



INSTRUCTION – BATTERY HEAT INSTALLATION

Subject: Battery Heat System Installation Resource
Kit p/n: TSB2800 and Others

Document No: TN02800
Revision: B
Date: APR-16-2020

RECORD OF REVISIONS

When updated, this document is changed in its entirety.

REV	DATE	DESCRIPTION	BY	CKD
B	APR-16-2020	Add caution and 1000 series documents.	DNE	GDO
A	SEP-01-2015	Reformat	DNE	GDO
	NOV-01-2010	Previous revisions date controlled	DNE	N/A

Current revision approval: _____

ACRONYMS

Alternating current (AC), Center of gravity (CG), Circuit protection device (CPD), Maintenance Manual (MM), Next Higher Assembly (NHA), Original equipment manufacturer (OEM), Remove and replace (R&R), Section (§), To be determined (TBD), Top-level drawings (TLD).

1. PURPOSE

This instruction provides guidance for installation of 115- and 230-volt Battery Installation Kit p/n: TSB2800 and other battery systems and subcomponent parts, installed as in conjunction with or independent of primary preheat system.

2. DESCRIPTION

Installation Kit consists of cable kit with CPD and thermal control assemblies. For additional details refer to TLD 02800 and cable kit wire diagram drawing 03116.

Battery heat element, power plug and light supplied separately based on airframe and battery make and model.

During cold weather operations preconditioning batteries with heat reduces freeze point depression and optimizes battery performance, amperage output and charge potential.

Systems are operated on the ground while connected to external shore power, refer to Operating Guide TPG1000.

- a) Standard preset thermostat limits operation of battery heaters to ambient air temperatures below +5°C / 41°F.
- b) Heated batteries reach thermal equilibrium in approximately six hours.
- c) Kits may be installed independently or as subcomponent of higher-level kit.
- d) For additional descriptions, installation regulations and procedures refer to TNG1000.

PROPRIETARY DATA

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3. INSTALLATION

 **Caution: Do Not** connect power to elements before completing Functional System Check.

- Technicians and users of this instruction should be familiar with Installation Guide TNG1000 and applicable documents associated specific installation when available.

3.1 Inventory

Start with parts and document inventory, refer to subject kit TLD or NHA drawings as applicable.

3.2 Weight and Balance

Weigh kit and intended installation hardware before installation. Weight varies by installation, typical installed weight for single battery kit approximately 1.0 lb / 0.5 kg and dual battery 2.0 lb / 1.0 kg. When required use battery station arm for CG calculations. Refer to TNG1000 for change requirements.

3.3 Elements

 **Caution: Use Only** Approved battery elements, refer to drawing 02800 for listing. **Do not** use any other heat element than approved for application.

- A. Measure resistance of element before installing and record in § 4. Table 4.1.
 - a) Should alternate or additional elements be required contact Tanis engineering.
 - b) Element positioning and lead orientation may vary from figures, refer § 4.
 - c) **Do Not** cut, overlap or fold elements.
 - d) Contaminants such as dirt, grease, and/or processing lubricants, must be removed from battery prior to installing heat element.
- B. Belt-type battery elements: Wrap element around perimeter of battery flat side in, position clear of bracketing, connectors, and chafe points. Installation does not use bonding sealant.
 - a) Secure with cable-ties or appropriate lacing. Gently lace alternating tension between ties. Excessive tension may cause damage or result in pulling grommets out.
 - b) Non-heated adaptor panels can be cut and configured when required.
 - c) When locating heater in battery box additional passthrough hole may be required for element lead, configure and seal as required.
 - d) When installing in confined areas protect element from abrasion and snags. Suggest thin cardboard or other appropriate material to protect element from sharp edges during installation, remove protector once installed.
- C. Pad-type battery elements: Installation locates element between battery and battery containment wall/box or is bonded to bottom or side of battery box, refer to specific instructions or contact Tanis engineering.

3.4 Electrical

Locate electrical components with reference to narratives and examples below and § 4.

Note: All battery systems are to be configured with CPD and thermal controller. Circuit protection may be supplied through primary system or independently.

- a) Electrical circuit refer to cable kit wire diagram drawing 03116 and Figure 4.1.
- b) Routing suggested, final routing TBD by installing authority.
- c) Plug type and mounting method or system interconnect TBD by installing authority.
- d) Extension cord receptacle plug (outlet) available for 230-volt systems, refer to instruction TN02829
- e) Wires and cables are to be supported by suitable cable ties, clamps, grommets, or other devices at intervals of not more than 6-inches / 15.25-centimeters, except when contained in ducts or conduits. Reference TNG1000 and AC 43.13-1 (as amended) Chapter 11.
- f) Only connect power after completing Functional System Check with ohmmeter, § 3.5.

