



TYPE CERTIFICATE DATA SHEET Nº EH-2016T09

Type Certificate Holder:

HARTZELL PROPELLER INC.

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Piqua, Ohio - OH 45356-2634

USA

EH-2016T09

Sheet 01

HARTZELL

3C1

17 November 2016

Propellers of models described herein conforming with this data sheet, which is part of Type Certificate No. 2016T09, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Civil Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

TYPE Constant speed, hydraulic (See Notes 3 and 4)

ENGINE SHAFT Special flange (See Note 1)

HUB MATERIAL Aluminum alloy

BLADE MATERIAL See below

NUMBER OF BLADES Three

HUB ELIGIBLE 3C1 (see Notes 1 and 4)

Blade Eligible (See Note 2)	Maximum Continuous	Takeoff	Diameter Limits (See Note 2)	Approx. Max. Mass Complete (For reference only) (See Notes 3 and 7)	Blade Construction (See Note 10)
	hp (rpm)	hp (rpm)	m (in)	kg (lb)	

Hub models: 3C1-L(430 through 919), 3C1-R(430 through 919) (See Note 1)

76C03-0 to 76C03-10	285 (2700)	285 (2700)	1.93 (76) to 1.68 (66) (-0 to -10)	20.6 (45.5)	Carbon Composite
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CERTIFICATION BASIS Based on RBAC 21.29(1)(a)(ii) the following requirements are applicable: 14 CFR Part 35 amendments 35-1 through 35-9A effective on 19 March 2013. Models included: 3C1-L(), 3C1-R().

TYPE CERTIFICATION

<u>Model</u>	<u>Application</u>	<u>Issued TC</u>
3C1	04 November 2016	17 November 2016

PRODUCTION BASIS Not Applicable.

IMPORT REQUIREMENTS Each propeller imported separately and/or spare parts must be accompanied by an Export Airworthiness Approval, issued by FAA, attesting that the particular propeller and/or parts were submitted to the governmental quality control before delivery and are in conformity with the ANAC approved type design.

NOTES

NOTE 1 Hub model Designation - $\frac{3}{[1]}$ $\frac{C}{[2]}$ $\frac{1}{[3]}$ $\frac{-L}{[4]}$ $\frac{675}{[5]}$ $\frac{A1}{[6]}$, where:

[1] 3 Number of Blades

[2] C Preload type:
Basic hub series (C)

[3] 1 Operating Mode: (See Notes 3 and 4)
1 – Constant speed, oil to increase pitch, no blade counterweights

[4]-L Mounting flange:
First character is mounting flange type
L: SAE #2 flange with six 7/16" bolts and four 5/8" drive bushings on a 4-3/4" bolt circle
R: SAE #2 flange with six 1/2" bolts and five 3/4" bushings on a 4-3/4" bolt circle

Second character, when used indicates flange index with respect to #1 blade, viewed clockwise facing propeller flange:

<u>Second character</u>	<u>Angular index</u>	<u>Clocking Feature</u>	<u>Flange</u>
Blank	0 and 180 degrees	Non counter bored holes	L, R
B	120 and 300 degrees	Non counter bored holes	R

- [5] 675 Extension:
Distance in inches between engine flange and blade centerline (implied decimal after first digit). Example: 675 = 6.75 inches
- [6] A1 One or more alphanumeric hub descriptor (first character must be alpha)
Any alpha character indicates a minor change not affecting eligibility
Any numeric character indicates a minor configuration change not affecting eligibility
L when used indicates left hand rotation

NOTE 2 Blade Model Designation - H 76 C 03 B -2R , where
(See Notes 5 and 6) [1] [2] [3] [4] [5] [6]

- [1] Denotes Blade Configuration:
Blank denotes right-hand tractor
H denotes right-hand pusher
J denotes left-hand tractor
L denotes left-hand pusher
- [2] Basic diameter rounded to the nearest inch.
- [3] First character: Basic blade series for hub model (must match hub series)
Second character when used: Major blade characteristic
- [4] Basic blade model (two character numeric)
- [5] B or K denotes deicing or anti-ice boots
- [6] Number of inches cut off from (or added to if +) basic diameter
R when used denotes specifically rounded tip for cutoff diameter
Any other character in this location denotes tip shape

