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Service Bulletin

No. A-101 Rev. G

**Aircraft Heater
Upgrade to I-Series**

This page transmits the revision of Service Bulletin A-101 Rev. F, to Service Bulletin A-101 Rev. G, dated August 22, 2012.

- Revision SB A-101 Rev. F, dated July 12/06
- Revision SB A-101 Rev. G, dated August 22/12

FAA approval has been obtained on technical data in this publication that affects type design.

Changes are shown by a change bar in the lower left or right margins of the revised pages.

Some of these changes that do not affect technical content may not be highlighted in this transmittal sheet.

This revision is issued to change the following:

- Revise SB A-101 Rev. F to Rev. G by changing organizational content and format.
- Expanded effectivity for I-Series heaters.
- Added reference notes to I-Series heaters.
- Added reference notes for available kits to upgrade to I-Series heaters.
- Added I-Series heaters upgrade instructions for B-Series heaters.
- Added Appendix Table 1 for available kits for upgrade to I-Series heaters.
- Changed Chart 1 to Appendix Chart 1 for supersedure data for I-Series heaters.
- Placed Appendix Chart 1 and Appendix Table 1 at end of SB.

The Service Bulletin SB A-101 Rev. F has been revised in its entirety.

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1. Planning Information

A. Effectivity

- (1) All Hartzell Engine Technologies LLC (HET) I-Series aircraft heaters delivered from the factory for the purpose of installation.
- (2) All B-Series aircraft heaters with I-Series upgrade for the purpose of installation.
- (3) All B-Series aircraft heaters eligible for I-Series upgrade.

CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS SERVICE BULLETIN (SB). THE INFORMATION CONTAINED IN THIS SB MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. OBSOLETE INFORMATION USE MAY CREATE AN UNSAFE CONDITION THAT MAY RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. REFER TO THE HET WEBSITE FOR THE MOST RECENT REVISION LEVEL.

B. Concurrent Requirements

- (1) None

C. Reason

- (1) To revise Service Bulletin A-101 Rev. F to A-101 Rev. G by updating general format, company information, and by adding I-Series upgrade information.
- (2) HET/Janitrol B-Series heaters have undergone various product improvements that are approved and available to users to upgrade the combustion heater to HET's current configuration and to provide basis for installation approval.
- (3) To announce the availability of the I-Series model aircraft heater and to provide approval for the I-Series model installation. (See Chart 1)
- (4) To provide a method to upgrade eligible B-Series heaters to an I-Series model heater by adding supplementary upgrade instructions and making available upgrade parts kits.
- (5) Regulatory action is not expected.

D. Description

- (1) This SB advises users of improvements and recommends upgrade of their particular heater at the next required overhaul to HET's current configuration. (Chart 1)
 - (a) This SB provides an approved method to upgrade eligible B-Series heater models to I-Series heater models by the application of instructions.
 - (b) This SB provides Table 1 showing the approved upgrade parts kits for application on eligible B-Series heater models for I-Series heater model upgrade.

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E. Approval

- (1) FAA approval has been obtained on technical data in this publication that affects type design.

F. Compliance

- (1) Upgrade to I-Series Heater: At next overhaul, convert all eligible B-Series aircraft heater models B1500, B2030, B3040, B4050, B2500, B3500, and B4500 as listed in Chart 1 to I-Series heaters by incorporating the instructions herein.
 - (a) All I-Series aircraft heater models I-1500, I-2500, I-3500, and I-5000 as identified in 3.A(1) or as delivered from the HET factory are in compliance and are approved for use per the applicable heater found in Appendix Chart 1 of this SB.
 - (b) All B-Series aircraft heater models B1500, B2030, B3040, B4050, B2500, B3500, and B4500 if upgraded to I-Series models I-1500, I-2500, I-3500, and I-5000, per instructions herein and per Appendix Table 1 are in compliance and are approved for use per the applicable heater found in Appendix Chart 1 of this SB.

G. Manpower

- (1) Negligible for Inspection.
- (2) If I-Series upgrade is performed at overhaul, an additional one-half (1/2) man hour is required to upgrade the heater. This does not include removal and installation which will vary with the aircraft model and type.

H. References

CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF A DOCUMENT.

- (1) Aircraft/rotorcraft Service or Maintenance manual as may be applicable to your specific make or model aircraft/rotorcraft.
- (2) B-Series Aircraft Heater Maintenance & Overhaul Manual 24E25-1 Rev. D or later.
- (3) B-Series Aircraft Heater Maintenance & Overhaul Manual 94E47 Rev. C or later.

I. Other Publications Affected

- (1) None.

