



INSTRUCTION – PREHEAT KIT INSTALLATION

Subject: TSHEC120-2407-115 and TSHEC120-2407-230
Heli-Preheat Kits, EC120B

Document No: TNH2407

Revision: B

Date: DEC-31-2018

RECORD OF REVISIONS

When revised document changed in its entirety.

REV	DATE	DESCRIPTION	BY	CKD
B	DEC-31-2018	Configure with TU03125, AV and battery heaters.	DNE	SSJ
A	NOV-03-2016	Reformat and standardized part numbers	GDO	DNE
	DEC-06-2010	Previous edition TN02407 date controlled	DNE	RCK

Current revision approval: _____

1. PURPOSE

This instruction provides guidance for installation of Subject kits listed above.

2. REQUIREMENTS

Subject kit Top-Level Drawing, 2407-115 or 2407-230, associated parts and documents as listed.

- Tools, hardware, consumables, power supply, and extension cords, not supplied.
- Pad element bonding sealant supplied separately, refer to TN02788.
- Door and firewall connector kits require hardware, reference drawings 02840 and 03125.

3. INSTALLATION

⚠ Caution: Energized elements can cause 2nd and 3rd degree burns. **Do Not** connect elements or system to power before completing installation and Functional System Check, TNG1000.

- Technicians and users of this instruction should be familiar with Installation Guide TNG1000.

3.1 Abbreviations:

AGB: Engine accessory gearbox, MRGB: Main rotor gearbox, TRGB: Tail rotor gearbox,
AC: Alternating current, CG: Center of gravity, CPD: Circuit protection device, Section: §, TBD:
To be determined.

3.2 Inventory

Start with parts inventory and document review, refer to top-level drawing item list.

3.3 Weight and Balance

Weight kit before installation. Approximate installed weight (less cabin heater): 5.0 lb. / 2.3 kg.
Use centerline of upper deck at forward engine firewall for Weight and Balance calculations (CG).
Refer to TNG1000 for change requirements.

AV Cabin Heater weight 1.3 lb / 0.6 kg approximate. For permanent installation use location of
installation for CG. Example deck below right front seat or location as installed.

PROPRIETARY DATA

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3.4 Elements

Locate elements with reference to narratives and examples in § 4.

- a) Measure resistance of each element before installing, Table 4.1. or 4.2 as applicable.
- b) AV/Cabin Heater, supplied configured for occasional use. For operation and installation options refer to TPG3094 and TN03094.
- c) Battery heater element wrapped around parameter of battery and secured with cable-ties or appropriate lacing. Note: Avoid chafe and pinch points between battery and bracket.
- d) Should operational procedures or environment conditions require alternate or additional elements, contact Tanis engineering.

3.5 Electrical

Locate electrical components with reference to § 4.

- a) Electrical routing suggested finial routing TBD by installing authority.
 - b) Refer to cable kit wire diagram drawing 02803, and installation guide TNG1000.
 - c) For wire termination and tooling, refer to instructions TN02793 and TN03012.
1. Shore power plug (inlet): Locate on right side aft of baggage door in step or near rear step with plug door kit TD02840, refer to Figure 4.8.

Supplied or optional plug may be located in baggage compartment or other TBD by installer, refer to TNG1000 for examples of optional plug configurations.

230-volt kit supplied with extension cord plug adaptor, refer to instruction TN02829.
 2. Indicator Light: Locate with door kit or in panel adjacent to plug, refer to TN02840 and TN03039.
 3. Grounding: Attach ground wire to airframe with proper metal-to-metal bonding. Resistance of ground connection not to exceed .003 ohms. Use existing ground lug in baggage compartment when available.
 4. Junctions: Locate junctions in serviceable areas that allow leads to reach corresponding components. Secure with cushioned clamps, cable-ties, and/or appropriate lacing.
J-A - Baggage hold forward of step or in near aft side of plug.
J-B – MRGB compartment, right side forward of engine compartment.
 5. Circuit Protection Devices (CPD): Secure in serviceable area near junction J-A.
 6. Firewall Connectors: TU03125, Firewall Connector Kits supplied for use as needed installed with refer to drawing 03125.
 7. Leads:
 - 01 - Power lead with CPD, terminate in plug locate CPD inaccessible area in baggage hold or near plug.
 - 02 - Indicator lead, route from CPD to light.
 - 03 - Junction lead from J-B to J-A, route with existing wiring through deck or use supplied firewall connector TU03125 location TBD, suggest right side forward of engine firewall.
 - 04 through 07 – Hydraulic tank and MRGB element leads, route from J-B to corresponding elements.

