TANIS
AIRCRAFT PRODUCTS

COLD WEATHER MODIFICATION

OPERATING GUIDE

Document No: TPG0005 Rev. C
Dated: JUN-15-2016

FOR

ROTORCRAFT
PREHEAT SYSTEM

Aircraft Registration:_____

Installed Preheat System Electrical Specifications:

Voltage:_____ Wattage:_____ Amperage:_____

Battery heat kit installed: ☐ Yes ☐ No
AV/Cabin Heater installed: ☐ Yes ☐ No

(This page and Appendix completed at time of installation)

RECORD OF REVISION

When updated, this document is changed in its entirety.

REV	DATE	DESCRIPTION	BY	APPROVAL
C	JUN-15-2016	Add figures with layout and connection points	GDO	
B	MAR-21-2014	Formatting change to Operating Guide	DNE	DNE
A	OCT-05-2010	Initial Release	DNE	N/A

CONTENTS

A. PURPOSE AND SCOPE

The purpose of this guide is to provide instruction for the proper and safe use of the Tanis Preheat System installed on this aircraft, and to aid the operator in complying with standard aviation and airframe/engine manufacturer's procedures.

For specific instructions relating to engine starting and cold weather operations refer to applicable POH (Pilots Operating Handbook) and/or AFM (Airplane Flight Manual), FAA Advisory Circular - Cold Weather Operation of Aircraft AC No: 91-13C.

Instructional reference to other cold weather modifications, such as interior heaters, covers and cowl plugs, are not part of this cold weather modification and are not included in this Operating Guide. Weather planning and aircraft preparation are the responsibility of the operator.

This system does not change existing environmental flight restrictions.

B. GENERAL INFORMATION

Preheating is recommend at temperatures at/or below 0.0°C / 32°F. Manufacturers require preheat when an engine has been cold soaked or exposed to a temperature with a wind chill factor of -6.7°C / 20°F° or below, for a period of 2 hours or more.

A cold soaked engine may start only to cause damage that shows up later. Rapid heating after a cold start coupled with rapid expansion of parts and poor lubrication can damage or cause excessive wear that can lead to poor engine and aircraft operation, premature repairs, overhaul, or failure. Single point, inadequate, or superficial application of preheat does not evenly heat internal parts or de-congeal oil throughout, engine, gearboxes, oil reservoirs and tanks.

The multi-point preheat system installed on this aircraft properly applies a thorough even application of heat to critical driveline components, and fluids. Preheating increases reliability and safety of operations reduces thermal stress, run-up, and launch times.

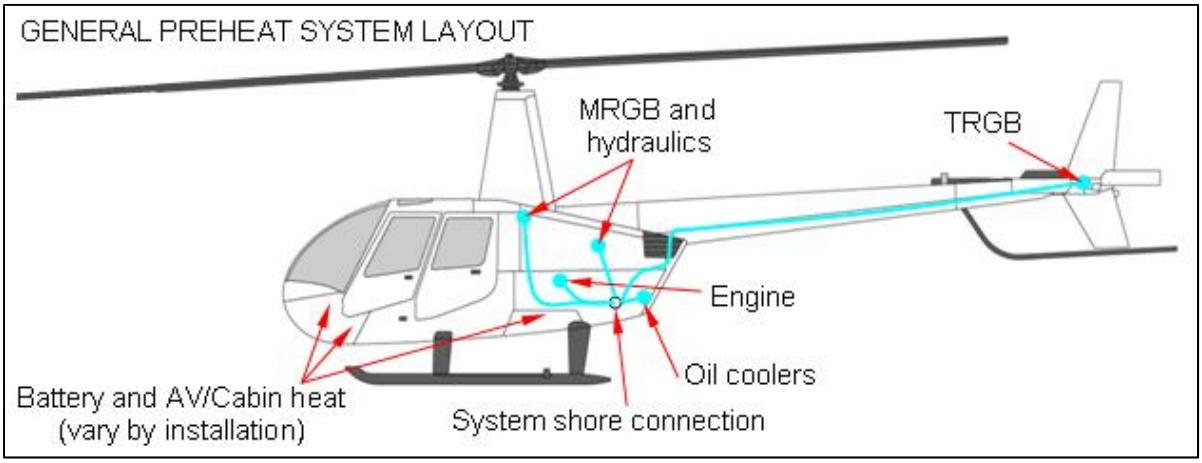

Figure 1 – Generic preheat system layout (TRGB element not used on some models).

1. Preheating

Preheating is accomplished through electrical resistance elements located on engine and critical driveline components. Heated components reach an average state of thermal equilibrium in six hours, with a temperature rise of approximately 33.33°C ± 5.56 / 60° F ± 10, over ambient air temperature. The preheat system is self-regulating by design. Timers and thermostats are not used with the main system.

Battery heater (when installed) is controlled through a thermal controller that limits operation of the battery element to temperatures below freezing.

AV/Cabin heater (when installed) is on anytime it is connected to power.

Power is routed through a dedicated wiring assembly with circuit protection (listed in Section F), and red power indicator light.

2. Power Requirement

The system does not operate in flight, is not connected to or dependent on aircraft systems, and is only capable of operation when connected to a ground based power source.

System design is for operation at plus or minus 10% of system voltage requirement.

A ground based power source capable of supplying or producing required voltage and load for the duration of operation is required. This is commonly AC (alternating current).

The shore power plug and placard (Figures 1 and 2) identify system voltage. Specific voltage and amperage requirements for the system installed are recorded on the cover page. For detailed electrical values and maintenance information, reference recorded documents in section G. Appendix.

3. Power Connection

Shore power and connection (extension cord), are the responsibility of the operator. 230-volt systems are supplied with receptacle plug adapter (TP02829-230), for field installation on extension cord supplied by operator. Extension cord is to be in good condition and of adequate gauge to carry the total current draw of the system. A wire gauge of at least 16 is recommended for an extension cord 50 feet or less in length (Table 1). A cord exceeding 100 feet is not recommended; if in doubt, use the next heavier gauge. The smaller the gauge number, the heavier the cord. Note that an undersized cord will cause a drop in line voltage and loss of power, along with possible overheating of the cord.

Table 1 - Extension cord specifications

Conductor gauge/wires:	Maximum amps:	Maximum length:
16/3	13 A	50'
14/3	15 A	50'
	13 A	100'
12/3 10/3	15 A	100'
	15 A	100'

(Circuit protection 12-Amp fuses)

4. Power Connection and Placard

Shore/ground power connection point (inlet) is the Shore Power Plug. Locations vary by installation. Placard with voltage requirement is located adjacent to shore power plug (Figures 1 and 2).

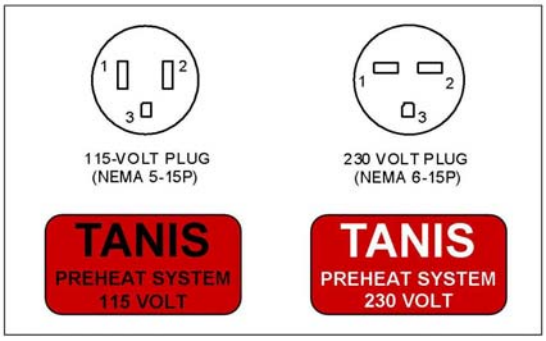

Figure 2 - Plugs and placards. Alternate placard stating "TANIS" and voltage requirement is acceptable.

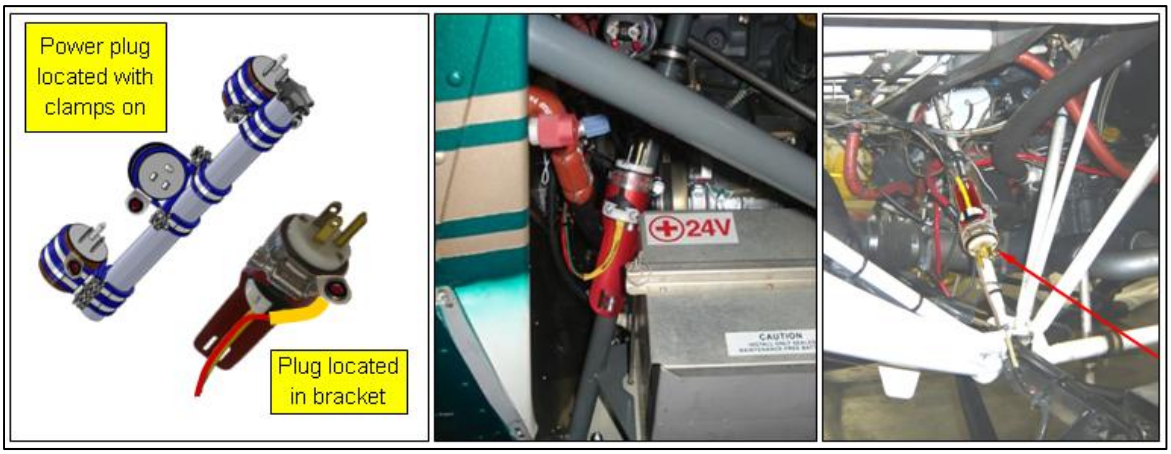

Figure 3 - Shore power plug location varies by installation. Common location is on pilot side with other shore connections or accessible through an inspection panel.

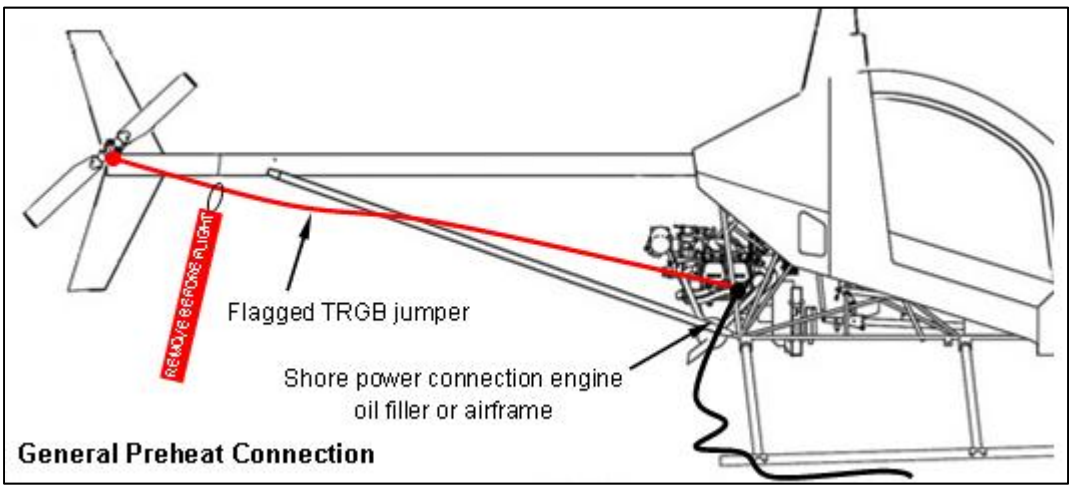

Figure 4 – Small piston powered helicopter preheat system plug commonly located on the engine oil filler tube or airframe tubing (Figure 3). Note: TRGB jumper not used on all models.

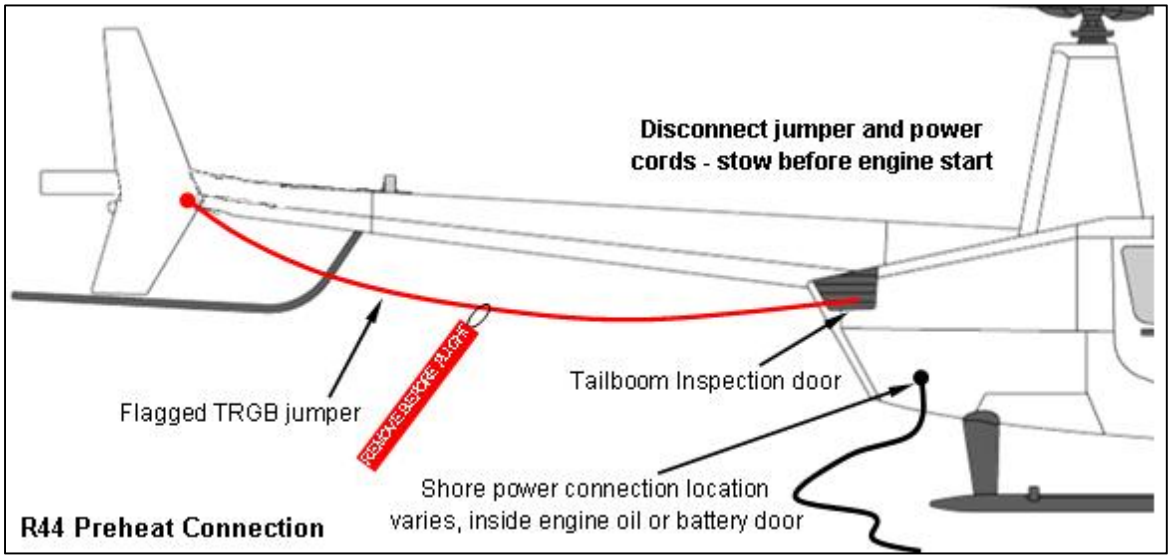

Figure 5 – Helicopter preheat system plug location varies by installation. Common location is on pilot side of airframe with other shore connections or accessible through inspection panel, or plug mounted on skin (TRGB jumper lead not used on all models).

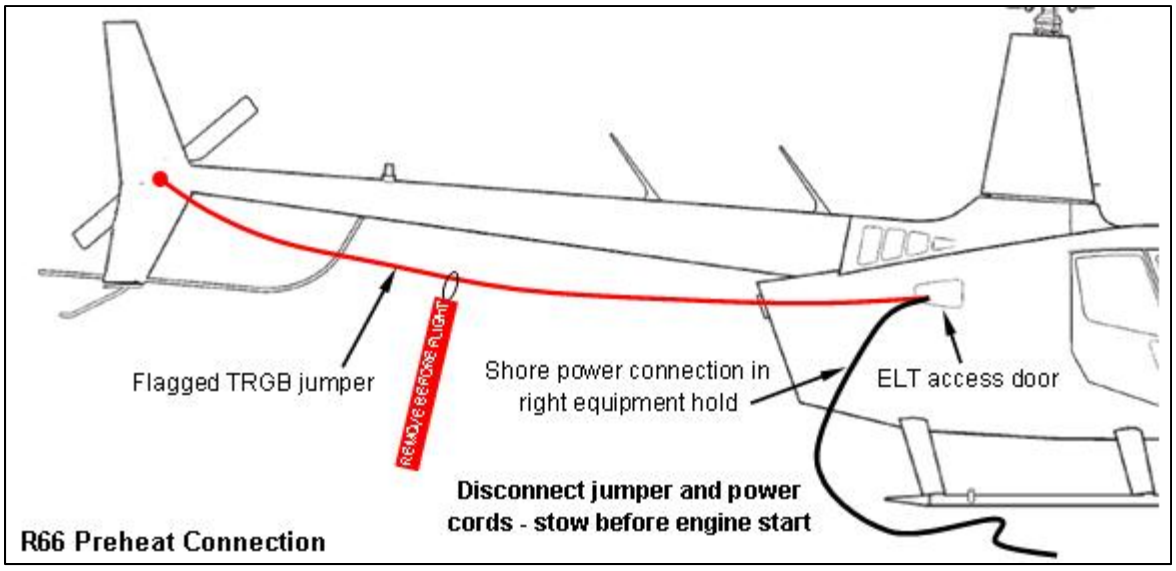

Figure 6 – R66 preheat system plug on pilot side accessible through an ELT access door.