External shore power plug (inlet): Plug supplied separately or through NHA. Identify method of power connection. Battery kit may be interconnected with primary system or installed independently with dedicated plug.

Cable Kit w/CPD p/n: TCB3116 (dwg 03116): Terminate CPD power lead in plug, locate CPD in serviceable area. Secure thermal control cable assembly in battery station with existing wiring and or/or battery cables, connect to circuit protected power lead, position battery connector for battery removal and service, thermal control connector for connection with controller.

Thermal Control p/n: TLP3046-05: Locate in battery environment 6-18 inches / 15-45 cm from battery. Mount using cable anchor TU02782 and installation kit CB92, refer to instruction TN03046 and TN02782, and cable kit wire diagram drawing 03309.

Ground wire: Green 22759-181 wire with ring crimp. Verify OEM engine/airframe bonding strap is installed. Attach ring crimp end to applicable ground on airframe or engine, terminate in power plug. Connection not to exceed .003 ohms, refer to TNG1000.

Placard: Affix supplied TU02615- placard near plug or placard stating at minimum "Tanis Preheat" and voltage requirement.

3.5 Completion

1. Inspect: Visually inspect and verify components are connected and secure.
2. Check: Perform Functional System Check, refer to Installation Guide TNG1000.
3. Record: Retain data and record as indicated in Instructions for Continued Airworthiness TCA1000 and Operating Guide TPG1000.

4. TABLES AND FIGURES

This section contains location for recording installed batter heat elements and figurers with examples of typical installations, actual installation may vary due to existing equipment or operating requirements.

System and individual element value tolerances +/- 10%.

Battery heat circuit normally open (off) and closed (on) below +5°C / 41°F (option: +10°C / 50°F) refer to TN03046, drawing 03116 and Functional System Check located in Installation Guide TNG1000.

To calculate the specific wattage of an individual element or installed system, measure total resistance between circuit contacts and use the following formula.

$$\underline{V}oltage\ squared, \text{ divided by } \underline{R}esistance = \underline{W}attage \ (V^2/R=W).$$

To calculate resistance value of an element using the part numbers the digits after the dash (-) callout voltage and the numbers after the slash (/) callout wattage.

$$\underline{V}oltage\ squared, \text{ divided by } \underline{W}attage = \underline{R}esistance \ (V^2/W=R).$$

For additional details refer to Electrical section located in Installation Guide TNG1000.

Table 4.1. Record as installed:

System Volts: _____ **Amps:** _____ **Watts:** _____ **Ohms:** _____

Battery Heat Element	Part Number	Wattage	Ohms

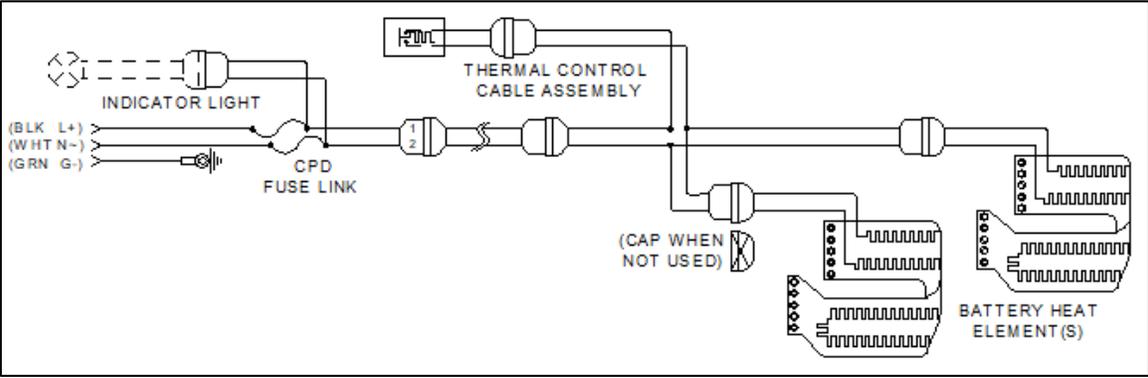


Figure 4.1. Typical battery kit circuit. Installation kit p/n: TSB2800 supplied with CPD fused link and dual battery cable assembly, sealing cap installed on second lead when not used.