- 08 – Engine element lead, route from junction J-B located on right side of MRGB compartment to left side forward of engine firewall, route aft through forward engine firewall with existing wiring or use supplied firewall connector kit TU03125 location TBD, continue aft to engine element.
 - 09 - TRGB element lead, route forward with existing wiring from tail rotor gearbox to tailboom disconnect, install connector kits per wire diagram, continue forward to junction J-A.
 - 10 - Battery heater lead, route from battery station to junction J-A. lead 10 connects to thermal control cable assembly. Position element connector for disconnect during maintenance and locate thermal control 6 - 18 inches / 15 - 45 cm from battery, secure with cable anchor TU02782, refer to TN03046
 - 11 - AV/Cabin Heater lead with CPD, terminate in plug locate CPD inaccessible area in baggage hold or near plug, route forward with existing wiring into crew cabin to AV heater. AV heater to be permanently installed with reference to instruction TN03094. Heater location TBD installer. May be removed for flight or seasonal use.
8. Placard TU02615: Affix supplied or field fabricated placard in visible location adjacent to shore power plug. Alternate field fabricated placard with *Tanis Preheat* and voltage requirement (115-Volt or 230-Volt) may be used.

3.6 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: Record and retain data as indicated in Instructions for Continued Airworthiness TCA1000 and Operating Guide TPG1000.

4. TABLES AND FIGURES

This section contains technical information and examples of typical installations, actual installation may vary due to existing equipment or operating requirements.

Table 4.1. 115-Volt Electrical Values.

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

* Battery heater circuit normally open, closed below +5°C / 41°F refer to TN03046 and Functional System Check located in Installation Guide TNG1000.

** AV/Cabin heater ohms and inrush amperage varies due to heater design, refer to TN03094.

115 Volt Kit:

Recommended power source, continuous 115-volt 15-amp service.

Plug. System total with AV heater			Total:	8.0 Amps	915 Watts	14.5 Ohms
* Without battery heater:				7.3 Amps	855 Watts	15.5 Ohms
** Without battery and AV heater:				3.1 Amps	355 Watts	37.3 Ohms
Qty	Element Part Number	Element Location			Watts	Ohms
* 1	TBP2647-115/60	Battery		each:	60	220.4
1	TEP2672-115/37	Hyd oil tank		each:	37	357.4
1	TEP2675-115/95	Engine AGB tank		each:	95	139.2
1	TEP2700-115/60	MRGB LH		each:	60	220.4
1	TEP2713-115/25	MRGB RH		each:	25	529.0
1	TEP2715-115/18	TRGB		each:	18	734.7
1	TEP3181-115/120	MRGB Upper		each:	120	110.2
** 1	THP3094-500	AV/Cabin Heater		each:	500	26.5

Table 4.2. 230-Volt Electrical Values.

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

* Battery heater circuit normally open, closed below +5°C / 41°F refer to TN03046 and Functional System Check located in Installation Guide TNG1000.

** AV/Cabin heater ohms and inrush amperage varies due to heater design, refer to TN03094.

230 Volt Kit:

Recommend power source, continuous 230-volt, minimum 6-amp service.

