Hartzell Propeller Inc.
One Propeller Place
Piqua, OH 45356

HP46-310-NST

Revision 2 – March 16, 2009

INSTRUCTIONS FOR INSTALLATION AND POST-MAINTENANCE RE-INSTALLATION OF A HARTZELL PHC-G3YF-1E/7890(K) PROPELLER ON PIPER PA-46-310P MALIBU AIRCRAFT

LOG OF REVISIONS

Revision	Revised Page(s)	Description of Revision	Engineer	Date
1	3,4 & 5	Updated revision log and page header. Added "wire" to New AWG...pg3 B1-8,10, 11 pg 4 B2-6,8,9. Revised SN effectivity and dwg refs for std installation pg 4. Pg 5 add alternate instructions revised SN effectivity B2-12.	L. Doud	12-9-02
2	All	Added bracket modification sketch and reformat entire document. Added Product Support contact information.	L. Doud	3/16/09

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

FAA Approved _____ Date _____

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Please read these instructions and the Maintenance Manual Supplement before starting installation. If you have any questions regarding installation of this STC, please contact Hartzell Propeller at:

Phone: (937) 778-4379 or
1-800-942-7767

E-mail: techsupport@hartzellprop.com

NOTE: Approximately 35 hours of labor are required to install the STC kit.

Section A, Firewall-Forward Installation

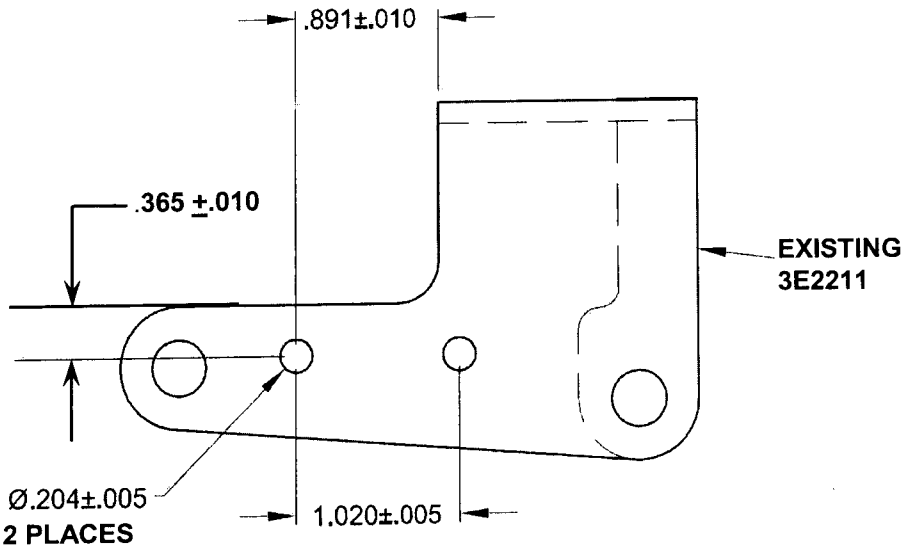
A1. Remove original propeller and spinner.

A2. Install new spinner bulkhead on the propeller per Hartzell Manual 145.

A3. Install propeller de-ice system rotating components on the propeller per Goodrich drawing 5E2707.

A4. Install new propeller and spinner dome on the aircraft in accordance with Hartzell Manual 145.

A5. Modify propeller brush block bracket per the sketch below and and install M.O.V. assembly per Goodrich drawing 5E2707.



BRACKET MODIFICATION

INSTRUCTIONS FOR INSTALLATION OF A HARTZELL PHC-G3YF-1E/7890(K) PROPELLER ON PIPER PA-46-310P MALIBU AIRCRAFT

A6. Install the propeller de-ice equipment per Goodrich drawing 5E2707.

Section B, Cabin Equipment Installation

For Aircraft S/N 46-8408001 Thru 46-8408037

Reference Hartzell Drawing E-7623 and Goodrich Drawing 5E2707 for additional propeller de-ice system installation details.

