AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL - BRASIL

TYPE CERTIFICATE DATA SHEET Nº EH-8711

Type Certificate Holder:

HARTZELL PROPELLER INC.
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USA

EH-8711-06

Sheet 01

HARTZELL

HC-C3Y
PHC-C3Y

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Propellers of models described herein conforming with this data sheet, which is part of Type Certificate No. 8711, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

TYPE	Constant speed, hydraulic (See Notes 3 & 4)
ENGINE SHAFT	Special flange (See Note 1)
HUB MATERIAL	Aluminum alloy
BLADE MATERIAL	Aluminum alloy
NUMBER OF BLADES	Three

HUB ELIGIBLE HC-C3YR-4, HC-C3YR-1, HC-C3YF-1, PHC-C3YF-1 and PHC-C3YF-2 (See Notes 1 & 4)

Blade Eligible (See Note 2)	Max. Continuous Power kW (hp) - rpm	Takeoff Power kW (hp) - rpm	Diameter Limits (See Note 2) m (in)	Approx. Max. Weight Compl. (See Notes 3 and 7) kg (lb)
Counterweighted Propeller - Hub Model HC-C3YR-4				
C6890-0 to C6890-10	261 (350) – 2 850	261 (350) – 2 850	1.78 (70) to 1.52 (60) (-0 to -10)	37.65 (83.0)
Non Counterweighted Propeller - Hub Model HC-C3YR-1, HC-C3YF-1, PHC-C3YF-1				
7282-0 to 7282-6	224 (300) - 2 700	224 (300) - 2 700	1.88 (74) to 1.72 (68) (-0 to -6)	30.84 68.0)
7693+2 to 7693-10	261 (350) – 2 700	261 (350) – 2 700	2.03 (80) to 1.72 (68) (-0 to -10)	33.11 (73.0)
7663-0 to 7663-10	261 (350) - 2 800	261 (350) - 2 800	1.98 (78) to 1.72 (68) (-0 to -10)	31.3 (69.0)
8468-0 to 8468-14	298 (400) – 2 700	298 (400) – 2 700	2.18 to 1.83 (72) (-0 to –14)	34.02 (75.0)
8468-6 to 8468-14	231 (310) – 2 850	231 (310) – 2 850	2.03 (80) to 1.83 (72) (-6 to –14)	34.02 (75.0)
9587-15 to 9587-25	212 (285) – 2 700	212 (285) – 2 700	2.08 (82) to 1.83 (72) (-15 to -25)	35.38 (78.0)
7691-0 to 7691-10	261 (350) – 2 850	261 (350) – 2 850	1.98 (78) to 1.73 (68) (-0 to –10)	30.39 (67.0)
8068+2 to 8068-10	261 (350) – 2 700	261 (350) – 2 700	2.13 (84) to 1.83 (78) (+2 to –10)	34.93 (77.0)
8068-2 to 8068-10	261 (350) – 2 700	231 (310) – 2 850	2.03 (80) to 1.83 (78) (-2 to –10)	34.93 (77.0)
Counterweighted Propeller - Hub Model PHC-C3YF-2				
C7663-0 to C7663-10	261 (350) – 2 800	261 (350) – 2 800	1.98 (78) to 1.73 (68) (-0 to –10)	35.38 (78.0)
C7693-0 to C7693-10	261 (350) – 2 700	261 (350) – 2 700	1.98 (78) to 1.73 (68) (-0 to –10)	36.29 (80.0)

CERTIFICATION BASIS RBHA 35, which endorses the FAR Part 35, included amendment 35-1 through 35-6, effective on 01 August 1990.

TYPE CERTIFICATION

Model	Application	Issued TC
HC-C3Y	18 Nov. 1986	18 Sep. 1987
PHC-C3Y	06 Feb. 1965	23 Sep. 1998

IMPORT REQUIREMENTS Each propeller imported separately and/or spare parts must be accompanied by an export airworthiness approval issued by the FAA (or a third country authority, in case of used engine imported from such country) attesting that the particular engine and/or parts were submitted to the governmental quality control before delivery and are in conformity with the ANAC approved type design.

