United States of America

Department of Transportation -- Federal Abiation Administration

Supplemental Type Certificate

Number SA03334CH

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 * of the * Regulations.

Criginal Product - Type Certificate - Number: Abake: Abadel:

*See attached FAA Approved Model List (AML) *No. SA03334CH for list of approved aircraft models and *applicable airworthiness regulations

Description of Type Design Change.

Installation of C&D combustion heater P/N CD14193-1 in accordance with Installation Instructions IN14193-1, Revision A, dated August 20, 2015 or later FAA approved revision. When installing on model 58, S/N TH-1 thru TH-436, Installation kit IN29155, Revision -, dated August 20, 2015 or later FAA approved revision is also required.

Similations and Conditions.

- 1. Compatibility of this design change with previous modifications must be determined by the installer.
- 2. FAA accepted Instructions for Continued Airworthiness, ICA14193-1, Revision A, dated August 25, 2015 or later FAA approved revision is required.
- 3. FAA approved Airplane Flight Manual Supplement, FMS14193-1, Revision A, dated August 20, 2015 or later FAA approved revision is required.
- 4. A copy of this certificate must be maintained as part of the permanent records for the modified engine.
- 5. 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 offect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Tate of application January 2, 2014

Jute of issuance June 24, 2014



Tate reissued. September 24, 2015; February 11, 2016

State amended : September 24, 2015

By direction of the Administrator

Timothy P. Smyth Manager,

Chicago Aircraft Certification Office

(Title)

 Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

 FAA FORM 8110-2(10-68)
 PAGE 1 of 2 PAGES

 This certificate may be transferred in accordance with FAR 21.47.

INSTALLATION OF COMBUSTION HEATER

)14			1	1
ued: June 24, 20	AML AMENDMENT DATE		9/24/2015	9/24/2015
Date Iss	ATION	REVISION AND DATE	Rev. A 8/20/2015	Rev. A 8/20/2015
	INSTALL INSTRUC	NUMBER	IN14193-1	IN14193-1
	CERTIFICATION BASIS FOR	ALTERATION	CAR 3	CAR 3
	ORIGINAL TYPE CERTIFICATE NUMBER		3A16	A23CE
	AIRCRAFT MODEL		95-B55 S/N TC-1658 and up; E55 S/N TE-959, TE-968 and up; 58 S/N TH-1 thru TH-436 (w/Installation Kit 29155), S/N TH-437 and up; G58.	58TC
	AIRCRAFT	MAKE	Beechcraft Corporation	Beechcraft Corporation
	ITEM		-	2

Date reissued: 9/24/2015; 2/11/2016 Date amended: 9/24/2015

Manager, Chicago Aircraft Certification Office FAA Approved: N.1. Smyth Timothy P. Smyth



IN14193-1 Rev: A Dated: 8/20/15 Page 1 of 7

SFP 9

INSTALLATION INSTRUCTIONS FOR COMBUSTION HEATER P/N CD14193-1

For Raytheon (Beech) Models 95-B55, S/N TC-1658 and up, E55, S/N TE-959, TE-968 and up, 58, S/N TH-1 thru TH-436, 58, S/N TH-437 and up, 58TC, G58,

READ COMPLETE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

This system has been built to be installed on an aircraft that conforms to that aircrafts original Type Certificate (TC). If this 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. Accomplish all fiberglass repair/patching in accordance with AC43.13-1B Chapter 3, Section 3-3 Accomplish all Metal Repair in accordance with AC43.13-1B Chapter 4, Section 4 "Procedures"

LOG OF REVISIONS

Rev.	Description	Pages Revised	Date	
Α	Added Beech 58, S/N TH-1 thru TH-436 and subsequent instructions.		8/20/15 A A PPL	OVED
		1/1		UILD

1. PREPARATION AND NOTES

NOTE: When installing CD14193-1 in TH-1thru TH-436 installation kit P/N 29155 is requiredERTIFICATION OFFICE CENTRAL REGION

NOTE: Full compliance with the FAA approved C&D Associates Inc. 'Combustion Heater Airworthiness Limitations' are required. These FAA-approved Airworthiness Limitations must become a permanent part of the Aircraft Operations and Procedures manual. They can be found in the Instructions for Continued Airworthiness (ICA) Manual.