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2. Material Information

- (1) None for I-Series heater or I-Series upgraded heater.
- (2) One (1) each, Inconel® (IS) combustion heater upgrade parts kit (as required in Table 1*). *Additional parts may be necessary based on whether the upgrade is being done to coincide with overhaul of the heater or as a repair only.*

* The B-Series heater models come in many varieties, any additional P/N's needed to complete this SB or heater overhaul must be obtained from the HET 24E25-1 or 94E47 Overhaul & Maintenance manual in the Illustrated Parts Catalog (IPC) section. **All I-Series combustion tube assemblies have an (IS) following the P/N.**

3. Accomplishment Instructions

WARNING: THIS PROCEDURE MUST BE PERFORMED BY COMPETENT AND QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH AIRFRAME MAINTENANCE THAT IS SPECIFIC TO THE CABIN HEATING SYSTEM. FAILURE TO DO SO MAY RESULT IN ECONOMIC LOSS, EQUIPMENT DAMAGE, AND/OR PHYSICAL INJURY.

CAUTION: DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS SERVICE BULLETIN (SB) AND THE HET 25E24-1 OR 94E47 OVERHAUL & MAINTENANCE MANUAL. INSTALLATION ACTIVITY MUST BE DONE IN ACCORDANCE WITH THE MOST RECENT REVISION OF THE APPLICABLE AIRCRAFT MAINTENANCE MANUAL. INFORMATION CONTAINED IN THESE MANUALS OR THIS SB MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. FAILURE TO COMPLY WITH THE SB OR THE USE OF OBSOLETE INFORMATION MAY CREATE AN UNSAFE CONDITION THAT MAY RESULT IN DEATH, INJURY, AND/OR SUBSTANTIAL PROPERTY DAMAGE. REFER TO THE APPLICABLE AIRCRAFT MAINTENANCE MANUAL INDEX FOR THE MOST RECENT REVISION LEVEL OF THE PUBLICATION. REFER TO THE HET WEBSITE FOR THE CURRENT REVISION LEVEL OF THE HEATER MANUALS.

A. I-Series Heater Upgrade Example:

Upgrade all eligible B-Series heaters to the current production model at the next required overhaul. For example, the PA31T/T1 CHEYENNE original installation used a 62D33 Janitrol heater and subsequent upgrades have resulted in the 10E21-4(EL) model B3500 incorporating an improved ignition system, spark plug, fuel feed, and combustion tube. The latest version of this same heater incorporates an Inconel® combustion tube making it a 10E21-4(IS) model I-3500.

- (1) Chart 1 shows supersedure data by HET/Janitrol heater model. The chart is annotated with an asterisk (*) indicating the current production model of a given heater. Also noted is the principle change element between models showing the continual upgrade of that model.

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A. I-Series Heater Upgrade Example: (cont'd)

- (2) FAA AD #2004-21-05 on the B-Series heaters requires periodic inspections as found in 24E25-1 or 94E47 Heater Overhaul & Maintenance manual to assure the integrity and airworthiness of the combustion tube in each heater (standard or extended life - EL tube). Heaters failing a pressure decay test at these periodic inspection intervals require immediate overhaul including replacement of the combustion tube. The inspection interval then reverts back to the initial 500 hour period or the same as a new heater thus the AD cycles repetitively. It is recommended at the point of overhaul, that the heater be upgraded to the most current production specifications (I-Series). **FAA AD #2004-21-05 does not apply to the current production I-Series model or I-Series upgrade heaters.**
- (3) New or Upgraded I-Series heaters still require periodic inspections to assure the integrity and airworthiness of the combustion tube at intervals extended beyond those for B-Series. These inspections are called out in the Heater Owners manual P/N 99M90. Any heater failing a pressure decay test during a periodic inspection will require immediate overhaul including replacement of the combustion tube. The I-Series Heater Owners manual P/N 99M90 comes with each new or rebuilt heater and is included in each upgrade parts kit.

B. Inspection for Heater Model

NOTE: Do not depend on this SB for gaining access to the aircraft heater. This instruction requires that you use the applicable aircraft manufacturers maintenance manuals.

- (1) Remove the necessary panels to gain access to the aircraft heater. The typical heater may be located either in the nose or the tail of the aircraft and other places in rotorcraft.
- (2) Locate the heater Data Plate as shown in Fig. 1 (typical) to determine the B-Series model. If Data Plate has an I-Series model, upgrade instructions contained in this SB do not apply. If Data Plate is a B-Series, observe model and part number and refer to Appendix Table 1 to find the appropriate upgrade kit P/N.

