

INST-061920

**INSTRUCTIONS FOR INSTALLATION OF HARTZELL**

**HC-C3YF-1N/NM8410(B,K)-4**

**PROPELLER ON BEEHCRAFT BONANZA-SERIES AIRCRAFT**

**STC SA04505CH**

**LOG OF REVISIONS**

Revision	Revised Pages	Description of Revision	Date
IR	All	Initial Release	03/18/2021

NOTE: All changes are indicated by a black vertical line along the left margin.

FAA Approved \_\_\_\_\_

Les Doud  
STC ODA Administrator  
Hartzell STC ODA-100080-CE

Date \_\_\_\_\_

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*Please read these instructions and the Instructions for Continued Airworthiness before starting installation. If you have any questions regarding installation of this STC, please contact Hartzell Propeller at:*

*Phone: (937) 778-4376 or  
1-800-942-7767*

*E-mail: [techsupport@hartzellprop.com](mailto:techsupport@hartzellprop.com)*

***Engineering Drawing disclaimer***

The figures provided in the following installation instructions are for reference only. In the event of a disagreement between the current revision of the drawing on file at Hartzell Propeller, Inc. and the figures in this document, the current revision of the drawing shall be used.

***List of required documents and/or drawings***

Hartzell Propeller Owner's Manual No. 145 ..... All installations (Included w/ STC kit)  
Hartzell Ice Protection System Manual No. 180 ..... All installations with ice protection  
(Available online)  
Hartzell Ice Protection Installation Drawing 106833 ..... Electrothermal de-ice only (Included  
w/ STC kit, if applicable)

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**1.0 General**

These STC installation instructions provide the necessary information to install the HC-C3YF-1N/NM8410(B,K)-4 propeller with applicable aluminum spinner, along with optional governor model S-1-35, on Beechcraft Bonanza-series aircraft noted in Section 2.0. The “K” blade model suffix denotes optional de-ice boots.

**2.0 Applicable Models**

The table below summarizes the aircraft models included in this STC along with the required engine. No other aircraft / engine combinations are applicable.

It is the responsibility of the installer to verify compatibility of this STC with previously approved modifications installed on the airplane.

**Table 1: Aircraft Effectivity**

<b>Model</b>	<b>Aircraft Serial Number Range</b>	<b>Engine Model</b>	<b>Engine Power/RPM Takeoff Rating</b>
S35	D-7140 D-7310 through D-7976	IO-520-(B, BB)  IO-550-B	285 HP @ 2700 RPM
V35	D-7977 through D-8598		
V35A	D-8599 through D-9068		
V35B	D-9069 and up		
35-C33A	CE-1 though CE-179		
E33A	CE-180 though CE-289		
E33C	CJ-1 though CJ-25		300 HP @ 2700 RPM
F33A	CE-290 and up		
F33C	CJ-26 and up		
36	E-1 through E-184		
A36	E-185 thru E-2110		
	except E-1946 and E-2104		

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## INSTRUCTIONS FOR INSTALLATION OF HARTZELL

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#### 3.0 Propeller Installation – No Ice Protection

**Note:** To minimize airframe vibration during operation, rotate the engine crankshaft to position #6 cylinder piston at top-dead-center before removing original propeller.

- 1) Remove the original propeller and spinner in accordance with the applicable Aircraft Maintenance Manual (AMM).

**Note:** The chapter references in the following steps are contained in the Installation and Removal section of Hartzell Propeller Owner's Manual No. 145.

- 2) Unpack and inspect the new propeller according to Chapter 2 of Hartzell Propeller Owner's Manual No. 145 (Manual 145). If installing the optional Hartzell S-1-35 governor, refer to Section 5.0 of this document.
- 3) Install the spinner bulkhead onto the new propeller hub in accordance with the "Installation of a Metal Spinner Bulkhead" instructions in the "Bulkhead Installation" section of the Manual 145.

**Note:** Mount the new propeller to engine flange so that one blade is horizontal with and parallel to cylinder #6.

- 4) Follow instructions for "Installation of "F" Flange Propellers" in Manual 145 to install the new propeller and spinner dome onto the aircraft. Additionally, reference the appropriate AMM specific to the airplane model and S/N being modified.
- 5) Attach Hartzell Propeller, Inc. Airplane Flight Manual Supplement AFMS-061920 to the existing Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual.
- 6) Revise weight and balance records to show:

**Removal** of original propeller and spinner

Refer to aircraft records and/or Required Equipment List for appropriate propeller weight and moment arm.

