

United States of America  
Department of Transportation -- Federal Aviation Administration  
**Supplemental Type Certificate**

*Number* SA01949CH

*This certificate issued to*

Hartzell Engine Technologies LLC  
2900 Selma Highway  
Montgomery, Alabama 36108

*certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations.*

See Type Certification Data Sheet No. A-799 for complete certification basis.

*Original Product - Type Certificate Number:* A-799  
*Make:* Cessna  
*Model:* 170, 170A, 170B

*Description of Type Design Change:*

Installation of C&D Associates Combustion Heater Kit 12, P/N CD11214K12, in accordance with C&D Associates Heater Installation Instructions IN11214K12, Rev. -, dated April 15, 2003 or later FAA approved revision.

*Limitations and Conditions:*

1. Compatibility of this design change with previously approved modifications must be determined by the installer.
2. Check aircraft Weight and Balance.
3. Full compliance with the C&D Combustion Heater Airworthiness Limitations, MM10000 Maintenance Manual, Second Edition, Rev A, dated April 4, 2002, or later FAA approved revision, is required.
4. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

*This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.*


*Date of application:* April 15, 2003

*Date reissued:* February 11, 2016

*Date of issuance:* March 23, 2004

*Date amended:*



*By direction of the Administrator*  
  
(Signature)

Timothy P. Smyth  
Manager,  
Chicago Aircraft Certification Office

(Title)



## HEATER INSTALLATION INSTRUCTIONS FOR HEATER KIT #12, P/N CD11214K12

For Cessna 170, 170A, 170B

### READ COMPLETE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

This system has been built to be installed on an aircraft that conforms to that aircraft's original Type Certificate (TC). If aircraft has been modified from the original TC (modifications such as props, engines, fuel system etc.) contact C&D Associates, Inc. for possible adjustments to this installation.

Accomplish all wiring in accordance with AC43.13-1B Chapter 11, Electrical Systems.  
Accomplish all plumbing in accordance with AC43.13-1B Chapter 8, Section 2, par. 8-31.

Preparation: The new heating system will be installed in the right floor area aft of the co-pilots seat tracks under the passenger seat. The new fuel pump will be located under the floor of the pilots seat. To facilitate installation, remove all seats and floor covering. Place the fuel selector in the off position and drain all fuel from the left fuel tank.

1. Heater Floor Cavity: (See Figure 1)
  - a. Using the flooring edge just aft of the rivet line behind the front right seat tracks, and the right hand floor rivet line to measure as instructed in Figure 1 for the floor cut out.
2. Heater Mounting Brackets:
  - a. Use the forward bulkhead and center stringer in the heater cavity as measuring points. Measure along belly skin surface.
  - b. Position the new mounting brackets, P/N 21191E front, P/N 21191F back, into position and use as a template to mark rivet locations.
  - c. Rivet into place using 3/16" rivets.
3. Combustion Air Inlet:
  - a. Knockout 1 1/2" hole as indicated in Figure 1.
  - b. Rivet into place using 5 evenly spaced 1/8" rivets
4. Exhaust:
  - a. Knockout 2 5/8" hole as indicated in Figure 1 for the exhaust location. Use the forward bulkhead to measure along belly skin surface.
5. Combustion Air Blower:
  - a. Install four 10/32 rivnuts as indicated in Fig 1 in the baggage area floor and install combustion air blower mount.
  - b. Position combustion air blower assembly with the air outlet at approximately in the 2 o'clock position. (See Fig. 2)
  - c. Fasten with two worm drive clamps. Connect the combustion air inlet installed in the belly to the combustion air inlet of the blower using two worm drive clamps.
6. Ignition:
  - a. Install four 10/32 rivnuts as indicated in Fig. 1 upper right. Install the ignition unit with lead connection forward. (See Fig. 1)
7. Fuel Line:
  - a. Ref. AC43.13-1B Chapter 8, Sect. 2, Paragraph 8-31.
  - b. Route the fuel line along the right side of the heater cavity under the floor (fastening to the floor stringer) as indicated using three clamps. (See insert of Fig 1)
  - c. Install a fuel line 90° bulkhead fitting through the bulkhead as shown and fasten with washer and nut. Fabricate fuel line from bulkhead over to the pump location.
  - d. Secure to bottom side of floor as indicated using Adel clamps.

8. Fuel Pump:

- a. Install the fuel pump under the pilot seat floor as indicated in Fig. 1.
- b. Mount the removable fuel pump cap forward for ease of fuel filter access.
- c. Connect inlet fuel line to the existing fuel line under the floor, outboard of the new fuel pump location. The existing fuel line has a "T" fitting installed for this purpose.

