

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

P-891 Revision 16 Hartzell HC-93Z December 22, 2014

TYPE CERTIFICATE DATA SHEET NO. P-891

Propellers of models described herein conforming with this data sheet (which is part of Type Certificate No. P-891) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

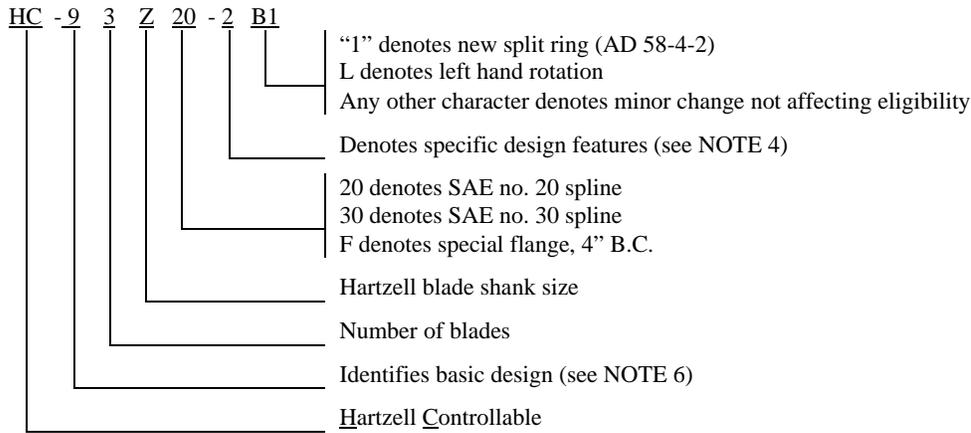
Type Certificate Holder	Hartzell Propeller Inc. Piqua, OH 45356
Type	Constant speed; hydraulic (see NOTES 3 and 4)
Engine shaft	SAE Spline (see NOTE 1)
Hub material	Alloy Steel
Blade material	Aluminum Alloy
Number of blades	Three
Hub models	HC-93ZF-2; HC-93Z20-1, -2; HC-93Z30-2 (see NOTES 1 and 4)

Blades (See NOTES 2 and 6)	Maximum Continuous		Takeoff		Diameter Limits (see NOTE 2)	Approx. Max. Wt. Complete (For Reference Only) (See NOTES 3 and 7)
	HP	RPM	HP	RPM		
<u>Hub Models HC-93Z20-1, -2; HC-93Z30-2</u>						
9349-0 to 9349-13	390	2330	420	2330	93" to 80" (-0 to -13)	105 lb.
9350-0 to 9350-13	390	2330	420	2330	93" to 80" (-0 to -13)	105 lb.
10151-0 to 10151-11	390	2180	400	2180	101" to 90" (-0 to -11)	108 lb.
10151C-0 to 10151C-11	390	2180	400	2180	101" to 90" (-0 to -11)	108 lb.
10152-5 1/2 to 10152-13	450	2300	450	2300	95 1/2" to 88" (-5 1/2 to -13)	119 lb.
11451-4 to 11451-14	390	1700	390	1700	110" to 100" (-4 to -14)	122 lb.
<u>Hub Model HC-93ZF-2</u>						
10151-8 to 10151-11	300	2070	340	2140	93" to 90" (-8 to -11)	108 lb.

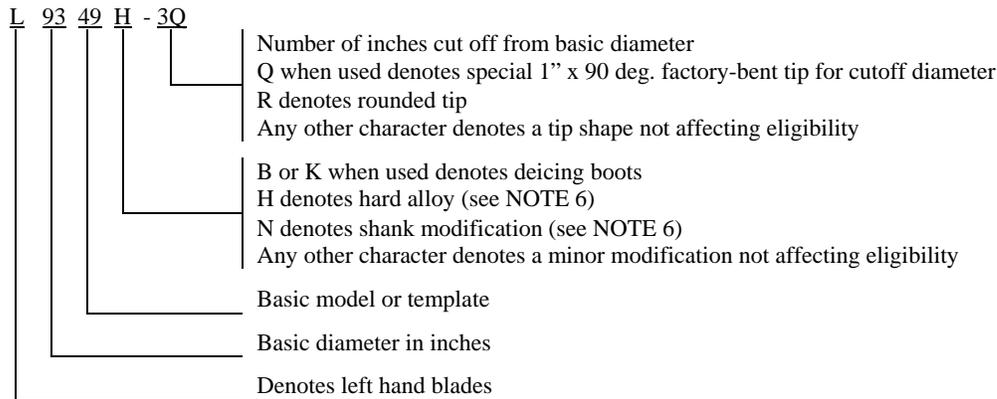
Certification Basis:	Civil Air Regulations Part 14 effective March 5, 1953 with amendments 14-1 and 14-2 thereto. Type Certificate no. P-891 issued July 22, 1955. Date of application for type Certificate: April 13, 1955 The following models were included in the original certification basis: HC-93Z20-2, HC-93Z20-1, HC-93Z30-2, and HC-93ZF-2
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Production Basis:	Production Certificate no. 10
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NOTE 1: Hub Model Designation