Plug. System total with AV heater			Total:	4.0 Amps	915 Watts	57.8 Ohms
* Without battery heater:				3.7 Amps	855 Watts	61.9 Ohms
** Without battery and AV heater:				1.5 Amps	355 Watts	149.0 Ohms
Qty	Element Part Number	Element Location			Watts	Ohms
* 1	TBP2647-230/60	Battery		each:	60	881.7
1	TEP2672-230/37	Hyd oil tank		each:	37	1429.7
1	TEP2675-230/95	Engine AGB tank		each:	95	556.8
1	TEP2700-230/60	MRGB LH		each:	60	881.7
1	TEP2713-230/25	MRGB RH		each:	25	2116.0
1	TEP2715-230/18	TRGB		each:	18	2938.9
1	TEP3181-230/120	MRGB Upper		each:	120	440.8
** 1	THP3094-500	AV/Cabin Heater		each:	500	26.5

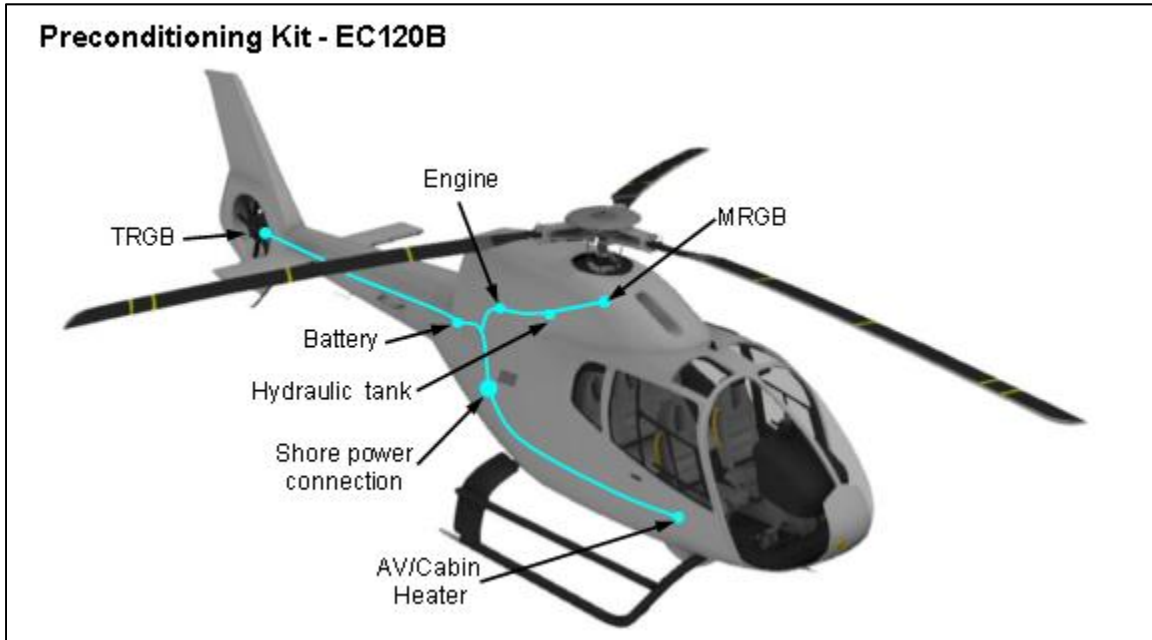


Figure 4.1. Overview of preconditioning kit.



Figure 4.2. TBP2647-31- Battery element (generic example shown, location of battery may vary). Secure around top of battery clear of battery, position clear of bracketing, connectors, and chafe points. Use cable ties or appropriate lacing. Gently lace in place alternating tension between ties. Excessive tension may cause damage or result in pulling grommets through element edge. Note: Due to varying battery configuration and/or location alternate elements available.

Thermal control cable assembly, secure with existing wiring, on battery cables or as required. Position element connector for disconnect during maintenance and thermal control TLP3046-, 6 to 18 inches from battery using cable anchor TU02782 or secure with existing cabling, refer to instructions TN03046 and TN02782.



Figure 4.3. THP3094-500 AV/Cabin Heater is to be permanently mounted using supplied Click Bond studs or equivalent. Location TBD and varies due to seating configuration. May be removed for flight or seasonal use. Suggest locating below seat. Power cable from plug routed into crew cab with existing wiring. For additional installation and thermostat options, refer to TN03094.

