



**LOG OF REVISIONS**

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IR	1-6	Initial Release	5/30/2017	<i>Harold Haskins</i>

**1.0 250 Hour Inspection\***

The mandatory 250 Hour Inspection shall be conducted on new South Wind 900 series heaters or overhauled heaters with a new combustion tube assembly upon the accumulation of 500 heater hours. Then, thereafter at intervals not to exceed 250-heater hours or twenty-four (24) months, whichever occurs first (See AD 2017-06-03). If an hour meter is used on the heater assembly, it should be connected across terminal numbers 4 and ground on the heater terminal strip. If an hour meter is not used, count one (1) heater hour for each two (2) flight hours for normal aircraft operation. Consideration should be given for any excessive ground operation of the heating system. The 250-Hour Inspection consists of the functional checks/inspections as listed below and the Pressure Decay Test.

*\*NOTE: The term hours in this manual refers to heater hours of operation and not aircraft hours.*

- Inspect ventilating air and combustion air inlets and exhaust outlet for restrictions and security at the aircraft skin line. If external scoops, jutting out into the air stream are used, make sure they are not distorted and are securely attached to the aircraft skin.
- Check all fuel lines for security at joints and shrouds, making sure that no evidence of leaks exists. Check the security of fuel lines at the various attaching points in the aircraft.
- Inspect electrical wiring at the heater terminal block and components for loose connections, possible chaffing of insulation, and security of attachment points.

**1.1 Pressure Decay Test Setup**

Evaluation of the condition of the combustion chamber shall be made at the 250-hour inspection.

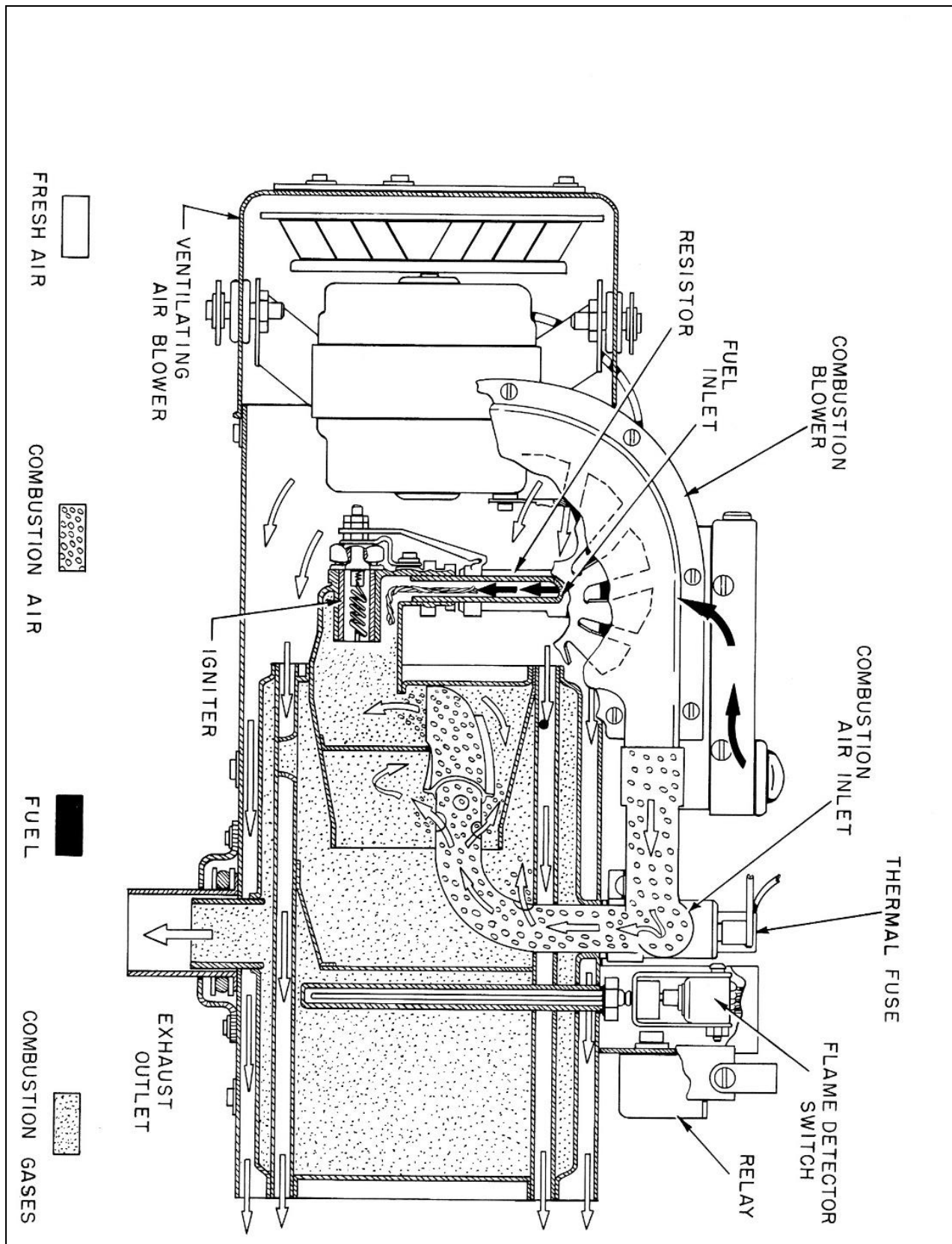
This test is intended to be accomplished while the heater is installed with a minimum of accessory disconnection. When necessary or desired for convenience, the heater assembly may be removed from the aircraft to conduct the pressure decay test. The following equipment is necessary to conduct the Pressure Decay Inspection Test.

