Subject: TANIS INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (ICA)

Document No: TCA1000
Revision: D
Date: AUG-07-2023

AIRCRAFT RECORD

Record and retain documents as indicated below and in Section 3

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

Installed Preheat Kit Part No:_____ Serial No: _____

Supplemental Type Certificate (when applicable): _____

RECORD OF REVISIONS

When revised this document is changed in its entirety.

REV	DATE	DESCRIPTION	BY	CKD
D	AUG-07-2023	Add plug inspection, dielectric TU03126, kit removal info	DNE	MFHB
C	OCT-05-2022	Format, add descriptions, remove ohms table	DNE	JAL
B	AUG-10-2020	Add statement § 1 for replacing kit-specific ICA	DNE	GDO

Current revision approval: Dirk Ellis

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Date: 2023.08.07 14:48:50 -05'00'

CONTENTS

1. INTRODUCTION

1.1 Purpose

This document together with the information recorded and retained in Section (§) 3, is the Instructions for Continued Airworthiness (ICA) manual for the Tanis Aircraft Products preconditioning (preheat) kit(s) recorded on the cover page.

This manual is in response to Code of Federal Regulation (CFR) Title 14 Part 23, 25, 27, and 29, § .1529 and/or Part 33 A33.1, as applicable. For consistency, it has been formatted with guidance from Order 8110.54A.

Note: This ICA may be used to supersede and/or replace an existing Tanis Preheat Kit/System ICA when completed as noted, refer to the cover page and § 3.

1.2 Airworthiness Limitation Section

There are no additional Airworthiness Limitations that result from this modification.

The Airworthiness Limitations section of this manual is FAA approved and specifies inspections and other maintenance required under 14 CFR Sections 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been approved.

1.3 Documents

It is the user's responsibility to complete the cover page and record and retain documents as indicated in § 3.

When updating or replacing the ICA transfer recorded information from page one and any retained information to the new manual.

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

To access current document revisions, go to the Tanis Technical Data library at http://www.tanisaircraft.com/ or contact Tanis Aircraft Products' customer support.

2. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

2.1 Introduction

Content, Scope, Purpose, and Arrangement:	This document identifies the Instructions for Continued Airworthiness for the modification of the aircraft and/or engine by the installation of a Tanis preheat kit by providing documentation of recommended methods, inspections, processes, and procedures. Information specific to the kit installed is required to be recorded on the cover page of this document and recorded and retained in § 3 as part of this document.
Applicability:	This applies to aircraft altered by the installation of a Tanis Aircraft Products preheat kit recorded on the cover page of this document.

Reference documentation:	Related Documents recorded in § 3 Installation Guide: TNG1000 Rev H Operating Guide: TPG1000 Rev F (or later FAA-approved revisions).
Retention:	This document, or the information contained within, will be included in the aircraft's permanent records.

2.2 Description of Alteration

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. Kits are permanently installed independent of aircraft systems. Available in 115V and 230V configurations.

A complete preheat system uses a combination of Pad and/or Threaded type heat elements to heat engine(s), gearboxes, accessories, and fluids. Small self-contained forced air heater(s) heat avionics. Belt-type pad heat element(s) heat battery(s).

Systems with dedicated plug door(s) may include a micro switch wired into Crew Alerting System (CAS) circuit for open door annunciation.

Tanis preheat systems are easily identified. All parts are labeled per 14 CFR Part 45 § 45.15. Electrical harnesses are made from red jacketed cabling with surface print and yellow labels. Heating elements have red leads and yellow labels. For kit-specific description refer to Preheat Kit Installation Instruction recorded in § 3 of this document.

2.3 Control and Operation

For system operation, power, and extension cord requirements refer to the Operating Guide listed under the Reference documentation in § 2.1 of this document.

2.4 Periodic Maintenance Instructions

Before the winter season or once in a 12-month cycle, an inspection that includes the application of dielectric grease on shore power plug contacts, and a Functional System Check are recommended refer to §§ 2.5, 2.6, and 2.7.

2.5 Inspection

Start with a review of kit-specific Installation Instructions recorded in § 3. Visually inspect the shore power plug, indicator light, and circuit-protection device (CPD). From there, following the red harness leads to individual components, inspect cabling, junctions, connectors, and heat elements for the security of attachment, fluid incursion, damage, and wear. In addition, look for signs of fatigue, chafing, vibration, flexing, and heat damage.