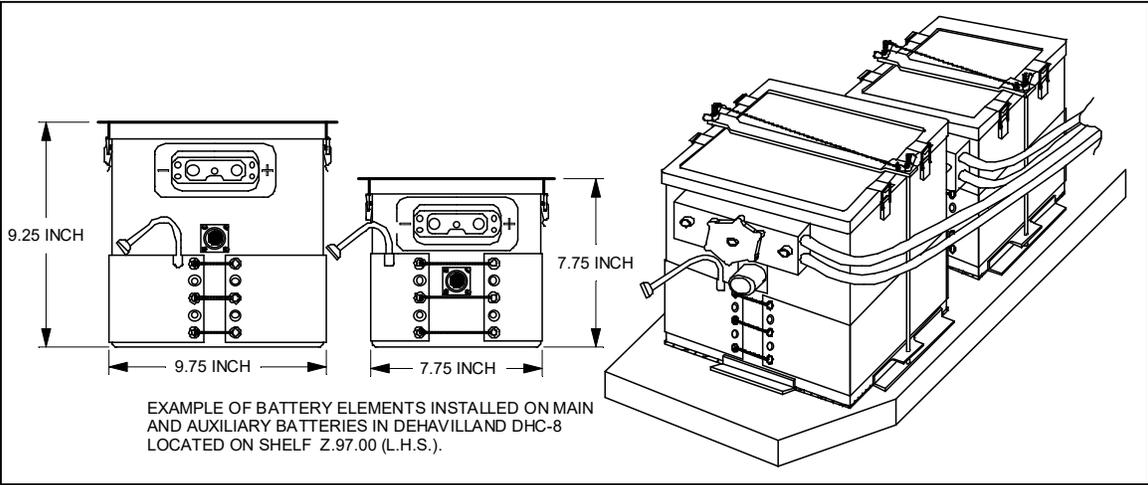


Figure 4.2. Example of battery heat element installation. Ambient air thermal control (thermostat) mounted in battery environment/station 6-18 inches / 15-45 cm from batteries.



Figure 4.3. Examples of plug and light mounting: Plug with clamps, and flush plug mounted in bracket secured to APU connector. For additional plug mounting options refer to Installation Guide TNG1000.

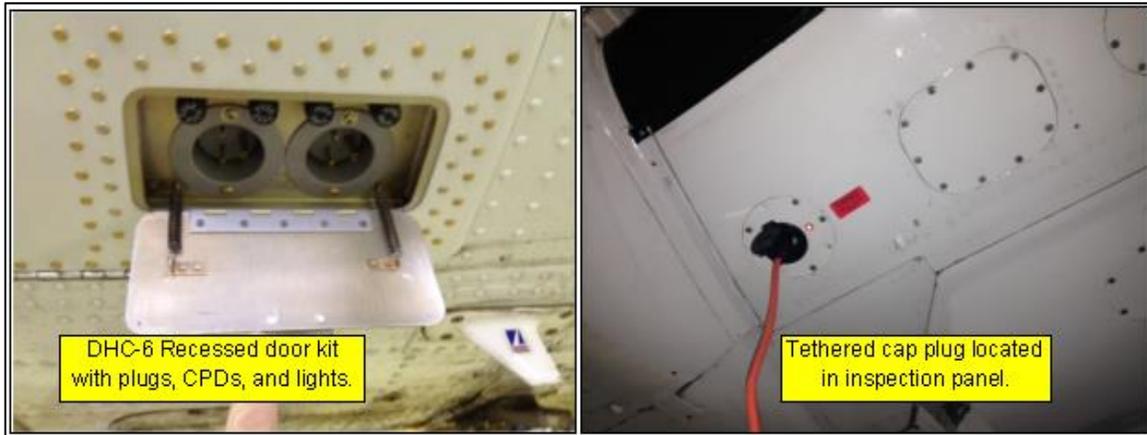


Figure 4.4. Examples of plug and light mounting. Left: Plugs in door kit with light and TU03141 CPD kits. Right: Flush plug with cap located in non-structural inspection panel. For additional plug mounting options refer to Installation Guide TNG1000.

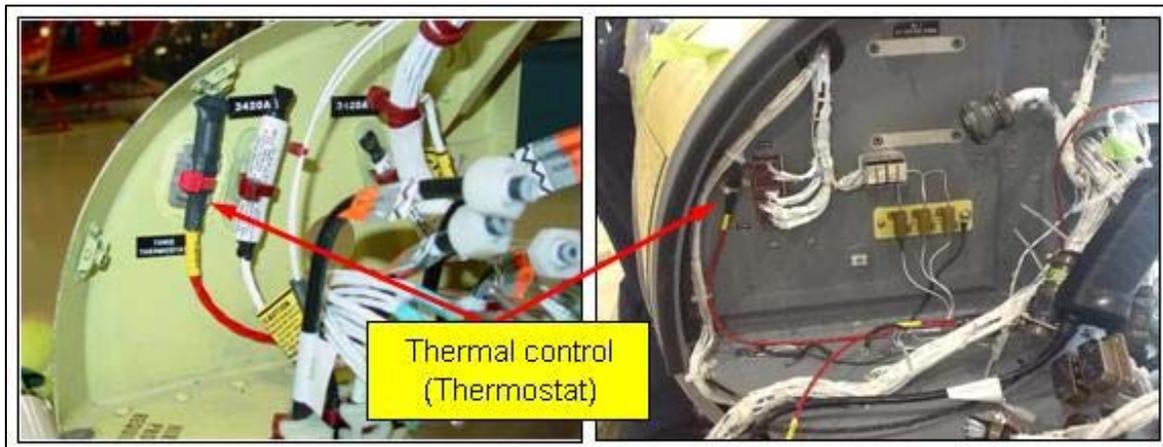


Figure 4.5. Examples of thermal control mounted with cable anchor TU02782 in battery compartment 6-18 inches / 15-45 cm from battery heat element, refer to instruction TN03046 and TN02782.