**Installation** of new propeller and spinner

Item	Model	Weight (lb)	Arm
Propeller	HC-C3YF-1N/NM8410-4	57.7	Refer to Aircraft Equipment List
Spinner w/ mounting kit, painted	A-2295-15	6.2	Refer to Aircraft Equipment List

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Item	Model	Weight (lb)	Arm
Spinner w/ mounting kit, polished	A-2295-15P	5.8	Refer to Aircraft Equipment List
Governor (optional)	S-1-35	2.9	Refer to Aircraft Equipment List

- 7) Perform Post-Installation Checks in accordance with Manual 145.
- 8) Make the appropriate logbook entries and return the aircraft to service with FAA Form 337 referencing this STC.
- 9) Perform a functional check flight using normal procedures, note maximum RPM setting, and adjust governor high-RPM stop in accordance with AMM procedures, if necessary.
- 10) Post-installation dynamic balance of the propeller/engine combination is recommended, but not required, in accordance with the Maintenance Practices section of Manual 145.

**4.0 Propeller Installation – Electrothermal Ice Protection (not approved for Flight Into Known Icing)**

**Note:** To minimize airframe vibration during operation, rotate the engine crankshaft to position #6 cylinder piston at top-dead-center before removing original propeller.

- 1) Remove the original propeller and spinner in accordance with the applicable Aircraft Maintenance Manual (AMM).

**Note:** The chapter references in the following steps are contained in the Installation and Removal section of Hartzell Propeller Owner's Manual No. 145.

- 2) Unpack and inspect the new propeller according to Chapter 2 of Hartzell Propeller Owner's Manual No. 145 (Manual 145). If installing the optional Hartzell S-1-35 governor, refer to Section 5.0 of this document.
- 3) Verify/inspect spinner bulkhead and propeller-mounted de-ice components are properly installed and secured on the new propeller in accordance with Hartzell Ice Protection Installation Drawing 106833.
- 4) Install the engine-mounted propeller de-ice components and associated bracket on the engine by following the steps below. Installation instructions for airframe de-ice kit 108347 within Hartzell Propeller Ice Protection System Manual 180 (Manual 180)

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contains additional details for this procedure. Instructions for Continued Airworthiness (ICA) are also included on drawing 106833 and detailed in Manual 180.

- i. Disconnect brush block wires from existing brush block. For future reference, it may be beneficial to take a photo of the wiring/installation prior to removing any components.
- ii. Remove existing de-ice brush block, bracket, and attaching parts from the engine.
- iii. Temporarily position brush block shim 1H1157 and brush block assembly 3H2062-2 onto the brush block bracket 106803 using the hardware stack-up shown in Figure 1. For ease of alignment, do not torque hardware at this time.

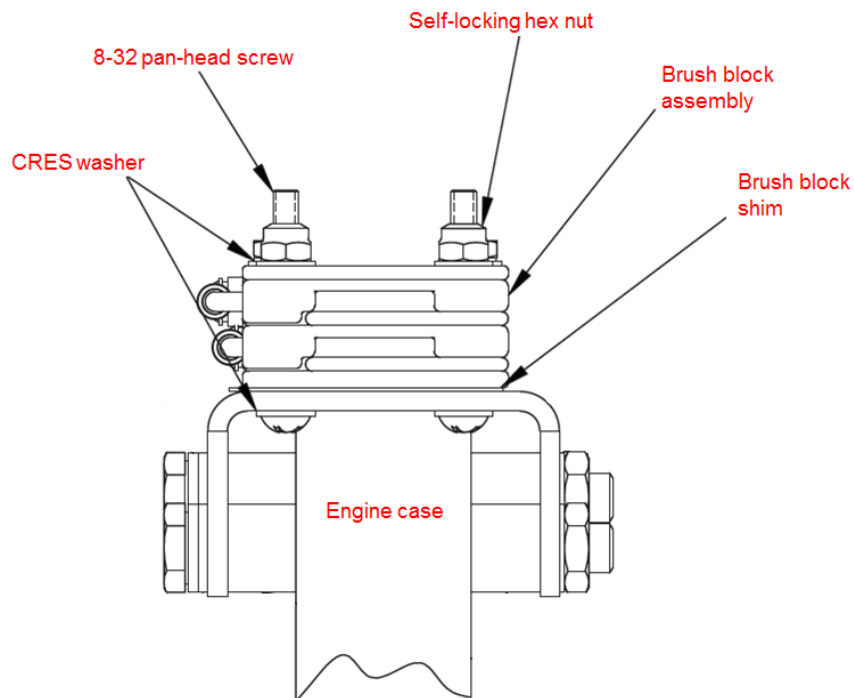


Figure 1: Brush Block Assembly Hardware Detail - View Looking Aft

- iv. Position MOV module 106802 onto the brush block bracket using the hardware stack-up shown in Figure 2. The MOV module should have two wires already attached. Torque attaching hardware on the MOV only according to Hartzell Ice Protection Installation Drawing 106833 and/or Manual 180.

