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STC SA02677CH-D

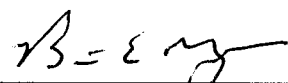
August 8, 2008

**INSTRUCTIONS FOR FIELD INSTALLATION**  
of a  
**HARTZELL HC-I3YR-1N/N7605(K)+2 or HC-I3Y1R-1N/N7605(K)+2 PROPELLER**  
**and D-6750-1(P) SPINNER**  
**ON PIPER PA-46-350P (MALIBU MIRAGE) AIRCRAFT**  
Serial Number 4622001 to 4622200 and 4636001 to 4636131

**LOG OF REVISIONS**

Revision	Revised Page(s)	Description of Revision	Engineer	Date
New	All	Original Release	B. Meyer	8/8/08

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

FAA Approved   
Brian E. Meyer  
DAS administrator  
Hartzell DAS-100082-CE

Date MARCH 13, 2009

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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) 778-4379 or  
1-800-942-7767*

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

**APPLICABLE MODELS**

Piper Models PA-46-350P (Malibu Mirage) as listed below with electric propeller de-ice:

Aircraft Serial Number
4622001 through 4622200
4636001 through 4636131

- NOTES:**
- 1) Approximately 40 hours of labor are required to install the STC kit if STC SA01340CH is not currently installed.
  - 2) These instructions require that the aircraft is in the type-certificated configuration with the two-blade Hartzell HC-I2YR-1BF/F8074(K) propeller installed or that Hartzell STC SA01340CH is already installed. If any other propeller has been installed, the aircraft must be returned to the original type-certificated configuration before installing this STC.
  - 3) If Hartzell STC SA 01340CH for the earlier 3-blade composite propeller installation has been installed, Section B below should be verified as being accomplished (since this is required under STC01340CH) and the steps in Section B do not need to be repeated.
  - 4) Hartzell Drawing E-7359, Revision G or later, is required.

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**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 Hartzell Drawing 102960.
- A4. Install new propeller and spinner dome on the aircraft in accordance with Hartzell Manual 145.
- A5. Install the engine-mounted propeller de-ice equipment per Hartzell Drawing 102960.

**Section B, Cabin Equipment Installation**

- B1. Replace existing 15 amp propeller heat circuit breaker in the pilots-side circuit breaker panel with a 20 amp breaker, per Hartzell Drawing E-7359.
- B2. Replace propeller heat ammeter per Hartzell Drawing E-7359.
- B3. Remove, or tape and tie back, existing 16 gage wires (D6A16 & D7A16) from the circuit breaker to the propeller heat switch and shunt located in the instrument panel. Replace with 14 gage wire per Hartzell Drawing E-7359.
- B4. Remove existing timer power wire (D8A16) from the shunt and retain for use as a control wire from the unused pole of the surface de-ice switch. This wire transitions to D8B16 as it passes through the pressure bulkhead and will now attach to terminal G of the timer instead of terminal B. The timer is located on the forward side of the pressure bulkhead in the baggage compartment.
- B5. Replace existing squat-switch relay per Hartzell Drawing E-7359. Relay assembly (K-7) is located aft of the pilots circuit breaker panel behind the interior side panel on SN's 4622001 through 4622075, under floorboard just forward of the co-pilot seat on SN's 4622076 and up.
- B6. Rewire cabin heat, vent/defog, propeller heat, and surface de-ice switches per Hartzell Drawing E-7359. The prop heat will now override the cabin heater; the surface de-ice switch will now also function as the prop heat ground test switch.

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- B7. Install the following label above the surface de-ice switch: "PROP HEAT TEST (10 sec. max) "
- B8. Electrical load effects: Replacement of the Hartzell HC-I2YR-1BF/F8074K two-blade propeller with a Hartzell HC-I3YR-1N/N7605K+2 or HC-I3Y1R-1N/N7605K+2 three-blade propeller increases the propeller heat (de-ice) current draw by 8.0 amps.

