



OPERATING GUIDE

Subject: PREHEAT OPERATION INSTRUCTIONS

Document No: TPG1000

Revision: F

Date: AUG-07-2023

AIRCRAFT RECORD

Record as indicated below

Aircraft Make and Model: _____ **Registration No:** _____

Installed Preheat/Preconditioning Kit Part No: _____

Voltage: _____ Wattage: _____ Amperage: _____

Plug location: _____

AV/Cabin Heater installed: Yes No

Battery Heater installed: Yes No

RECORD OF REVISIONS

When revised this document is changed in its entirety.

REV	DATE	DESCRIPTION	BY	CKD
F	AUG-07-2023	Update Warnings, add §§ 6.3 and 6.4, remove AC 91-13c	DNE	MFHB
E	OCT-29-2020	§ 5 Typo, correct rise over ambient 33°C	DNE	GDO
D	JAN-15-2020	Rev corrects date discrepancy adds statement § 1	DNE	GDO

Current revision approval:

PROPRIETARY DATA

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1. PURPOSE

This manual is for use by operators of Tanis Aircraft Products preconditioning (preheat) kit(s) recorded on the cover page. It contains the necessary information for their safe operation, and cannot be substituted for the airplane, rotorcraft or engine, flight manual, or operating handbook (AFM/POH).

This manual is in response to the Code of Federal Regulation (CFR) Title 14 Part 25, 27, and 29, § .1581 and Part 33.5 (b), as applicable. For consistency, it has been formatted with guidance from AC 25.1581.

This Operating Guide may be used to supersede and/or replace existing Tanis Preheat Kit/System operating instructions or Tanis FMS when completed as indicated on page 1 of this document.

2. MALFUNCTION PROCEDURES

 **Warning:** Should malfunction be detected, such as tripped circuit protection device (DPD), breaker or blown fuse, smoke, or lack of heat, disconnect the system from power. Placard (flag) as inoperative In Accordance With (IAW) applicable regulations if eligible, and/or defer IAW approved Minimum Equipment List and/or Non-Essential Equipment and Furnishings MEL/NEF as applicable.

Before replacing fuses or resetting breakers disconnect from power, and refer to Instructions for Continued Airworthiness (ICA): TCA1000.

Common system fuse p/n: TU02848, 12-Amp 1.25 x. 25 ceramic tube fuse. Acceptable alternates: Bussmann ABC-12 ceramic tube fuse or AGC-12 glass tube fuse.

3. DOCUMENT

It is the user's responsibility to complete the cover page as indicated.

When updating or replacing this manual, transfer recorded information from the cover page to the new manual.

For acronyms, regulatory guidance, and fundamental technical procedures refer to Installation Guide: TNG1000.

To access current revisions and related documents go to the Technical Data library at <http://www.tanisaircraft.com/> or contact Tanis Aircraft Products' customer support.

4. AIRWORTHINESS LIMITATIONS

This system does not change existing environmental flight restrictions.

- For specific instructions relating to engine starting and cold weather operations refer to the applicable Pilots Operating Handbook (POH), Airplane Flight Manual (AFM), and/or Engine Operations Manual.
- Instructional reference to other cold weather modifications such as covers, and cowl plugs are not included in this Operating Guide.
- Weather planning and aircraft preparation is the responsibility of the operator.

5. GENERAL INFORMATION AND DESCRIPTION

Preconditioning, or “Preheating” as it is referred to in colder climates, is a Best Practice safety procedure that warms up critical mechanical parts, fluids, and systems when the aircraft is not running, on the ground, and connected to external power.

As a rule, preheated components reach thermal saturation at 6 hours with an approximate temperature rise (delta) over ambient of 33°C (±5°C) / 60°F (±10°F). In Avionics, crew, and passenger cabins the temperature delta over ambient varies. When additional heat is required insulated engine cowl and/or aircraft covers are used. With the addition of insulated covers, you may expect an increase in the delta of between 40 to 60%.

- a) Operation and regular use increase engine and battery life, reliability, and safety of operations. It also reduces torque oscillations, thermal stress, warm-up, and launch times.
- b) Primary systems Do Not use controllers or thermostats; however, avionics, battery, and cabin heaters may incorporate controllers and/or thermostats.
- c) AV/Cabin Heaters precondition avionics and helps clear windows of frost, snow, and ice.
- d) Battery Heaters reduce freeze point depression and allow for higher amperage output and proper charging.

5.1 Best Practices

 **Warning:** Do Not operate when outside air temperature (OAT) is above +38°C / +100°F.
Do Not operate with insulated covers when OAT is above +21°C / +70°F.

The system may be connected to power immediately after engine shutdown. It is designed to be operated continually between flights and/or plugged in 6 or more hours before departure.

Best Practice Guidelines for When to Precondition/Preheat.

- +4.5°C / +40°F OAT and below preheat is recommended.
- -6.5°C / +20°F OAT and below (ambient or windchill) industry established requirement.
- -12°C / +10°F OAT and below preheat and use insulated cowl cover(s) and/or cowl plugs.

5.2 Plug and Placard

The power plug (inlet) is placarded with the voltage requirement. Location and type of placard vary. Refer to the cover page and Figure 5.2.

