

INST_102706, Revision C, 4/10/08

INSTRUCTIONS FOR INSTALLATION

OF A HARTZELL HC-C2YR-1BFP/F7497 OR HC-C2YR-1N/N7605 PROPELLER

AND A-2295(P) SPINNER ON DIAMOND DA 40 AIRCRAFT

STC SA02476CH-D

LOG OF REVISIONS

Revision	Revised Page(s)	Description of Revision	Engineer	Date
A	5	Addition of equivalent Hartzell P/N fasteners for oil cooler plate	B. Meyer	11/30/07
B	8	Change governor bracket P/N to D41-6126-00-01	L. Doud	3/13/08
	8	Add torque value for governor mounting nuts.		
C	3	Added notes clarifying engine mass ballast is not compatible with aluminum blade propeller.	L. Doud	4/10/08
	5	Added note to remove engine mass ballast (if installed) when installing aluminum blade propeller.		
	7	Added note to update weight and balance if removing engine mass ballast.		

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

FAA Approved _____

Date _____

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**INSTRUCTIONS FOR INSTALLATION OF A
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ON DIAMOND DA 40 AIRCRAFT**

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

GENERAL

These STC installation instructions provide the necessary information to install either an aluminum-blade Hartzell propeller model HC-C2YR-1BFP/F7497 or a composite-blade propeller model HC-C2YR-1N/N7605 on the Diamond DA 40. These instructions also include information necessary to install the optional Hartzell S-1-6 governor.

The following modifications and STCs are required for installation of this Hartzell propeller STC:

Diamond Aircraft Modifications

MÄM 40-013/a	Alteration to Trim Range - Increased trim range required for autopilot installation.
OÄM 40-109a	Improvement of Engine Cooling
C41-7906-00-00	Oil Cooling System Modification (installation of oil cooler face plate assembly, P/N C41-7609-01-00)

The following modifications or STCs are considered compatible with, but not required for this Hartzell propeller STC:

Diamond Aircraft Modifications

MÄM 40-113/a	LRT Rudder (standard w/ S/N 40.363 and up)
OÄM 40-071/b	Long Range Fuel Tanks
OÄM 40-063	Towing Device Installation
OÄM 40-077	MT-P420 Governor
OÄM 40-078/a	Winterization Kit - winter kit associated with the cooling improvement (OÄM 40-109/a)
MÄM 40-227	1200 Kg Maximum Take-Off Mass

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STCs

SA03281AT

Power Flow Systems Inc. Exhaust

This STC is compatible with the powerplant installation modifications incorporated during installation of STC SA02292NY but without the MT propeller and the engine mass ballast installation (see exception to engine mass ballast in note below).

Note: The engine mass ballast installed per STC SA02292NY is compatible only with the composite blade HC-C2YR-1N/N7605 propeller; the engine mass ballast installation is not compatible with the aluminum blade HC-C2YR-1BFP/F7497 propeller.

This STC is also compatible with the Garmin G1000 Integrated Avionics System STC SA01254WI.

Except for the Power Flow Systems Inc. STC listed above, any modifications that change engine induction or exhaust systems, change engine ignition timing, increase horsepower or otherwise alter the specifications of the Lycoming IO-360-M1A engine defined in Type Certificate Data Sheet 1E10 are not approved with this STC without specific written authorization from Hartzell Propeller Inc.

All propeller governor models listed in FAA Type Certificate A47CE that have a maximum output pressure of 350 psi are compatible with the propellers in this STC and may be used in lieu of the Hartzell S-1-6 governor.

It is responsibility of the installer to verify compatibility of this STC with previously approved modification or to contact Diamond Aircraft Industries and Hartzell Propeller Inc. to verify compatibility of this STC with other aircraft modifications not listed above.

SECTION 1: New production aircraft

1. Verify the oil cooler face plate assembly (P/N C41-7609-01-00) is installed.
2. Install the new spinner and propeller in accordance with the appropriate Hartzell Owner's Manual:

HC-C2YR-1BFP/F7497 – Manual 115N “Compact” Models with Aluminum Blades

Note: **Do not** install engine mass ballast per STC SA02292NY (Diamond drawing C41-7106-01-00) if installing the aluminum blade HC-C2YR-1BFP/F7497 propeller.