A rectangular data plate for Janitrol Heaters. At the top is the Janitrol Heaters logo. Below it, the text reads "AIRCRAFT HEATER". There are three input fields for "MODEL NO.", "PART NO.", and "SERIAL NO.". Below these are two input fields for "RATED BTU/HR" and "FUEL". Further down are input fields for "VOLTAGE", "FUEL", and "PSIG", followed by a "FACTORY REBUILT" checkbox. At the bottom, there are input fields for "SPECIFICATION FAA-TSO-C20", "APPROVAL", and "CABIN". The logo for Kelly Aerospace, Fort Deposit, Alabama, is at the bottom left.



Typical Janitrol
Heater Data Plate

Typical HET
Data Plate

A rectangular data plate for Hartzell Engine Technologies. At the top is the Hartzell Engine Technologies logo. Below it, the text reads "AIRCRAFT HEATER". There are three input fields for "MODEL NO.", "PART NO.", and "SERIAL NO.". Below these are two input fields for "RATED BTU/HR" and "FUEL". Further down are input fields for "VOLTAGE", "FUEL", and "PSIG", followed by a "CUSTOMER P/N" input field. At the bottom, there are input fields for "APPROVAL" and "CABIN".



Fig. 1 - Data Plates

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C. Instructions:

NOTE 1: Because the B-Series heaters come in many varieties, overhaul or repair information needed to complete this SB must be obtained from either HET 24E25-1 or 94E47 Heater Overhaul & Maintenance manual as applicable to your heater model.

NOTE 2: The owner should consider performing the upgrade to the I-Series heater at overhaul as the amount of work to remove and replace the combustion tube assembly as a repair is substantial. Select required upgrade kit from Appendix Table 1 prior to starting work.

NOTE 3: Do not depend on this SB to provide instructions for removing the heater from the aircraft or rotorcraft. Use the applicable aircraft manufacturers service instructions or maintenance manuals for removal or installation of the heater is mandatory.

- (1) To overhaul any HET/Janitrol heater, it is required that it be removed from the aircraft or rotorcraft. Removal from the aircraft is required for upgrade to the I-Series in accordance with this SB.
- (2) Preparing to upgrade the B-Series heater:
 - (a) When preparing to upgrade the B-Series models B1500, B2030, B3040, and B4050, it is essential that the instructions for overhaul or repair in the HET 24E25-1 Overhaul & Maintenance manual be followed. This SB provides supplemental instructions which apply to the upgrade only. An upgrade parts kit is available per Appendix Table 1 which provides necessary parts for specific model and P/N heaters.
 - (b) When preparing to upgrade the B-Series EL models B2500, B3500, and B4500, it is essential that the instructions for overhaul or repair in the HET 94E47 Overhaul & Maintenance manual be followed. This SB provides supplemental instructions which apply to the upgrade only. An upgrade parts kit is available per Appendix Table 1 which provides necessary parts for specific model and P/N heaters.
- (3) Following the disassembly steps in the HET 24E25-1 or 94E47 Heater Overhaul & Maintenance manual as applicable, carefully remove the required hardware and components necessary to open the jacket and remove the combustion tube assembly. (Refer to Fig. 2.)

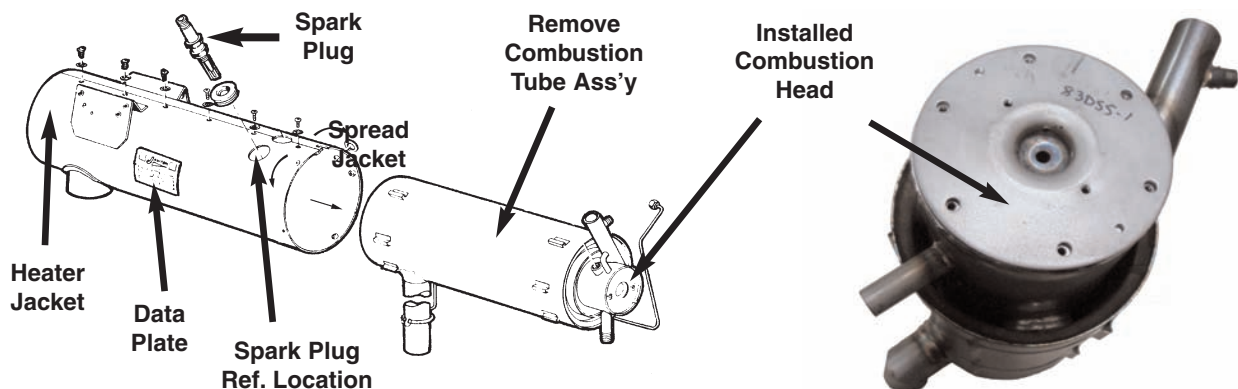


Fig. 2 - Remove Combustion Tube Assembly (typical)

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C. Instructions: (cont'd)

- (4) Once the combustion tube assembly has been removed, It will be necessary to remove the combustion head assembly for modification. Remove the hardware and pull out the combustion head assembly. (Refer to Fig. 3.)

