

INSPECTION PROCEDURE

Troy Indiana

Page 1 of 8

Pressure Decay Test, Aircraft Heaters

Document No./Section:

IP-347

Originator:

James Tarter

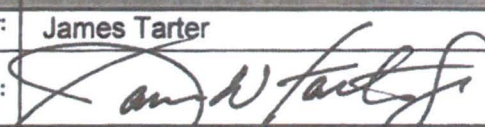
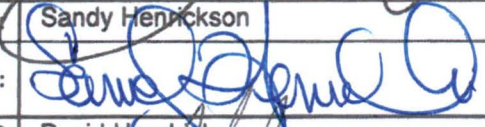
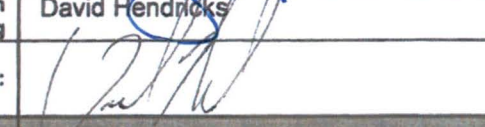
System Date:

May 17, 2014

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APPROVALS & REVISIONS

TITLE:	REQUIRED APPROVALS	DATE:	TITLE:	APPROVALS AS DESIGNATED	DATE:	✓
Originator:	James Tarter	DATE:			DATE:	
Signature:		5/20/14	Signature:			
Quality:	Sandy Hendrickson	DATE:			DATE:	
Signature:		5/20/14	Signature:			
Design Engineering:	David Hendricks	DATE:			DATE:	
Signature:		5/20/14	Signature:			
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			Signature:			

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NOTE: All revisions to this inspection procedure must be approved by the FAA. This procedure is applicable to an issued FAA Airworthiness Directive.

INSPECTION PROCEDURE	Troy Indiana	Page 2 of 8
	Document No./Section: IP-347	
Pressure Decay Test, Aircraft Heaters	System Date: May 17, 2014	Revision: Original
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1.0 Purpose

Define the process to perform a pressure decay test on the combustion heat exchanger in Aircraft Combustion Heater models 8240, 8253, 8259 and 8472.

2.0 Application

Aircraft Combustion Heater models 8240, 8253, 8259 and 8472.

3.0 Frequency

The PDT shall be performed at each 250 hour inspection as defined in the applicable service manual.

4.0 Associated Content / References

- Service manual applicable to the heater model being tested.
- Pressure Decay Test Kit - A pressure decay test kit is necessary to conduct the PDT. Pressure decay test kits are available from various suppliers. The kit should contain, at a minimum, ¼ inch air supply line with a calibrated pressure gauge of 0-15 psig range, ¼ inch air supply line with a calibrated pressure gauge of 0-160 psig range, 2 shut off valves, 2 air pressure regulators, clamps, plugs, tubing, seals and seal bulbs sufficient to seal the openings from the combustion tube.
 - If a pressure decay test kit is unavailable, the components of the kit as defined above may be acquired separately.

5.0 Definitions

Pressure Decay Test (PDT) – A pressure test to identify possible leakage in the combustion heat exchanger. This test can be performed on wing or on bench as set forth herein.

Water Submersion Test (WST) – A pressure test performed with the item being tested submersed in water to allow for more accurate location of leakage if present. This test can only be performed on the combustion heat exchanger after being removed from the combustion heater assembly as set forth herein.

6.0 Pressure Decay Test Procedure

- 6.1 To conduct the pressure decay test the heater must be sealed at all openings into the combustion chamber assembly. The openings into the combustion chamber include the combustion air inlet tube, the fuel drain, the spark plug hole and the exhaust tube. (Figure 1)

INSPECTION PROCEDURE

Troy Indiana

Page 3 of 8

Pressure Decay Test, Aircraft Heaters

Document No./Section:

IP-347

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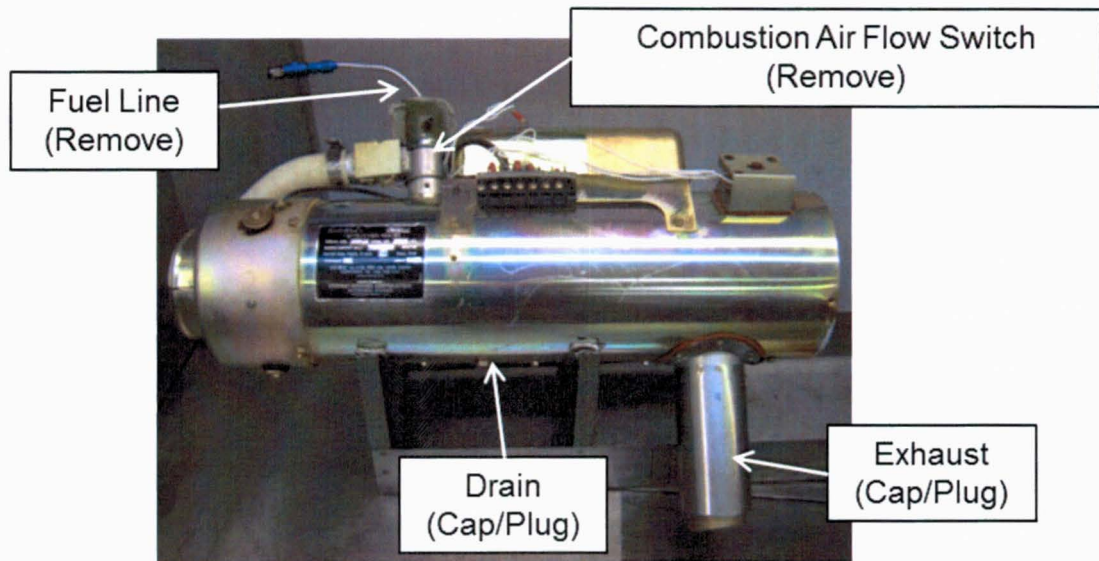


Figure 1

- 6.2 Loosen and remove all flex tubing, elbows and adapters that may be mounted between the combustion air blower and heater. This includes removal of the fuel line and the combustion airflow switch. The combustion air inlet is shown with the combustion airflow switch removed, and fuel tube sticking out. (Figure 2)

INSPECTION PROCEDURE

Troy Indiana

Page 4 of 8

Pressure Decay Test, Aircraft Heaters

Document No./Section:

IP-347

Originator:

James Tarter

System Date:

May 17, 2014

Revision:

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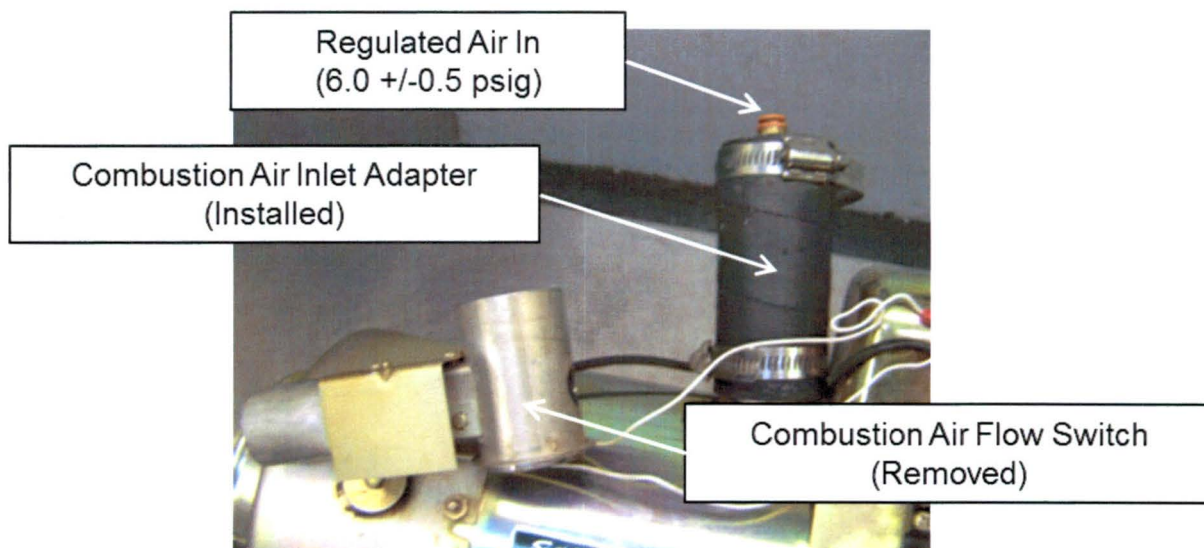


Figure 2

- 6.3 Install the PDT combustion air inlet adaptor on the combustion air inlet. (Figure 2)
- 6.4 Verify that all other openings into the combustion chamber are sealed. Then insert exhaust seal bulb into the exhaust. (Figure 3, 4)

INSPECTION PROCEDURE

Troy Indiana

Page 5 of 8

Pressure Decay Test, Aircraft Heaters

Document No./Section:

IP-347

Originator:

James Tarter

System Date:

May 17, 2014

Revision:

Original

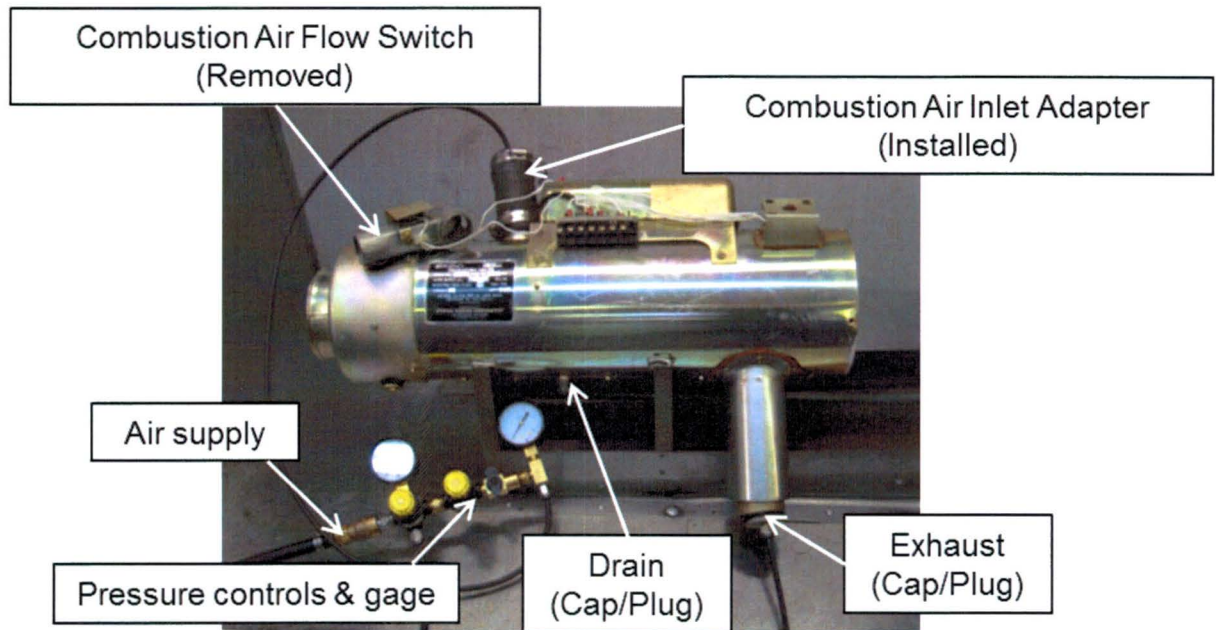


Figure 3

- 6.5 Slowly inflate the exhaust seal bulb, using the regulated supply air, until the exhaust tube is sealed. When properly installed, the exhaust seal bulb will hold itself in place. (Figure 4)

INSPECTION PROCEDURE

Troy Indiana

Page 6 of 8

Pressure Decay Test, Aircraft Heaters

Document No./Section:

IP-347

Originator:

James Tarter

System Date:

May 17, 2014

Revision:

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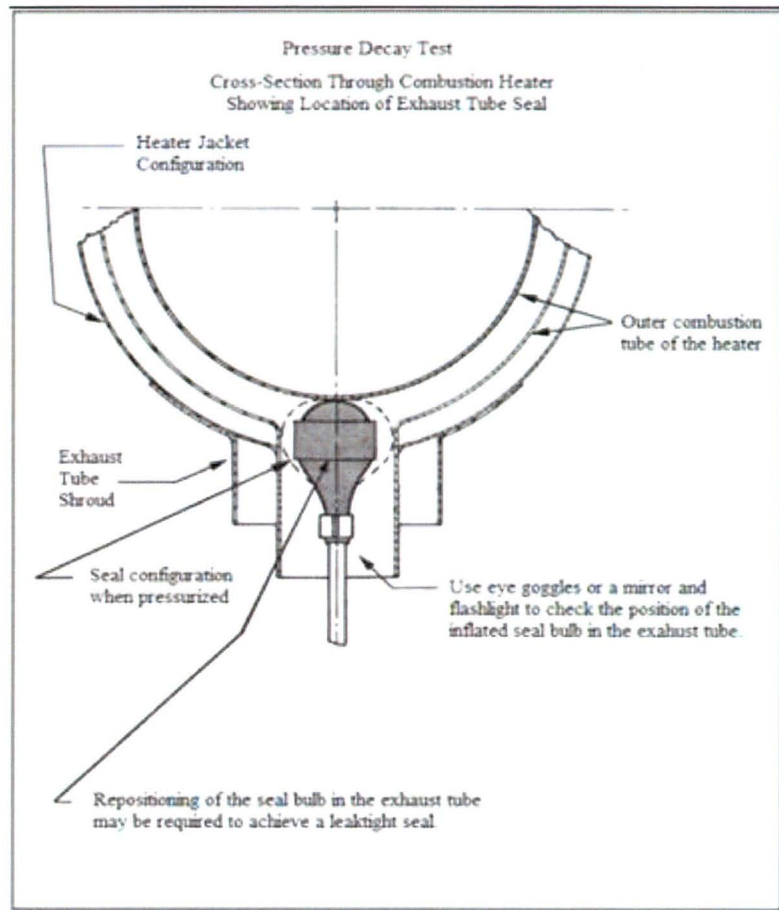