HC-C2YR-1N/N7605 – Manual 145 “Compact” Models with Composite Blades

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Follow the spinner pre-installation instructions for "spinner bulkhead to propeller hub installation." Follow the instructions for "installation of "K" and "R" flange propellers" when installing the propeller.

3. If aircraft does not have the Garmin G1000 system, re-mark tachometer with a green arc (normal operating range) from 500 to 2700 RPM and a 2700 RPM redline.

The green arc can be marked with Operating Range Decals from Aircraft Spruce and Specialty (www.aircraftspruce.com), P/N 10-03905 or equivalent green decal, tape, or paint. If needed, Advisory Circular AC 20-88A provides guidelines on marking aircraft powerplant instruments.

On VM 1000 equipped airplanes, in addition to re-marking the green arc on the display glass, add a placard on the unit next to the VM 1000 identification plate stating "The tachometer display arc on this unit has been re-marked in accordance with STC SA02476CH-D."

4. Attach Hartzell Propeller Inc. Airplane Flight Manual Supplement AFMS_102706 to the existing Diamond DA 40 Airplane Flight Manual.
5. Incorporate the following information in the aircraft weight and balance records:

Installation of Hartzell HC-C2YR-1BFP/F7497 propeller and Hartzell A-2295(P) spinner:

Weight of propeller and spinner = 62.8 lbs.
Moment arm = 15.0 inches (aft of datum).

OR

Installation of Hartzell HC-C2YR-N/N7605 propeller and Hartzell A-2295(P) spinner:

Weight of propeller and spinner = 46.8 lbs.
Moment arm = 15.0 inches (aft of datum).

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**INSTRUCTIONS FOR INSTALLATION OF A
HARTZELL HC-C2YR-1BFP/F7497 OR HC-C2YR-1N/N7605 PROPELLER
ON DIAMOND DA 40 AIRCRAFT**

6. Add the following items to the Equipment List:

Airplane Serial No.:		Registration:		Date:	
Description	Type	Part No.	Manufacturer	S/N	Installed
PROPELLER	HC-C2YR-1BFP/F7497		Hartzell Propeller Inc.		
SPINNER	A-2295(P)		Hartzell Propeller Inc.		

OR

Airplane Serial No.:		Registration:		Date:	
Description	Type	Part No.	Manufacturer	S/N	Installed
PROPELLER	HC-C2YR-1N/N7605		Hartzell Propeller Inc.		
SPINNER	A-2295(P)		Hartzell Propeller Inc.		

7. If installing the Hartzell S-1-6 governor, follow the procedures provided in Section 3 now.
8. Make the appropriate logbook entries and return aircraft to service with FAA Form 337 referencing STC SA02476CH-D.
9. Check for leaks and proper operation during normal, production pre-flight testing. During normal production/pre-delivery flight tests, note maximum RPM setting and readjust governor high-RPM stop if necessary.
10. Post-installation dynamic balance of the propeller/engine combination is recommended, but not required, per Section 61-00-15 of Hartzell Owner's Manual 115N or 145.

SECTION 2: Field installation of the propeller kit

1. Remove the original propeller and spinner.

Note: If removing an MT propeller, use the latest-approved revision of the Diamond DA 40 aircraft maintenance manual(s) (Section 61-10-00). If removing a Hartzell HC-C2YR-1BF/F7495S propeller, use Hartzell Owner's Manual number 115N in conjunction with the Diamond service manual.

Note: If installing the aluminum blade HC-C2YR-1BFP/F7497 propeller, remove engine mass ballast if previously installed per STC SA02292NY.

2. Install the new spinner and propeller in accordance with the appropriate Hartzell Owner's Manual:

HC-C2YR-1BFP/F7497 – Manual 115N “Compact Models with Aluminum Blades
HC-C2YR-1N/N7605 – Manual 145 “Compact” Models with Composite Blades

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ON DIAMOND DA 40 AIRCRAFT**

Follow the spinner pre-installation instructions for "spinner bulkhead to propeller hub installation." Follow the instructions for "installation of "K" and "R" flange propellers" when installing the propeller.