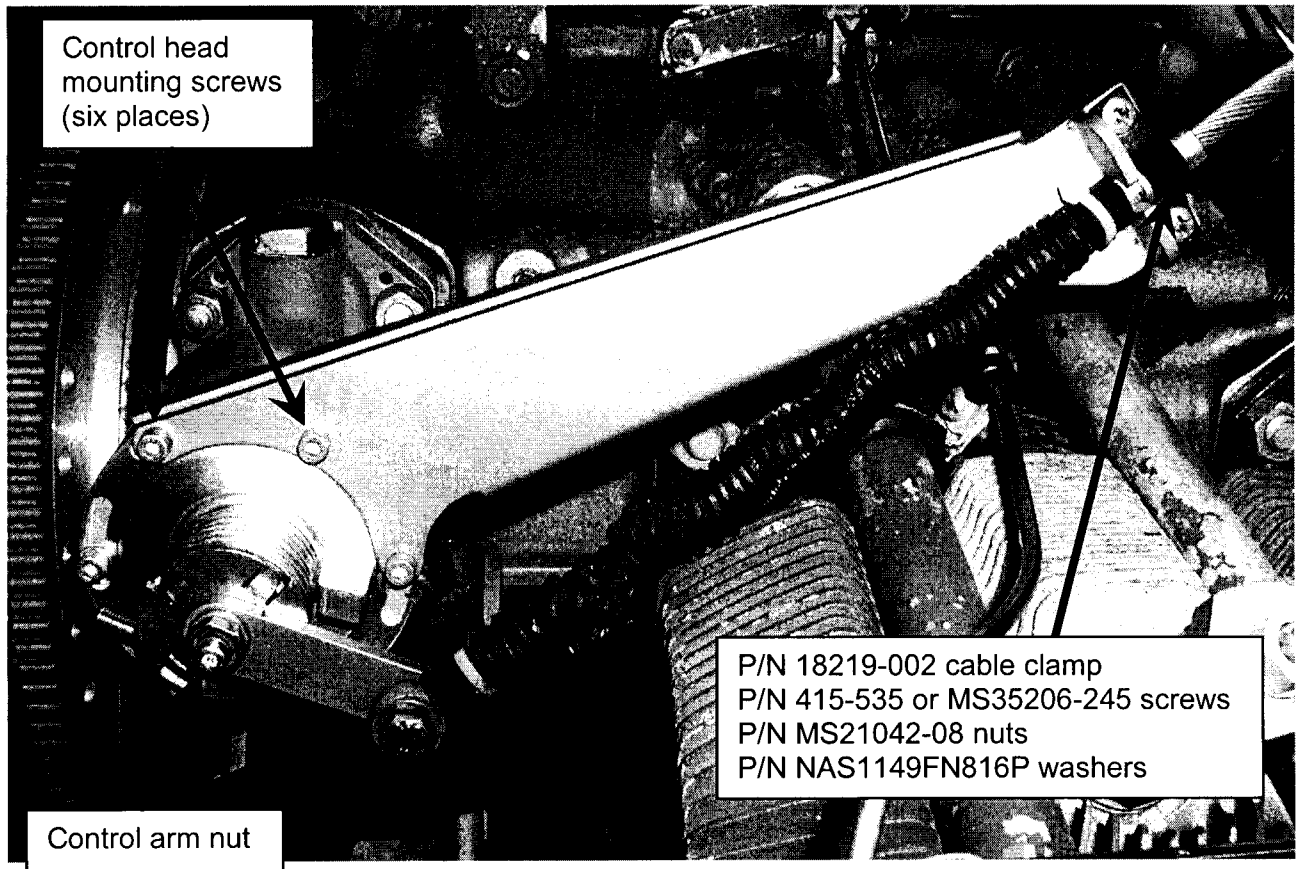
**Section C, Optional Governor Installation**

- C1. Hartzell governor S-1-30 may be installed in conjunction with this STC, however Hartzell governor models V-5-2 and V-11-1 remain approved and are compatible with this STC.
- C2. Remove current governor using the latest version of the aircraft maintenance manual.
- C3. Install Hartzell S-1-30 governor using the latest version of the aircraft maintenance manual. See Figure 1 for governor installation.
- C4. Attach the governor control cable to the bracket per the aircraft maintenance manual using the cable attachment Clamp (Piper P/N 18219-002), Screws (Piper P/N 415-535 or MS35206-245), Nut (MS21042-08) and Washer (NAS1149FN816P).
- C5. Attach cable rod end to governor control arm with bolt, nut and washers specified in airplane parts catalog and as shown in Figure 2. Verify full travel of propeller control lever in cockpit.
- C6. Adjust governor control arm and/or head only if necessary to obtain full travel of cockpit propeller control lever. The control arm can be reindexed on the shaft for large adjustments (7-15°) by removing the control shaft nut and washer (see Figure 1). Reposition the arm on the control shaft hex key as necessary. The control arm can be moved in smaller increments by flipping the arm and using the double-cut hex pattern. Reinstall arm, washer, nut and torque to 72-96 in-pounds.