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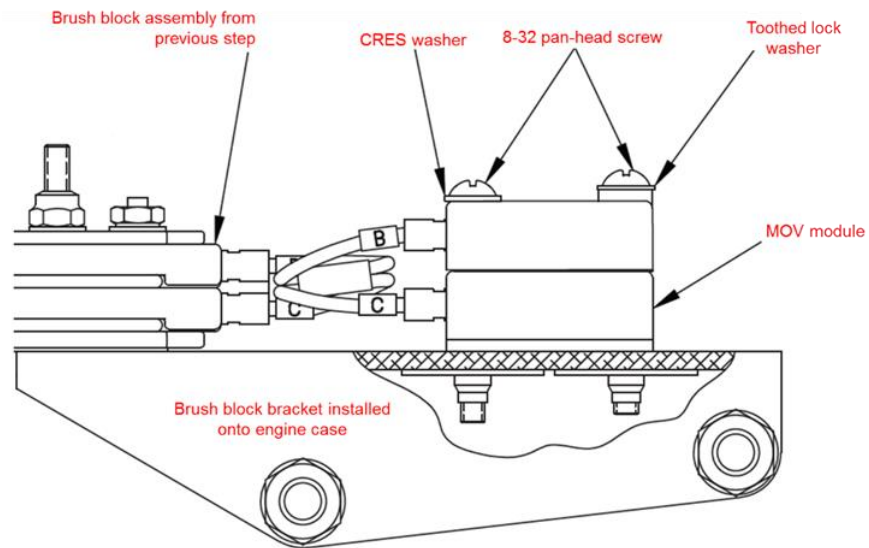


Figure 2: MOV Module Hardware Detail - Left Side View

- v. Attach wiring harness between MOV module and brush block assembly as follows. Route the wire harness similar to Figure 3.
  - a) Connect MOV wire B to brush block assembly terminal B
  - b) Connect MOV wire C to brush block assembly terminal C
  - c) Connect inboard brush ring terminal to engine ground



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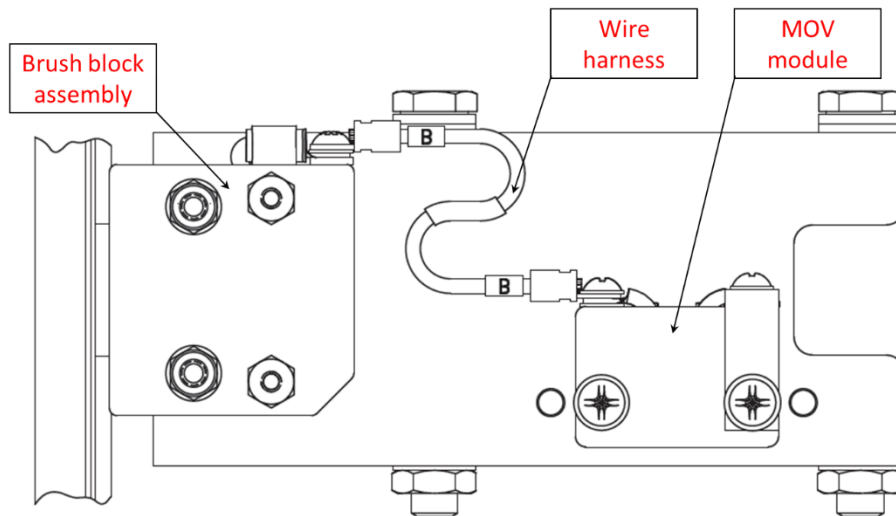


Figure 3: MOV Module Wire Routing

- vi. Using string tie (or similar), temporarily retract brush block brushes to prevent damage to the brushes or propeller during propeller positioning.
  - vii. Install brush block bracket in place of the removed bracket. Torque hardware holding the bracket to engine according to AMM procedures and/or Engine Maintenance Manual procedures.
- 5) Install the spinner bulkhead onto the new propeller hub in accordance with the "Installation of a Metal Spinner Bulkhead" instructions in the "Bulkhead Installation" section of the manual.
  - 6) Slide the de-ice slip ring 106613 over the engine flange. Allow it to hang between the engine case and engine flange. Exercise caution as to not damage the de-ice slip ring or the engine flange.