NOTE: Follow the Aircraft Flight Manual and C&D Flight Manual Supplement (FMS) for 'Combustion Heater PREFLIGHT/OPERATIONAL CHECK AND SHUTDOWN PROCEDURE.'

NOTE: Janitrol AD2004-21-05 Combustion Heater Airworthiness Directive <u>does not</u> apply to the C&D Associates, Inc. P/N CD14193-1 Combustion Heater.

NOTE: Removal of the Combustion Heater and the installation of the C&D Associates Products TSO-C20 approved heater P/N CD14193-1 will affect weight and balance.

NOTE: Insert the attached label, 21503, into the aircraft flight manual in the heater operating section. Correct equipment list to reflect new C&D Associates, Inc. heater and part number.

NOTE: Utilize existing aircraft combustion heater operating instructions or other FAA approved combustion heater operating instructions where applicable.

NOTE: The (^) symbol indicates step variation for 58, S/N TH-1 thru TH-436.

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2. INSTALLATION

VERY IMPORTANT - Read through entire R&R instructions before beginning heater removal

- NOTE: Follow the Aircraft Service Manual or other FAA approved source for removal of the existing Combustion Heater.
- NOTE: Install the C&D Associates, Inc. TSO-C20 Approved Combustion Heater utilizing the existing Aircraft Service Manual or other FAA approved source where applicable.
- 2.1 Before removing Ray Dome (Nose Bowl) transfer mark as pictured in figure 1. Mark should be 2 5/8" towards center from left side of nose wheel well opening.
- 2.2 Remove Ray Dome, disconnecting the radio antenna if installed. Gain access to Combustion Air Switch (Janitrol) and existing exhaust extension by removing nose baggage, forward left side floor.
- 2.3 With fuel selectors in the off position, disconnect fuel line from heater and plug line. Mark heater terminal strip (airframe side) wires per insulator numbered 6-1 so as to reconnect on new heater in the same manner as removed.
- 2.4 Disconnect exhaust extension by removing 6 screws from external cover plate. Carefully extract exhaust extension by "wobbling" off heater from inside nose baggage compartment.
 (^) Not Applicable
- 2.5 Patch exhaust hole per AC43.13-1B Chapter 4 "Metal Repair" NOTE: The CD14193-1 utilizes a fixed exhaust/CA pickup NOTE: Exhaust is part of old core to be returned) (^) Not Applicable
- 2.6 Remove Combustion Air Pressure Switch/vacuum lines and wires to heater.
 NOTE: Switch is part of old core to be returned.
 NOTE: A new combustion Air Switch is attached to the new C&D Ignition Assembly.
 (^) Not Applicable
- 2.7 Cover original equipment combustion air switch hole in firewall with a suitable patch (Non-structural).
 (^) Not Applicable
- 2.8 Remove the aft worm drive clamp attaching heater to Airframe in nose gear wheel well.
- 2.9 Disconnect cabin air hose, which extends into right side of Airframe from the heater.
- 2.10 Remove drain lines and aft drain fitting as well as combustion air inlet and outlet hoses.
- 2.11 Remove Combustion Air Blower Assembly, by extracting 8 bolts from combustion air blower airframe bracket. Disconnect lead wire & slide entire assembly down and out.
 NOTE: Set aside airframe bracket for later reworking.
 NOTE: Combustion air hose routing -- new hose must follow original path.
 (^) Not Applicable
- 2.12 Heater now is held in place by 3 screws connecting sliding IRIS valve to heater front and a 2-part bulkhead clamp plate. Remove lower half of bulkhead clamp only. Disconnect heater fuel line from "out" port of fuel pump in nose wheel well. Fuel line and lower firewall clamp plate now can be rotated and guided forward and out. Set aside.
 - (^) Remove aft heat distribution plenum from heater.

