

I. General

1. Type / Models:

HC-E3Y / HC-E3YR-1, HC-E3YR-2, HC-E3YR-7
HC-I3Y / HC-I3YR-1, HC-I3Y1R-1

2. Type Certificate Holder:

Hartzell Propeller Inc.
Piqua, OH 45356
USA

3. Manufacturer:

Hartzell Propeller Inc.

4. Date of Application:

HC-E3YR-1: Before 1989 *
HC-E3YR-2: Before 1979 *
HC-E3YR-7: Before 1989 *
HC-I3YR-1: Before 1994 *
HC-I3Y1R-1: 07 April 2009

*: The exact Date of Application was not recorded in individual EASA Member States.

5. EASA Certification Reference Date:

22 March 1968

6. EASA Certification Date:

HC-E3YR-1: 13 February 1989 *
HC-E3YR-2: 16 February 1979 *
HC-E3YR-7: 13 February 1989 *
HC-I3YR-1: 11 November 1994 *
HC-I3Y1R-1: 01 February 2010

*: The EASA Certification Date has been taken over from individual EASA Member States.

II. Certification Basis

1. **FAA Certification Basis:** Refer to FAA TCDS no. P33EA

2. **EASA Certification Basis:**

2.1 **Airworthiness Standards:**

HC-E3YR-7:

14 CFR Part 35 with amendments 35-1 through 35-5 effective 14 October 1980.

HC-E3YR-1, HC-E3YR-2:

14 CFR Part 35 with amendments 35-1 through 35-6 effective 1 August 1990.

HC-I3YR-1 and HC-I3Y1R-1:

14 CFR Part 35 with amendments 35-1 through 35-8 effective 23 December 2008 and CS-P paragraphs 240, 360, 370, and 380 effective 24 October 2003.

Note 1:

Application was made to EASA Member States before EASA was established. Refer to Commission Regulation (EU) No 748/2012.

Note 2:

The above mentioned propeller models are EASA certified based on member states approvals prior to EASA existence. The original and updated FAA certification basis as indicated above had been taken over from the FAA TCDS.

2.2 **Special Condition:** None

2.3 **Equivalent Safety Findings:** None

2.4 **Deviations:** None

III. Technical Characteristics

1. **Type Design Definition:**

The HC-E3Y and HC-I3Y propeller types are defined by a main assembly drawing (the parts list is on the drawing) or later approved revision.

HC-E3YR-1:	Drawing D-4245 dated 08 July 1987
HC-E3YR-2:	Drawing D-3280 dated 13 May 1978
HC-E3YR-7:	Drawing D-4260 dated 22 November 1983
HC-I3YR-1 with aluminum blades:	Drawing E-6011 dated 30 September 1993
HC-I3YR-1E with composite blades:	Drawing E-6749 dated 26 June 1997
HC-I3YR-1N with composite blades:	Drawing 102188 dated 06 February 2009
HC-I3Y1R-1N with composite blades:	Drawing 103007 dated 13 February 2009

2. Description:

The propeller types are 3-blade variable pitch propellers with a hydraulically operated blade pitch change mechanism providing the operation mode "Constant Speed". The -1 models do not feather, the -2 models incorporate feathering and unfeathering features and the -7 models incorporate constant speed with reversible thrust. (See Notes 1 and 4).

The hub is milled out of aluminum alloy. The blade materials are:

- Aluminium alloy.
- Composite (N7605 blade)
- Aramid Composite (7690 and 7890 blades).

Optional equipment includes spinner and ice protection.

3. Equipment:

Spinner:	See Note 7
Governor:	See Note 3
Ice Protection:	See Note 7

4. Dimensions:

See Table of Section IV.

5. Weight:

Depending on Propeller-Design Configuration:
See Table of Section IV.

6. Hub/Blade-Combinations:

See Table of Section IV.

