

**Installation Instructions for the 700 Series Aircraft Engine Heaters**

Store epoxy components at room temperature (50° to 80° F) prior to use.

**Caution:** Failure to do this may result in a failure of the adhesive to mix or cure properly. Brief exposures to high temperatures or freezing are acceptable provided that the materials are stabilized at room temperature and each part is re-mixed prior to use.

Epoxy **must** be at room temperature (50° to 80° F) before mixing.

**NOTE:** The engine oil, and oil sump or tank should be at **70°F, or warmer** for the adhesive to cure properly. This **temperature must be maintained** during the curing process to ensure proper adhesion of the heat pad. Localized area heating is generally not effective due to the mass of the engine.

**CAUTION: DO NOT PLUG THE HEATER IN BEFORE INSTALLATION. This will cause damage to heater and can cause personal injury.**

1. Remove the engine cowling and any "SCAT" tubes, etc. to gain access to the oil sump area.
2. The SAFE-HEET heating pad should be located on the engine oil sump or tank below the normal oil level. Find the best location for the heater by placing it in different locations while observing clearances from moving parts and heat sources such as throttle linkages and exhaust system components.

**NOTE:** The heater pad will conform to large radius oil tank contours, but can be damaged by sharp bends or uneven surfaces. Silicone pad heaters rely on total contact between the heat pad and the surface to be heated. Voids between the heat pad and the surface to be heated will cause localized overheating and failure of the heating pad. If the oil sump has casting numbers or other raised imperfections, they should be filed or ground down to smooth the surface. **DO NOT cut, bend or trim the heater pad, this will damage the heating element and void the warranty.**

3. Strip the paint from the oil sump or tank where the heating pad will be installed.
4. Rough the area with sandpaper to ensure a good bonding surface is available.
5. Clean the area with a residue free solvent such as lacquer thinner, acetone, or M.E.K to remove any oil or contaminants that would affect the adhesion of the heat pad to the engine. If any silicone compounds, sprays, or lubricants have been used in the application area, clean the area with a pre-paint silicone remover or Naptha. Change rags frequently. Lacquer thinner, acetone or other

Project Engineer: <i>[Signature]</i> Date: <i>FEB-27-2018</i> Engineering Manager: <i>[Signature]</i> Date: <i>2/21/18</i>	Quality Manager: <i>[Signature]</i> Date: <i>2-27-18</i> Manufacturing Manager: <i>[Signature]</i> Date: <i>2-28-18</i>
McFarlane Aviation, Inc. 696 East 1700 Road Baldwin City, Kansas 66006	
Drawing: <b>Installation Instructions: 700 Series Aircraft Engine Heaters</b>	
Size: <b>A</b> Scale: <b>None</b>	Drawn: <b>JB</b> Sheet: <b>1</b> OF <b>3</b>
Drawing: <b>SH118</b>	
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<b>REVISION</b>	
<b>C</b>	

C	01/05/2018	See Revision Sheet
B	01/18/2010	Changed note about temperature storage of epoxy.
A	11/29/2005	Re-write & re-format
~	08/14/2005	ORIGINAL
*X*: Bold letter indicates revision level.		

standard solvents will not remove silicones. **All paint, grease, oil, and silicone contaminants must be removed to ensure a proper bond.**

6. Mix the contents of epoxy containers "A" and "B" thoroughly until a consistent blend is achieved. Failure to mix them thoroughly will cause the epoxy not to cure. Although it may appear inadequate, there is sufficient epoxy in the containers to bond the heater pad to the oil sump or tank.
7. Apply an even coat of mixed epoxy to the aluminum side of the heater pad.
8. Position the heater pad on the oil sump or tank and press into place.
9. Using the enclosed plastic spreader, **gently** work out any trapped air or excess adhesive. Work from the center of the pad towards the outer edges. Use caution not to damage the heater pad.
10. Remove any excess adhesive (adhesive smudges on the outside of the heater pad are not harmful). Uncured adhesive can be removed with soap and water.
11. Place the enclosed wax paper and foam pressure pads over the heater pad. Compress the foam pressure pads against heater pad and oil sump or tank and secure them in place using duct tape, wire, or other suitable methods.
12. Allow the epoxy to cure for a minimum of 18 hours at an engine temperature of 70 degrees F, or for 4 hours at 110 degrees F.

**NOTE:** The SAFE-HEET unit may also be used as a heat source for assisting in the curing process if the input voltage is reduced to less than 60 volts. This can be accomplished by using the SAFE-HEET 707 Variable Temperature Controller. **If the SAFE-HEET unit is to be used to aide in the curing process, accomplish steps 15 and 16 prior to plugging it in.**

**NOTE:** High humidity will slow the curing process.

13. After curing, remove the pressure pads and wax paper. The adhesive is almost hard when it is fully cured. It is fully cured when it can not be dented with your thumbnail.
14. Carefully route the power cord to an easily accessible opening such as an oil door, cowl access door, or lower cowl opening. The power cord must be fully supported and secured in the engine compartment using good aircraft maintenance practices.
15. Attach the green ground wire from the SAFE-HEET heating pad to a suitable ground point on the engine. Test for a good ground by checking electrical conductivity between the ground pin on the power plug and the aircraft.
16. Install the enclosed GFCI Ground Fault Circuit Interrupter, Service Kit 709SK, per the included installation instructions.

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**NOTE:** When using the SAFE-HEET 707 Variable Temperature Controller, connect the controller in-line between the GFCI and the SAFE-HEET heater. The GFCI unit requires full voltage to function properly.

17. Make a logbook entry for installation of the SAFE-HEET heater, Part Number \_\_\_\_\_ per McFarlane Aviation Installation Instructions Drawing number SH118.

**Instructions For Continued Airworthiness**

**Prior to use:** Check cord for security and condition. When plugging the heater into a power source verify that the GFCI does not trip.

**Scheduled Inspections:** Check cord for security, condition, proper grounding and routing. Check ground wire for security and proper grounding. Check heater pad for security, condition, discoloration, or damage. Clean away any oil or other surface contamination. Test the CFCI for load shut off by pressing the Test Button with the GFCI plugged in.

**GENERAL PRECAUTIONS**

**Do not** use ungrounded outlets. (For protection from electrical shock, or engine damage, a GFCI must be used.).

**Do not** neglect your heater.

SAFE-HEET Model dimensions:

700 – 4” x 4” x .050”

705 – 3 ½” x 7 ¼” x .050”

720 – 4” x 7” x .050”



McFarlane Aviation, Inc.  
696 East 1700 Road  
Baldwin City, Kansas 66006

Drawing:

**Installation Instructions: 700 Series  
Aircraft Engine Heaters**

Size: **A**    Scale: **None**    Drawn: **JB**    Sheet: **3** OF **3**

Drawing:

**SH118**

REVISION

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