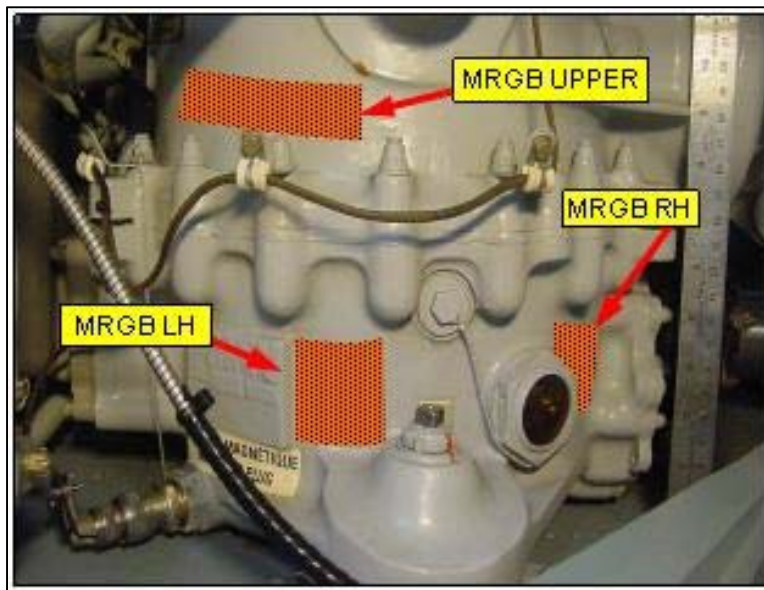


Figure 4.4. MRGB elements. Examples for locating elements shown; TEP2700- left of sight glass, TEP2713- right of sight glass, TEP3181- above case split. Location of elements may vary due to case design. Position elements to allow leads to follow existing wiring and lines.

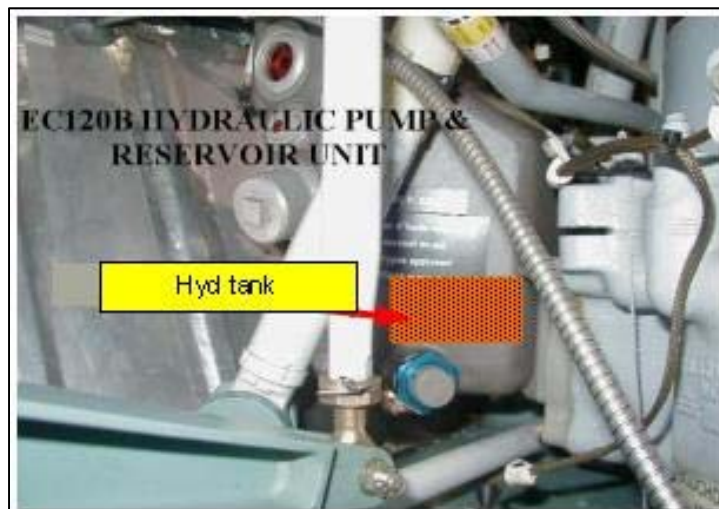


Figure 4.5. TEP2672- Hydraulic tank element below nominal oil level position for lead routing.



Figure 4.6. TEP2675- Engine element on side or bottom of tank, position lead down.

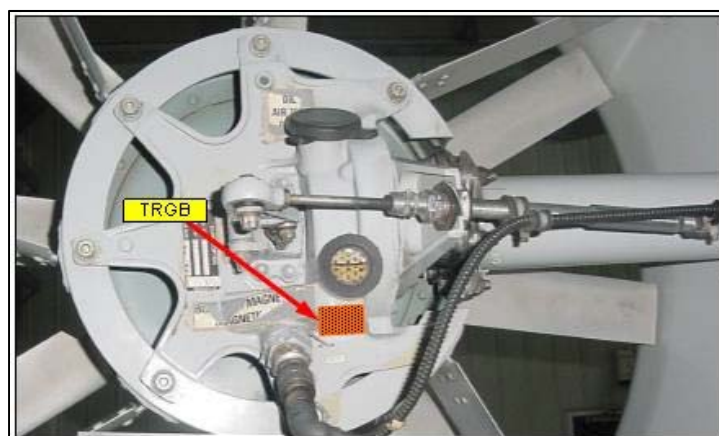


Figure 4.7. TEP2715- TRGB element on case below sight glass position lead to follow chip light wiring and secure connector.