- Pressure Decay Test Kit, Part No. HH830 or equivalent, which includes the following components:
- 1/4-inch air supply line with 0-15 PSIG pressure gauge, shut-off valve and air pressure regulator.
- 1/4-inch air supply line with 0-100 PSIG pressure gauge, shutoff valve and air pressure regulator.
- P/N HH830-5 Pressure Decay Bulb, included in PDT Kit P/N HH830.

To conduct the pressure decay test, the heater must first be sealed at all openings into the combustion chamber assembly. The openings into the combustion chamber include the combustion air inlet tube, fuel tube and the exhaust tube (See Figure 1).

*Note: To obtain access to the heater exhaust tube in some aircraft, you must loosen and remove aircraft mounted exhaust tube and exhaust tube shroud from the heater assembly, then insert pressure decay bulb. Inspect exhaust clamps and hardware for rust/corrosion and replace if necessary.*

The remaining steps necessary to prepare for the pressure decay test are listed in the following paragraphs, "a" through "j".



**FIGURE 1 - 940 Heater - Cutaway**

- a. Remove the fuel control valve cover from the fuel control valve shroud, then remove the copper fuel line and cap the fuel tube where it sticks out of the heater jacket. Store safely away to protect the copper fuel line from damage.
- b. It is recommended that the flame detector switch be removed and inspected. See Stewart Warner 940 Series Service Manual PM-10035 for inspection procedure. If removed, be sure to reinstall the

flame detector switch before pressure testing the heater.

- c. The heater terminal strip is attached to a U shaped bracket known as the Flame Detector Switch Guard. This guard must be moved over to gain access to the combustion air tube and thermal fuse assembly. Remove the four screws that attach the guard to the heater jacket and gently move the guard out of the way. See Figure 2.



**FIGURE 2 - Combustion Air Elbow and Thermal Fuse Assembly Shown Installed.**

- d. Remove spade terminals (if present) from the thermal fuse assembly.

*Note: Model 940B does not use a thermal fuse assembly.*

- e. You will have to remove some wires to be able to rotate the combustion air inlet tube up. After you have labeled and removed the wires, loosen the screw on clamp and rotate the combustion air elbow and thermal fuse assembly up to gain access to the combustion air inlet tube. See Figure 3.