Figure 4

- 6.6 Attach a compressed air supply line to the combustion air inlet adapter fitting, (Figure 3). Slowly apply 2 or 3 psig of air pressure from the compressed air regulator to check that the exhaust tube, combustion air inlet, spark plug, and fuel drain are sealed and leak proof.
- 6.7 Check all seals for security and leak tightness using a soap and water solution or other available method. When all seals, caps and plugs are leak proof, start the pressure decay test.
- 6.8 Apply 6.0 ± 0.5 psig to the combustion chamber through the air pressure regulator feeding the combustion air inlet adapter. After the pressure reaches 6.0 ± 0.5 psig and is stabilized, shut off the compressed air supply line and start the timer. (This valve should be checked for leaks prior to the start of testing as should all connections.) It is best to remove the compressed air supply from the regulator to eliminate possible bleed through. After 45 seconds, the pressure in the combustion

INSPECTION PROCEDURE	Troy Indiana	Page 7 of 8
	Document No./Section:	
Pressure Decay Test, Aircraft Heaters		IP-347
Originator: James Tarter	System Date: May 17, 2014	Revision: Original

chamber must not indicate any decay in pressure; if pressure decay is evident this is considered a failure of the pressure decay test.

- 6.9 There is a potential that the leak is from one of the areas sealed with the PDT Kit fittings used to conduct the PDT, recheck all these seals for leaks. If such a leak is discovered, reseal the area and repeat the pressure decay test.
- 6.10 If the pressure decay test is repeated, and if any pressure decay is noted in the repeat test, then the heater must be removed from the aircraft and identified as out of service.
- 6.11 The PDT may be repeated with the combustion heater removed from the aircraft (better access to ensure proper sealing of all test fittings). If no leakage is identified during this off wing PDT the heater may be returned to service.
- 6.12 If a leak is identified during either the on wing or bench PDT the heater must be removed from service.

Before the heater can be returned to service a water submersion pressure test (WST) per Para.7.0 must be performed.

6.12 a. If no leakage is identified during the WST, the heat exchanger can be re-assembled into the combustion heater assembly and returned to service.

6.12 b. If leakage is identified during the WST refer to the applicable service manual for instructions regarding repair and/or replacement.

7.0 Water Submersion Testing (WST)

- 7.1 Disassemble the heat exchanger from the combustion heater assembly (refer to the appropriate service manual).
- 7.2 Seal all of the heat exchanger openings using the PDT kit.
- 7.3 Submerge the heat exchanger in a tank/vessel filled with clean room temperature water and apply 15 psig +/-0.5 psig pressure for a minimum of 5 minutes. Carefully inspect all of the heat exchanger welds and surfaces for leakage. No leakage is acceptable.
 - 7.3 a. If no leakage is found, the heat exchanger may be reassembled into the combustion heater assembly and the heater returned to service upon successful completion of all applicable tests/inspections specified in the service manual.
 - 7.3 b. If leakage is identified, refer to the applicable service manual for instructions regarding repair and/or replacement. If a repair is performed pursuant to the service manual, the water submersion test (Para. 7.0) must be repeated to validate the repair actions have been successful.

INSPECTION PROCEDURE	Troy Indiana		Page 8 of 8
	Pressure Decay Test, Aircraft Heaters		
Originator: James Tarter	Document No./Section: IP-347	System Date: May 17, 2014	Revision: Original

8.0 Replacement Heat Exchanger

- 8.1 If the heat exchanger must be replaced pursuant to the applicable service manual and a replacement heat exchanger (new or used) is procured to facilitate the return of the combustion heater assembly to service, the WST (Para. 7.0) must be performed prior to returning the combustion heater assembly to service.

9.0 Records

- 9.1 All testing performed per this Inspection Procedure must be documented within the service log of the aircraft and/or heater. If the heat exchanger is replaced this must also be recorded.

10.0 Technical Support

- 10.1 Technical support is available if required from Meggitt (Troy), Inc. (formerly, Stewart Warner *South Wind Corp.*) or any FAA certified aircraft combustion heater service center, such as Harold Haskins, Inc.
- Harold Haskins, Inc.
116 Race Track Road
Dothan, Alabama 36303
(334) 873-4116
 - Meggitt (Troy), Inc.
3 Industrial Drive
Troy, Indiana 47588
(812) 547-7071
Attn: Customer Service