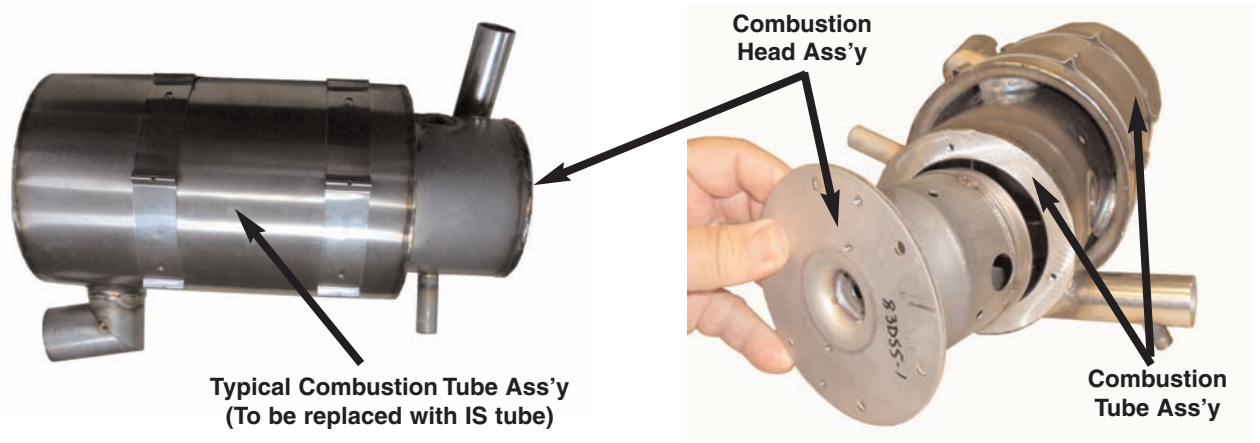


Figure 3 - Combustion Tube & Combustion Head Ass'y

- (5) With the combustion head assembly removed, inspect for condition. If there appears to be any deformation, soft areas, or burn through, replace combustion head assembly. If not, clean per the appropriate steps in the applicable manual.
- (6) Locate the combustion head anode as shown in Figure 4. Not all eligible B-Series heater combustion heads will have an anode rod installed. If no anode rod appears, steps 7 and 8 are not applicable.

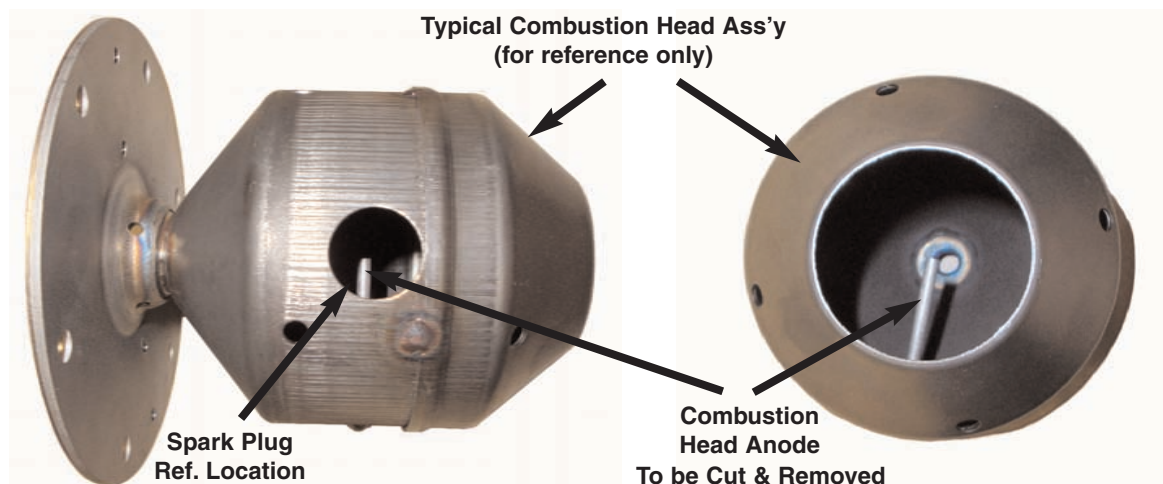


Figure 4 - Remove Combustion Head Anode

- (7) Mark the anode rod 0.25 inch from the wall where it is attached by weld and cut the rod off using a suitable tool.

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C. Instructions: (cont'd)

- (8) Discard the removed piece of the anode rod. Dress the sharp edges of the remaining anode rod. The remaining rod should be level and rounded on the end. Remove filings or debris and clean the combustion head assembly.