Secure thermal control cable assembly in battery station with existing wiring and or/or battery cables, connect to circuit protected power lead, position battery connector for battery removal and service, thermal control connector for connection with controller

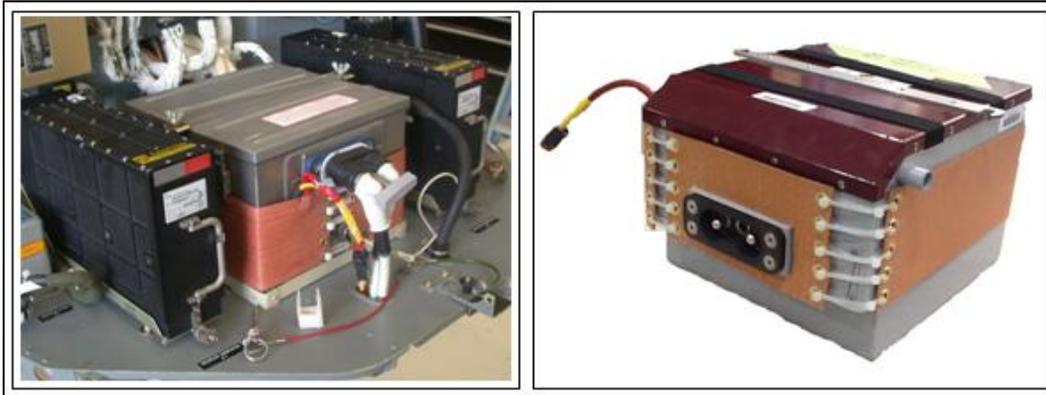


Figure 4.6. Installation examples. **Left** - NiCad battery with element positioned to avoid battery contacts. **Right** - Concord RG-407/427 battery with element and adaptor panel. Adaptor panel cut to fit around contact block. **Do Not** cut element.

Wrap element around perimeter of battery flat side in, position clear of bracketing, connectors, and chafe points. Installation does not use bonding sealant.

Secure with cable-ties or appropriate lacing. Gently lace alternating tension between ties. Excessive tension may cause damage or result in pulling grommets out.

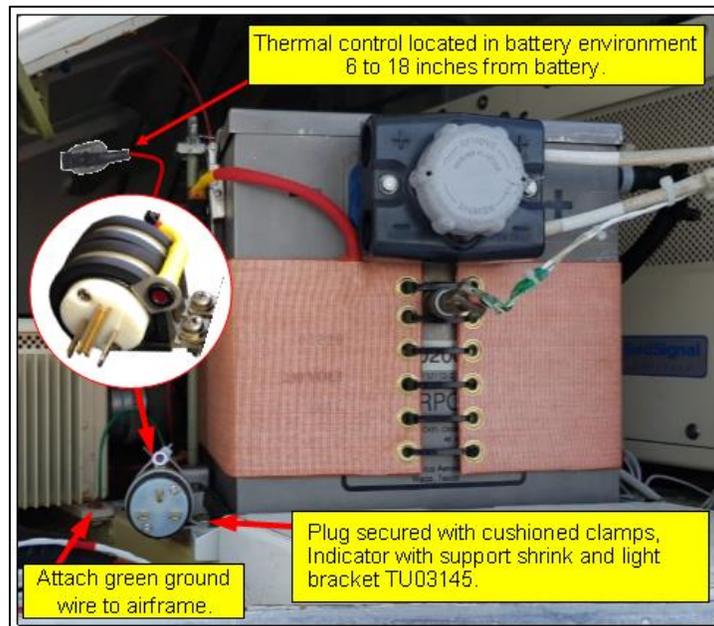


Figure 4.7. Example of battery element wrapped around perimeter of battery flat side in, position clear of bracketing, connectors, and chafe points. Installation does not use bonding sealant.

Secure with cable-ties or appropriate lacing. Gently lace alternating tension between ties. Excessive tension may cause damage or result in pulling grommets out.

Thermal control located in battery environment with cable-tie anchor TU02782 or lace with existing wiring, refer to instructions TN02782 and TN03046.

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