9. Electrical: Ref. AC43.13-1B Chapter 11

- a. If using existing aircraft heater control switch, install P/N 20667, controlling relays in accordance with Figure 3.
- b. If installing the new rotary heater control switch P/N 20654A, locate in a convenient location on the instrument panel. See wiring schematic Fig. 4.
- c. 15-amp circuit breaker for the new heating system is required.
- d. Connect this circuit breaker to the red wire of the new switch. Secure the black wire to ground. Route the remaining wires of the switch to the new heater following an existing wire bundle.
- e. The new switch has two relays in the wiring a short distance from the switch. Secure the relays in such a manner as to minimize movement.
- f. Route fuel pump wire from pump to front side of bulkhead, over to heater wiring as indicated. Secure to terminal #2.
- g. Secure wiring in accordance with AC43.13-1B, Chapter 1

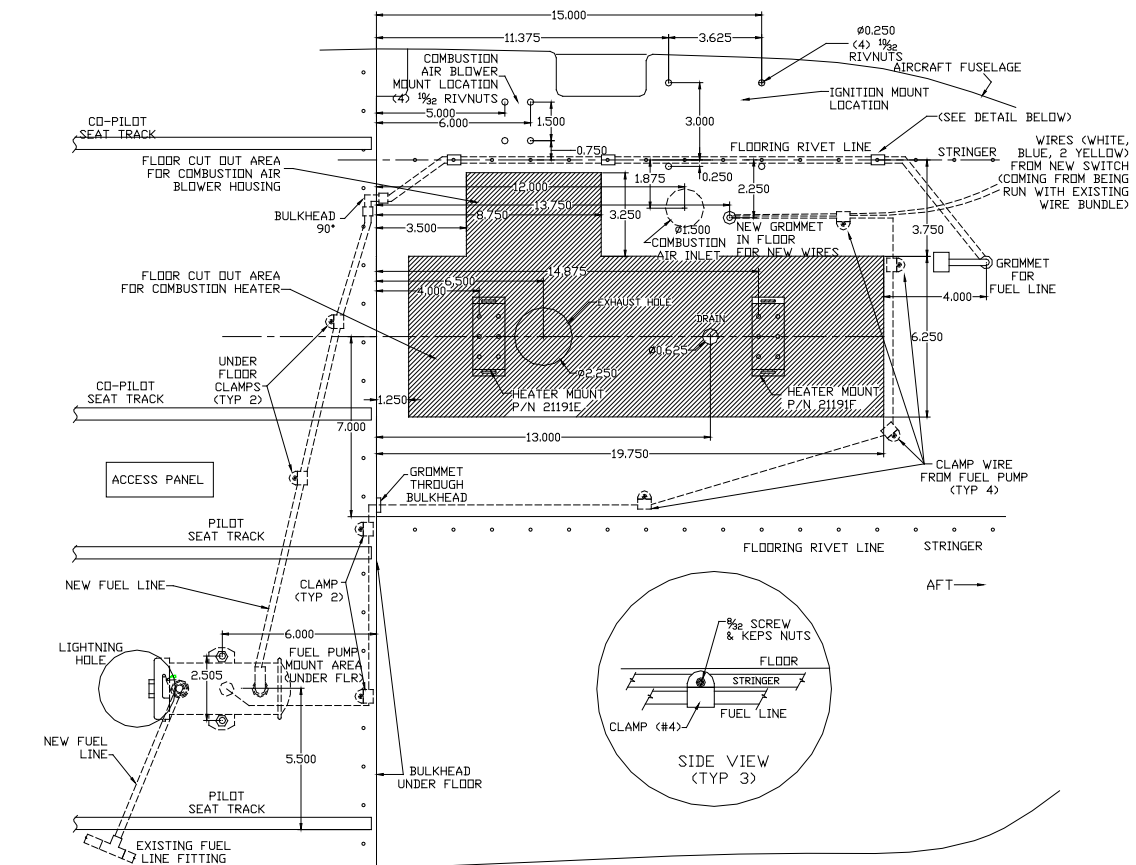
10. Heater Installation:

- a. Place the new heater in the mounts and secure with the two worm drive clamps.
- b. Make sure the exhaust shroud and drain clear the holes made for them.

11. Electrical Connections: Figure 5

- a. Connect the electrical wires as indicated. White wire to terminal #1, blue wire to terminal #6, fuel pump wire to terminal #2. Two yellow wires to the yellow wires of the thermostat.

