

HARTZELL PROPELLER INC.
SERVICE BULLETIN

TRANSMITTAL SHEET

HC-SB-61-240

**Propellers - Conversion of Aerobatic HC-() (2,3)YR-1()
Propellers**

December 22, 2015

This page transmits a revision to Service Bulletin HC-SB-61-240.

- Original Issue, dated Nov 12/99
- Revision 1, dated Feb 15/12
- Revision 2, dated Dec 22/15

Propeller assemblies that have complied with a previous revision of this Service Bulletin are not affected by this revision.

Changes are shown by a change bar in the left margin of the revised pages.

Revision 2 is issued to change the following in the Service Bulletin:

- Updated the parts lists with current part numbers as necessary
- Added instructions that after counterweight installation the blades will be stamped with a prefix letter "C"
- Revised instructions for installation of the counterweights
- Revised instructions for installation of governors
- Other formatting changes

This Service Bulletin has been reissued in its entirety.

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1. Planning Information

A. Effectivity

- (1) Hartzell Propeller Inc. propeller model HC-() (2,3)YR-1() propeller with 7690() composite blades installed on aerobatic aircraft affected by this Service Bulletin.

WARNING: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS SERVICE BULLETIN. INFORMATION CONTAINED IN THIS SERVICE BULLETIN MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. FAILURE TO COMPLY WITH THIS SERVICE BULLETIN OR THE USE OF OBSOLETE INFORMATION MAY CREATE AN UNSAFE CONDITION THAT MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. REFER TO THE SERVICE BULLETIN INDEX FOR THE MOST RECENT REVISION LEVEL OF THIS SERVICE BULLETIN.

B. Concurrent Requirements

- (1) Additional service documents may apply to the components/propellers affected by this Service Bulletin. Compliance with additional service documents may be necessary in conjunction with the completion of the Accomplishment Instructions in this Service Bulletin. Refer to the Hartzell Propeller Inc. website at www.hartzellprop.com for a cross-reference of service documents.

C. Reason

- (1) Affected propellers on aerobatic aircraft have experienced instances of engine overspeed (>10%) during certain aerobatic maneuvers that result in extended loss of engine oil pressure. In some cases, these overspeed instances have resulted in significant engine damage or engine failure.
- (2) Hartzell Propeller Inc. has determined that these overspeed conditions are caused by oil starvation to the propeller during aerobatic maneuvering, causing the propeller blades to move to a lower blade angle, resulting in an overspeed condition.

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- (3) Hartzell Propeller Inc. has determined that a propeller conversion, and the addition of blade counterweights to the propeller will protect against engine overspeed due to oil starvation.
- (4) This Service Bulletin may be used to convert a Hartzell Propeller Inc. non-counterweighted propeller to a counterweighted propeller to protect against engine overspeed. If a counterweighted propeller is starved of oil during operation, the propeller blades move to a high blade angle, resulting in engine underspeed. Once engine oil supply has been restored, normal propeller governing will resume.

D. Description

- (1) This Service letter provides Additional Maintenance Information (AMI).
- (2) This Service Bulletin authorizes a propeller modification that permits the installation of counterweighted blades. This modification requires airframe changes and extensive rework of the propeller, resulting in a propeller model number change.
- (3) Performing the propeller component modifications in accordance with the Accomplishment Instructions in this Service Bulletin will convert the HC-() (2,3)YR-1() propeller to a HC-() (2,3)YR-4() propeller.
- (4) The Hartzell Propeller Inc. Service Center is the only facility authorized for modification of the propeller hub and installation of the counterweight on the blade.

E. Compliance

- (1) Compliance with this Service Bulletin is optional and may be accomplished at the discretion and convenience of the operator.

F. Approval

- (1) FAA acceptance has been obtained on technical data in this publication that affects type design.

G. Manpower

- (1) Accomplishment of this Service Bulletin will require approximately 7.2 man-hours per propeller.