PRODUCTION BASIS Production Certificate No. 10.

NOTES:

NOTE 1 Hub model Designation. - P HC -C 3 Y R -1 RF, where:

P …. when used indicates dowel location with respect to centerline through blade sockets when viewing hub from flange mounting face:

Dowel Pin	T/C mark
Blank …90 & 270 deg	30 deg. clockwise
E …….. 0 & 180 deg	240 deg. clockwise.
P …….. 0 & 180 deg	120 deg. clockwise

HC … Hartzell Controllable

-C …. Identifies basic design: "C" denotes no integral shaft extension.

3 ….. Number of blades

Y …. Hartzell blade shank size

R …. F …. Denotes flange with six ½" bolts and two ½" dowels on a 10.16 cm (4 in) bolt circle

D…..Similar to F except uses eight ½" bolts and no dowels

K or R … SAE N° 2 flange with six ½" bolts on a 12.07 cm (4-3/4 in) B.C., K has four ¾" drive bushings and R has five

N ……. Special flange with eight 9/16" bolts and two dowels on a 10.80 cm (4.25 in) B.C.

-1 …. Denotes specific design features (See Note 4)

- 1: non-feathering, no counterweights, governor oil pressure increases pitch
- 2: feathering with counterweights, governor oil pressure decreases pitch
- 4: non-feathering, counterweights, governor oil pressure decreases pitch
- 5: similar to -2, but compatible with turbine engine oil

RF … F …. When used denotes modified pitch change system (integral on HC-C3YN-5A)

K …. When used with -2 models indicates specific flange mounting studs

L …. Denotes left hand rotation

M …. When used denotes 139.35 cm^2 (21.6 in^2) piston area and large return spring

R …. When used denotes 139.35 cm^2 (21.6 in^2) piston area

U …. Denotes added feather assist spring (integral on HC-C3Y( )-5 model)

Any other character denotes a minor change not affecting eligibility

NOTE 2 Blade Model Designation. - FL C 76 63 D -3R , where:

FL ..... Denotes blade configuration: right-hand tractor unless otherwise noted
- F …. Denotes a large pitch change knob
- H …. Denotes right-hand pusher
- J …. Denotes left-hand tractor
- L …. Denotes left-hand pusher
- No prefix is used for composite blade

C ……. When used denotes counterweighted blades

76 ….. Basic diameter minus 5.08 cm (2 in) (5.08 cm (2 in) correction does not apply to ( ) 9684 blade)

63 ….. Basic blade model

D …… D or F … Denotes dimensional modification form original design
- B or K … Denotes deicing boots
- R …. When used denotes rounded tip for basic diameter
- S …. When used denotes square tip for basic diameter*
- Any other character denotes minor change not affecting eligibility

-3R …. Number of inches cut off from basic diameter
- Q … When used denotes special 2.54 cm (1 in) x 90 deg. Factory-bent tip for cutoff diameter
- R …. When used denotes specifically rounded tip for cutoff diameter
- Any other character in this location denotes tip shape

* Blades may incorporate either round or square tips, yet may not be marked with an “R” or “S” in the blade model designation. This character is used to distinguish between two or more tip shapes available at the same diameter. Certain blades use “S” to denote shotpeening of the blade exterior surface.