The control head can also be rotated for small adjustments (~1°) if necessary to utilize the full travel of the propeller control lever. To adjust the head, loosen the six socket head cap screws securing the control head. Rotate the control head as necessary and snug the screws finger-tight. After adjustments are complete, remove the six mounting screws individually, coat threads of screw with Loctite 242 and torque the screws holding the cable bracket to 21-25 in-pounds (Note: that is inch-pounds, NOT foot-pounds).

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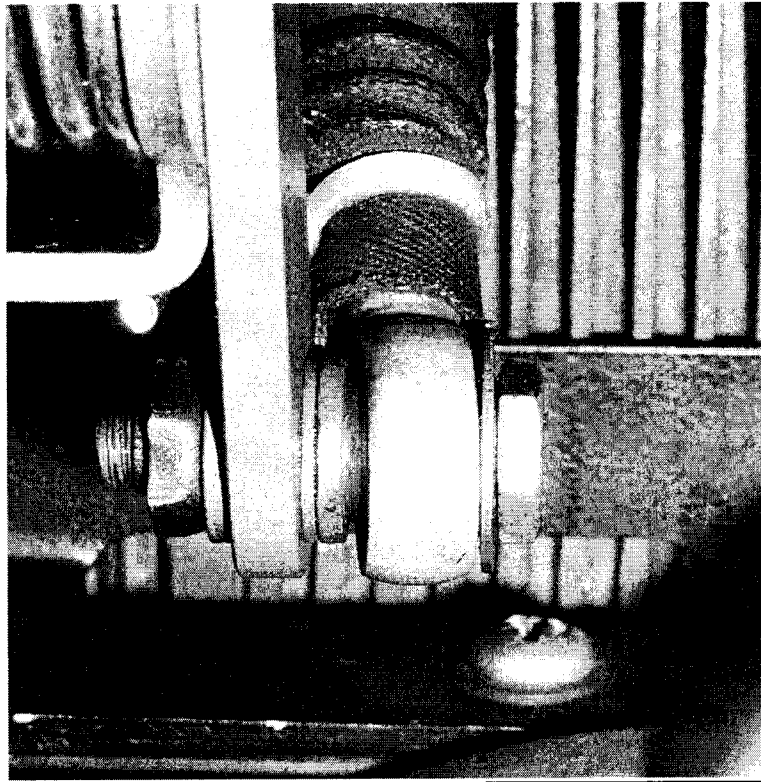
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**Figure 1**

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**Figure 2**

**Section D, 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 touching the de-ice boots while the functional test is conducted to warn of any unintended de-ice boot heating.

- D1. With engine off, turn on battery master and note the voltage on the aircraft voltmeter.
- D2. Turn on auxiliary cabin heat and blower; note voltage level (drop) on main voltmeter.

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- D3. Turn on propeller de-ice. Note the aircraft voltage increase. The increase verifies that the auxiliary cabin heater is shut off through the switch interlock. Verify that propeller de-ice current is zero. Zero de-ice current indicates that the "squat" switch lockout is functioning properly.
- D4. Next, with prop heat still on, push the propeller de-ice "push to test" (surface de-ice) switch. 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.
- D5. Shut off all aircraft electrical equipment.
- D6. Turn on 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.
- D7. Jack aircraft and swing the landing gear to ensure that the landing gear ground lockout/squat switch system still functions properly.
- D8. 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).
- D9. Shut down engine. Check engine oil level and replenish as necessary.

**Section E, Documentation**

- E1. Attach Hartzell Propeller Inc. Airplane Flight Manual Supplement AFMS\_080808\_350P97 to existing Piper Airplane Flight Manual.

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- E2. Revise weight and balance records to show the removal of the original propeller and spinner (and governor if applicable) and the addition of the following equipment at the same moment arm:

	Weight (pounds)
Propeller, Hartzell (HC-I3YR-1N/7605K+2)	63.5
Or, propeller, Hartzell (HC-I3Y1R-1N/7605K+2)	59.0
Spinner, Hartzell (D-6750-1(P))	5.0
Governor, Hartzell S-1-30 (optional)	3.3

Note: For aircraft without propeller de-ice subtract 0.8 pounds from the propeller weights above.

- E3. Make aircraft logbook entry and return aircraft to service with FAA Form 337 referencing STC.
- E4. Perform a functional check-flight using normal procedures, note maximum RPM setting and readjust governor high-RPM stop if necessary.
- E5. Post-installation dynamic balance of the propeller/engine combination is recommended but not required. Dynamic balance information is provided in the Maintenance Practices section of Hartzell Owner's Manual 145.