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H. Weight and Balance

- (1) A two bladed propeller will increase in weight by approximately 6.69 lbs. (3.03 kg).
- (2) A three bladed propeller will increase in weight by approximately 10.04 lbs. (4.55 kg).

NOTE 1: Due to the addition of balance weights and other assembly factors, it is advisable to weigh the propeller following final assembly to determine final weight of the propeller.

NOTE 2: Some aerobatic propeller systems use a hydraulic accumulator that is located on the governor input line between the engine and the governor. If this accumulator is removed while performing this Service Bulletin, aircraft weight and balance must be recalculated. The effect of removing this accumulator has not been included in the above weights. The accumulator weight is approximately 4.3 lbs (1.95 kg).

I. Electrical Load Data

- (1) Not affected

CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF A DOCUMENT.

J. References

- (1) Hartzell Propeller Inc. Owner's Manual 145 (61-00-45)
- (2) Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02)- Volume 7, Consumable Materials is available on the Hartzell Propeller Inc. website at www.hartzellprop.com
- (3) Hartzell Propeller Inc. Compact and Lightweight Compact Non-Feathering (-1) and Aerobatic (-4) Propeller Overhaul and Maintenance Manual 113B (61-10-13)
- (4) Hartzell Propeller Inc. Service Bulletin HC-SB-61-329

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K. Publications Affected

- (1) Hartzell Propeller Inc. Compact and Lightweight Compact Non-Feathering (-1) and Aerobatic (-4) Propeller Overhaul and Maintenance Manual 113B (61-10-13)
- (2) Hartzell Propeller Inc. Composite Propeller Blade Maintenance Manual 135F (61-13-35)
- (3) Hartzell Propeller Inc. Standard Practices Manual 202A (61-01-02) - Volume 7, Consumable Materials, Packaging and Storage, is available on the Hartzell Propeller Inc. website at www.hartzellprop.com

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2. Material Information

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS SERVICE BULLETIN MAY INVOLVE PROPELLER CRITICAL PARTS (PCP). REFER TO THE APPLICABLE PROPELLER OVERHAUL OR OWNER'S MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS.

A. Parts - Two-Bladed Propeller

<u>New Part Number</u>	<u>Description</u>	<u>Old Part Number</u>	<u>Qty.</u>
A-1305	Balance Weight	N/A	A/R
A-1381	Washer, 1/2" Cres.	N/A	6
A-1744	Hex Head Bolt, 3/8-24	N/A	4
A-2043-1	Nut, 3/8-24, Hex, Self-locking	N/A	14
A-2067	Stud, Mounting, 1/2-20	N/A	6
A-2069	Nut, Mounting, Castellated	N/A	6
105030-()	Strip, Wear, Blade Shank	N/A	2
A-2418-5	Rod, Pitch Change	A-2418-2	1
A-2420-()	Collar, Stop	N/A	A/R
A-4257	Screw, Set, 5/8-18, Drilled	N/A	1
B-2428-2	Cylinder	B-2428-1	1
B-3807	Nut, 5/8-18, Hex, Self Locking	N/A	1
B-3822-36P	Screw, 3/8-24, Cap	N/A	8
B-3828-6	Nut, Hex, Self-Locking, Flanged	N/A	8
B-3834-0632	Washer	N/A	16
B-3838-3-5	Cotter Pin	N/A	1
B-3851-1032	Washer	N/A	1
B-3840-()	Screw, 10-32, Fillister Head	N/A	A/R
B-3842-0750	Spring Pin, 3/32", Cres.	N/A	6
B-6544	Cap, Fitting, Lubrication	N/A	4
C-3317-018	O-ring	N/A	1
C-3317-115-1	O-ring	N/A	1
C-3317-210-1	O-ring	N/A	1
C-3317-228	O-ring	N/A	1
C-3317-247	O-ring	N/A	1
C-3317-340-()	O-ring	N/A	2
C-3317-348-1	O-ring	N/A	1
C-7249	Slug, Counterweight	N/A	4
D-6105-2	Erosion Shield, Blade, 7690	D-6105-3	2
D-2201-16	PCP:Hub Unit, HC-C2Y(K,R)-(2,4)	D-2201-17	1
D-7327	Spinner Assembly	C-3568	1
D-7248	PCP:Clamp, Counterweight	N/A	2
C7690E	PCP:Blade Assy, Composite	7690()	2

NOTE: The Hartzell Propeller Inc. D-6529-1, D-6529-21, and the D-6529-41 PCP:Hub Units, HC-C2Y(K,R)-(2,4) cannot be modified for compliance with this Service Bulletin.