NOTE 3 Pitch Control (weight of pitch control extra) (See Notes 4 and 10)
(a) Approved with Hartzell governors per drawings C-4770 and C-4772. Mass: 2.04 kg (4.5 lb) (See Note 10)
Governor Model Designation - D 1 4 Z , where
[1] [2] [3] [4]

- [1] Basic body and major parts modification
[2] Minor adjustment to obtain engine/propeller/governor compatibility
[3] Minor adjustment not affecting eligibility
[4] L when used indicates left hand rotation
Z when used indicates drive coupling type
Any other character denotes a minor change not affecting eligibility
- (b) Maximum output pressure: 350 psig
- (c) The 3C1 models use governor oil to increase pitch and do not have counterweighted blades. (See Note 4)
- (d) All governors and propeller control systems must be approved as part of the aircraft installation regardless of manufacturer. (See Note 10)

NOTE 4 Feathering – Not applicable
Reversing – Not applicable

- NOTE 5** Left-hand Models (See Notes 1 and 2)
The left-hand version of an approved propeller model is approved at the same rating and diameter as listed for right-hand model.
- NOTE 6** Interchangeability:
- (a) Propellers
 Not applicable
 - (b) Governors
 Hartzell governors with a “Z” suffix in their model designation may be used interchangeably with corresponding governors without the “Z”. For example, the F-6-24Z is a replacement for the F-6-24 and the F-6-24 is a replacement for the F-6-24Z.
 - (c) Blades
 Not applicable
 - (d) Ice Protection Systems
 Refer to Hartzell service Letter HC-SL-30-260 for ice protection system component interchangeability.
- NOTE 7** Accessories:
- (a) Propeller spinner. (weight of spinner extra)
 - (1) Approved with Hartzell and other manufacturers’ spinners when listed on Hartzell type design data.
 - (2) All propeller spinners must be approved as part of the aircraft installation regardless of manufacturer. (See Note 10)
 - (b) Propeller deicing (weight of deicing equipment extra)
 - (1) Propeller models listed in this data sheet are approved for use with propeller ice protection equipment listed in Hartzell Manual 159() or in other Hartzell type design data.
 - (2) All propeller ice protection equipment must be approved as part of the aircraft installation regardless of manufacturer. (See Note 10)
- NOTE 8** Shank Fairings: Not applicable.
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NOTE 9Special Limits:

Table of Propeller - Engine Combinations

Approved Vibrationwise for Use on Normal Category Single Engine Tractor Aircraft

The maximum and minimum propeller diameters that can be used from a vibration standpoint are shown below. No reduction below the minimum diameter listed is permissible, since this figure includes the diameter reduction allowable for repair purposes. The engine models listed below are the configurations on the engine type certificate unless specifically stated otherwise. Modifications to the engine or airframe that alter the power of the engine models listed below during any phase of operation have the potential to increase propeller stresses and are not approved by this list. Such modifications include, but are not limited to, the addition of a turbocharger or turbonormalizer, increased boost pressure, increased compression ratio, increased RPM, altered ignition timing, electronic ignition, full authority digital engine controls (FADEC), or tuned induction or exhaust. Also, any change to the mass or stiffness of the crankshaft/counterweight assembly is not approved by this list.

Hub Model	Blade Model	Engine Model	Max. Dia.	Min. Dia.	Placards
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NOTE 10

Propeller installation must be approved as part of the aircraft Type Certificate and demonstrate compliance with the applicable aircraft airworthiness requirements.

Propellers models listed herein consist of basic hub and blade models. Most propeller models include additional characters to denote minor changes and specific features as explained in Notes 1 and 2. Refer to the aircraft Type Certificate Data Sheet or "Especificação de Aeronave" (EA) for the specific propeller model applicable to the installation.

Propellers with composite blades must be evaluated for bird impact resistance prior to approval on any type aircraft. Hartzell propeller must perform tests and/or analyses based on aircraft configuration and operating conditions to determine the potential hazard as a result of a bird strike.

NOTE 11Special Limits

(a) Life limits and Mandatory inspections

(1) Airworthiness limitations, if any, are specified in Hartzell Manual 480.

The propeller CMACO must evaluate the propeller installation for each new aircraft installation to assess possible changes in the airworthiness limitations.

NOTE 12Special Notes

(a) Refer to Hartzell Manual no. 202() for overspeed and overtorque limits.

(b) Refer to Hartzell Service Letter HC-SL-61-61() for overhaul periods.



MÁRIO IGAWA

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