In addition, systems with dedicated plug door(s) may include a micro switch wired into Crew Alerting System (CAS) circuit for open-door annunciation. To verify open the door and look for the button head of the switch, it will be centered at the hinge or located near the door latch. When operating properly the switch will trigger the door annunciation in the cockpit display. To verify

operation, refer to the applicable aircraft Flight and/or Maintenance Manual (FMS/MM) and/or kit-specific Preheat Kit Installation Instructions and Top-Level Drawing recorded in § 3.

Inspect as installed:

(a) Shore Power Plug (inlet): Inspect the plug on the aircraft for signs of arcing, carbon deposits and/or corrosion, loose or missing plug blades or ground pin (contacts), overheating, discoloration, burning, pitting, cracking, or foreign object debris (FOD) in or around the plug.

If plug contacts show signs of deposits of any kind, carbon, corrosion, or otherwise, Abrasive Crocus Cloth may be used to clean up light deposits.

After inspection and/or cleaning apply dielectric grease to plug contacts, refer to § 2.6.

If there are any questions about the integrity of the plug replace it. For part replacement refer to § 2.8.

(b) Cable Kit: Inspect the security of attachment, appropriate routing, exposed wires, signs, discoloration, overheating, arcing, or cracks in the insulation. Ensure the Indicator light functions as expected (when installed). To repair, refer to the kit-specific cable kit drawing recorded in § 3 and/or Tanis Installation Guide: TPG1000.

(c) AV/Cabin Heater (forced air PTC type heater): Inspect for the security of attachment and integrity of the mounting structure, air intake, and exhaust ports for FOD and obstructions. Clear as required. There are no approved repairs for this heater only replacement.

(d) Battery Heater: Inspect the battery heat element(s) for the security of attachment, signs of abrasion, broken or missing lacing or grommets, oil damage, or exposed heating wire. There are no approved repairs for this heater only replacement.

(e) Pad Heat Elements: Inspect for the security of attachment, and bonding on the substrate. Should any portion of the pad heat element come loose from the substrate, it may be re-bonded. Also, inspect for signs of abrasion, oil damage, exposed wire, delamination, or developing areas of gray/yellow. These are indicators the pad element requires replacement. There are no approved repairs for these elements only replacements.

(f) Threaded Heat Elements: Inspect for security of installation and inspect element lead transition, where lead exits the element body, for signs of heat damage or broken wires. There are no approved repairs for these elements only replacements.

(g) In cases of extreme or adverse failure outside the realm of normal use, contact Tanis Aircraft Products' customer support.

2.6 Dielectric Grease Application

After inspecting, cleaning, or replacing an aircraft shore power plug (inlet), the application of a thin layer of Dielectric Grease p/n: TU03126, DC 4, or equivalent that meets MIL-S-8660C, ASTM D-149, is recommended. Dielectric grease may be applied using a cotton-tipped swab or equivalent applicator completely coat the plug contacts (blades and ground pin). Dielectric grease helps to ensure the integrity of the connection by reducing electrical arcing, corrosion, and the formation of conductive paths at electrical interface points.

2.7 Functional System Check

⚠ **Warning:** Energized elements can cause 2nd and 3rd-degree burns.

Thermal imaging cameras and/or infrared devices may be used for the validation of elements and system operation. Due to variation in target emissivity reflected temperature values will vary from actual temperatures.

If a discrepancy is noted, correct it before proceeding to the next step. For Troubleshooting refer to § 2.14. For control and operation see § 2.3. * Skip when not installed or test separately.

(a) Plug the system into an appropriate power source, and verify * red indicator light is on (illuminated). Then in about 30 minutes, the area next to each element should feel warm.

(b) * AV/Cabin Heater: Check for audible fan and warm air circulation. When equipped with a controller verify operation based on the controller type below.

Adjustable Thermostat: Test by dialing the temperature selector above ambient and the heater should switch on.

Preset Controller: Test with the controller at a temperature below its setpoint (25°C / 77°F) and the heater should be on. When required, cool the controller with an ice pack and/or general-purpose freeze spray (circuit chiller); MicroCare p/n: MCC-FRZ, Chemtronics p/n: ES1052 Freeze Spray, or equivalent.

(c) * Battery heater: Test with the controller at a temperature below its setpoint (+5°C / 41°F) and the battery element should be on and start to feel warm after a short period. When required, cool the controller with an ice pack and/or general-purpose freeze spray (circuit chiller); MicroCare p/n: MCC-FRZ, Chemtronics p/n: ES1052 Freeze Spray, or equivalent.

