DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

P6EA
Revision 13
Hartzell
HC-A3V, HC-A3MV
PHC-A3V, PHC-A3MV
EHC-A3V, EHC-A3MV
December 16, 2002

TYPE CERTIFICATE DATA SHEET NO. P6EA

Propellers of models described herein conforming with this data sheet (which is part of Type Certificate No. P6EA) 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	Spline shaft, special flange (see NOTE 1)
Hub material	Alloy steel
Blade material	Aluminum alloy
Number of blades	Three
Hub models	( )HC-A3(M)VF-(2,3,4,5,7), HC-A3(M)VF-1, HC-A3(M)VK-(1,2,4), HC-A3(M)V20-(1,2,3,5), HC-A3(M)V21-2, EHC-A3(M)VF-2 (see NOTES 1 and 4)

Blades (see NOTE 2)	Maximum Continuous HP	Maximum Continuous RPM	Takeoff HP	Takeoff RPM	Diameter Limits (see NOTE 2)	Approx. Max. Wt. Complete (For Reference Only) (See NOTES 3 and 7)
V7636D-0 to V7636D-6	336	2850	336	2850	76 5/8" to 70 5/8" (-0 to -6)	90.0 lb.
V8433-0 to V 8433-12	400	2650	400	2650	84 5/8" to 72 5/8" (-0 to -12)	94.0 lb.
V8485-0 to V8485-12	346	2030	400	2030	84 5/8" to 72 5/8" (-0 to -12)	94.0 lb.
V8833-0 to V8833-10	380	2450	380	2450	88 3/8" to 78 3/8" (-0 to -10)	97.0 lb.
V9333C-0 to V9333C-13	340	2200	340	2200	93 5/8" to 80 5/8" (-0 to -13)	100.0 lb.
V9333D-0 to V9333D-13	340	2400	340	2400	93 5/8" to 80 5/8" (-0 to -13)	100.0 lb.
V10133-0 to V10133-13	390	2180	390	2180	101 5/8" to 88 5/8" (-0 to -13)	103.0 lb.
V10133D-0 to V10133D-3	390	2180	390	2180	101 1/2" to 98 1/2" (-0 to -3)	103.0 lb.
V10133D-3 to V10133D-12.5	420	2180	420	2180	98 1/2" to 88" (-3 to -12.5)	103.0 lb.

For #20 or #21 spline shaft add 3 lb. For HC-A3(M)V(F,K)-4 subtract 7 lb.

Certification Basis:	( )A3V( ) models: CAR Part 14 with amendment 14-1 effective Dec. 15, 1956. ( )A3MV( ) models: FAR Part 35 with amendments 35-1 through 35-6 effective Aug. 18, 1990 Type Certificate No. P6EA issued Aug. 15, 1962 Date of application for Type Certificate: July 27, 1962 Models certificated on or subsequent to March 7, 1967 are certified under Delegation Option Authorization provisions of FAR Part 21 Subpart J.
Production Basis:	Production Certificate no. 10

NOTE 1. Hub Model Designation

( ) HC A 3 V ( ) - ( ) ( )

- L denotes left hand rotation
  Any other character denotes a minor change not affecting eligibility
- Denotes specific design features (see NOTE 4)
- F denotes special flange with six 1/2" bolts and two 1/2" dowels on a 4" bolt circle
  K denotes SAE # 2 flange with six 1/2" bolts and four 3/4" drive bushings on a 4-3/4" bolt circle
  20 denotes SAE #20 spline
  21 denotes SBAC #2 spline
- V denotes a double shoulder blade retention system
  MV denotes a single shoulder blade retention system
- Number of blades
- Identifies basic design
- Hartzell Controllable
- Dowel location with respect to blade centerline when viewing hub from flange mounting face
  Blank: 90 and 270 deg. clockwise
  E,P Align T/C marks on propeller and engine flange

NOTE 2: Blade Model Designation

L V 84 33 ( ) - ( )Q

- Number of inches cut off from basic diameter
  Q when used denotes special 1" x 90 deg. factory-bent tip. No cutoff permitted.
  R when used denotes specifically rounded tip for cutoff diameter. *
- C or D denotes a dimensional modification from the original design
  B denotes deicing boots
  A when used with 8433 blades denotes 1 deg. of sweepback in lieu of the standard 2 deg.
  R or S when used denote round or square tips respectively for the basic diameter *
  N denotes a shank modification (see NOTE 6)
  Note: one or more letters may be used as appropriate
- Basic blade model
- Basic diameter in inches
- V denotes a double shoulder blade shank with internal needle bearing
  MV denotes a single shoulder blade shank with internal needle bearing
- L when used denotes left hand blade

* Some blade designs incorporate round or square tip shapes, yet have no "R" or "S" in their model designation. This character is used to distinguish blades when two or more tip shapes are available at the same diameter.