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- 2.13 Heater Removal: Remove complete heater.
 - NOTE: To remove heater from nose gear wheel well, rotate heater core counter clockwise 45° pulling out and down gently.
 - NOTE: The less you force it the easier this process will be. When heater core hangs up, try rotating and pulling back the opposite way, heater core should rotate from airframe easily.
- 2.14 Remove combustion air inlet bolted to bulkhead. (^) Not Applicable
- 2.15 Install CD14193-1 and secure using previously removed clamps.
 (^) Install CD14193-1 using kit P/N 29155 and supplied instructions.
- 2.16 Install new combustion air blower using previously removed bracket and clamps.
 (^) Install per kit P/N 29155 and supplied instructions.
- 2.17 Connect 8" sceet between blower inlet and 1 1/2 manifold of heater exhaust.
- 2.18 Reconnect heater fuel line to fuel pump in nose gear wheel well. NOTE: Because of the addition of the fuel filter on new unit, the fuel inlet sits approx. 2 ¹/₂" forward of its original position. Adjust the old fuel line to fit the new heater.
- 2.19 In accordance with AC43.13.1B Chapter 3 (3-3 "Repairing Holes") patch/repair <u>all</u> holes in the nose bowl.
 (^) Not Applicable
- 2.20 Carefully create new 2 5/8 exhaust hole in nose bowl as pictured in figures 1 & 2.
 (^) Not Applicable



Figure 1

Figure 2

- 2.21 Reconnect heater wiring as removed.
 NOTE: Verify wiring is correct per the aircraft service manual.
 NOTE: Two wires in line with the previously removed combustion air switch are no longer used.
 (^) Wire per Kit P/N 29155 instructions and hardware supplied
- 2.22 Perform "HEATER OPERATIONAL TEST AFTER INSTALLATION" as outlined in section III of this manual.

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2.23 Install nose bowl and remaining access panels previously removed.

2.24 Make appropriate log book entry with reference to the included ICA14193-1 and amend weight and balance.



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3. TESTING

3.1 HEATER OPERATIONAL TEST AFTER INSTALLATION:

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

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

TEMPERATURE ADJUSTMENT

- 3.1.1 Trim and smooth by filing, the "Combustion air inlet and the Exhaust pipe" scarf angle, (extending out of the aircraft) with supplied templates. When properly accomplished combustion air inlet and exhaust pipe will have similar angles of attack. This will provide proper balance between the combustion air and the exhaust in flight. Be sure to utilize template on page 2 for proper degree of angle.
- 3.1.2 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.

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

- 3.1.3 Setting upper limit temperature upper limit switch
 - 3.1.3.1 If your heater is equipped with a CD21252.....
 - 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.

CAUTION: Be sure not to short any other terminals.

- 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 as follows.
 - For non-pressurized aircraft set switch to a low of 215° and a high of 255°.
 - For pressurized aircraft set switch to a low of 190° and a high of 225°.
- NOTE: Adjustment is made by rotating a small 1/16" screw located next to the wires on the side of the switch. It may have a dab of inspectors lacquer over the screw. Rotation clockwise one turn will increase temperature approx. 20° F. Decrease temperature by turning counterclockwise (Fig 4).
- After sensor is adjusted, place small drop of tamper proof seal on adjustment screw to lock in settings so as to not change due to vibration. Use a product that can be easily removed for readjustment if necessary.
- 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.
- □ Remove the temperature probe sealing the hole with high temperature silicone.



FIGURE 4



3.1.5 Remove the fuel gauge installed in step 3.1.4. Leave the "tee" fitting and cap off for future pressure readings if desired.

