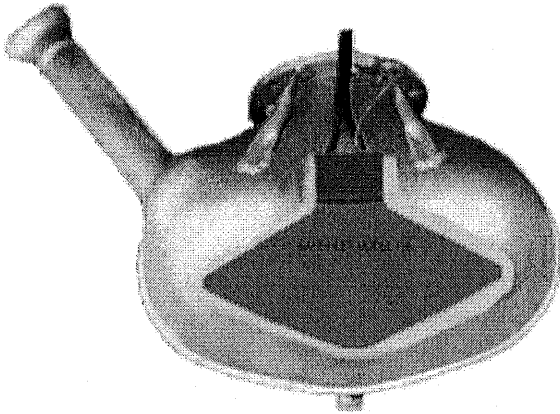


SAFE-HEET

700 Series Silicone Pad Aircraft Engine Heaters

EASY TO USE

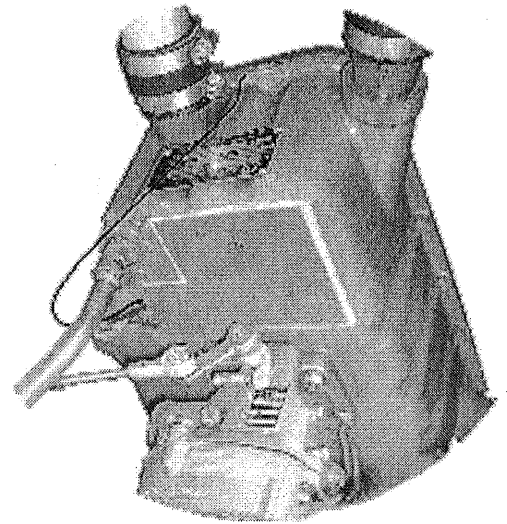
- Permanent installation. Thin flexible pad bonds to engine oil sump.
- S.T.C. or 337 form not required. A log book entry is all that is required.
- No engine or airframe modifications required.
- Kit contains instructions and materials.
- Uses standard 110 A.C.
- Can be used with a timer.



NOW

**Includes
New GFCI
Service Kit
709SK**

**Ground fault protected
for improved safety!**



ECONOMICAL AND EFFICIENT

- Puts the heat where it is needed with little loss to the surrounding atmosphere.
- Heats the air inside the engine.
- Uses about 300 Watts. Costs about 3 cents per hour to operate.
- Less than 1 hour will generally warm the engine oil from subzero to safe easy starting temperature.
- Entire engine will be warm in 2 to 3 hours.
- Thermo-Conductive Adhesive for efficient heat transfer and lower surface temperatures.
- Metal foil heatsink is vulcanized to pad contact face for even heat transfer.
- Reduces costly starter and engine abuse during cold weather starts.

SAFE

- U.L. recognized components. 100% Thermo-Fused Element.
- External ground wire allows the engine and airframe to be grounded to the electrical outlet, reducing the risk of electrical shock in damp outdoor locations.
- Thermostatically controlled to maintain oil sump temperature less than 160° F.
- No flame or hot air to burn cowling or plastic parts.
- Reduces the risk of fires associated with cold starts.

SAFE-HEET DIVISION



Aviation Products

McFarlane Aviation, Inc.
696 E. 1700 Rd.
Baldwin City, KS 66006

(800) 544-8594

www.mcfarlane-aviation.com

Drawing Number SH118 Rev. A 11/29/05

Installation Instructions For The 700 Series Aircraft Engine Heaters

Caution: If storing this product for any length of time prior to installation, store the two (2) epoxy containers in an area where the temperature is maintained between 50 and 80 degrees F. Failure to do this may result in a failure of the adhesive to mix or cure properly. **DO NOT ALLOW EPOXY TO FREEZE.**

NOTE: The engine oil, and oil sump or tank should be at **70 degrees 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 injury to persons.

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 silicone remover. Lacquer thinner, acetone or other standard solvents will not remove silicones. **All paint, grease, oil, and silicone contaminates 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 not appear like it, 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.