- f. Install pressure seals on the Combustion Chamber using the parts supplied in the Pressure Decay Test Kit. The following attachments are to be made on the heater. Install and tighten in place the Combustion Air Tube Pressure Supply Assembly using the hose clamps as shown in Figure 4.

*Note: Prior to starting the pressure decay test, check all lines and fittings for leakage.*

- g. Check the exhaust tube for sharp projections that could damage the pressure decay bulb during



**FIGURE 3 - Combustion Air Elbow and Thermal Fuse Assembly Shown In Raised Position**

inflation. See Figure 5. Products of combustion may need to be cleaned from inside of exhaust tube if the build-up is large enough to keep the bulb from sealing. Deposits may be removed by brushing or scraping.

*NOTE: Do not attempt repair or use a damaged pressure decay bulb as it may rupture suddenly when pressurized.*

- h. After the bulb is properly inserted into the exhaust tube, and while holding it in place, **slowly** inflate the seal to **80 ±5** psig pressure using the regulated supply air. When properly installed and inflated, the bulb will hold itself in place.
- i. Attach a supply line to the fitting on the Combustion Air Inlet Seal Fixture (Figure 4). Slowly apply 2 or 3 psig of air pressure from the regulator as shown in test set-up diagram to check that exhaust seal is leak-tight. Pressure to the pressure decay bulb air supply may be increased to 50-psig max, if required to achieve a leak-tight seal.
- j. Check all seals for security and leak-tightness using a spray bottle with soap and water solution or other available method. When all seals, caps and plugs are leak proof, start the Pressure Decay Test.

## 1.2 Pressure Decay Test

- a. Apply  $6.0 \pm 0.5$  psig to the combustion chamber through the air pressure supply regulator.
- b. After the pressure reaches  $6.0 \pm 0.5$  psig and stabilizes, close the shut-off valve at the low-pressure side of the test kit manifold and start the timer. This valve should be checked for leak tightness prior to the start of testing, as should all connections.
- c. At 45 seconds, the pressure in the combustion chamber **must** exceed 4.0 psig. If the pressure decays to less than four (4) psig before the 45-seconds, which indicates a leak is present either in