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B. Parts - Three-Bladed Propeller

<u>New Part Number</u>	<u>Description</u>	<u>Old Part Number</u>	<u>Qty.</u>
A-1305	Balance Weight	N/A	A/R
A-1381	Washer, 1/2" Cres.	N/A	6
A-1744	Hex Head Bolt, 3/8-24	N/A	6
A-2043-1	Nut, 3/8-24, Hex, Self-locking	N/A	21
A-2067	Stud, Mounting, 1/2-20	N/A	6
A-2069	Nut, Mounting, Castellated	N/A	6
105030	Strip, Wear, Blade Shank	N/A	3
A-2418-5	Rod, Pitch Change	A-2418-2	1
A-2420-()	Collar, Stop	N/A	A/R
A-4257	Screw, Set, 5/8-18, Drilled	N/A	1
B-2281-1	Cylinder	B-2281	1
B-3807	Nut, 5/8-18, Hex, Self Locking	N/A	1
B-3822-36P	Screw, 3/8-24, Cap	N/A	12
B-3828-6	Nut, Hex, Self-Locking, Flanged	N/A	12
B-3834-0632	Washer	N/A	24
B-3838-3-5	Cotter Pin	N/A	1
B-3851-1032	Washer	N/A	1
B-3840-()	Screw, 10-32, Fillister Head	N/A	A/R
B-3842-0750	Spring Pin, 3/32", Cres.	N/A	6
B-6544	Cap, Fitting, Lubrication	N/A	6
B-7073-L1	Bolt, 10-32, Hex Head	N/A	3
C-3317-018	O-ring	N/A	1
C-3317-115-1	O-ring	N/A	1
C-3317-210-1	O-ring	N/A	1
C-3317-228	O-ring	N/A	1
C-3317-251	O-ring	N/A	1
C-3317-340-()	O-ring	N/A	3
C-3317-426-1	O-ring	N/A	1
C-7249	Slug, Counterweight	N/A	6
D-6105-2	Erosion Shield, Blade, 7690	D-6105-3	3
D-7327	Spinner Assembly	C-3568	1
D-7248	PCP:Clamp, Counterweight	N/A	3
C7690E	PCP:Blade Assy, Composite	7690()	3
D-3251-2R	PCP:Hub Unit , HC-C3YR-(2,4)R	D-3251-1R	1
or			
E-7172-1R	PCP:Hub Unit , HC-C3Y(K,R)-(2,4)	E-7157-1R	1
or			
E-7172-11R	PCP:Hub Unit , HC-C3YR-(2,4)R	E-7157-11R	1
D-7267P	Spinner Assembly	D-6936-P	1
D-7248	PCP:Clamp, Counterweight	N/A	3
C7690E	PCP:Blade Assy, Composite	7690()	3

NOTE: The Hartzell Propeller Inc. E-7157-41R PCP:Hub Units, HC-C3Y(K,R)-(2,4) cannot be modified for compliance with this Service Bulletin.

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C. Governors

- (1) Replacement of the governor is required when a HC-() (2,3)YR-1() propeller is converted to a HC-() (2,3)YR-4().
- (2) Contact Hartzell Propeller Inc. Product Support for the part number of the new

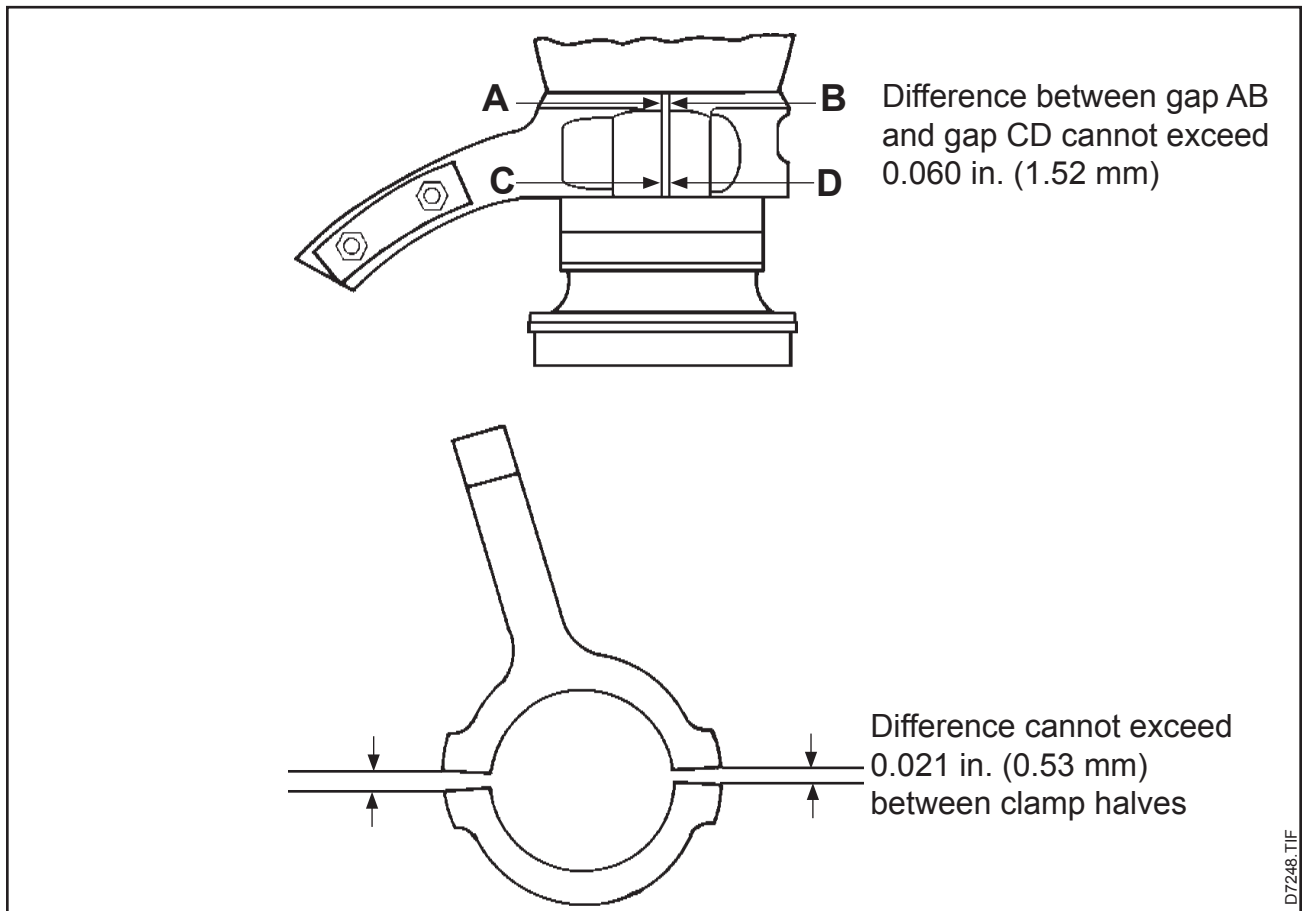


Figure 1 - Blade Clamp Installation

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governor required.

3. Accomplishment Instructions

CAUTION: INSTRUCTIONS AND PROCEDURES IN THIS SERVICE BULLETIN MAY INVOLVE PROPELLER CRITICAL PARTS. REFER TO THE APPLICABLE PROPELLER OVERHAUL OR OWNER'S MANUAL FOR INFORMATION ABOUT PROPELLER CRITICAL PARTS.