TERMS OF LIMITED WARRANTY – All SAFE-HEET Engine Heaters are warranted for a period of one (1) year from the date of sale to the original consumer against defects in materials and workmanship. The manufacturer's only obligation shall be to repair or replace at the manufacturer's option, the product, provided it is returned transportation prepaid to the factory within one (1) year from the date of sale to the original customer. Defects or failures due to incorrect installation, improper handling or usage, or any other condition beyond our control, as to any and all of which the manufacturer will be sole judge, are specifically excluded from this warranty. This warranty gives you specific legal rights. You may have implied warranty rights which vary by state. No other liability of any kind, arising from the use of the product, whether defective or not, is assumed.

10. Remove any excess adhesive (adhesive smudges on the outside of the heater pad are not harmful). Uncured adhesive can be cleaned up 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 step 15 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 Surge Protector, Service Kit 709SK, per the included installation instructions.

NOTE: When using the SAFE-HEET 707 Variable Temperature Controller, connect in-line between the GFCI and the SAFE-HEET heater.

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.

GENERAL PRE-CAUTIONS

Do not use ungrounded outlets. (For maximum protection from electrical shock a ground fault power receptacle must be used).

Do not neglect your heater.

SAFE-HEET Model dimensions:

700 – 4" X 4" X 1/32"

705 – 3 1/2" X 7 1/4" X 1/32"

720 – 4" X 7" X 1/32"

TERMS OF LIMITED WARRANTY – All SAFE-HEET Engine Heaters are warranted for a period of one (1) year from the date of sale to the original consumer against defects in materials and workmanship. The manufacturer's only obligation shall be to repair or replace at the manufacturer's option, the product, provided it is returned transportation prepaid to the factory within one (1) year from the date of sale to the original customer. Defects or failures due to incorrect installation, improper handling or usage, or any other condition beyond our control, as to any and all of which the manufacturer will be sole judge, are specifically excluded from this warranty. This warranty gives you specific legal rights. You may have implied warranty rights which vary by state. No other liability of any kind, arising from the use of the product, whether defective or not, is assumed.