7. Control System:

Propeller governors: See Note 3

8. Adaptation to Engine:

Special flange: See Note 1

9. Direction of Rotation:

Direction of rotation (viewed in flight direction) as identified by a letter-code in the propeller designation. (See Note 5)

IV. Operational Limits

Blades (See Note 2)	Max. Continuous kW - rpm (min ⁻¹)	Take Off kW - rpm (min ⁻¹)		Diameter Limits (cm) (See Note 2)	Approx. Max. Wt. Complete (kg) (See Notes 3,7)	Blade Construction (See Note 10)
<u>Non-Counterweighted Propellers HC-E3YR-1, HC-I3YR-1*</u>						
7392-0 to 7392-10	261	2850	261	2850	190,5 to 165,1 (-0 to -10)	36,3 Aluminum Alloy
7468-0 to 7468-10	261	2700	261	2700	193,0 to 167,6 (-0 to -10)	36,3 Aluminum Alloy
7479-2 to 7479-8	283,4	2900	283,4	2900	187,9 to 172,7 (-2 to -8)	37,4 Aluminum Alloy
7590-0 to 7590-10	261	2850	261	2850	195,6 to 170,2 (-0 to -10)	36,5 Aluminum Alloy
7663-0 to 7663-10	231,2	2800	231,2	2800	198,1 to 172,7 (-0 to -10)	34,2 Aluminum Alloy
7666-0 to 7666-10	231,2	2700	231,2	2700	198,1 to 172,7 (-0 to -10)	36,1 Aluminum Alloy
7673-0 to 7673-10	231,2	2700	231,2	2700	198,1 to 172,7 (-0 to -10)	35,2 Aluminum Alloy
7693-0 to 7693-10	261	2700	261	2700	198,1 to 172,7 (-0 to -10)	36,3 Aluminum Alloy
7854-0 to 7854-8	298,3	2650	298,3	2650	203,2 to 182,9 (-0 to -8)	37,2 Aluminum Alloy
8068+2 to 8068-10	261	2700	261	2700	213,4 to 182,9 (+2 to -10)	37,9 Aluminum Alloy
8459-0 to 8459-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	35,2 Aluminum Alloy
8465-0 to 8465-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	36,5 Aluminum Alloy
8467-0 to 8467-14	298,3	2575	298,3	2575	218,4 to 182,9 (-0 to -14)	38,3 Aluminum Alloy
8468-0 to 8468-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	37,0 Aluminum Alloy
8470-0 to 8470-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	36,5 Aluminum Alloy
8475-0 to 8475-14	298,3	2650	298,3	2650	218,4 to 182,9 (-0 to -14)	38,3 Aluminum Alloy

Blades (See Note 2)	Max. Continuous kW - rpm (min ⁻¹)		Take Off kW - rpm (min ⁻¹)		Diameter Limits (cm) (See Note 2)	Approx. Max. Wt. Complete (kg) (See Notes 3,7)	Blade Construction (See Note 10)
8477-0 to 8477-14	298,3	2575	298,3	2575	218,4 to 182,9 (-0 to -14)	39,7	Aluminum Alloy
9587-6 to 9587-22	261	2575	261	2575	231,1 to 190,5 (-6 to -22)	38,3	Aluminum Alloy
9684-12 to 9684-18	246,1	2400	246,1	2400	213,4 to 198,1 (-12 to -18)	41,5	Aluminum Alloy
<u>Non-Counterweighted Propeller HC-I3YR-1</u>							
N7605+2 to N7605-10	261	2700	261	2700	203,2 to 172,7 (+2 to -10)	28,3	Composite
7693+2 to 7693-10	350	2700	350	2700	203,2 to 172,7 (+2 to -10)	35,4	Aluminum Alloy
<u>Non-Counterweighted Propeller HC-I3Y1R-1</u>							
N7605+2 to N7605-10	261	2700	261	2700	203,2 to 172,7 (+2 to -10)	26,3	Composite
<u>Non-Counterweighted Propellers HC-E3YR-1, HC-I3YR-1*</u>							
7690	261	2850	261	2850	198,1	28,6	Aramid Composite
7890	298,3	2700	298,3	2700	203,2	31,7	Aramid Composite
<u>Counterweighted Propellers HC-E3YR-2, HC-E3YR-7*</u>							
C7468-0 to C7468-10	261	2700	261	2700	193,0 to 167,6 (-0 to -10)	38,8	Aluminium Alloy
C7479-2 to C7479-8	283,4	2900	283,4	2900	188,0 to 172,7 (-2 to -8)	39,9	Aluminum Alloy
C7663-0 to C7663-10	231,2	2800	231,2	2800	198,1 to 172,7 (-0 to -10)	36,7	Aluminum Alloy
C7666-0 to C7666-10	231,2	2700	231,2	2700	198,1 to 172,7 (-0 to -10)	38,6	Aluminum Alloy
C7673-0 to C7673-10	231,2	2700	231,2	2700	198,1 to 172,7 (-0 to -10)	37,6	Aluminum Alloy
C7854-0 to C7854-8	298,3	2650	298,3	2650	203,2 to 182,9 (-0 to -8)	37,2	Aluminum Alloy
C8459-0 to C8459-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	37,6	Aluminum Alloy
C8465-0 to C8465-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	39,0	Aluminum Alloy
C8467-0 to C8467-14	298,3	2575	298,3	2575	218,4 to 182,9 (-0 to -14)	40,8	Aluminum Alloy