2.8 Removal and Replacement

If a part requires removal and/or replacement, refer to the kit-specific Preheat Kit Installation Instruction and Top-Level Drawing recorded in § 3 of this document for an itemized listing of the part(s) and related instructions. Once the part is removed cap and secure wiring. Placard system as “inoperative” IAW applicable regulations if eligible or defer IAW approved Minimum Equipment List / Nonessential Equipment Furnishings (MEL/NEF).

To remove an entire system/kit refer to kit-specific Preheat Kit Installation Instruction recorded in § 3. Identify and remove parts and subassemblies using common aviation tools. Inspect, reseal, and secure as needed any aircraft components that supported the kit when installed. Remove the shore power plug(s) and placard(s), and update aircraft records accordingly to reflect the change.

2.9 Servicing Information

For recommended periodic maintenance instructions refer to § 2.4. In the event of suspected system or component failure refer to § 2.15.

2.10 Special Tools

Standard aviation hand tools are all that is required for maintenance and repairs. Special tools are not required.

2.11 Special Inspection Requirements

In addition to special inspection events as defined by the aircraft maintenance manual inspect in the event of a hard landing, lightning strike, or water immersion. For inspection procedures refer to § 2.5.

2.12 Overhaul Intervals

No overhaul intervals exist for this system. There are no life-limited parts. Part life is based on condition per inspection. Parts are to be replaced upon failure or damage.

2.13 Commuter and Transport Category Aircraft

No changes are required.

2.14 Application of Protective Treatments

No protective treatments are required.

2.15 Troubleshooting

> ⚠ **Warning:** Troubleshooting *should be conducted by a qualified technician* with the system disconnected/unplugged from the power source.

The first step in the process of troubleshooting is to access the kit-specific Preheat Kit Installation Instruction and Cable Kit Drawing recorded in § 3 of this document. Additional Troubleshooting information is located in a dedicated section of the Installation Guide: TNG1000 refer to Reference documentation in § 2.1.

With the system unplugged, start troubleshooting using an ohmmeter. Connect ohmmeter leads to plug blade contacts and verify the system is not shorted. If the circuit is open replace CPD fuses or reset the breaker and recheck the circuit with a meter. Ohm's (Ω) of resistance should be consistent with values in the Electrical Values Table located in kit-specific Preheat Kit Installation Instructions recorded and retained in § 3. If the circuit is shorted, refer to the Cable Kit Drawing and troubleshooting section of the Installation Guide: TNG1000 to trace down the short. Remove and replace the suspect part as needed, there are no approved repairs for parts or elements only replacements. For electrical system wire/cable repair, splice, etc., refer to the kit-specific Cable Kit Drawing.

2.16 Diagram

The system's electrical wiring diagram is contained in the Cable Kit drawing recorded in § 3 of this document

2.17 ICA Revision and Distribution

To revise this ICA, a letter must be submitted to the ACO along with the revised ICA. The ACO will obtain Aircraft Evaluation Division (AED) acceptance and approve any revision to the Airworthiness Limitation Section 1.2 of this document.

2.18 Assistance

Flight Standards Inspectors or the certificate holder's Primary Manufacturing Inspector (PMI) have the required resources to respond to questions regarding this ICA. In addition, the customer may refer questions regarding this system and its installation to the manufacturer. Contact Tanis Aircraft Products' customer service at https://www.tanisaircraft.com/contact/ or email info@tanisaircraft.com.

2.19 Implementation and Record-Keeping

Modification of an aircraft by the installation of a Tanis preheat kit or Supplemental Type Certificate (STC) obligates the aircraft operator to include the maintenance information provided by this document in the operator's aircraft maintenance manual and/or the operator's aircraft scheduled maintenance program.

3. INSTALLATION RECORD

Installation Record

Installation Date: _____

Installed Kit Part No:_____ Serial No:_____

3.1 Related Documents

Record and retain (printed or electronic) as indicated below.

Kit Top-Level Drawing (TLD) No:_____ Revision:_____

Preheat Kit Installation Instruction:_____ Revision:_____

Cable Kit Drawing:_____ Revision:_____

3.2 Attached/Retained Documents

Related Documents recorded in § 3.1. are to be attached/retained and included as Section 3.2. of this document.