SAFE-HEET Application Guide

Model Series

Teledyne Continental Aircraft Engines

A65, A75, C-75, C-85, C-90, O200

C-125, C-145, O-300, GO-300, E165, E185, E225, IO-360, TIO-360, LTSIO-360

O-470, IO-470, LIO-470, FSO-470, TSIO-470, GIO-470, IO-520, GTSIO-520, LTSIO-520, IO-550

Avco Lycoming Aircraft Engines

O-235, O-290, O-320 (EXCEPT O-320-H), IO-320, AIO-320, LIO-320, AEIO-320

O-360, HO-360, LO-360, IO-360, HIO-360, AIO-360, LIO-360, LHIO-360, AEIO-360,

VO-360, IVO-360, TIO-360, TO-360, TIO-360, LTO-360

O-435, GO-435, VO-435, GO-480, GSO-480, IGSO-480

O-540, VO-540, TVO-540, IO-540, HIO-540, AEIO-540, IGO-540, IGSO-540,

IVO-540, TIO-540, LTIO-540, TIVO-540

IO-720

Franklin Aircraft Engines

6A4-150, 6A4-165

P/N

705

700

720*

700

700

700

700

720*

720*

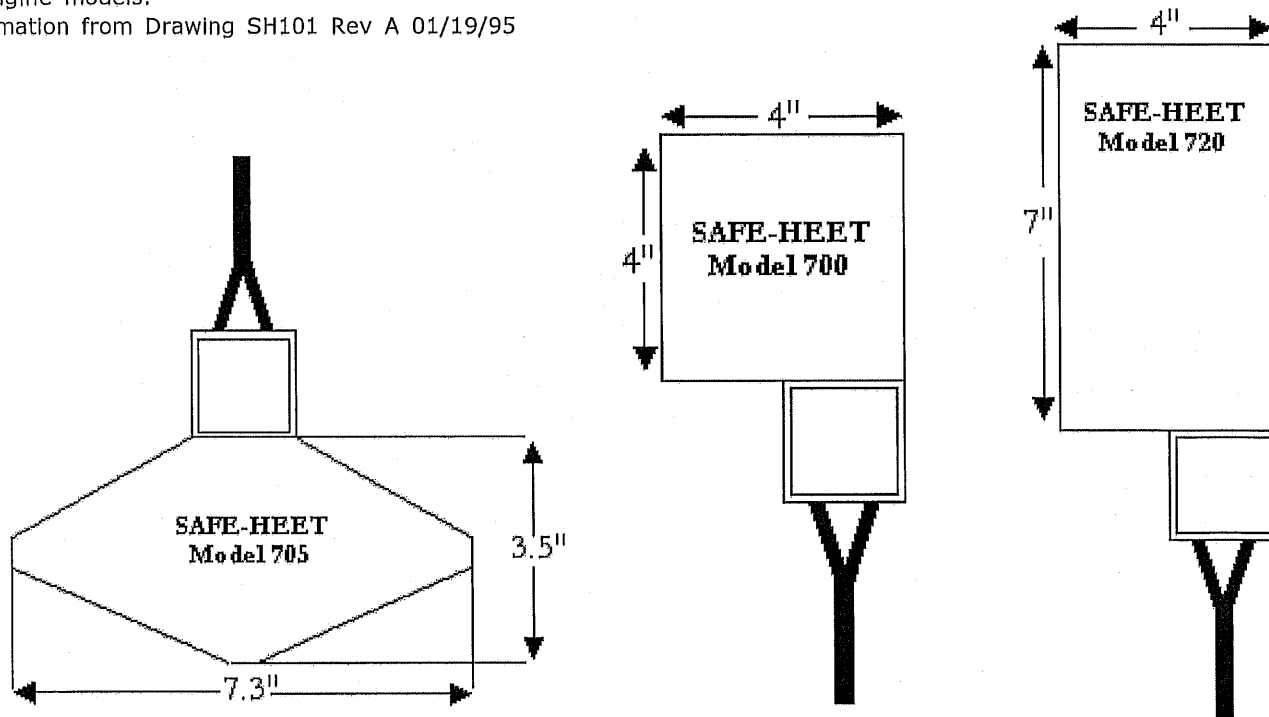
720*

700 or 720

*Where the oil sump area is limited, Model 700 may be used.

Engine oil sump configurations may vary for specific engine models. There is insufficient oil sump or oil tank area and clearances as specified in the SAFE-HEET Installation Instructions for use of the SAFE-HEET engine heaters on some engine-airframe installations. For dry sump engines, use SAFE-HEET pads on the oil tank. The installer must evaluate as per the SAFE-HEET Installation Instructions the available oil sump or oil tank area below the oil level for use of SAFE-HEET pads on all engine models.

Information from Drawing SH101 Rev A 01/19/95





U.S. Department
of Transportation
Federal Aviation
Administration

Small Airplane Directorate
Wichita Aircraft Certification Office
1801 Airport Road, Room 100
Mid-Continent Airport
Wichita, Kansas 67209

OCT 20 1992

Mr. David A. McFarlane
President, McFarlane Aviation Inc.
R.R. 3 Vinland Valley Aerodrome
Baldwin City, KS 66006

Dear Mr. McFarlane:

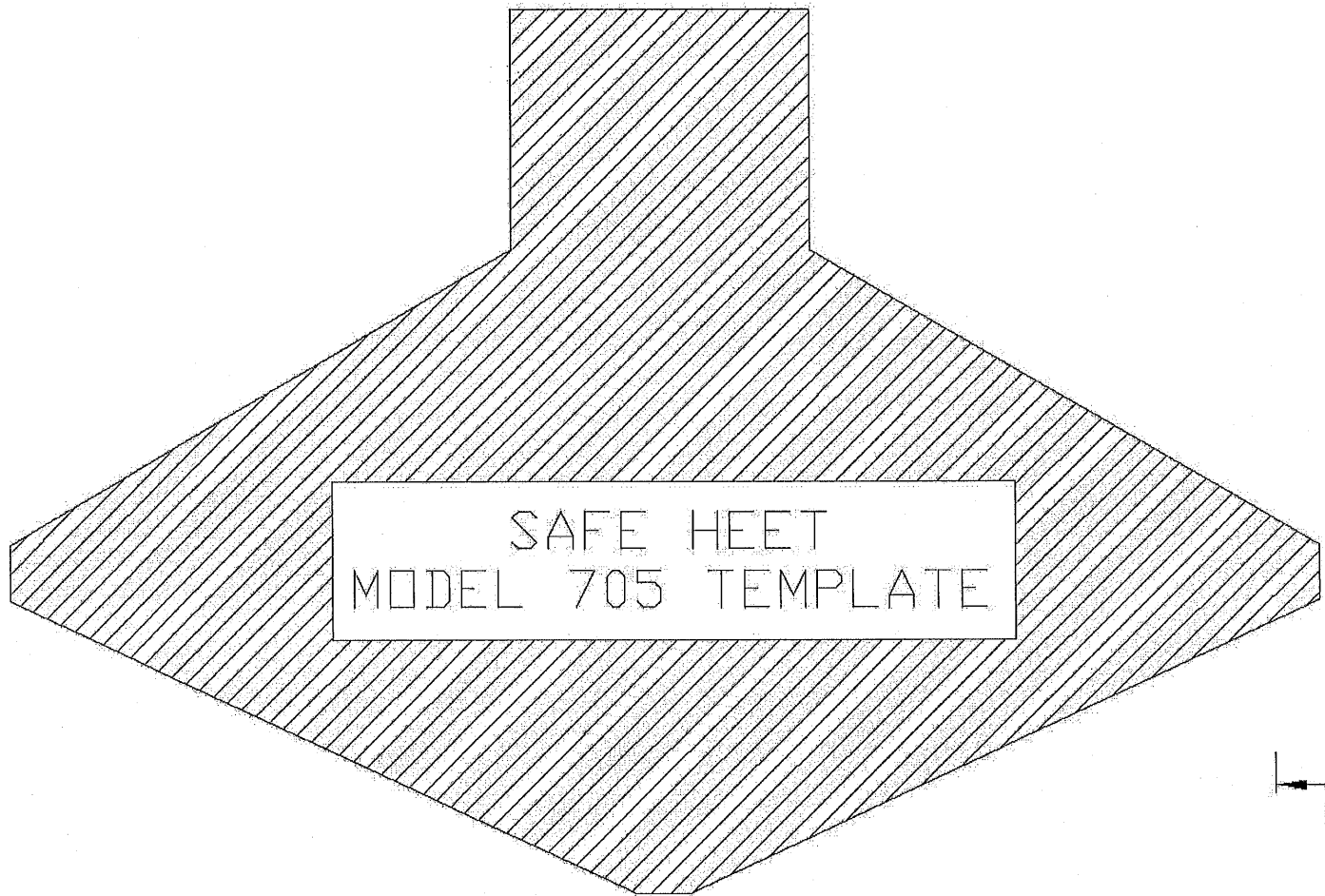
This refers to your October 8, 1992, letter and data submittal concerning the installation requirements applicable to the SAFE HEET aircraft engine preheater manufactured by your facility.

We concur with your assessment that the installation of the SAFE HEET preheater should be considered a minor alteration to the aircraft and only an engine log book entry is required. We are enclosing the data submitted with your letter.

Sincerely,

Lawrence A. Herron
Manager, Wichita Aircraft Certification Office

Enclosures



SAFE HEET PAD TEMPLATE,
USE FOR DETERMINING WHICH SAFE HEET MODEL
FITS YOUR PARTICULAR ENGINE.

SAFE-HEET PAD TEMPLATE.
USE FOR DETERMINING WHICH SAFE-HEET MODEL
FITS YOUR PARTICULAR ENGINE.