3. Install the oil cooler face plate assembly (P/N C41-7609-01-00) onto the face of the oil cooler as shown in Figure 1. Use the following hardware to secure the face plate assembly to the oil cooler:

AN/MS Part Number	OR, Equivalent Hartzell Part Number	Part Name	Quantity
MS24694-S52	102612-S52	Screw, 10-32, 100° Head	3
MS21042-3	102613-3	Nut, Hex, self-locking	3
AN960-10	B-3851-0363	Washer	3

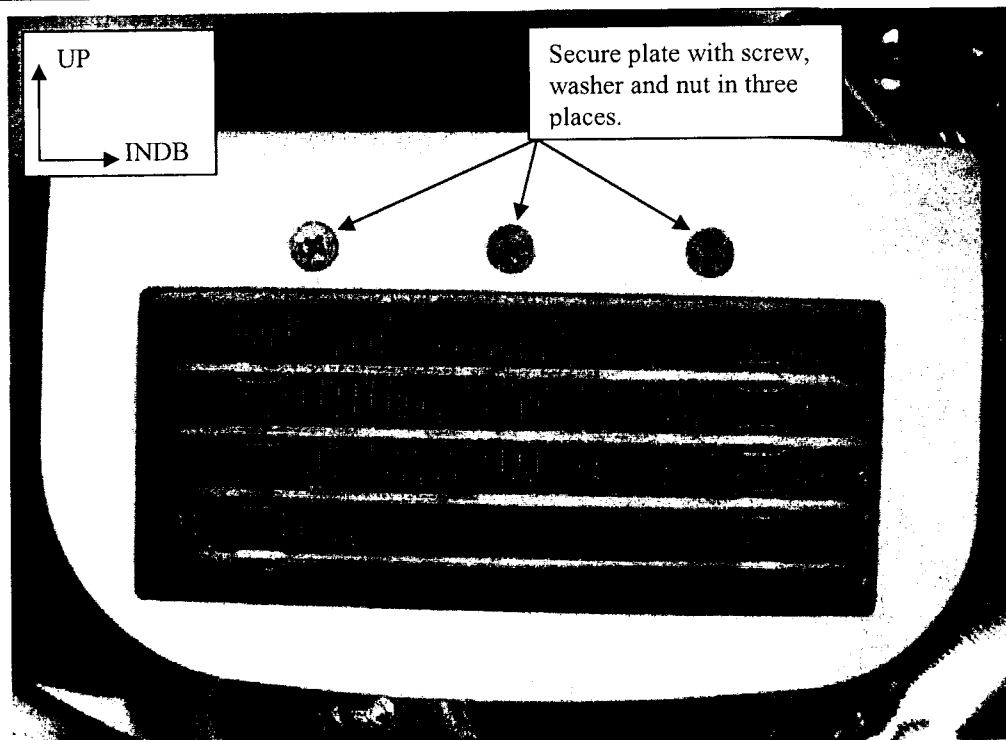


Figure 1: Oil Cooler Face Plate Installation

4. If installing the Hartzell S-1-6 governor, follow the procedures provided in Section 3 now.

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5. Refer to the latest-approved revision of the Diamond DA 40 aircraft maintenance manual to re-connect and re-install components removed for propeller removal (e.g. spark-plug-leads, cowl, etc.)
6. Attach Hartzell Propeller Inc. Airplane Flight Manual Supplement AFMS_102706 to the existing Diamond DA 40 Airplane Flight Manual.
7. Revise weight and balance records to show:

Removal of MT MTV-12-B/180-17 propeller and spinner:
Weight of propeller and spinner = 46.4 lbs.
Moment arm = 15.0 inches (aft of datum).

OR

Removal of Hartzell HC-C2YR-1BF/F7495S propeller and A-2295(P) spinner:
Weight of propeller and spinner = 59.3 lbs.
Moment arm = 15.0 inches (aft of datum).

Note: Update weight and balance records when removing engine mass ballast previously installed per STC SA02292NY.

OR

Removal of MT MTV-12-B/183-59b propeller and spinner
Use weight and arm provided in STC SA02292NY for this MT propeller and spinner.