C. SYSTEM OPERATION

⚠ Caution: Do not touch hot elements as they can burn bare skin.

The aircraft is not to be fueled and engine is not to be operated while the system is connected to shore power or extension cord (plugged in).

1. Guidelines

Use fluids and oils as recommended by the manufacturer for conditions of flight, and only operate the preheat system with aircraft fluids at operational levels.

1.1. When available, follow specific preheat instruction provided by airframe and/or engine manufacturer.

1.2. Design is for continual operation in all weather and temperature conditions while on the ground.

1.3. For maximum benefit, system should be in continual operation for 6 hours or longer before engine start (approx. temp. rise of 60°F / 33.33°C over ambient).

1.4. When operating at temperatures with a wind chill of -12°C / +10°F and below, the use of insulated engine cowl cover is suggested. Available separately, insulated covers increase efficiency by insulating and acting as windbreak.

1.5. When the system is connected to power, the red indicator light will turn on (illuminate), and elements will begin to heat. Verify operation after about 30 minutes by reaching into cowls and feeling for warmth.

1.6. When installed, the tailrotor gearbox element is commonly connected by a jumper lead that is flagged with a streamer stating, **"Remove Before Flight".** This lead is only connected during preheat, and is **disconnected and stowed before engine start-up.** Note: TRGB jumper is not required on all models.

2. Control

Connection to ground/shore power controls operation.

2.1. Activate system by connecting (plugging) to appropriate power.

2.2. Deactivate the system by disconnecting (unplugging) from power.

3. Preflight Procedures

Follow applicable aircraft Preflight Procedures and Check Lists, adding the following:

3.1. Remove engine and airframe cowl plugs and/or covers, if used.

3.2. Verify system has been in operation for the required period of time, check to see that the power indicator light is on, and engine, main and tail rotor gearboxes feel warm. When applicable check cockpit instrumentation readouts.

3.3. If used, disconnect tail rotor jumper flagged, ***"Remove Before Flight".***

3.4. Unplug/disconnect extension cord from aircraft.

3.5. Latch any access doors that were open.

3.6. Stow extension cord and tailboom jumper cable in appropriate location.

3.7. Start the aircraft following normal starting procedures.

4. Post Flight Operation

Engine preheat system may be plugged in after full engine shut down.

4.1. Once the aircraft is secured, if used connect tail rotor gearbox heater jumper cable.

4.2. Plug the preheat system in and verify operation by checking power indicator light is on (illuminated).

4.3. If used, install cowl plugs and/or covers per manufacturer's instructions.

D. WEIGHT AND BALANCE

Equipment List and Weight & Balance figures recalculated at time of system installation.

E. HANDLING, SERVICING, AND MAINTENANCE

For detailed information regarding maintenance, installation and electrical values, refer to specific installation instructions and ICA listed in the Appendix.

F. MALFUNCTION PROCEDURES

Should a malfunction be detected, such as tripped circuit protection (blown fuse), smoke, or lack of heat, disconnect the system from power and placard (flag) as inoperative IAW applicable regulations if eligible, or defer IAW approved MEL/NEF if applicable, and inspect before flight. Repairs are to be conducted by appropriately rated and certified technician or maintenance/repair facility. For trouble shooting, inspection and repairs refer specific installation instructions and ICA listed below.

For fuse replacement, disconnect system from power and replace fuses. For direct replacement use Tanis part number TU02848, 12-Amp 1.25x.25 ceramic tube fuse. Acceptable alternates are Bussmann ABC-12 or AGC-12.

G. APPENDIX - INSTALLATION LOG

Date of Installation: _____

Installed Preheat Kit(s): _____

Installation Instruction: _____
Document - Revision - Date

Instructions for
Continued Airworthiness (ICA): _____
Document - Revision - Date

(This page and the cover page completed at the time of installation)

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