Figure 1  
(From top)



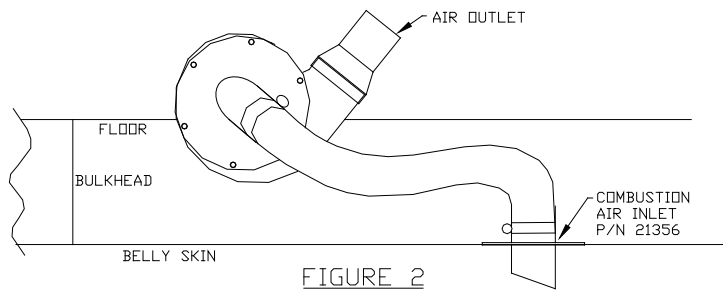


FIGURE 2

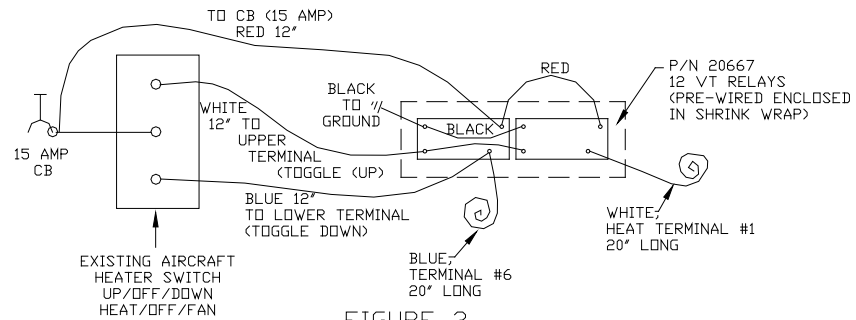


FIGURE 3

EXISTING HEATER SWITCH

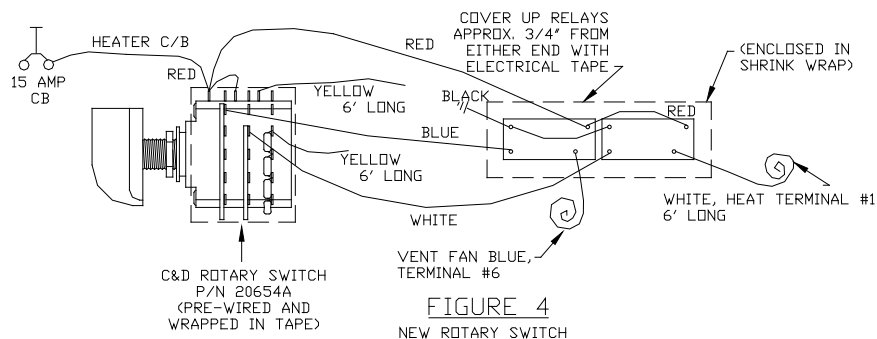


FIGURE 4

NEW ROTARY SWITCH

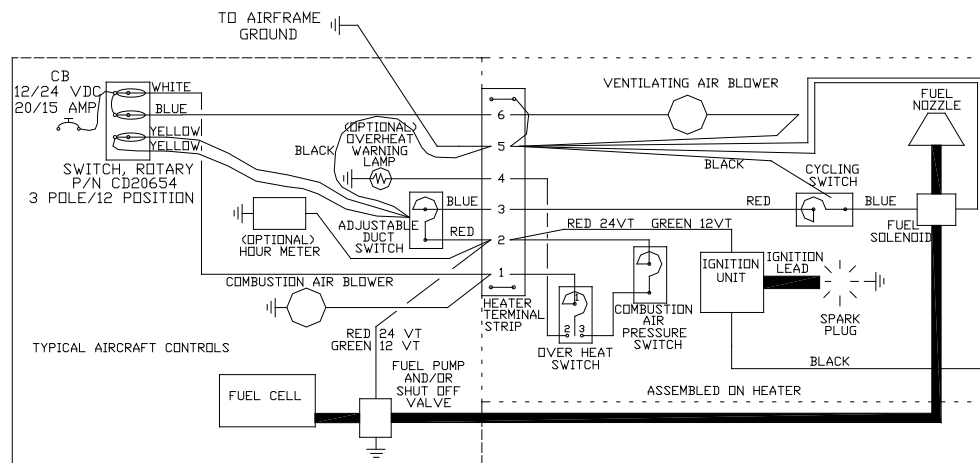


FIGURE 5

12. HEATER OPERATIONAL TEST AFTER INSTALLATION:

IMPORTANT!! Please complete the followings steps after the new heater is installed in the aircraft.

a. (Heater terminal strip numbered 1 2 3 4 5 6).

b. Install a temperature probe (min 0-500° F) in the outlet plenum 6-8” aft of the heater. A good location would be approx. 6” aft of the heater or near the thermostat sensor. Usually you can find a small access point somewhere in the ducting aft of the heater. Otherwise it may be necessary to drill a small 1/8” hole through the heat distribution plenum allowing a thermo couple to enter unobstructed, into the heated air stream approx. 1”.