NOTE 3 Pitch Control. (See Note 9)

(a) Approved with Hartzell governors per drawing list C-4470, C-4771 or C4472. Weight.: 2.04 kg (4.5 lb). (See NOTE 10)

Governor Model Designation - D -1 -4 Z, where :
- D … Basic body and major parts modification
- -1 … Minor adjustment to obtain engine/propeller/governor compatibility
- -4 … Minor adjustment not affecting eligibility
- Z …. 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) The -2, -4 and -5 models have counterweighted blades and use oil to decrease pitch. The -1 models do not have counterweighted blades and use oil to increase pitch. (See Note 4)

(c) Maximum governor output pressure: 350 psi for all propeller models

(d) All governors must be approved as part of the aircraft installation regardless of manufacturer. (See Note 10)

NOTE 4

(a) Feathering. The –1 and –4 models do not feather.
The –2 and –5 models incorporate feathering and unfeathering features.
The –5 model is turbine oil compatible.

(b) Reversing. Not applicable

(c) Piston Size. Piston area is 114.2 cm^2 (17.7 in^2) except as noted in Note 1.

NOTE 5

Left-hand Models.

The left-hand version of an approved propeller model is approved at the same rating and diameter as listed for the right-hand model. (See Notes 1 and 2)

NOTE 6

Interchangeability.

(a) Propellers:
- "F" type propellers with modified pitch chance system are interchangeable with corresponding propellers with standard pitch change system. (See Notes 1 and 2)
- HC-C3YR models may replace corresponding HC-C3YK models. (See Note 1)

(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 F-6-24 is replacement for the F-6-24Z.

(c) Blades:
Shot-peened blades may replace non shot-peened blades either individually or as a set (See Note 2)

(d) Ice Protection Systems:
Refer to Hartzell Service Letter HC-SL-30-260 for ice protection system component interchangeability.

NOTE 7

Accessories.

(a) Propeller Anti-icing (weight of anti-icing equipment extra):
- Approved with fluid feed boots listed in Hartzell approved type design data when installed in accordance with Hartzell specification H-S-2 or Manual 133( ).
- Approved with fluid feed equipment listed in Hartzell approved type design data on propeller models for which equipment is available.

(b) Propeller Deicing (weight of deicing equipment extra):
- Approved with Goodyear ice guards (electrical propeller deicer) when installed in accordance with instructions outlined in Goodyear Report No. AP-147 dated 23 October 1961.
- Approved with Goodrich electrical deicing kit 5EXXXX-X, 7EXXXX-X, 77-XXX, 67-XXX or 65-XXX when installed in accordance with Goodrich report No ATA 30-60-07.
- Approved with Safeway deicing boots 6848, 6870, or 6888 when installed in accordance with manufacturer's instructions.
- Approved with ice protection when listed on Hartzell type design data.

(c) Propeller Spinner (weight of spinner extra):
- Approved with spinners when listed in Hartzell approved type design data.

NOTE 8

Shank Fairings.

Not applicable.

NOTE 9

Special Limits.

Table of Propeller – Engine Combinations

Approved Vibrationwise for Use on Normal Category Single Engine Tractor Aircraft

The Maximum and minimum propeller diameter 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 limited 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. Diam. m (in)	Min. Diam. m (in)	Placards
PHC-C3YF	F7663 F7663-( )R F7663-( )T	TCM TSIO-360-E, EB, F, FB	1.93 (76)	1.83 (72)	None
PHC-C3YF	7663	TCM IO-470-L	1.93 (76)	1.87 (74)	None
PHC-C3YF	F7663	TCM IO-470-U	1.98 (78)	1.93 (76)	None
HC-C3YF	7663	TCM IO-520-A, J	1.93 (76)	1.87 (74)	None
HC-C3YF	7663	TCM TSIO-520-C, H	1.93 (76)	1.87 (74)	None
PHC-C3YF	7663	TCM IO-520-B, C	1.93 (76)	1.87 (74)	None
PHC-C3YF	7663	TCM TSIO-520-B, D, E	1.93 (76)	1.87 (74)	None
PHC-C3YF	F7663D-2Q	TCM IO-520-B, BA, BB	1.93 (76)	1.93 (76)	None
PHC-C3YF	F7663	TCM IO-550-B	1.93 (76)	1.87 (74)	None
HC-C3YF	F7663R	LYC IO-540-K1A5	1.98 (78)	1.93 (76)	None
HC-C3YR	F7663R	LYC IO-540-K1A5	1.98 (78)	1.93 (76)	None

NOTE 9 (Cont.)

PHC-C3YF	F7961( )	TCM O-470-A, J, K, L, R, S, U	1.98 (78)	1.96 (77)	None
PHC-C3YF	F7961( )	TCM IO-520-A, B, BA, BB, D, F, J, L	1.98 (78)	1.96 (77)	Do not exceed 20” manifold pressure below 2200 RPM.
PHC-C3YF	F7691( )	TCM IO-550-B, D, F.	1.98 (78)	1.96 (77)	Do not exceed 20” manifold pressure below 2200 RPM.
HC-C3YR	F8068	LYC IO-540-K1A5(D), K1F5(D), K1G5(D), K1J5(D)	2.08 (82)	1.98 (78)	None
PHC-C3YF	F8068	TCM IO-470-D, E, F, M, S IO-520-A, J IO-550-D, E, F, L TSIO-520-C, H	2.08 (82)	1.98 (78)	None
PHC-C3YF	F8068-2	TCM IO-520-D, E, F, L	2.03 (80)	1.98 (78)	None
HC-C3YF	8468-( )R	TCM IO-520 series with 4th, one 5th and two 6th order dampers, 8.5 to 1 compression ratio or less, 300HP at 2 850 RPM or less.	1.98 (78)	1.96 (77)	None
HC-C3YF	8468	TCM IO-520- A, J	2.03 (80)	1.96 (77)	None
HC-C3YF	8468	TCM TSIO-520-A, C	2.03 (80)	1.96 (77)	None
HC-C3YF PHC-C3YF	8468	TCM IO-520-B, BA, BB, C, CB	2.03 (80)	1.96 (77)	None
HC-C3YF PHC-C3YF	8468	TCM TSIO-520-B, BB, D, E, EB	2.03 (80)	1.96 (77)	None
PHC-C3YF	F8468A( )	TCM O-470-K, L	2.03 (80)	1.96 (77)	None
PHC-C3YF	F8468A( )	TCM IO-470-F	2.03 (80)	1.96 (77)	None
PHC-C3YF	F8468A( )	TCM IO-520-D	2.03 (80)	1.96 (77)	None

NOTE 9 (Cont.)

PHC-C3YF	F8468A( )	TCM IO-550-D	2.03 (80)	1.96 (77)	None
PHC-C3YF	F8468A( )	TCM TSIO-520-C, G, H, M, N, P, R, T	2.03 (80)	1.96 (77)	None
PHC-C3YF	F8468A-( )R	TCM O-470-A s/n 41000 & up, J, K, L, R, S, U	2.03 (80)	1.96 (77)	None
PHC-C3YF	F8468A-( )R	TCM TSIO-520-U, UB	2.03 (80)	1.98 (78)	None
HC-C3YR	F8468A	LYC O-540-B4B5	1.98 (78)	1.93 (76)	None
HC-C3YR	F8468R	LYC IO-540-K1J5D	2.13 (84)	1.93 (76)	None
HC-C3YR	8468	LYC IO-540-K1G5	2.03 (80)	1.93 (76)	None
HC-C3YR	8468	LYC IO-540-A1()5	2.03 (80)	1.98 (78)	None
HC-C3YR	8468-( )R F8468-( )R	LYC IO-540-K1A5	2.13 (84)	1.93 (76)	None
HC-C3YR	F9587C	TCM IO-520-D (Note: installation must be de-rated to 2 700 RPM max)	2.08 (82)	2.03 (80)	None

NOTE 10

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

NOTE 11

Life Limits and Mandatory Inspections.

Airworthiness Limitations, if any, are specified in Hartzell Manuals 113( ) or 117().

NOTE 12

Special 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.

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