Installation of Hartzell HC-C2YR-1BFP/F7497 propeller and A-2295(P) spinner:
Weight of propeller and spinner = 62.8 lbs.
Moment arm = 15.0 inches (aft of datum).

OR

Installation of Hartzell HC-C2YR-N/N7605 propeller and A-2295(P) spinner:
Weight of propeller and spinner = 46.8 lbs.
Moment arm = 15.0 inches (aft of datum).

8. If aircraft does not have the Garmin G1000 system, re-mark tachometer with a green arc (normal operating range) from 500 to 2700 RPM and a 2700 RPM redline.

The green arc can be marked with Operating Range Decals from Aircraft Spruce and Specialty (www.aircraftspruce.com), P/N 10-03905 or equivalent green decal, tape, or paint. If needed, Advisory Circular AC 20-88A provides guidelines on marking aircraft powerplant instruments.

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On VM 1000 equipped airplanes, in addition to re-marking the green arc on the display glass, add a placard on the unit next to the VM 1000 identification plate stating "The tachometer display arc on this unit has been re-marked in accordance with STC SA02476CH-D."

9. Add the following items to the Equipment List:

Airplane Serial No.:		Registration:		Date:	
Description	Type	Part No.	Manufacturer	S/N	Installed
PROPELLER	HC-C2YR-1BFP/F7497		Hartzell Propeller Inc.		
SPINNER	A-2295(P)		Hartzell Propeller Inc.		

OR

Airplane Serial No.:		Registration:		Date:	
Description	Type	Part No.	Manufacturer	S/N	Installed
PROPELLER	HC-C2YR-1N/N7605		Hartzell Propeller Inc.		
SPINNER	A-2295(P)		Hartzell Propeller Inc.		

10. Perform ground engine run to functionally test and leak check the Hartzell propeller installation.
11. Make the appropriate logbook entries and return aircraft to service with FAA Form 337 referencing STC SA02476CH-D.
11. Fly a functional check-flight using normal procedures, note maximum RPM setting and readjust governor high-RPM stop if necessary.
12. Post-installation dynamic balance of the propeller/engine combination is recommended, but not required, per Section 61-00-15 of Hartzell Owner's Manual 115N or 145.

SECTION 3: Hartzell S-1-6 Governor Installation

1. If replacing an MT or Woodward/Ontic governor, remove the governor using the latest-approved revision of the Diamond DA 40 aircraft service manual(s) (Section 61-20-00).
2. Attach the control cable bracket (Diamond P/N D41-6126-00-01) to the top of the S-1-6 governor using two of the socket-head cap screws attaching the governor head to the body. Torque the screws holding the cable bracket to 21-25 in-pounds (Note: that is inch-pounds, NOT foot-pounds). See bracket installed in Figure 2.

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3. Install the Hartzell S-1-6 governor on the engine using the procedures in the latest-approved revision of the Diamond DA 40 maintenance manual (Section 61-20-00). Torque governor hold-down nuts to 17 ft-lbs (+3/-0 ft-lbs).
4. Connect the RPM control cable to the S-1-6 governor. All hardware used to connect the RPM control cable as specified in the DA 40 aircraft service and parts manuals are used to connect the cable to the S-1-6 governor. However, additional washers are required to locate the head of the clamping screw at the preferred height above the control arm. In the installation photo shown in Figure 2, two AN960-10 and one AN960-10L washers are placed under the head of the clamping screw.

The Diamond supplied washer is placed between the cable and the control arm. The clamping bushing and nut supplied by Diamond secure the cable to the clamping screw. The clamping screw should rotate freely in the control arm after the cable is securely clamped.

5. Revise weight and balance records to show:

If retrofitting - removal of MT or Woodward/Ontic propeller governor
Weight of governor = use equipment list weight for applicable governor
Moment arm = use equipment list arm for governor (aft of datum).

Installation of Hartzell S-1-6 propeller governor:
Weight of governor = 3 lbs.
Moment arm = use equipment list arm for governor (aft of datum).

6. Add the following item to the Equipment List:

Airplane Serial No.:		Registration:		Date:	
Description	Type	Part No.	Manufacturer	S/N	Installed
PROPELLER GOVERNOR	S-1-6		Hartzell Propeller Inc.		