NOTE:

Table 1 contains the part number for various I-Series heater upgrade parts kits. The part kits are specific to a heater model and P/N. Be sure you identify your heater model and P/N and select the proper kit. Each kit contains the necessary parts for upgrade including the combustion tube, spark plug, and various gaskets and hardware.

- (9) Carefully install the combustion head assembly into the combustion tube and install the assembly into the jacket. If an overhaul, some components may need to be replaced or overhauled along with the listed required replacement parts. Whether overhaul or repair, all rubber or flexible components and gaskets must be replaced during the upgrade.
- (a) Follow the steps for assembly as required in the appropriate section of the 24E25-1 or 94E47 Heater Overhaul & Maintenance. Use standard torque unless a specific torque is called out.
- (b) Using the upgrade parts kit selected from Table 1, refer to the above manual IPC to identify each of the components and their location.
- (10) When replacing the spark plug, (Refer to Figure 5.):
- (a) The I-1500 model requires the existing Type I spark plug:
- Check spark plug gap.
 - Install with the same torque as shown in the appropriate section of the applicable manual for Type I or III spark plug.
- (b) All other models require the use of the 10E75-3 spark plug (Type III):
- Install with the same torque as shown in the appropriate section of the applicable manual for Type I or III spark plug.
 - No gap adjustment may be made on the 10E75-3 spark plug (Type III).

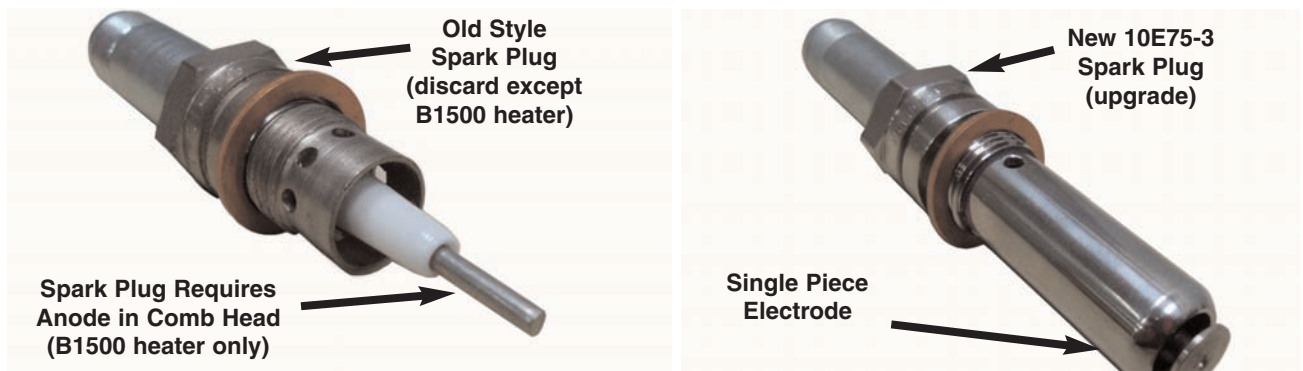


Figure 5 - Spark Plug

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C. Instructions: (cont'd)

NOTE: Future heater maintenance and overhaul activities must utilize the I-Series Owners manual P/N 99M90 (contained in upgrade kit) and Overhaul manual P/N 99M91 (order through HET customer service) once the upgrade has been completed.

- (11) When assembly is complete, follow the steps for testing in the appropriate section of the applicable manual and perform the heater operational bench test.
- (12) The upgrade requires installation of the new Data Plate included in the upgrade parts kit. Remove the existing data plate and record the heater S/N. Clean the data plate area using a suitable solvent and dry. Wipe area with isopropyl alcohol to remove any solvent residue.
 - (a) The new Data Plate in the kit has all information for the heater except the S/N. Using a metal stamp tool, stamp the S/N as recorded above in the proper area of the new Data Plate. The data plate has adhesive backing, remove wax paper and adhere to the jacket surface in the original data plate location.
- (13) Upon successful bench testing of the heater assembly, reinstall in the aircraft or rotorcraft. Utilize the most recent aircraft service instructions or maintenance manual for the installation. Upon completion, proceed to 3.D Return to Service.