Blades (See Note 2)	Max. Continuous kW - rpm (min ⁻¹)		Take Off kW - rpm (min ⁻¹)		Diameter Limits (cm) (See Note 2)	Approx. Max. Wt. Complete (kg) (See Notes 3,7)	Blade Construction (See Note 10)
C8468-0 to C8468-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	39,5	Aluminum Alloy
C8470-0 to C8470-14	298,3	2700	298,3	2700	218,4 to 182,9 (-0 to -14)	39,0	Aluminum Alloy
C8475-0 to C8475-14	298,3	2575	298,3	2575	218,4 to 182,9 (-0 to -14)	40,8	Aluminum Alloy
C8477-0 to C8477-14	298,3	2575	298,3	2575	218,4 to 182,9 (-0 to -14)	42,2	Aluminum Alloy
C9587-6 to C9587-22	261	2575	261	2575	231,1 to 190,5 (-6 to -22)	40,8	Aluminum Alloy
C9684-12 to C9684-18	246,1	2400	246,1	2400	213,4 to 198,1 (-12 to -18)	47,6	Aluminum Alloy
<u>Counterweighted Propeller HC-E3YR-2*</u>							
C7693-0 to C7693-10	298,3	2700	298,3	2700	198,1 to 172,7 (-0 to -10)	38,8	Aluminum Alloy

*: Weights shown are for HC-E3YR-1 and -2 models only. Subtract 0,9 kg for ()HC-I3Y() models and add 2,2 kg for HC-E3YR-7 model.

1. Maximum Take Off Power and Speed:

See Table of Section IV.

2. Maximum Continuous Power and Speed:

See Table of Section IV.

3. Propeller Pitch Angle:

See Note 3.

V. Operating and Service Instructions

Airworthiness Limitations	Hartzell Manuals 113 (), 115N, 117 () or 145 () *
Overspeed and Overtorque Limits	Hartzell Manual 202 () *
Instruction for Continued Airworthiness	Hartzell Manual 113B, 117D, 127, 133C, 135F and 202A *
Propeller Integration Manual	Hartzell Manual 191 *
Propeller Owner's Manual	Hartzell Manual 145 * Hartzell Manual 115N *
Service Letter for overhaul periods	HC-SL-61-61 () *
Service Bulletins	