NOTE 3. Pitch Control

(a) Approved with Hartzell governors per drawings C-4770 and C-4772. Wt.: 4.5 lb.

D - 1 - 4 Z — Governor model designation

- 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
- 4: Minor adjustment not affecting eligibility
- 1: Minor adjustment to obtain engine/propeller/governor compatibility
- D: Basic body and major parts modification

(b) Approved with Hoof model 1-000-007 series Wt.: 3.5 lb.

(c) Approved with Hamilton Standard models 1A4, 1M12, 1P12, and 1Q12 Wt.: 4.5 lb.

(d) Approved with Woodward model X210XXX Wt.: 3.5 lb

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

The HC-A3(M)V(F,K)-4 propeller has no counterweights, hence require a governor which supplies oil to increase pitch. Governors on drawing C-4770 meet this requirement.

NOTE 4. (a) Feathering The -1 and -4 models do not feather. The -2, -3, -5 and -7 models incorporate feathering and unfeathering features. The -4 models do not have counterweights.

(b) Reversing The -3, -5 and -7 models incorporate reversing when used with the appropriate controls.

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) Blades

(1) Blades with an “N” suffix, such as (M)V8433N, are interchangeable with corresponding blades without the “N” suffix, provided that all blades in the same propeller are identical.

(2) Blades with “M” prefix, such as MV8433N, can be substituted for corresponding blades without the “M” prefix provided that all blades in the same propeller are identical and that the hub model also contains the characters “MV”. Blades without the “M” prefix cannot be substituted for those with the “M” prefix.

(b) Propellers

(1) Propellers listed in this data sheet may replace corresponding propellers listed in Type Certificate Data Sheets P14EA, P-913 and P-884.

(2) Propellers listed in T.C.D.S. nos. P14EA, P-913 and P-884 may not replace propellers listed in this data sheet.

(3) In the model designation HC-A3(V,MV)( ), the “A” may be substituted for propeller models with “8” in the same location and “V” or “MV” may be substituted for propeller models with “X” in the same location as listed in T.C.D.S nos. P14EA, P-913 and P-884.

(4) In the model designation HC-A3(V,MV)( ), the “MV” may be substituted for “V”, however “V” may not replace “MV”.

(c) 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.

NOTE 7. Accessories

(a) Propeller anti-icing (weight of anti-icing equipment extra)

(1) 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( ).

(2) Approved with fluid feed equipment listed in Hartzell approved type design data on propeller models

(b) Propeller deicing (weight of deicing equipment extra)

(1) 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.

(2) Approved with Goodyear Ice Guards (electrical propeller deicer) when installed in accordance with instructions outlined in Goodyear Report no. AP-147 dated October 23, 1961.

(3) Approved with Safeway deicing boot 6848 and 5735 kit when installed in accordance with manufacturer's instructions.

(c) Propeller spinner (weight of spinner extra)

(1) Approved with Hartzell and other manufacturer's 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 foe 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 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. (inches)	Min. Dia. (inches)	Placards
EHC-A3VF PHC-A3VF	7636-4Q	TCM IO-520-A, -B, -C, -D, -E, -F, -J	72	72	none
EHC-A3VF	V7636D	TCM IO-470-U; 8.6:1 compression ratio or less; two 6th order, one 5th order and one 4.5 order dampers; 260 HP at 2625 RPM or less. T/C marks must be aligned.	76 5/8	74	none
EHC-A3VF	V7636N-2Q	TCM IO-470-U	74 5/8	74 5/8	none

HC-A3VF PHC-A3VF	V7636D	TCM IO-470 series; 8.6:1 compression ratio or less; two 5th and two 6th order dampers; 260 HP at 2625 RPM or less	76 5/8	76 5/8	none
PHC-A3VF EHC-A3VF	V7636D	TCM IO-520 series; two 6th, one 5th and one 4th order dampers; 8.5:1 compression ratio or less; 300 HP at 2850 RPM or less	76 5/8	74	none
Hub Model	Blade Model	Engine Model	Max. Dia. (inches)	Min. Dia. (inches)	Placards
HC-A3VK	V7636D	LYC O-540 and IO-540 series; 8.5:1 compression ratio or less; two 6th order dampers; 250 HP at 2575 RPM or less; centerline of one blade must be in line with no. 1 crank throw facing engine from propeller end.	76 5/8	70 5/8	none
HC-A3VK	V7636D	LYC O-540 and IO-540 series; 8.7:1 compression ratio or less; one 6th and one 5th order dampers; 290 HP at 2575 RPM or less; centerline of one blade must be in line with no. 1 crank throw facing engine from propeller end.	76 5/8	70 5/8	none
HC-A3V21	LV7636D	Bristol Siddeley Gypsy Queen 30 MK.2 series; 6.5:1 compression ratio or less; 250 HP at 2500 RPM or less	76 1/4	75	Maintain manifold pressure above 15” Hg for airspeeds above 140 MPH
PHC-A3VF	V8433	TCM IO-520-BB, NB TSIO-520-DB	84 1/4	74 1/4	none
PHC-A3VF	V8433	TCM IO-470 series; 7:1 compression ratio or less; one 5th and one 6th order dampers; 225 HP at 2600 RPM or less	80 5/8	78 5/8	none
HC-A3VF PHC-A3VF EHC-A3VF	V8433	TCM IO-470 series; four 6th order dampers; 8.6:1 compression ratio or less; 260 HP at 2625 RPM or less	84 5/8	80	none
HC-A3VF PHC-A3VF	V8433	TCM IO-520 series; 8.5:1 compression ratio or less; two 6th, one 5th and one 4th order dampers; 285 HP at 2700 RPM or less	84 1/4	78 1/4	none
PHC-A3VF	V8433	TCM IO-520-BA	82 5/8	78 1/4	none
HC-A3V20	V8433	LYC GO-435, GO-435-C2B, -C2B1	84 5/8	84 5/8	none
HC-A3V20	V8433	LYC GO-480-A1A, -D1A, B, -B1B, -B1C, -B1D	84 5/8	84 5/8	none
HC-A3V20	V8433	LYC GO-480-B1A6	84 5/8	84 5/8	Avoid continuous operation on the ground between 1300 and 1650 RPM and between 2100 and 2500 RPM