3.2 Verify proper installation is completed in accordance with the aircraft maintenance manual.

- 3.2.1 Verify all wires are secure and free of obstruction and chaffing.
- 3.2.2 If the hoses need to be replaced, we recommend Sceet-6 (1 ¹/₂") red from the blower to the heater and Ceet-6 (1 ¹/₂") black from outside air to the blower.
- 3.2.3 For additional information see the "maintenance manual (MM10001)" included with this heater under "Testing after installation or overhaul."
- 4 After installation, complete the operation and heat output tests specified in the C&D Associates, Inc. MM10001 Maintenance Manual for aircraft combustion heaters Rev L, dated 5/21/15 or later FAA approved revision. Tests should be accomplished in accordance with section 10.3 operational test, and 10.4 for heat output. Also in accordance with the "Instructions for Continued Airworthiness" "Preflight/Operational check and Shutdown Procedure." Rev E dated 5-21-15. These FAA-approved Instructions for Continued Airworthiness must be complied with and become a permanent part of the Aircraft Operations and Procedures manual.
- 5 Documentation:
 - 5.1 Weight & Balance.
 - 5.1.1 If changed remove old heater of __ lbs (verify weight). And install new heater of 28 lbs. 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 #SA03334CH. Original heater replacement is authorized by way of FAA form 337. Alteration of aircraft by way of STC or PMA supplemental number and date must be recorded in the appropriate aircraft records.
 - 5.1.2 If unchanged removal of the Combustion Heater and the installation of the C&D Associates Products TSO-C20 approved heater will have no net effect on weight and balance or electrical load requirements.
 - 5.2 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" located in MM10001 Rev L dated 5/21/15 or later FAA approved revision."
 - 5.3 Utilize existing aircraft combustion heater operating instructions or other FAA approved combustion heater operating instructions where applicable.
 - 5.4 Electrical requirements: 24VDC.
 - 5.5 Fuel consumption: Maximum operation _____ gal/hour.

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DOCUMENTATION AND PARTS REQUIREMENT TABLE

DOCUMENTATION		Quantity	
 FAA/PMA Supplement #SA03334CH 			
2. Label for flight manual (21503)			
MM10001 Maintenance Manual	Sectore St.		
 Instructions for Continued Airworthiness (ICA) (include 	es Limitations)		
5. Quality Assurance Certificate of Compliance #527			
PARTS			S/N
1. (1) Heater	CD14193-1		
2. (1) Blower	29056		
3. (1) Fuel Pump	29120		
3. (1) Installation Kit (58, S/N TH1 thru TH-436 only)	29155		
Initials:	Date:		

For warranty information see website <u>www.CDaircraftheaters.com</u> *For eligibility information see website <u>www.aircraftheater.com</u>*



CD14193-1 INSTALLATION KIT

P/N 29155

SUPPLEMENTAL CD14193-1 INSTRUCTIONS FOR USE WITH HAWKER BEECHCRAFT 58, S/N TH-1 thru TH-436.

READ COMPLETE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

This system has been built to be installed on an aircraft that conforms to that aircrafts original Type Certificate (TC). If this 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.

LOG OF REVISIONS

Rev.	Description	Pages Revised	Date
		HAA APPR	OVEI
		cy .	
		SEP 2 4 20)15

1. SUPPLEMENTAL PREPARATION

1.1. Heater Removal:

CHICAGO AIRCRAFT CERTIFICATION OFFICE

- 1.1.1. Fabricate and install a cover plate over the hole in the bulkhead created by the reference of the second plate over the hole in the bulkhead created by the reference of the second plate over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the hole in the bulkhead created by the reference over the bulkhead created by the
- 1.1.2. From the nose wheel well remove both fuel pumps, fuel filter, fuel shut off and fuel line to the heater. Return all items (except the Iris valve) to C&D for core refund.
- 1.2. Electrical Preparation
 - 1.2.1. At the existing heater control switch identify the wire coming from the Iris valve switch. This main wire coming from the Iris valve to the heater blower switch can be identified by the following procedure.
 - 1.2.1.1. Open the Iris with the air control.
 - 1.2.1.2. Place the heater/blower switch in the off position.
 - 1.2.1.3. With master switch on, check with a voltmeter as to which wire on the back of the heater/blower switch has power. The following wire marking should correspond to the finding.
 - TH-1 thru TH-436 wire marking "H5B12"
 - This wire so identified will provide power from the 20-amp heater/blower circuit breaker though the Iris switch to the heater control switch.
 - 1.2.2. All other component wiring from the heater control switch to the old heater ignition, blower, fuel pumps, fuel shut off valve and temperature control switches should be removed or deactivated.