CAUTION: Never drill into combustion heater itself! Verify nothing will be damaged in this process.

CAUTION: Verify thermal couple is not touching plenum internal wall.

c. Place a 6” 20G jumper wire with 2 small alligator clips (or the like) across the heater terminal strip numbers 2 and 3, which will bypass the aircraft thermostat. (Fig. 7)

CAUTION: Be sure not to short any other terminals.

d. Install the fuel pressure gauge (0-15). Tee into as shown. (Fig. 6)

1) With the heater running, verify fuel pressure. Preferred pressure is 8psi. (6.5psi min, 10psi max)

2) With the heater running, verify that the outlet plenum temp. is approx. 250°. Adjust the temperature of the heat duct outlet distribution plenum to an average ambient temperature off 225°. Typical readings will be a low of 215° and a high of 255°. Adjustment is made by rotating a small 1/16” screw located next to the wires on the side of the switch. Rotation clockwise one turn will increase temperature approx. 20°F. Decrease temperature by turning counter clockwise. (Fig. 8)

NOTE: Adjust screw no more than ¼ turn at a time.

3) Remove the jumper wire and verify that the temperature is controlled by the aircraft thermostat from low (approx. 75° F) to medium to high (approx. 250° F) which is what the cycling switch is set at.

4) Remove the temperature probe. If drilled, seal the 1/8” hole with high temperature silicone.

5) Remove the fuel gauge installed in step 12.d. Leave the “tee” fitting and cap off for future pressure readings if desired.

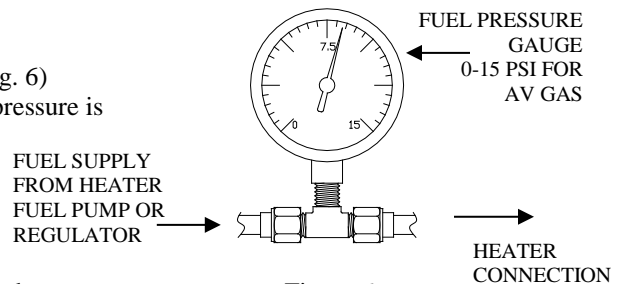
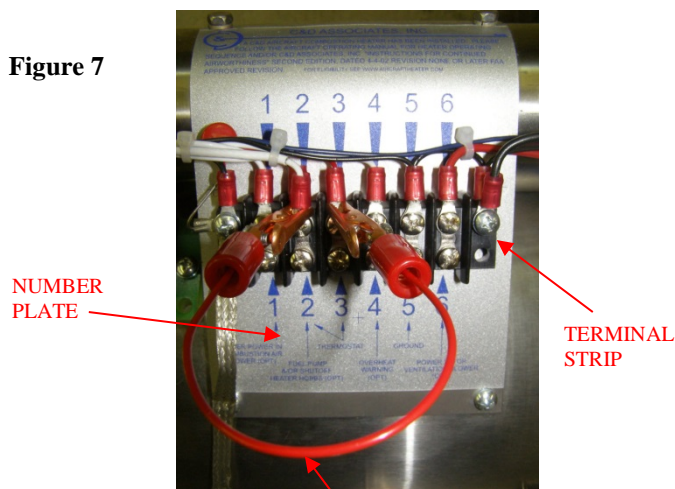


Figure 6

If the hoses need to be replaced, we recommend Sceet-6 (1 ½”) red from the blower to the heater and Ceet-6 (1 ½”) black from outside air to the blower.