D. Return to Service

- (1) Before attempting a start of the installed heater, pressurize the heater fuel system lines and check lines and fittings to ensure no leaks exist. Be sure all air intake scoops, air ducts, and exhaust tubes are clean and free of debris. Utilize the applicable and most recent aircraft service instructions or maintenance manual as required.
- (2) Place the aircraft outside or in a well ventilated area and perform a normal heater start, run, and shutdown. Utilize the most recent aircraft or rotorcraft AFM or POH to determine the procedure for proper operation.
- (3) Using the applicable aircraft manufacturer's maintenance manuals of the latest revision, install any portion of the aircraft that was removed to gain access.
- (4) Make a logbook entry to indicate that the heater being returned to service is an I-Series heater model (a or b):
 - (a) The heater being installed is a new I-Series heater shown in Chart 1 of this SB.
 - (b) The heater I-Series upgrade has been accomplished per instructions in this SB. Installation eligibility requirements are met by the heater upgrade.
 - (c) Compliance with this SB is the terminating action for this Service Bulletin.
- (5) The aircraft may be returned to service only after making the logbook entry of compliance with HET Service Bulletin A-101 Rev. G (or later) as applicable.

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4. Warranty Statement

- A. The sole warranty for the actions within this service bulletin are contained in the HET Limited Warranty Policy issued with the purchase of each new or rebuilt aircraft heater or aircraft heater piece part (see terms and conditions therein).
- B. Issuance of this service bulletin in no way constitutes an implied or expressed warranty of any kind.
- C. This publication does not imply or state any responsibility for the workmanship of any person or entity performing work or maintenance on the aircraft heating system.

5. Contact Information:

- A. All communications regarding this Service Bulletin, must be placed either through Hartzell Engine Technologies Technical Support at (888) 461-6077 or via Fax (334) 386-5450. For the Warranty department, (334) 386-5441.
- B. Written communications must be placed through Hartzell Engine Technologies Technical Support, 2900 Selma Highway, Montgomery, AL 36108, USA.
- C. If E-mail communication is desired, go to our website:<http://www.hartzellenginetech.com> and select "contact" and follow the instructions.

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APPENDIX - Chart 1 - Supersedure Data

Combustion Heaters

HEATER:	MODEL:	CHANGE:
82D20-2	B3040	Chg Blower & Cycling SW
07E02-1	B3040	New Version - Press. 81D94
07E02-1(EL)	B3500	Extended Life Tube
* 07E02-1(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
07E94-1	B4050	Original -12VDC
07E94-1(EL)	B4500	Extended Life Tube
* 07E94-1(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
07E94-2	B4050	24 VDC Version -B4050
07E94-2(EL)	B4500	Extended Life Tube
* 07E94-2(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
62D33	B3040	Original - Fuel Inlet 47° R
62D33-1	B3040	Relocate Fuel Inlet 55° L
63D33-2	B3040	Ignition Upgrade
10E21-1	B3040	Phase I - 10E75-3 Sparkplug
10E21-2	B3040	Phase II - Comb. Hd.
10E21-3	B3040	Phase III - CTA & Fuel Feed
10E21-4	B3040	Auto Reset - O/T Switch
10E21-4(EL)	B3500	Extended Life Tube
* 10E21-4(IS)	I-3500	Inconel® Combustion Tube
A34D35	B3040	Original - Calibrated Head
02E17-1	B4050	Standard Head -1975
13E55-1	B4050	Blower & Ignition Upgrade
13E55-1(EL)	B4500	Extended Life Tube
* 13E55-1(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
02E17-2	B4050	Original - 1975
13E55-2	B4050	Blower & Ignition Upgrade
13E55-2(EL)	B4500	Extended Life Tube
* 13E55-2(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
19E69-1	B4050	Original - 1979-B4050
19E69-1(EL)	B4500	Extended Life Tube
* 19E69-1(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug

(*) indicating the latest TSO C20 approved production model of a given heater.

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APPENDIX - Chart 1 - Supersedure Data (cont'd)

Combustion Heaters

HEATER:	MODEL:	CHANGE:
20D35	B2030	Original - Calibrated Head
20D35-1	B2030	Standard Head, Ign. Upgrade
20D35-1(EL)	B2500	Extended Life Tube
* 20D35-1(IS)	I-2500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
22D25	B3040	Original - Calibrated Head
22D25-1	B3040	Standard Head, 1974
22D25-1(EL)	B3500	Extended Life Tube
* 22D25-1(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
23E62-1	B4050	Original - new model, 1982
23E62-2	B4050	Auto Reset - O/T Switch
23E62-2(EL)	B4500	Extended Life Tube
* 23E62-2(IS)	I-5000	Inconel® Combustion Tube
37D77	B3040	Original - Calibrated Head
37D77-1	B3040	Standard Head, 1973
37D77-1(EL)	B3500	Extended Life Tube
* 37D77-1(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
39D90-1	B4050	Original 1974
39D90-1(EL)	B4500	Extended Life Tube
* 39D90-1(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
42D79	B2030	Original - Calibrated Head
42D79-1(EL)	B2500	Std. Head, Ign. Upgrade & Extended Life Tube
* 42D79-1(IS)	I-2500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
45D70	B3040	Original - Calibrated Head
45D70-1	B3040	Standard Head, 1974
45D70-2	B3040	Auto Reset - O/T Switch
45D70-2(EL)	B3500	Extended Life Tube
* 45D70-2(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
47D65	B3040	Original - Calibrated Head
47D65-1	B3040	Standard Head, 1973, Ign. Chg.
47D65-2	B3040	Obsolete; see -3
47D65-3	B3040	10E75-3 Sparkplug
47D65-3(EL)	B3500	Extended Life Tube
* 47D65-3(IS)	I-3500	Inconel® Combustion Tube

(*) indicating the latest TSO C20 approved production model of a given heater.