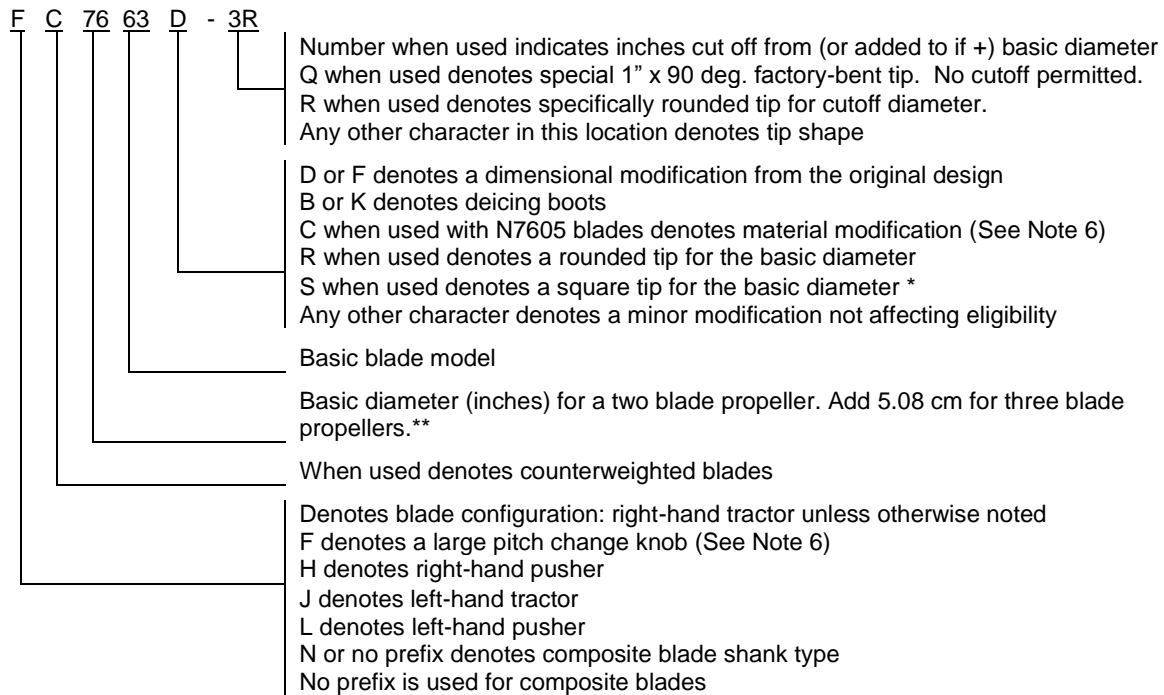
*: or later approved revision

VI. Notes

1. Hub Model Designation:

<p>() HC - E 3 Y 1 R - 2 AF</p>	<p>L denotes left hand rotation T denotes spring kit (package) in hub extension U denotes spring kit (package) in propeller dome R when used with -1 model denotes a piston area of 139.35 cm² F when used denotes modified pitch change system (See Note 6) A when used with -2 model signifies a single piece shaft extension Any other character denotes a minor change not affecting eligibility</p> <p>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 -7: non-feathering, reversing, with counterweights, governor oil pressure decreases pitch</p> <p>R denotes SAE #2 flange with six 1/2" bolts and five 3/4" bushings on a 4-3/4" bolt circle F denotes special flange with six 1/2" bolts and two 1/2" dowels on a 4" bolt circle</p> <p>1 when used denotes hub design modification compatible only with blade models listed in the front of this Data Sheet</p> <p>Hartzell blade shank size</p> <p>Number of blades</p> <p>E denotes a 12,7 cm integral shaft extension I denotes a 5.08 cm integral shaft extension</p> <p><u>Hartzell Controllable</u></p> <p>When used indicates dowel location with respect to centerline through blade sockets when viewing hub from flange mounting face</p> <table border="0"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Dowel Pin</u></th> <th style="text-align: center;"><u>T/C Mark</u></th> </tr> </thead> <tbody> <tr> <td>Blank:</td> <td style="text-align: center;">90 & 270 deg.</td> <td style="text-align: center;">30 deg. Clockwise</td> </tr> <tr> <td>P:</td> <td style="text-align: center;">0 & 180 deg.</td> <td style="text-align: center;">120 deg. Clockwise</td> </tr> </tbody> </table>		<u>Dowel Pin</u>	<u>T/C Mark</u>	Blank:	90 & 270 deg.	30 deg. Clockwise	P:	0 & 180 deg.	120 deg. Clockwise
	<u>Dowel Pin</u>	<u>T/C Mark</u>								
Blank:	90 & 270 deg.	30 deg. Clockwise								
P:	0 & 180 deg.	120 deg. Clockwise								