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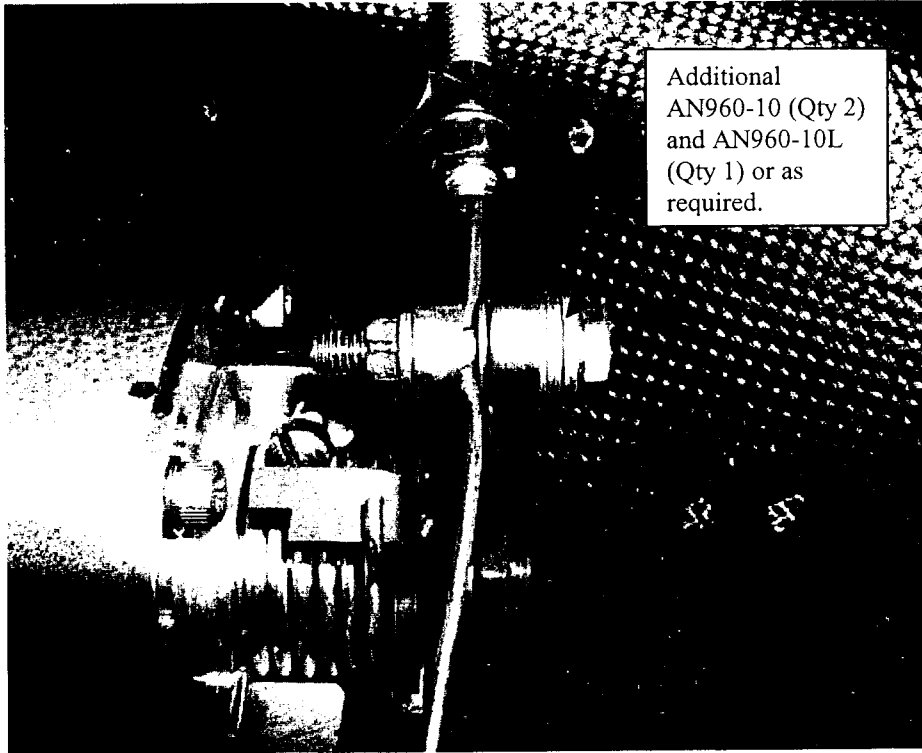


Figure 2: Hartzell S-1-6 Governor Installation

AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATIONS

MAKE	MODEL NO.	TYPE <small>(Airplane, Radio, Helicopter, etc.)</small>	NAME OF APPLICANT
Diamond	DA 40	Airplane	Hartzell Propeller Inc.

LIST OF DATA

IDENTIFICATION	TITLE
Document: INST_102706 Revision C Dated 4/10/08	INSTRUCTIONS FOR INSTALLATION OF A HARTZELL HC-C2YR-1BFP/F7497 OR HC-C2YR-1N/N7605 PROPELLER AND A-2295(P) SPINNER ON DIAMOND DA 40 AIRCRAFT. _____ END _____
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"> <p style="text-align: center; margin: 0;">FEDERAL AVIATION ADMINISTRATION CHICAGO AIRCRAFT CERTIFICATION OFFICE</p> <p style="margin: 0;"><input type="checkbox"/> Acknowledges receipt</p> <p style="margin: 0;"><input checked="" type="checkbox"/> Accepts DER/DOA/DAS FAA Approval</p> <p style="margin: 0;"><input type="checkbox"/> Approves DER Recommendation</p> <div style="display: flex; justify-content: space-between; font-size: small;"> <div style="width: 30%;"> <p>Title _____</p> <p>SENIOR Proj ENGR Manager, ACE: <u>118c</u></p> </div> <div style="width: 30%;"> <p>Initials/Signature _____</p> <p></p> </div> <div style="width: 30%;"> <p>Date _____</p> <p><u>8/21/08</u></p> </div> </div> </div>	

PURPOSE OF DATA
Revise Installation Instructions for STC SA02476CH-D regarding compatibility with Diamond engine mass ballast installation.

APPLICABLE REQUIREMENTS (List specific sections)
14 CFR 23.901

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