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APPENDIX - Chart 1 - Supersedure Data (cont'd)

Combustion Heaters

HEATER:	MODEL:	CHANGE:
62D95-1B	B3040	Original
62D95-1B(EL)	B3500	Extended Life Tube
* 62D95-1B(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
65D79	B4050	Original - Calibrated Head
65D79-1	B4050	Standard Head, 1973
65D79-2	B4050	CTA upgrade
65D79-3	B4050	Auto Reset - O/T Switch
65D79-3(EL)	B4500	Extended Life Tube
* 65D79-3(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
74D01-1	74D01	B2030 CTA Upgrade
74D01-2	B2030	CTA Change
74D01-3	B2030	Standard Head
74D01-3(EL)	B2500	Ignition Upgrade
* 74D01-3(IS)	I-2500	Extended Life Tube Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
81D94-1	B4050	Original
81D94-2	B4050	Overheat Switch Change
81D94-3	B4050	C/A Switch Move, New Nozzle
81D94-3(EL)	B4500	Extended Life Tube
* 81D94-3(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
82D20-1	B3040	Original
82D20-1(EL)	B3500	Extended Life Tube
* 82D20-1(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
88D81-1	B3040	Original
88D81-2	B3040	Switch Change
88D81-2(EL)	B3500	Extended Life Tube
* 88D81-2(IS)	I-3500	Inconel® Combustion Tube
90D38-1	B3040	Optional - B3040 - now std.
90D38-1(EL)	B3500	Extended Life Tube
* 90D38-1(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
90D38-2	B3040	Original - flue change to -1
90D38-2(EL)	B3500	Extended Life Tube
* 90D38-2(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug

(*) indicating the latest TSO C20 approved production model of a given heater.

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APPENDIX - Chart 1 - Supersedure Data (cont'd)

Combustion Heaters

HEATER:	MODEL:	CHANGE:
90E00-1	B4050	Original
90E00-1(EL)	B4500	Extended Life Tube
* 90E00-1(IS)	I-5000	Inconel® Combustion Tube
90E14-1	B4050	Original Heater
90E14-1(EL)	B4500	Extended Life Tube
* 90E14-1(IS)	I-5000	Inconel® Combustion Tube
91E18-1	B4050	Original
91E18-1(EL)	B4500	Extended Life Tube
* 91E18-1(IS)	I-5000	Inconel® Combustion Tube
91E88-1	B3040	Original - New Model, 1988
91E88-1(EL)	B3500	Extended Life Tube
* 91E88-1(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
94E11-1	B4050	Original
94E11-1(EL)	B4500	Extended Life Tube
* 94E11-1(IS)	I-5000	Inconel® Combustion Tube
96C60	B1500	Original - Calibrated Head
* 96C60(IS)	I-1500	Inconel® Combustion Tube
96C62	B3040	Original - Calibrated Head
96C62-1	B3040	Jacket & Switch Changes
96C62-1(EL)	B3500	CTA Chg & Extended Life Tube
* 96C62-1(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
99C42	B1500	Original - Calibrated Head
* 99C42(IS)	I-1500	Inconel® Combustion Tube
99C80	B4050	Original, Calibrated Head
99C80-1	B4050	CO2 Ftg., Sealing
99C80-2(EL)	B4500	Extended Life Tube
* 99C80-2(IS)	I-5000	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
37D88	B2030	Original 1966
A37D88	B2030	Auto Reset -O/T Switch
B37D88	B2030	Standard Head -1973
B37D88(EL)	B2500	Extended Life Tube
* B37D88(IS)	I-2500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug

(*) indicating the latest TSO C20 approved production model of a given heater.