A. Disassembly

- (1) Disassemble the propeller in accordance with the Disassembly chapter of Hartzell Propeller Inc. Compact and Lightweight Compact Non-Feathering (-1) and Aerobatic (-4) Propeller Overhaul and Maintenance Manual 113B (61-10-13).
- (2) Upon disassembly, discard all consumable hardware (ie -O-rings, self-locking nuts, seals, etc.). The piston rod, spinner, and cylinder will be replaced with new components upon reassembly.

B. Hub Modification

- (1) Hartzell Propeller Inc. will perform a factory-only modification to convert the two-blade D-2201-17 hub to a D-2201-16 hub,.
- (2) Hartzell Propeller Inc. will perform a factory-only modification to convert the three-blade D-3251-1R hub to a D-3251-2R hub, or the E-7157-1R hub to a E-7172-1R hub, or the E-7157-11R hub to a E-7172-11R hub.

NOTE: Hub conversion involves boring out the piston rod bore of the hub and installing a bushing. A newly manufactured hub will not have this bushing installed. Although the converted hub will differ in appearance from a newly manufactured hub, the converted (bushed) hubs are to be considered functionally identical and interchangeable with the newly manufactured (unbushed) hubs.

- (3) The modified hub must be restamped to indicate the new part number:
 - (a) Restamp the D-2201-17 hub as a D-2201-16 hub.
 - (b) Restamp the D-3251-1R hub as a D-3251-2R hub.
 - (c) Restamp the E-7157-1R hub as a E-7172-1R hub.

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(d) Restamp the E-7157-11R hub as a E-7172-11R hub.

C. Blade Modification

- (1) Return the 7690(A,C) blades to Hartzell Propeller Inc. Hartzell Propeller Inc. will perform a factory-only modification in accordance with Hartzell Propeller Inc. Service Bulletin HC-SB-61-329 to convert the 7690(A,C) blades to C7690E blades.
- (2) The 7690(A,C) blades will be re-stamped with a "C" prefix letter to indicate that the blades are now counterweighted.

D. Counterweight Installation

- (1) Counterweight installation will be performed by Hartzell Propeller Inc. at the time of conversion. Should counterweight reinstallation be required in the future, install the counterweight in accordance with these instructions.
- (2) Install the counterweight in accordance with Hartzell Propeller Inc. Composite Propeller Blade Maintenance Manual 135F (61-13-35).

E. Propeller Assembly

- (1) Using the parts listed in the "New Part Number" column under Paragraph 2.A., assemble the propeller in accordance with the Assembly chapter of Hartzell Propeller Inc. Compact and Lightweight Compact Non-Feathering (-1) and Aerobatic (-4) Propeller Overhaul and Maintenance Manual 113B (61-10-13).

NOTE: When reassembling the propeller, the assembly instructions for the Aerobatic (-4) Propellers should be followed.

- (2) Re-identify the propeller model by restamping the hub to reflect the new propeller model, either HC-()2YR-4() for a two blade propeller, or HC-()3YR-4() for a three blade propeller as appropriate.
- (3) Make a log book entry to record propeller overhaul, propeller model number

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and blade model number change, and compliance with this Service Bulletin.

F. Aircraft Modification - Governor Removal, Aircraft Without an Accumulator System

WARNING: ALWAYS FOLLOW AIRFRAME MANUFACTURER'S MANUALS AND PROCEDURES. THEY MAY CONTAIN ISSUES VITAL TO AIRCRAFT SAFETY THAT ARE NOT CONTAINED IN THIS SERVICE BULLETIN.

CAUTION: USE ADEQUATE PRECAUTIONS TO PROTECT THE GOVERNOR ASSEMBLY FROM DAMAGE WHEN IT IS REMOVED FROM THE AIRCRAFT ENGINE AND WHEN IT IS STORED. DO NOT ALLOW PRESSURE AGAINST GOVERNOR BODY WITH A WRENCH WHEN REMOVING THE NUTS.