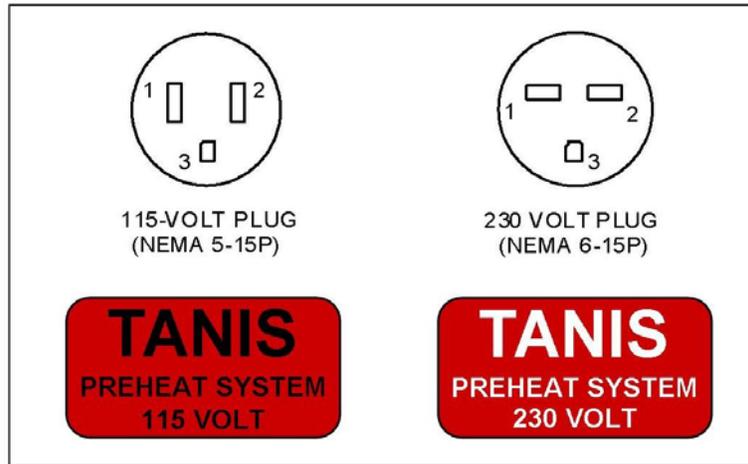


Figure 5.2. Plug and placard configurations. An alternate placard may be field fabricated stating: *Tanis Preheat and voltage requirement (115 Volt or 230 Volt).*

5.3 Plug Locations:

Refer to the cover page of this manual for recorded plug location.

- Fixed-wing: The plug is commonly mounted on the engine, accessed through an engine oil door, cowl opening, or dedicated plug door located on the pilot side of the aircraft.
- Rotor-wing: The plug is commonly accessed through a dedicated plug door located near the pilot door, aft right side, or upper transmission deck.

6. REQUIREMENTS

- The cover page with completed Aircraft Record.
- Power, extension cord, and installed preheat system.
- Only operate preheat system with aircraft fluids at operational levels.
- Use fluids and oils recommended by the manufacturer for conditions of flight.

6.1 Power

External/shore power source capable of supplying rated voltage and load for the time of operation. Refer to the cover page for recorded power requirements.

6.2 Extension Cord

Only use Hard Service rated extension cord in good condition and adequate gauge rated for required amperage loads and environment conditions. When in doubt, use the next heavier gauge. The smaller the gauge number heavier the cord.

A 12-gauge extension cord is recommended for system loads up to 12-Amps. Voltage requirement at end of the cord, +/- 10% of placarded system voltage. Stringing cords together is not recommended.

Minimum requirements by extension cord length and gauge:

- 50 ft. / 15 m or less, minimum 16 gauge.
- 50 to 100 feet ft. / 15 to 30 m, minimum 14-gauge.
- 100 to 200 ft. / 30 to 60 m, minimum 12 gauge.
- 200 ft. / 60 m and over, refer to the regional coding requirement and/or contact Tanis Aircraft Products' customer support.

Proper use of extension cords is critical to your safety. Always refer to electrical coding requirements for the country and/or region of operation. The use of an undersized cord is unsafe and may result in loss of power, drop-in line voltage, and overheating of plugs and extension cords.

6.3 Extension Cord Inspection

Before each use inspect the extension cord and its plugs. Check the gauge of the cord (§ 6.2) and look for cracks, damaged insulation, discoloration, loose or missing plug blades, and any indications of overheating or burning, especially on the power outlet end (the aircraft end that plugs into the preheat system plug (inlet) on the aircraft).

Note: For recommended Hard Service extension cord replacement plugs, contact Tanis Aircraft Products' customer support.

6.4 Aircraft Plug (inlet) Inspection

Before each use inspect the aircraft power plug (inlet). Look for signs of arcing, carbon deposits and/or corrosion, loose or missing plug blades, overheating, discoloration, burning, or cracking. The extension cord outlet should fit positively and firmly on the aircraft preheat system plug (inlet) and should not be a "forced fit".

Note: The presents of clear dielectric grease on the plug is normal. Periodic maintenance recommends the application of a dielectric on the aircraft plug contacts (blades, and ground pin).

7. OPERATION INSTRUCTIONS

 **Warning: Do Not** connect or disconnect a “live” extension cord with the aircraft preheat plug. Before connecting or disconnecting preheat system or any other device, disconnect the extension cord from the power source. This reduces the chance of electrical arcing at the connection point on the aircraft.

Do Not fuel aircraft or operate engine(s) with preheat system connected to power.

7.1 Plug It In - Post Flight/Standby

The system may be operated immediately after engine shutdown and continuously between flights. This may include extended periods of hours, days, weeks, or months.

Use of insulated cowl cover(s) and/or cowl plugs is recommended when operating in windy conditions and/or in temperatures of -12°C / +10°F and below.

- (a) Check to see that the extension cord (inlet end) is unplugged from the power source.
- (b) Plug the extension cord (outlet end) into the preheat system plug (inlet) on the aircraft.
Do Not Force and/or rock the plug into place. It should be a firm fit not a “forced fit”.
- (c) Plug the extension cord (inlet end) into the shore power source.
- (d) Return to the aircraft and verify preheat system power indicator light is on and illuminated (when installed).

7.2 Unplug It - Preflight

Follow applicable aircraft preflight checklists and add the following:

- (a) Verify power indicator light is on (when installed) and heated components are warm.
- (b) Unplug the extension cord from the power source. **Note:** This is done before disconnecting the extension cord from the aircraft preheat system plug.
- (c) After unplugging the extension cord from the power source, disconnect it from the aircraft preheat system plug.
- (d) Latch any open-access doors.
- (e) Stow the extension cord in an appropriate location.
- (f) Start aircraft following normal procedures.

8. WEIGHT AND BALANCE

The equipment List and Weight & Balance figures were recalculated at the time of system installation.

9. HANDLING, SERVICING, AND MAINTENANCE

For detailed information regarding maintenance and installation refer to applicable installation instructions and Instructions for Continued Airworthiness, TCA1000, or ICA supplied with the kit.

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