B1-1. Replace existing 15 amp PROP HEAT circuit breaker in the pilots-side circuit breaker panel with a 20 amp circuit breaker (see drawing E-7623 Detail B).

B1-2. Disable existing Prop Heat relay (K313). Cap and stow the wires from P319-7 (cap and stow at circuit breaker panel), P319-17 (cap and stow at prop heat ammeter shunt) and P319-18 (cap and stow at PROP HEAT switch) to disable relay. Relay will remain installed but non-functional.

B1-3. Remove and discard existing PROP HEAT switch (S318). Install new higher-rated switch (see drawing E-7623 Detail G). Install bus wire for switch light ground and dimmer controls on switch (see drawing E-7623 Detail G). Cap and stow existing ground wire formerly attached to Terminal 3 of the old PROP HEAT switch.

B1-4. Route new AWG 14 wire from the PROP HEAT circuit breaker to Terminal 2 of the PROP HEAT switch on the instrument panel (see drawing E-7623 Detail A).

B1-5. Route new AWG 14 wire from Terminal 3 on PROP HEAT switch to positive side terminal on existing propeller heat ammeter shunt.

B1-6. Remove existing D8A16 wire from negative side of propeller heat ammeter shunt and connect to the unused Terminal 6 of the SURF DE-ICE switch (see drawing E-7623 Detail C).

B1-7. Replace propeller heat ammeter (see Hartzell Drawing E-7623 and Goodrich drawing 5E2707).

B1-8. Route new AWG 14 wire from the negative terminal of the propeller heat ammeter shunt to the Pressure Bulkhead Connector P304 (see drawing E-7623 Detail A). Splice two AWG 16 wires onto the new AWG 14 wire and terminate in Pins 3 & 4 of Pressure Bulkhead Connector P304 (cockpit side of pressure bulkhead).

B1-9. Connect existing D8B16 wire to terminal "G" on the prop de-ice timer (wire originates from Pressure Bulkhead Connector P402).

B1-10. Route new AWG 14 wire from the Pressure Bulkhead Connector P402 (firewall side of pressure bulkhead, see drawing E-7623 Detail A) to the existing prop de-ice timer

in the forward baggage compartment and connect to Terminal B on the de-ice timer. Splice two AWG 16 wires onto the new AWG 14 wire and terminate in Pins 3 & 4 of Pressure Bulkhead Connector P402 (firewall side of pressure bulkhead).

B1-11. Route new AWG 14 wire from prop de-ice timer terminal "C" forward through engine compartment to terminal "A" on the engine-mounted brush-block assembly.

B1-12. Connect new AWG 16 wire to the unused Terminal 4 of the SURF DE-ICE switch and route to ground (see drawing E-7623 Detail C).

B1-13. Install new Squat Switch Relay KUP-17D55-24 on torque tube support bracket per drawing E-7623 Detail D.

B1-14. Route new AWG 16 wire from Terminal 6 of the SURF DE-ICE switch to Terminal 8 of new squat switch relay. Route new AWG 16 wire from Terminal 12 of new squat switch relay to ground (see drawing E-7623 Detail C & E). Cut and splice-in AWG 20 wire from Terminal A of squat switch relay to Pin 1 of Gear Safety Solenoid connecter P336. Route new AWG 20 wire from Terminal B of squat switch relay to ground. Install Diode on squat switch relay concurrently with wires to Terminals A and B (see drawing E-7623 Detail E, observe diode polarity).

B1-15. Install the following label above the surface de-ice switch: "PROP HEAT TEST (10 sec. max) "

For Aircraft S/N 46-8408038 THRU 46-8608067, 4608001 and Up

Reference Hartzell Drawing E-7623 and Goodrich Drawing 5E2707 for additional propeller de-ice system installation details.

B2-1. Replace existing 15 amp PROP HEAT circuit breaker in the pilots-side circuit breaker panel with a 20 amp circuit breaker (see drawing E-7623 Detail B).