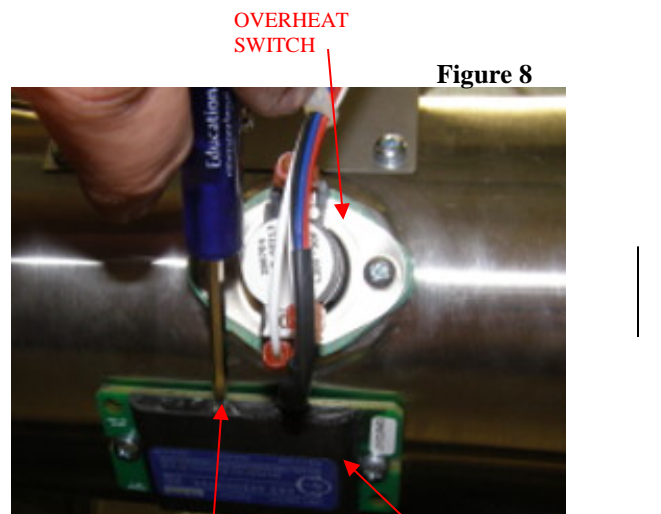
For additional information see the “maintenance manual (MM10001)” included with this heater under “Testing after installation or overhaul.”

Figure 7



JUMPER WIRE BYPASSING THERMOSTAT SENSOR (AIRCRAFT WIRES NOT INSTALLED)

Figure 8



CYCLING SW. ADJUSTMENT

CYCLING SWITCH P/N 21252



- After installation, complete the operation and heat output tests specified in the C&D Associates, Inc. MM10001 Maintenance Manual for aircraft combustion heaters revision H dated 9/10/13 or later FAA approved revision. Tests should be accomplished in accordance with section IX 'C' operational test, and 'D' for heat output, steps 1 and 2. Also in accordance with the "Instructions for Continued Airworthiness" step #1 "Preflight/Operational check and Shutdown Procedure."
- 7) NOTE: Follow the 'Combustion Heater PREFLIGHT/OPERATIONAL CHECK AND SHUTDOWN PROCEDURE' outlined within the Combustion Heater "Instructions for Continued Airworthiness", Second Edition, Revision: D, dated 10-03-11, or later revision, included with these instructions. This FAA-approved Instructions for Continued Airworthiness must be complied with and become a permanent part of the Aircraft Operations and Procedures manual.
  - 8) Verify all wires are secure and free of obstruction and chaffing.

13. DOCUMENTATION:

- a. Weight & Balance. Remove old heater and install new heater kit of 25 lbs at station 70. If the aircraft requires a weight and balance and a 337 must be completed and a copy of the STC attached. The logbook entry should contain the STC and PMA Supplement #. Original heater replacement is authorized by way of FAA form 337. Alteration of aircraft by way of STC and PMA supplemental number and date must be recorded in the appropriate aircraft records.
- b. Note: Insert the following statement (label 21503 provided) in the aircraft flight manual: "C&D Associates Inc. Combustion heater has been installed in this aircraft. Please follow the aircraft-operating manual for combustion heater operating sequence and/or C&D Associates Inc. Instructions for airworthiness." "Second Edition dated April 4, 2002 revision: none, or later FAA approved revision."
- c. Electrical requirements: 12VDC at 15Amp.
- d. Fuel consumption: Maximum operation 1 gal/hour.





C & D ASSOCIATES, INC.

IN11214K12

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4/15/03

Rev B dated 11/05/13

**DOCUMENTATION AND PARTS REQUIREMENT TABLE**

DOCUMENTATION		Quantity	
1. FAA/PMA Supplement #XX		_____	
2. Installation Instructions IN11214K12			_____
3. Label for flight manual			_____
4. MM10001 Maintenance Manual			_____
5. Quality Assurance Certificate of Compliance #527			_____
6. STC # SA091949CH			_____
7. 337 Form			_____
 PARTS			S/N
1. (1) Heater	CD11214-1	_____	_____
2. (2) Clamp	6-7"	_____	
3. (1) Drain	20651	_____	
4. (1) Thermostat Sensor Sw.	21253	_____	
5. (1) Plenum	21473	_____	
6. (1) Bracket Mount	21191E	_____	
7. (1) Bracket Mount	21191F	_____	
8. (2) Fuel Hose #4	20653	_____	
9. (4) Hose Clamps, 2"	2-2 1/2	_____	
10. (1) Combustion Air Inlet	21356	_____	
11. (2) Hose, Scelet	1 1/2" RED	_____	
12. (1) Switch Rotary (Optional)	20654	_____	
13. (1) Blower Assy (12V)	29052	_____	
14. (1) Fuel Pump	21370	_____	
15. (2) 90 deg. elbow	MS20822-4D	_____	
16. (1) Ground Wire	20655	_____	
17. (6) Rivnuts	A10K-80	_____	
18. (6) Nuts 10-32	MS20365-1032A	_____	
19. (6) Washers #10	AN960-10	_____	

Initials: \_\_\_\_\_ Date: \_\_\_\_\_