



GFCI - TROUBLESHOOT 80013

(When updated, this document is changed in its entirety)

REV	DATE	DESCRIPTION	BY	RELEASE
A	OCT-24-2014	Initial Release	DNE	

1. PURPOSE

The purpose of this document is address GFCI or GFI, tripping issues when associated with Tanis system operation, and describe repair option. Troubleshooting checklist is located in Section 6, repairs in Section 7, and figures in Section 8.

2. DESCRIPTIONS

GFCI is the National Electrical Code reference for outlets with ground fault protection and therefore used in this document. GFCI protected outlets interrupt electrical current flow when it detects an unintended path. (Like water or a person). GFCI may trip when a Tanis preheat system with Legacy elements are connected. GFCIs protect people from electric shocks and prevent electrical fires by interrupting electric current flow.

The term Legacy is used to describe Tanis systems and parts incorporating 1/4 inch ceramic heat cartridges (Figure 1).

3. PROBLEM

Connecting Tanis preheat system to power trips GFCI.

- Previous operation of system through non-GFCI outlet, or soon after flight, resulted in normal preheater operation.
- New hangar construction and updated wiring codes require GFCIs.
- Reduction of voltage flow of as little as 1/500 an amp, or less, trips GFCI outlet and outlets downstream of GFCIs.

4. CAUSE

Time and thermal cycling degrade the sealing compound used to seal/pot the ceramic heat cartridges. Under certain conditions when an element with a compromised seal is cool or unpowered, the ceramic material absorbs oil, or moisture from the air.

5. TROUBLESHOOTING

Perform Functional System Check (Section 6). To calculate specific wattage of individual element or installed system, measure resistance between element contacts or power plug contacts 1 and 2 (Section 8, Figure 1). Values can be calculated using the following formulas:

Voltage squared, divided by Resistance = Wattage ($V^2/R=W$).

Voltage squared, divided by Wattage = Resistance ($V^2/W=R$).

Wattage divided by voltage = Ampage ($W/V=A$).

PROPRIETARY DATA

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6. FUNCTIONAL SYSTEM CHECK



Caution: Contact with hot element can cause 2nd degree burns.

- Before proceeding, verify system is not powered or connected to a power source.
- Follow in sequence, record as indicated, and check off when completed.
- If discrepancy is found, correct before proceeding to next step.

* Skip when not installed.

[✓] Check the system as follows:

- 1) [] Verify system components are installed in accordance with kit installation instructions.
- 2) [] Verify effected component fluid levels are at operational levels.
- 3) [] Verify engine to airframe/engine bonding (ground strap) is as per OEM requirements.
- 4) [] Verify preheat system ground by checking for continuity between shore power plug ground, pin 3 (Section 8, Figure 2), engine, and airframe.
- 5) [] Using an ohmmeter, verify there is no continuity between shore power plug pins 1 and 2, and the ground pin 3.
- 5) [] Using an ohmmeter, measure resistance between the power pins 1 and 2, and record total system resistance: _____. Compare with table in appropriate ICA.
- 6) [] Connect system to power.
Note: If GFCI protected and circuit trips, proceed to Section 7, before proceeding.
- 7) [] * Verify power indicator light is on (illuminated).
- 8) [] Within 30-minutes, area adjacent to the elements will start to feel warm. Check each element individually.
- 9) [] When testing is completed, disconnect (unplug) from power, latch any access doors that were open, and stow extension cord in appropriate location.

7. REPAIR

Connect system to non-GFCI outlet, generator, or run engine (180°F / 82°C), for 30 minutes or longer to expel oil or moisture from ceramic material. Without pause proceed.

1. Degrease and clean, wire to element transition (Location wires enter element), of each element with ceramic cartridge (Section 8, Figures 1 and 3).
2. Dry with dry filtered compressed air.
3. Check for proper continuity with Ohmmeter.
4. Briefly test operation with GFCI outlet.
5. Disconnect from power.
6. Reseal wire to element transition area (Figure 3) with approved sealant; DC 730, DC 732 Clear, or P/S 700. (Reference TN02788 Instruction - Bonding for approved sealants). Use only enough to seal transition. An excess mass of sealant can cause wires to break during engine operation.
7. Let sealant cure for prescribed period as called out by sealant instruction.
8. Perform Functional System Check (Section 6).
9. Do not power system until sealant has completed cure.
10. Test operation with GFCI outlet.

8. FIGURES



Figure 1 - Examples of Tanis elements using ceramic cartridge heaters.

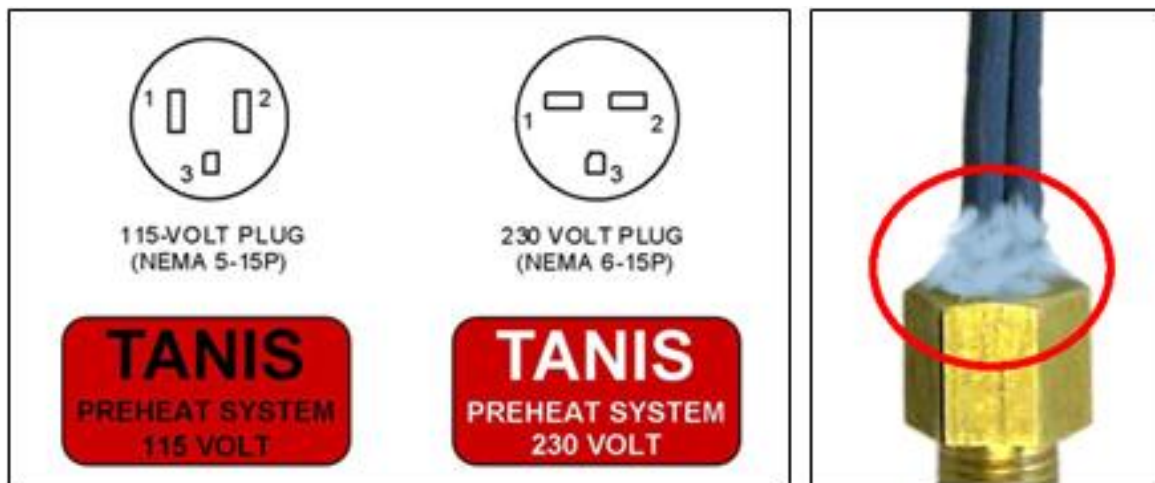


Figure 3 - Plug and placard configurations.

Figure 3 - Example of repair using proper amount of sealant at wire to element transition.

*****NOTHING FOLLOWS*****