B2-2. Route new AWG 14 wire from the PROP HEAT circuit breaker to the PROP HEAT switch on the instrument panel (see drawing E-7623 Detail A). Cap and stow or remove existing wire.

B2-3. Route new AWG 14 wire from PROP HEAT switch to existing propeller heat ammeter shunt. Cap and stow or remove existing wiring.

B2-4. Remove existing D8A16 wire from negative side of propeller heat ammeter shunt and connect to the unused Terminal 6 of the SURF DE-ICE switch (see drawing E-7623 Detail C).

B2-5. Replace propeller heat ammeter (see Hartzell Drawing E-7623 and Goodrich drawing 5E2707).

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B2-6. Route new AWG 14 wire from the negative side terminal of the propeller heat ammeter shunt to the Pressure Bulkhead Connector P304 (see drawing E-7623 Detail A). Splice two AWG 16 wires onto the new AWG 14 wire and terminate in Pins 3 & 4 of Pressure Bulkhead Connector P304 (cockpit side of pressure bulkhead).

B2-7. Connect existing D8B16 wire to terminal "G" on the prop de-ice timer (wire originates from Pressure Bulkhead Connector P402).

B2-8. Route new AWG 14 wire from the Pressure Bulkhead Connector P402 (firewall side of pressure bulkhead, see drawing E-7623 Detail A) to the existing prop de-ice timer in the forward baggage compartment and connect to "B" terminal. Splice two AWG 16 wires onto the new AWG 14 wire and terminate in Pins 3 & 4 of Pressure Bulkhead Connector P402 (firewall side of pressure bulkhead).

B2-9. Route new AWG 14 wire from prop de-ice timer terminal "C" forward through engine compartment to terminal "A" on the engine-mounted brush-block assembly.

B2-10. Connect new AWG 16 wire to the unused Terminal 4 of the SURF DE-ICE switch and route to ground (see drawing E-7623 Detail C).

B2-11. Install new Squat Switch Relay KUP-17D55-24 on torque tube support bracket (see drawing E-7623 Detail D).

B2-12. Aircraft SN 46-8408038 THRU 46-8608067, 4608001 THRU 4608007 ONLY
Route new AWG 16 wire from Terminal 6 of the SURF DE-ICE switch to Terminal 8 of new squat switch relay. Route new AWG 16 wire from Terminal 12 of new squat switch relay to ground (see drawing Detail C & E). Cut and splice-in AWG 20 wire from Terminal A of squat switch relay to Pin 1 of Gear Safety Solenoid connecter P336 . Route new AWG 20 wire from Terminal B of squat switch relay to ground. Install Diode on squat switch relay concurrently with wires to Terminals A and B (see drawing E-7623 detail E, observe diode polarity).

Aircraft SN 4608008 & UP
Route new AWG 16 wire from Terminal 6 of the SURF DE-ICE switch to new squat switch relay Terminal 4. Route new AWG 16 wire from Terminal 12 of new squat switch relay to ground (see drawing Detail C & E). Cut and splice-in or connect with ring terminal a AWG 20 wire from Terminal A of squat switch relay to wire G6F22 at S342 Gear Select Switch (See drawing E-7623 Detail F). Route new AWG 20 wire from Terminal B of squat switch relay to ground. Install Diode on squat switch relay concurrently with wires to Terminals A and B (See drawing E-7623 Detail E, observe diode polarity).

B2-13. Install the following label above the surface de-ice switch: "PROP HEAT TEST (10 sec. max) "

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Section C, Functional Ground Test

CAUTION: OPERATION OF THE PROPELLER DE-ICE SYSTEM WITHOUT THE ENGINE RUNNING IS LIMITED TO 10 SECONDS OR SEVERE DAMAGE TO THE COMPOSITE BLADES MAY RESULT.

NOTE: It is recommended that a person be stationed near the propeller touching the de-ice boots while the functional test is conducted to warn of any unintended de-ice boot heating. Propeller should be slowly rotated by hand with the propeller heat ON to minimize possibility of overheating and arcing of brush-block and slip-ring.