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APPENDIX - Chart 1 - Supersedure Data (cont'd)

Combustion Heaters

HEATER:	MODEL:	CHANGE:
A34D51	B3040	Original
C34D51	B3040	CTA & O'Heat SW Upgrade
C34D51(EL)	B3500	Extended Life Tube
* C34D51(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
A39D59	B3040	Original - Calibrated Head
C39D59	B3040	Standard Head, 1975
C39D59(EL)	B3500	Extended Life Tube
* C39D59(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
B34D51	B3040	Original - Calibrated Head
D34D51	B3040	Standard Head, 1973, Ign. Chg.
D34D51(EL)	B3500	Extended Life Tube
* D34D51(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug
39D59	B3040	Original - Calibrated Head
B39D59	B3040	Standard Head, 1974
D39D59	B3040	Auto Reset - O/T Switch
D39D59(EL)	B3500	Extended Life Tube
* D39D59(IS)	I-3500	Inconel® Combustion Tube, Anode Removed, 10E75-3 Spark Plug

(*) indicating the latest TSO C20 approved production model of a given heater.

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APPENDIX - Table 1 - B-Series Heater Upgrade Parts Kits

PART NUMBER STANDARD OR (EL)	MODEL ELIGIBLE	UPGRADE KIT PART NUMBER	UPGRADED TO MODEL (IS)	UPGRADED TO PART NUMBER
07E02-1	B3040 or B3500	07E02-1(IS)-U	I-3500	07E02-1(IS)
07E94-1	B4050 or B4500	07E94-1(IS)-U	I-5000	07E94-1(IS)
07E94-2	B4050 or B4500	07E94-2(IS)-U	I-5000	07E94-2(IS)
10E21-4	B3040 or B3500	10E21-4(IS)-U	I-3500	10E21-4(IS)
13E55-1	B4050 or B4500	13E55-1(IS)-U	I-5000	13E55-1(IS)
13E55-2	B4050 or B4500	13E55-2(IS)-U	I-5000	13E55-2(IS)
19E69-1	B4050 or B4500	19E69-1(IS)-U	I-5000	19E69-1(IS)
20D35-1	B2030 or B2500	20D35-1(IS)-U	I-2500	20D35-1(IS)
22D25-1	B3040 or B3500	22D25-1(IS)-U	I-3500	22D25-1(IS)
23E62-2	B4050 or B4500	23E62-2(IS)-U	I-5000	23E62-2(IS)
37D77-1	B3040 or B3500	37D77-1(IS)-U	I-3500	37D77-1(IS)
39D90-1	B4050 or B4500	39D90-1(IS)-U	I-5000	39D90-1(IS)
42D79-1	B3040 or B3500	42D79-1(IS)-U	I-3500	42D79-1(IS)
45D70-2	B3040 or B3500	45D70-2(IS)-U	I-3500	45D70-2(IS)
47D65-3	B3040 or B3500	47D65-3(IS)-U	I-3500	47D65-3(IS)
62D95-1B	B3040 or B3500	62D95-1B(IS)-U	I-3500	62D95-1B(IS)
65D79-3	B4050 or B4500	65D79-3(IS)-U	I-5000	65D79-3(IS)
74D01-3	B2030 or B2500	74D01-3(IS)-U	I-2500	74D01-3(IS)
81D94-3	B4050 or B4500	81D94-3(IS)-U	I-5000	81D94-3(IS)
82D20-1	B3040 or B3500	82D20-1(IS)-U	I-3500	82D20-1(IS)
88D81-2	B3040 or B3500	88D81-2(IS)-U	I-3500	88D81-2(IS)
90D38-1	B3040 or B3500	90D38-1(IS)-U	I-3500	90D38-1(IS)
90D38-2	B3040 or B3500	90D38-2(IS)-U	I-3500	90D38-2(IS)
90E00-1	B4050 or B4500	90E00-1(IS)-U	I-5000	90E00-1(IS)
90E14-1	B4050 or B4500	90E14-1(IS)-U	I-5000	90E14-1(IS)
91E18-1	B4050 or B4500	91E18-1(IS)-U	I-5000	91E18-1(IS)
91E88-1	B3040 or B3500	91E88-1(IS) -U	I-3500	91E88-1(IS)
94E11-1	B4050 or B4500	94E11-1(IS)-U	I-5000	94E11-1(IS)
96C60	B1500	96C60(IS)-U	I-1500	96C60(IS)
96C62-1	B3040 or B3500	96C62-1(IS)-U	I-3500	96C62-1(IS)
99C42	B1500	99C42(IS)-U	I-1500	99C42(IS)
99C80-2	B4050 or B4500	99C80-2(IS)-U	I-5000	99C80-2(IS)
B37D88	B2030 or B2500	B37D88(IS)-U	I-2500	B37D88(IS)
C34D51	B3040 or B3500	C34D51(IS)-U	I-3500	C34D51(IS)
C39D59	B3040 or B3500	C39D59(IS)-U	I-3500	C39D59(IS)
D34D51	B3040 or B3500	D34D51(IS)-U	I-3500	D34D51(IS)
D39D59	B3040 or B3500	D39D59(IS)-U	I-3500	D39D59(IS)