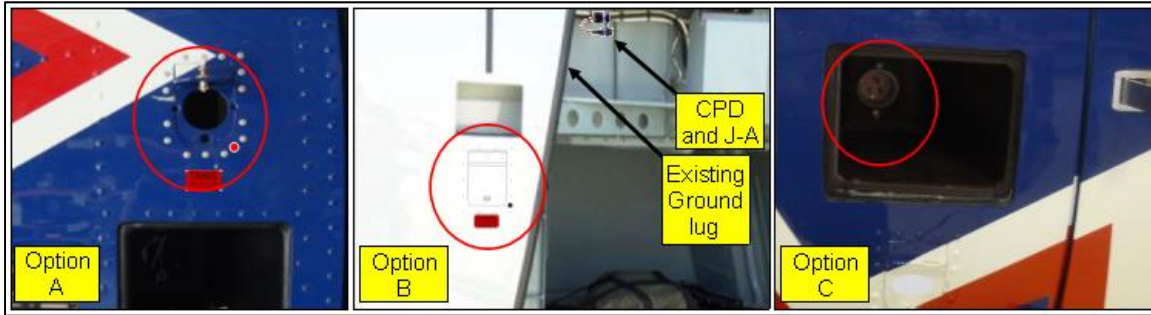


Figure 4.8. Shore power plug. Locate plug door kit in panel above or below step or locate plug in rear of step. When locating in step install plug from front and reinforce back side of step with supplied door kit doubler or field fabricate. Light may be located under door, next to or adjacent to plug, refer to drawing 02840, instructions TN02840, TN02070, and TN03039. Locate CPD and junction in serviceable area in baggage compartment or near rear of plug. Use existing ground lug when available.

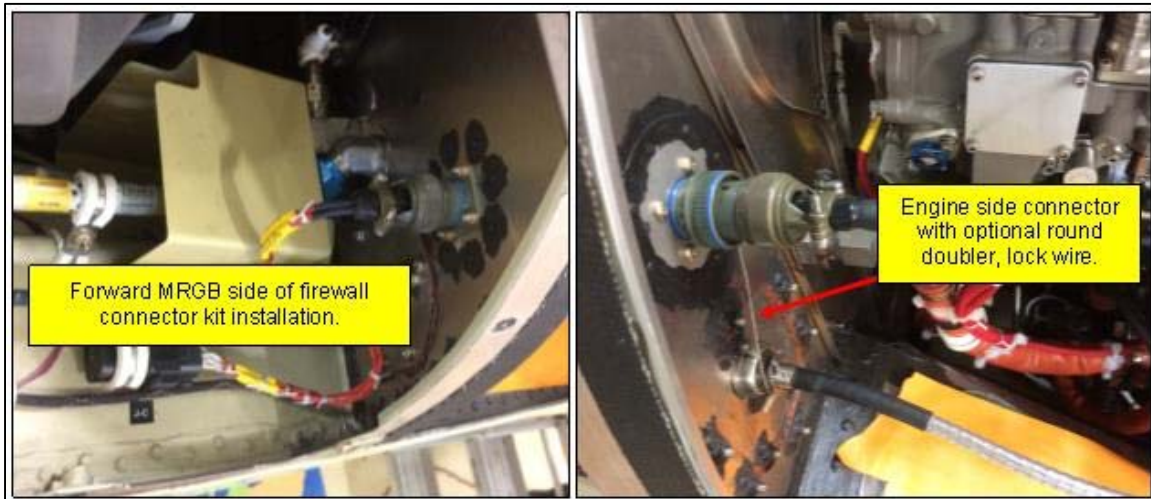


Figure 4.9. TU03125 firewall connector kits used for MRGB (main transmission) deck and engine firewall penetrations. Locations TBD installing technician. Generic example of installation shown with optional round doubler TU03189. Reference drawing 03125 for installation.

Suggested locations for connector kits:

MRGB deck; right aft side of compartment just forward of engine firewall, supports routing of junction lead 02 between junction J-A at plug and J-B in MRGB compartment.

Engine firewall; left lower side forward of engine AGB, supports routing of engine element lead 07.

Note: MRGB junction and engine element leads may be routed with existing wiring and/or penetration when available, refer to cable kit wire diagram 02803.

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