- (1) Remove the aircraft linkage and any other rigging from the governor.
- (2) Remove nuts and washers holding the governor to the engine pad in accordance with the Airframe Manufacturer's instructions.
- (3) Remove the governor.

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(4) Remove and discard the mounting gasket.

G. Aircraft Modification - Governor and Accumulator System Removal (if applicable)

(1) Some aerobatic propeller systems use a hydraulic accumulator that is located on the governor input line between the engine and the governor. This accumulator is not required following the propeller conversion. Remove the accumulator as follows:

WARNING: DURING ACCUMULATOR REMOVAL, AIRFRAME MANUFACTURER'S MANUALS AND PROCEDURES MUST BE FOLLOWED AS THEY MAY CONTAIN ISSUES VITAL TO AIRCRAFT SAFETY THAT ARE NOT CONTAINED IN THIS MANUAL.

CAUTION: USE ADEQUATE PRECAUTIONS TO PROTECT THE GOVERNOR ASSEMBLY FROM DAMAGE WHEN IT IS REMOVED FROM THE AIRCRAFT ENGINE AND WHEN IT IS STORED. DO NOT ALLOW PRESSURE AGAINST GOVERNOR BODY WITH A WRENCH WHEN REMOVING THE NUTS.

- (a) Remove the aircraft linkage and any other rigging from the governor.
- (b) Disconnect the oil line between the valve assembly and the accumulator.
- (c) Remove the accumulator and any associated mounting hardware.
 - 1 Refer to Hartzell Propeller Inc. Owner's Manual 145 (61-00-45) for required rework of the accumulator before storing or returning the accumulator to service.
- (d) Remove the governor and valve assembly.
- (e) Remove the studs from the governor mounting pad.
- (f) Install new 5/16-18 governor mounting studs in the engine:
 - 1 If a Hartzell Propeller Inc. governor is to be installed, install 5/16-18 x 1 3/4 inch mounting studs (Lycoming P/N 31C-14) to a driven height of 1.0 inch (25.4 cm).
 - 2 If a Woodward governor is to be installed, install 5/16-18 x 2.00 inch mounting studs (Lycoming P/N 31C-16) to a driven height of 1.31 inch (33.3 cm).
- (g) Make a log book entry to record the removal of the accumulator, if

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appropriate.

H. Installation of the Governor Assembly to the Engine

WARNING: DURING GOVERNOR INSTALLATION, AIRFRAME MANUFACTURER'S MANUALS AND PROCEDURES MUST BE FOLLOWED AS THEY MAY CONTAIN ISSUES VITAL TO AIRCRAFT SAFETY THAT ARE NOT CONTAINED IN THIS SERVICE BULLETIN.

CAUTION: USE ADEQUATE PRECAUTIONS TO PROTECT THE GOVERNOR ASSEMBLY FROM DAMAGE WHEN IT IS INSTALLED ON THE AIRCRAFT ENGINE. DO NOT GOUGE OR PUT PRESSURE AGAINST THE GOVERNOR BODY WITH A WRENCH WHEN REMOVING NUTS. FOR E,U AND V SERIES GOVERNORS USE CAUTION WHEN USING AN OPEN END WRENCH TO TIGHTEN MOUNTING NUTS. THE WRENCH CAN GET CAUGHT BETWEEN THE MOUNTING NUT AND GOVERNOR BODY WALL CAUSING THE WALL OF BODY TO BE PUSHED INWARD.

- (1) Install the governor in accordance with the Airframe and Engine manufacturer's manuals and procedures and Hartzell Propeller Inc. Service Letter HC-SL-61-277.
- (2) Make a log book entry to record the governor change.

I. Propeller Installation and Operational Check

- (1) Install the propeller in accordance with Hartzell Propeller Inc. Owner's Manual 145 (61-00-45).
- (2) Perform an operational check of the propeller assembly in accordance with the Hartzell Propeller Inc. Owner's Manual 145 (61-00-45).

J. Hartzell Propeller Inc. Contact Information

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