Hub Model	Blade Model	Engine Model	Max. Dia. (inches)	Min. Dia. (inches)	Placards
HC-A3VK	V8433	LYC O-540 and IO-540 series; 8.7:1 compression ratio or less; one 6th and one 5th order dampers; 290 HP at 2575 RPM or less; centerline of one blade must be in line with no. 1 crank throw facing engine from propeller end.	80 5/8	72 5/8	none
HC-A3VK	V8433	LYC O-540 and IO-540 series; 8.7:1 compression ratio or less; one 6th and one 5th order dampers; 290 HP at 2575 RPM or less; centerline of one blade must be in line with no. 1 crank throw facing engine from propeller end.	80 5/8	72 5/8	none
HC-A3VK	V8433	LYC IO-540-K1B5, -K1C5, -L1A5, -M1A5	77 5/8	76 5/8	none
HC-A3VK	V8433	LYC IO-720 series; 8.7:1 compression ratio or less; six 4th order, one 5th order and one 3.5 order dampers; 400 HP at 2650 RPM or less; centerline of one blade must be in line with no. 1 crank throw facing engine from propeller end.	77 5/8	75 5/8	Avoid continuous operation between 1800 and 2000 RPM when above 24” Hg M.P.
HC-A3VK	V8433 V8433S	LYC IO-720 series; 8.7:1 compression ratio or less; six 4th order, one 5th order and one 3.5 order dampers; 400 HP at 2650 RPM or less; centerline of one blade must be in line with no. 1 crank throw facing engine from propeller end.	84 5/8	77 3/4	none
HC-A3VF	V8833	TCM GIO-470 series; 8.6:1 compression ratio or less; 0.75:1 reduction gear ratio; six heavy 3rd order dampers; 310 HP at 3200 RPM or less.	88 3/8	88 3/8	none
HC-A3VF PHC-A3VF	V8833	TCM GTSIO-520 series; 7.5:1 compression ratio or less; 0.75:1 reduction gear ratio; six 3rd order dampers; 340 HP at 3200 RPM or less.	88 3/8	86 3/8	none
HC-A3V20	V8833	LYC GO-480-C1B6	86 3/8	82 3/8	Avoid continuous operation in flight below 2400 RPM
HC-A3V20	V9333C	LYC GO-435-C2B	93 5/8	87 5/8	none
HC-A3V20	V9333C	LYC GO-435-C2B1	90 5/8	90 5/8	none
HC-A3V20	V9333C	LYC GO-480-C1D6, -C2C6, -C2D6, -G2D6, -G2F6	93 5/8	89 5/8	none

Hub Model	Blade Model	Engine Model	Max. Dia. (inches)	Min. Dia. (inches)	Placards
HC-A3V20	V9333C	LYC GO-480-F2A	90 5/8	87 5/8	none
HC-A3V20	V9333C	LYC GO-480-F2A6, -F4A6, -F4B6	93 5/8	87 5/8	none
HC-A3V20	V9333C	LYC GSO-480-A1A6, -B1A6, IGSO-480-A1C6	93 5/8	88 5/8	none
HC-A3V20	V9333C	LYC GSO-480-B2D6	93 5/8	91 5/8	Avoid continuous operation between 2800 and 3100 RPM

NOTE 10. Special Notes

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

NOTE 11. Retirement Time

(a) Life Limits and Mandatory Inspections

(1) Airworthiness limitations, if any, are specified in Hartzell Manuals 114( ), 118( ) and 122( ).

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