C1. With engine off, turn on battery master and note the voltage on the aircraft voltmeter.

C2. Turn on propeller de-ice (PROP HEAT switch). Verify that propeller de-ice current is zero. Zero de-ice current indicates that the "squat" switch lockout is functioning properly.

C3. Next, with prop heat still on, push and hold (maximum of 10 seconds) the SURF DEICE switch (functions as propeller de-ice "push to test"). The propeller de-ice ammeter should indicate current flow, which verifies that the test function is working properly. Note heating of de-ice boots through touch.

NOTE: Normal de-ice current (green arc) may not be achieved on battery power.

C4. Shut off all aircraft electrical equipment.

C5. Turn on the battery master and the propeller de-ice and note zero prop de-ice current. With the propeller de-ice still on, depress the "squat" switch on the left main landing gear. The propeller de-ice ammeter should now indicate current flow. This verifies that the squat switch circuit functions properly allowing de-ice function in flight (with weight off the wheels). Shut off all aircraft electrical equipment.

C6. Jack aircraft and swing the landing gear per Piper maintenance manual procedures to ensure that the landing gear ground lockout/squat switch system still functions properly.

C7. With aircraft secured, start engine and cycle propeller several times to fill the propeller cylinder with oil. At 1200 RPM, turn on prop de-ice and depress test button. Prop de-ice ammeter should be in the normal operating range (green arc).

C8. Shut down engine. Check engine oil level and replenish as necessary.

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Section D, Documentation

D1. Attach Hartzell Propeller Inc. Airplane Flight Manual Supplement HP46-310-AFMS to existing Piper Airplane Flight Manual.

D2. Revise weight and balance records to show the removal of the original two-blade propeller and spinner and the installation of the three-blade propeller and spinner. The moment arm for the three-blade installation moves forward one inch:

Item	Weight (lbs)	Arm (inches)	Moment (in-lbs)
(Remove) Propeller, Hartzell BHC-C2YF-1BF/F8052(K)	-53	31.2	-1654
(Remove) Spinner, D-4810P	-5.7	29.0	-165
(Add) Propeller, Hartzell PHC-G3YF-1E/7890(K)	62.75	30.2	1895
(Add) Spinner, C-3535-3P	4.98	28.0	139
Total Change =	9.03	----------	215

D3. Make aircraft logbook entry and return aircraft to service with FAA Form 337 referencing STC.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

DATE: 3/17/09

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STATEMENT OF COMPLIANCE WITH THE FEDERAL AVIATION REGULATIONS

AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATIONS

MAKE	MODEL NO.	TYPE *(Airplane, Radio, Helicopter, etc.)*	NAME OF APPLICANT
Piper Aircraft	PA-46-310P	Airplane	Hartzell Propeller Inc.

LIST OF DATA

IDENTIFICATION	TITLE
Document: HP46-310-NST Revision 2 dated March 16, 2009	Instructions for Installation and Post-Maintenance Re-Installation of a Hartzell PHC-G3YF-1E/7890(K) Propeller on Piper PA-46-310P Malibu Aircraft.

END

PURPOSE OF DATA
Revision of Installation Instructions for STC SA01616CH.

APPLICABLE REQUIREMENTS *(List specific sections)*

23.901 Amendment 23-18

CERTIFICATION - Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under Part 183 of the Federal Aviation Regulations, data listed above and on attached sheets numbered XXX have been examined in accordance with established procedures and found to comply with applicable requirements of the Federal Aviation Regulations.

I (XX) therefore ☐ Recommend approval of these data
☒ Approve these data

SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)	DESIGNATION NUMBER(S)	CLASSIFICATION(S)
Leslie A. Doud	DERY-410155-CE	**Chart B – A7, B7, A16, B16 Chart G – A5, A7, A8, A10**

FAA FORM 8110-3 (11-70) SUPERCEDES PREVIOUS EDITION