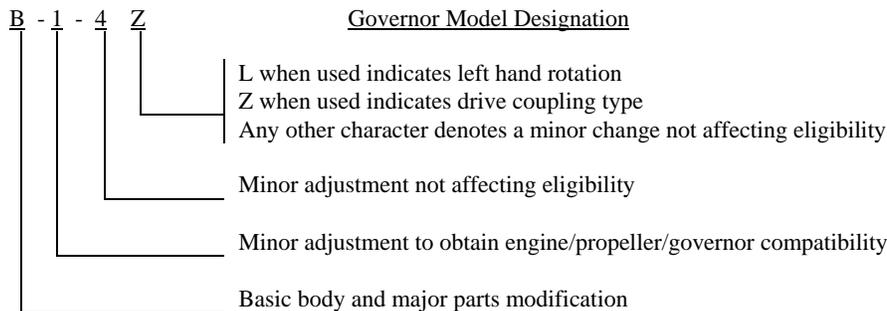


NOTE 2: Blade Model Designation



NOTE 3: Pitch Control

(a) Approved with Hartzell governors per drawings C-4770 and C-4772. Wt.: 4.5 to 6 lb. (see NOTE 10)



- (b) All models have counterweighted blades and use governor oil to decrease pitch. (see NOTE 4)
- (c) Governors must be approved as part of the aircraft installation regardless of manufacturer. (see NOTE 10)
- (d) Maximum control pressure for all models: 400 psig

NOTE 4: (a) Feathering The -1 models do not feather. The -2 models incorporate feathering and unfeathering features.
 (b) Reversing Not applicable

NOTE 5: Left-Hand Models

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

NOTE 6: Interchangeability

(a) Blades

- (1) Only blades listed in the same group of the following listed groups are sufficiently similar aerodynamically and vibrationwise to permit interchangeability in the same diameter without a flight test.
Group (1) 9349, 9350.
- (2) Blades with the suffix "N" in the basic model number may replace those without an "N" either individually or as a set. When the aircraft Type Certificate or Supplemental Type Certificate specifies blades with the letter "N" in the basic model number, the "N" character must be retained in all replacement blade models.
For Blades without the "N" suffix may be replaced by "N" suffix blades.
example: Blades with the "N" suffix may only be replaced by "N" suffix blades.
- (3) Hard and soft alloy blades of the same model designation are interchangeable. (See NOTE 2)

(b) Propellers

Only propellers listed in this data sheet may be replaced by corresponding propellers listed in Type Certificate Data Sheet no. P-907 provided the propeller designations are the same except that the identifying basic digit "9" (see NOTE 1) is replaced by the letter "B". See Table below (read across same row).

<u>Prop models on TCDS P-891</u>	may be replaced by	<u>Corresponding models on TCDS P-907</u>
HC-93Z20-1		HC-B3Z20-1
HC-93Z20-2		HC-B3Z20-2
HC-93Z30-2		HC-B3Z30-2
HC-93ZF-2		HC-B3ZF-2

(c) Governors (See NOTE 3)

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.

The Hartzell B-0 is the only model which is interchangeable with the Hamilton Standard 1M12 or 1Q12. Other Hartzell models are not interchangeable with any Hamilton Standard model without modification of the latter.

(d) Ice Protection Systems

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

NOTE 7: Accessories

- (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 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)
- (b) Propeller spinner (weight of spinner extra)
 - (1) Approved with Hartzell and other manufacturer's 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)

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 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.

<u>Hub Model</u>	<u>Blade Model</u>	<u>Engine Model</u>	<u>Max. Dia. (inches)</u>	<u>Min. Dia. (inches)</u>	<u>Placards</u>
HC-93Z20	9349	Lycoming R-680-9	88	82	none
		Lycoming R-680-13	88	88	none
HC-93Z20	9350	Lycoming R-680-9	88	82	none
		Lycoming R-680-13	88	88	none
HC-93Z20	10151	Lycoming GSO-480-A1A6	93	90	none
HC-93Z20	10151	Lycoming GO-480-G1D6	93	93	Avoid continuous operation between 3000 and 3350 engine RPM. Avoid descents at high engine speeds with less than 15 in. Hg manifold pressure.
HC-93Z20	10151C	Lycoming GO-480-G1D6	101	95	none
HC-93Z30	10152-5 ½	P&WA R-985 with one 4 ½ order and one 9 th order crankshaft damper	95 ½	95 ½	none
HC-93Z30	10152-7 ½	P&WA R-985 with one 4 ½ order and one 9 th order crankshaft damper	93 ½	93 ½	Avoid continuous operation between 1600 and 1850 RPM

NOTE 10: The 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: Retirement Time

(a) Life Limits and Mandatory Inspections

(1) Airworthiness limitations, if any, are stated in Hartzell Manual 114B or Service Letter 61().

NOTE 12: Special Notes

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

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