**FIGURE 4 - Combustion Air Inlet Tube – Pressure Supply Assembly Installed**

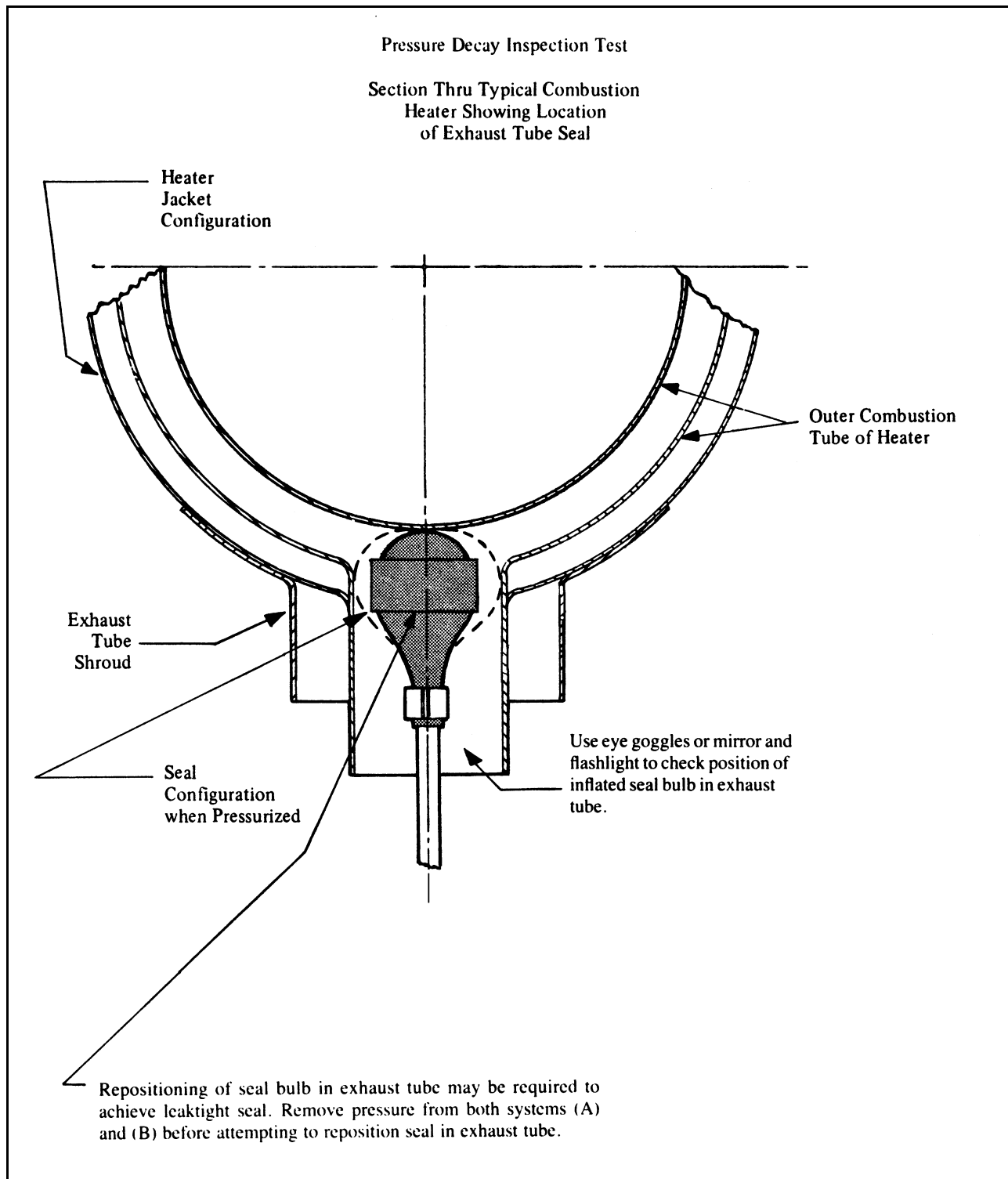
the combustion chamber, or around the seals. Recheck all the seals installed on the combustion chamber for leak tightness and rerun the Pressure Decay Test.

- d. If the heater continues to show rapid pressure decay of the combustion chamber, the heater must be removed from the aircraft, and a more complete inspection be made to determine the location of the leak.
- e. Deflate the bulb in the exhaust tube and remove carefully to avoid damaging the rubber section of the seal before removing heater from the aircraft.
- f. After the heater is removed from the aircraft, remove the ventilation blower assembly and conduct the pressure decay test again to check for leaks at the igniter (glow plug), the flame detector switch compression fitting, and weld seams prior to tear-down for necessary overhaul.

- g. Following the successful completion of the Pressure Decay Test, remove all test fittings, plugs, supply lines, etc., and reinstall combustion air elbow, thermal fuse assembly and flame detector switch (if removed), plus required combustion air supply lines which make up the aircraft installation. Reconnect fuel line, exhaust extensions, tubes and/or shrouds.

The heater assembly shall be overhauled at 1,000 hours, or whenever it fails to pass the Pressure Decay Test. Whenever the heater requires overhaul, all accessories should be removed, operationally checked, and overhauled as indicated in Stewart Warner South Wind Series 940 Heater Manual PM-10035, as revised.

*Note: If the heater does fail the Pressure Decay Test, overhaul with FAA approved parts, or replace with a newly overhauled heater, or disable or remove in accordance with paragraph (k) of AD 2017-06-03.*



**FIGURE 5 - Exhaust Seal Shown Installed Just Prior to Inflation**