2. Blade Model Designation:

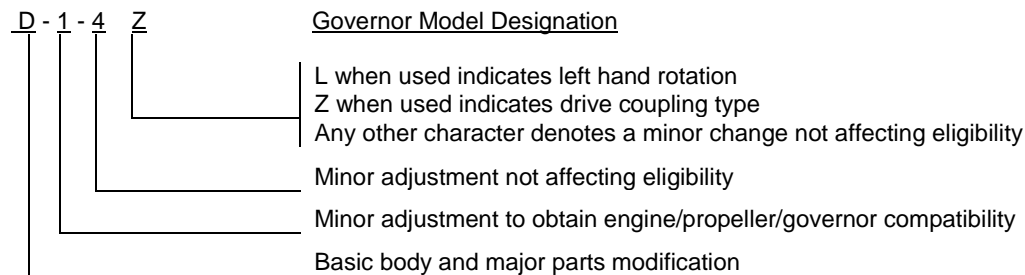


* Blades may incorporate either round or square tips, yet may not be marked with an "R" or "S" in their model designation. This character is used to distinguish between two or more tip shapes available at the same diameter. Certain blades use "S" to denote shot peening of the exterior surface. (See Note 6)

** Do not add 5,08 cm diameter correction to the 9684 and C9684 blade designs.

3. Pitch Control:

(a) Approved with Hartzell governors per drawings C-4770 and C-4772. Wt.: 2.04 kg (See Note 10)



(b) The -1 propeller models use oil to increase pitch and do not have counterweighted blades. The -2 and -7 models have counterweighted blades and use oil to decrease pitch. (See Note 4)

(c) Maximum governor output pressure: 2413.16 KPa for all propeller models

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

4. Feathering: The -1 and -7 models do not feather.
The -2 models incorporate feathering and unfeathering features.
Reversing: The -7 models incorporate reversing

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)

6. Interchangeability:

(a) Propellers

"F" type propellers with the modified pitch change system are interchangeable with corresponding propellers with the standard pitch change system. (See Notes 1 and 2)

(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

1. Shot-peened blades may replace non shot-peened blades either individually or as a set. (See Note 2)

2. N7605C() blades may replace N7605() blades either individually or as a set. N7605() blades may not replace N7605C() blades.

(d) Ice Protection Systems

Refer to Hartzell Service Letter HC-SL-30-260 for ice protection system component interchangeability.

7. Accessories: (See Note 10)

(a) Propeller ice protection system (weight of ice protection 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 Hartzell type design data.

(2) All propeller ice protection equipment must be approved as part of the aircraft installation regardless of manufacturer.

(b) 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.

(c) Pressure control valve (weight of pressure control valve extra)

Required for operation of -7 model propellers

8. Shank Fairings: Not applicable.

9. Special 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 turbnormalizer, 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. (cm)	Min. Dia. (cm)	Placards
HC-E3YR	F7673()R F7673()-()R	LYC TIO-540-S1AD	198,1	193,0	None
HC-E3YR	()8468	LYC TIO-540-A2B	203,2	198,1	None
HC-E3YR	8468	LYC IO-540-K1A5, - K1B5, -K1C5, -K1D5, -L1A5, -M1A5	213,4	193,0	None
HC-E3YR	F8475	LYC IO-720-A1A, - A1B, -A1BD	208,3	203,2	None
HC-E3YR	F8475	LYC IO-720-A1A, - A1B, -A1BD	203,2	193,0	None
HC-E3YR	F9587A-10	LYC TIO-540-J2B	221,0	218,4	Do not exceed 30 inches manifold pressure below 2400 RPM

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.

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 impact.

11. Retirement Time:

(a) Life Limits and Mandatory Inspections

(1) Airworthiness limitations, if any, are specified in Hartzell Manuals 115N or 145().

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.

13. EASA Type Certificate and Type Certificate Data Sheet No.: IM.P.132 replace the associated Type Certificates and Type Certificate Data Sheets of the EASA Member States.