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2. SUPPLEMENTAL INSTALLATION PROCEDURE

2.1. Heater

- 2.1.1. Secure the front adapter ring to the airframe using the six mounting holes.
- 2.1.2. From the nose wheel well, secure the heater to the heater mount using the 6" worm drive clamp making sure the spacers are properly positioned between the heater and the upper mounting bracket.
- 2.1.3. Reinstall the old Iris valve on the front of the new heater.
 - It may be necessary to remove some material from the bottom of the shelf above the Iris valve control
 arm attachment bracket in order to provide enough clearance for proper operation of the Iris as the
 control is moved open and closed.
 - Screen wire mesh P/N 20680 should be positioned on the very front of the Iris valve and mounting
 screws securing screen and Iris to heater adapter ring. Make sure Iris control moves freely and fully
 from open to close positions once installed.
- 2.2. Combustion Air Blower:
 - 2.2.1. Locate the new blower on the outboard side of the right vertical brace, under the radio shelf just forward of the front bulkhead.
 - 2.2.2. Measure 1-1/2 inches forward and 1-1/2 inches down. This identifies top left corner of mount.
 - 2.2.3. Using the mount as a template locate and drill four 1/4" holes.
 - 2.2.4. Secure the four rubber mounts and brackets using eight 10/32 kep nuts.
 - 2.2.5. Mount the blower assembly with motor aft and housing forward, air outlet nozzle positioned toward combustion air inlet adapter on heater in such a way as to allow connection of the red 1 ½ diameter sceet hose to the blower outlet and heater inlet. Air inlet should be pointed straight down at this point.
 - 2.2.6. Secure blower with two hose clamps.
 - 2.2.7. Black wire to airframe ground. Red wire to terminal #1 on heater.
- 2.3. Thermostat, Electronic (In front of copilot pedals)
 - 2.3.1. Remove the old thermostat and install the new electronic sensor.
 - 2.3.2. Route the red wire to the heater terminal #2, and the blue to terminal #3. Black to airframe ground.
 - 2.3.3. Follow the installation instructions included with the switch CD21253 and the linear rheostat control P/N CD21399.







- 2.4.1. Route two 14-gauge wires along existing wire bundles from the new heater terminals #1 and #6 to the heater/fan control switch.
- 2.4.2. The new heater control switch (P/N 21600) is a double pole double throw switch. Install two jumper wires on the back of the switch. One across from the two center posts and one from top post to bottom post on right side. Wiring should be created as directed to evenly distribute amp draw through contacts. Proper switch operation can be checked by placing the switch in the fan position and check for continuity to the wire routed to the heater terminal #6 for ventilation fan operation. With the switch in the heat position, continuity to heater #6 terminal and #1 terminal would be indicated.

CAUTION: Verify that when the air control is in the full off position (Iris valve closed) that the Iris valve micro switch is "open" not allowing current to the heater control switch.

- 2.4.3. Combustion air blower red wire to heater terminal #1 and black to ground.
- 2.4.4. Optional hour meter connection to terminal #2.
- 3. Documentation:
 - 3.1. Follow Heater Operational Test provided with IN 14193-1.
 - 3.2. Weight & Balance.
 - 3.2.1. Remove old heater of 35 lbs



DOCUMENTATION AND PARTS REQUIREMENT TABLE

	DOCUMENTATION		Quantity	
1.	FAA/PMA Supplement #			
2.	Installation Instructions IN29155			
3.	Label for flight manual			
4.	MM10001 Maintenance Manual			
5.	Quality Assurance Certificate of Compliance #527			
6.	STC #			
7	337 Form			
	55710111			
	PARTS			S/N
	1. (3) Rubber Straps	21410		
	2. (1) Adapter Ring	23600		
	3. (1) Fiber tape (1.5" thick)	60501		
	4. (1) Fiber tape (1" thick)	60502		
	5. (2) Clamp (7")	60900-104		
	6. (1) Switch, Thermostat Sensor	CD21253		
	7. (1) Linear Rheostat	CD21399		
	8 (1) Heater Control Switch	CD21600		
	9. (1) Blower Mount	21191B		
	10 (4) Shock Mount	21520		
	11 (8) Nuts	60172		
	12 (8) Washers	CD60177		
	12. (0) Washers	0000177		

Initials: Date: