Airscoop
48-05-01 - Oil shutoff valves
48-17-01 - Fire prevention modifications
50-46-01 - Oil tank standpipe

NOTE 2

52-25-01 - Vacuum system rework
52-20-05 - Propeller operating limits
58-08-03 - CB fire extinguish system
77-10-02 - Fire resistant propeller featuring line

New doublers and angles per Douglas Service Bulletin DC-3 No. 262 are required on Aircraft modified in accordance with this STC.

Ailerone permanently identified as complying with the balancing procedures of this STC are considered to comply with the aileron balancing procedures specified in AD 41-47-01. The elevator and rudder balance procedures of AD 41-47-01 are still appropriate and required.

NOTE 3 Airworthiness Directives (AD) currently in effect or issued subsequent to the date of this STC, which involved the Pratt & Whitney PT6A-67R engine or the Hartzell HC-B5MA-3/M11276 or Hartzell HC-B5MA-3()/M11691N, K model propellers are applicable to the engines or the propellers installed under this STC, and the applicability statement of such AD(s) notwithstanding.

NOTE 4 Maximum overspeed limit is as specified for transient overspeed. If these limits are exceeded, consult Pratt and Whitney of Canada Maintenance Manual No. 3036132, for disposition of engine or gear reduction box.

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NOTE 5 For Ground Operations: Hartzell HC-B5MA-3/M11276
 (a) Stabilized operation between 400 and 900 propeller RPM is prohibited.
 (b) Stabilized ground operation between 1050 and 1200 propeller RPM is prohibited, and above 1600 RPM unless headed into the wind.

For Ground Operations: Hartzell HC-B5MA-3()/M11691()
 (a) Stabilized ground operation between 400 to 900 propeller RPM is prohibited.
 (Propeller may be operated below 400 RPM if feathered)
 (b) Stabilized engine ground operation is prohibited above 1600 propeller RPM
 (except for takeoff and functional checks and must be headed into the wind.)

NOTE 6 Oil pressure at 72% Ng (27,000 RPM) gas generator speed and above with an oil temperature of 140-160 °F: 90-135 psig. Below 72% Ng (27,000 RPM) gas generator speeds: 60 psig (min.).

NOTE 7 Oil temperature range continuous from minus 40 °C (-40 °F) to 110 °C (230 °F). Limited periods of 10 minutes of 105 °C to 110 °C (221 to 230 °F).

NOTE 8 APPROVED FUELS (SEE Note 10)

<u>FUEL</u>	<u>SPECIFICATION</u>
Jet A	ASTM D1655
Jet A-1	ASTM D1655
Jet A-2	ASTM D1655
Jet B	ASTM D1655
JP-4	MIL-T-5624
JP-5	MIL-T-5624
JP-8	MIL-T-83133

The use of Aviation Gasoline (AVGAS) is not approved. For additional information see P&WC Service bulletin No. 14004.

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NOTE 9 APPROVED LUBRICATING OILS

Aeroshell Turbine Oil 500	Aeroshell Turbine Oil 560
Mobil Jet Oil II	Royco Turbine Oil 500
Mobil Jet Oil 254	Royco Turbine Oil 560
Castrol 5000	
Esso/Exxon Turbo Oil 2380	

For additional information see P & WC Service Bulletin No. 14001.

NOTE 10 Fuel anti-icing additive is required. The additive concentration, by volume, shall be in a minimum of 0.060% and and or maximum of 0.15%. The approved additives are:

Phillips PFA 55 MB
MIL-I-27686D
Prist (Ethylene Glycol Monomethyl Ester as defined in MIL-I-27686E)

NOTE 11 Deleted.

NOTE 12 No cargo or passenger interior configuration as been approved as part of this STC.

NOTE 13 Engine and airframe certificated operating temperature limits: minimum – 40 °C (-40 °F) to ISA +35 °C (ISA + 63 °F) maximum.

...END...