**Note:** Mount the new propeller to engine flange so that one blade is horizontal with and parallel to cylinder #6.
  - 7) Using proper support equipment, position the propeller onto the engine flange according to the instructions for "Installation of "F" Flange Propellers" in Manual 145. Do not install mounting hardware yet.
  - 8) In Manual 180, follow the installation instructions for airframe de-ice kit 108347 to secure the split mounting plate 4H3153 to the de-ice slip ring. Be sure the slip ring is located at the proper clock position to allow proper connection to the electrical terminals on the

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spinner bulkhead. This step will also cover the installation of the propeller to the engine flange in accordance with Manual 145.

**Note:** At this point, the brush block bracket should be properly secured and torqued to the engine case, the MOV module secured and torqued with wire harness routed to brush block assembly, and the propeller/spinner bulkhead/de-ice slip ring/split mounting plate assembly properly secured and torqued to the engine flange. The brush block assembly should not yet be secure and the airframe de-ice leads should not yet be connected.

**CAUTION: USE CARE NOT TO OVER-TORQUE THE BRUSH BLOCK SCREWS. ASSURE BRUSHES MOVE FREELY WITHIN THE HOUSING.**

- 9) Release the brush block assembly brushes from their temporarily-retracted position.
- 10) Follow the "Brush Alignment to Slip Ring" instructions in the "Assembly" section of Manual 180 to properly adjust and align the brush block brushes to the slip ring. Brush block assembly shims may be used as required (including zero shims) to ensure proper brush/slip ring alignment. Once alignment of the brushes is correct, torque the brush block assembly attaching hardware per Hartzell Ice Protection Installation Drawing 106833 and/or Manual 180.
- 11) Electrically-connect the propeller de-ice boots to the slip ring using the electrical terminals of the propeller bulkhead according to Hartzell Ice Protection Installation Drawing 106833.
- 12) Perform Post-Installation Checks in accordance with Manual 145.

**CAUTION: DO NOT OPERATE THE DE-ICE BOOTS FOR MORE THAN 30 SECONDS WITH THE ENGINE NOT OPERATING. OVERHEATING OF THE DE-ICE BOOT CAN CAUSE DAMAGE TO THE PROPELLER BLADES.**

- 13) Perform "Propeller De-ice Operational Check (Rotating)" in the "Inspection Procedures" section of Manual 180.
- 14) Once operational checks are satisfactory, install the A-2295-15(P) spinner dome according to the instructions for "One-Piece Spinner Dome Installation" in the Spinner Installation section of Manual 145.
- 15) Attach Hartzell Propeller, Inc. Airplane Flight Manual Supplement AFMS-061920 to the existing Pilot's Operating Handbook and FAA-Approved Airplane Flight Manual.

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16) Revise weight and balance records to show:

**Removal** of original propeller and spinner

Refer to aircraft records and/or Required Equipment List for appropriate propeller weight and moment arm.

**Installation** of new propeller and spinner

Item	Model	Weight (lb)	Arm
Propeller	HC-C3YF-1N/NM8410K-4	58.5	Refer to Aircraft Equipment List
Spinner w/ mounting kit, painted	A-2295-15	6.2	Refer to Aircraft Equipment List
Spinner w/ mounting kit, polished	A-2295-15P	5.8	Refer to Aircraft Equipment List
Airframe de-ice kit	108347	4.0	Refer to Aircraft Equipment List
Governor (optional)	S-1-35	2.9	Refer to Aircraft Equipment List

17) Make the appropriate logbook entries and return the aircraft to service with FAA Form 337 referencing this STC.

18) Perform a functional check flight using normal procedures, note maximum RPM setting, and adjust governor high-RPM stop in accordance with AMM procedures, if necessary.

19) Post-installation dynamic balance of the propeller/engine combination is recommended, but not required, in accordance with the Maintenance Practices section of Manual 145.

**5.0 Governor Installation (Optional)**

- 1) Gain access to the currently-installed governor in accordance with the applicable AMM procedures.
- 2) Remove the currently-installed governor in accordance with the applicable AMM procedures.
- 3) Install the new Hartzell S-1-35 governor in accordance with the applicable AMM procedures.
- 4) Return to remaining steps for propeller installation.