



INSTRUCTION – PREHEAT KIT INSTALLATION

Subject: P/N: TSFPC12-3080-115-PL and TSBPC12-3115-115-PL
or TSFPC12-3080-230-PL and TSBPC12-3115-230-PL.
Pilatus PC-12 Legacy Preheat Kit

Document No: TNF3080
Revision: F
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RECORD OF REVISIONS

When revised document changed in its entirety.

REV	DATE	DESCRIPTION	BY	CKD
F	JUN-05-2020	Revise Subject P/N adding Pilatus modifier -PL	DNE	GDO
E	SEP-18-2015	Segregate engine and battery kits (03115)	GDO	DNE
D	JUL-09-2015	Update images and battery information.	DNE	DNE

Current revision approval: _____

ACRONYMS

Alternating current (AC), Aircraft Maintenance Manual (AMM), Center of gravity (CG), Circuit protection device (CPD), Engine accessory gearbox (AGB), Manufacturer serial number (MSN), Original Equipment Manufacturer (OEM), Propeller reduction gearbox (PRGB), Section (§), Service Bulletin (SB), To be determined (TBD), Top-level Drawings (TLD).

1. PURPOSE

This instruction provides guidance for installation of 115 and 230-volt subject kits.

2. REQUIREMENTS

Parts and documents as listed in subject kit top-level drawings, refer to Section 4. Table 1 and Figure 1 (parts supplied by voltage).

- Tools, hardware, consumables, power supply, and extension cords, not supplied.
- Pad element bonding sealant supplied separately, refer to TN02788.
- Requires hardware and sheet metal work, refer to this instruction and related documents.
- Kit may be installed with reference to, or independent of, Pilatus SB: 25-040.

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 Inventory

Start with parts inventory and document review, refer to subject kit TLD and Table 1.

PROPRIETARY DATA

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3.2 Weight and Balance

Weigh kits before installation. Refer to TNG1000 for change requirements.

Approximate installed weights:

- Engine kit: 1.5 lb / 0.68 kg, when required use engine arm for CG calculations.
- Battery kit: 1.5 lb / 0.68 kg, (includes AC outlet). Use battery station arm for CG calculations.

3.3 Elements

Locate elements with reference to narratives and examples in § 4 and Pilatus SB when applicable.

- a) Measure resistance of each element before installing, Table 4.2. or 4.3 (by voltage).
- b) Battery elements secured in places with cable-ties or lacing.
- c) Pad heat elements bonded to engine gearboxes with sealant, refer to TN02788.
- d) Should alternate or additional elements be required contact Tanis engineering.

3.4 Electrical

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

- a) Final routing TBD by installing authority or in accordance with Pilatus SB, refer to § 2. d).
 - b) Refer to cable kit wire diagram drawings, 03079 (engine) and 03114 (battery), and installation guide TNG1000.
 - c) Wire termination and tooling refer to instructions TN02793 and TN03012.
 - d) 230-volt kit supplied with extension cord plug adaptor, refer to instruction TN02829.
 - e) Door kits and doublers supplied separately or may be field fabricated.
 - f) Use 0.040 to 0.080, 2024-T3 or equivalent for field-fabricated doublers and brackets.
 - g) Only connect power after completing Functional System Check with ohmmeter, § 3.5
1. Shore power plugs (inlet), indicator lights, and CPD: May require additional doubler or door configuration. Identify location and method for installation. Optional configurations outlined in Appendix A and TNG1000.
Plug 1 engine preheat kit, shore power plug (inlet) and light refer to Figures 4.1 and 4.2.
Plug 2 battery heat kit shore power plug (inlet) and light refer to Figures 4.1 and 4.3.
 2. Interior AC outlet: Refer to Figures 4.1 and 4.4.
 3. Placard: Affix supplied TU02615- placards or placard with equivalent stating at a minimum "Tanis", and the system voltage near both shore power plugs. When installing kit in accordance with Pilatus Service Bulletin use applicable Pilatus placards.

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: 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. Top-Level Drawings and Cross Reference.

Eligible for installation on PC-12 Legacy series fitted with PWC PT6A-67B engine.

Tanis Drawing	Description	Tanis P/N	Pilatus P/N	Pilatus SB
03080-115	Engine Preheat Kit – 115 Volt	TSFPC12-3080-115-PL	968.20.13.923	25-040
03115-115	Battery Heat Kit – 115 Volt	TSBPC12-3115-115-PL	968.20.13.926	25-040
03080-230	Engine Preheat Kit – 230 Volt	TSFPC12-3080-230-PL	N/A	N/A
03115-230	Battery Heat Kit – 230 Volt	TSBPC12-3115-230-PL	968.20.13.927	N/A

Table 4.2. Electrical Values 115-Volt Kits

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

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

Total load requirement 7.4 Amp.

Recommend 30 Amp 115 AC continuous power source: 15-amps per plug when operating in conjunction with cabin heater (supplied separately) connected in Plug 2 circuit.

Plug 1. 115-Volt Engine Preheat Kit			Total:	6.1 Amps	703 Watts	18.8 Ohms
Qty	Element P/N:	Location			Watts	Ohms
1	TEP3181-115/120	AGB LH (below sight glass)	each:		120	110.2
1	TEP2681-115/160	PRGB LH	each:		160	82.7
1	TEP2682-115/13	FCU	each:		13	1017.3
1	TEP2683-115/110	AGB LH (aft)	each:		110	120.2
1	TEP2684-115/300	PRGB RH	each:		300	44.1

Plug 2. 115-Volt Battery Heater Kit			Total:	1.3 Amps	148 Watts	89.4 Ohms
Qty	Element P/N:	Location			Watts	Ohms
* 2	TBP2648-38-115/74	Battery	each:		74	178.7

Table 4.3. Electrical Values 230-Volt Kits

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

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

Total load requirement 3.7 Amp.

Recommend 16 Amp 230 AC continuous power source: 8-amps per plug when operating in conjunction with cabin heater (supplied separately) connected in Plug 2 circuit.

Plug 1. 230-Volt Engine Preheat Kit			Total:	3.1 Amps	703 Watts	75.2 Ohms
Qty	Element P/N:	Element Location			Watts	Ohms
1	TEP3181-230/120	AGB LH (below sight glass)	each:		120	440.8
1	TEP2681-230/160	PRGB LH	each:		160	330.6
1	TEP2682-230/13	FCU	each:		13	4069.2
1	TEP2683-230/110	AGB LH (aft)	each:		110	480.9
1	TEP2684-230/300	PRGB RH	each:		300	176.3

Plug 2. 230-Volt Battery Heater Kit			Total:	0.6 Amps	148 Watts	357.4 Ohms
Qty	Element P/N:	Location			Watts	Ohms
* 2	TBP2648-38-230/74	Battery	each:		74	714.9

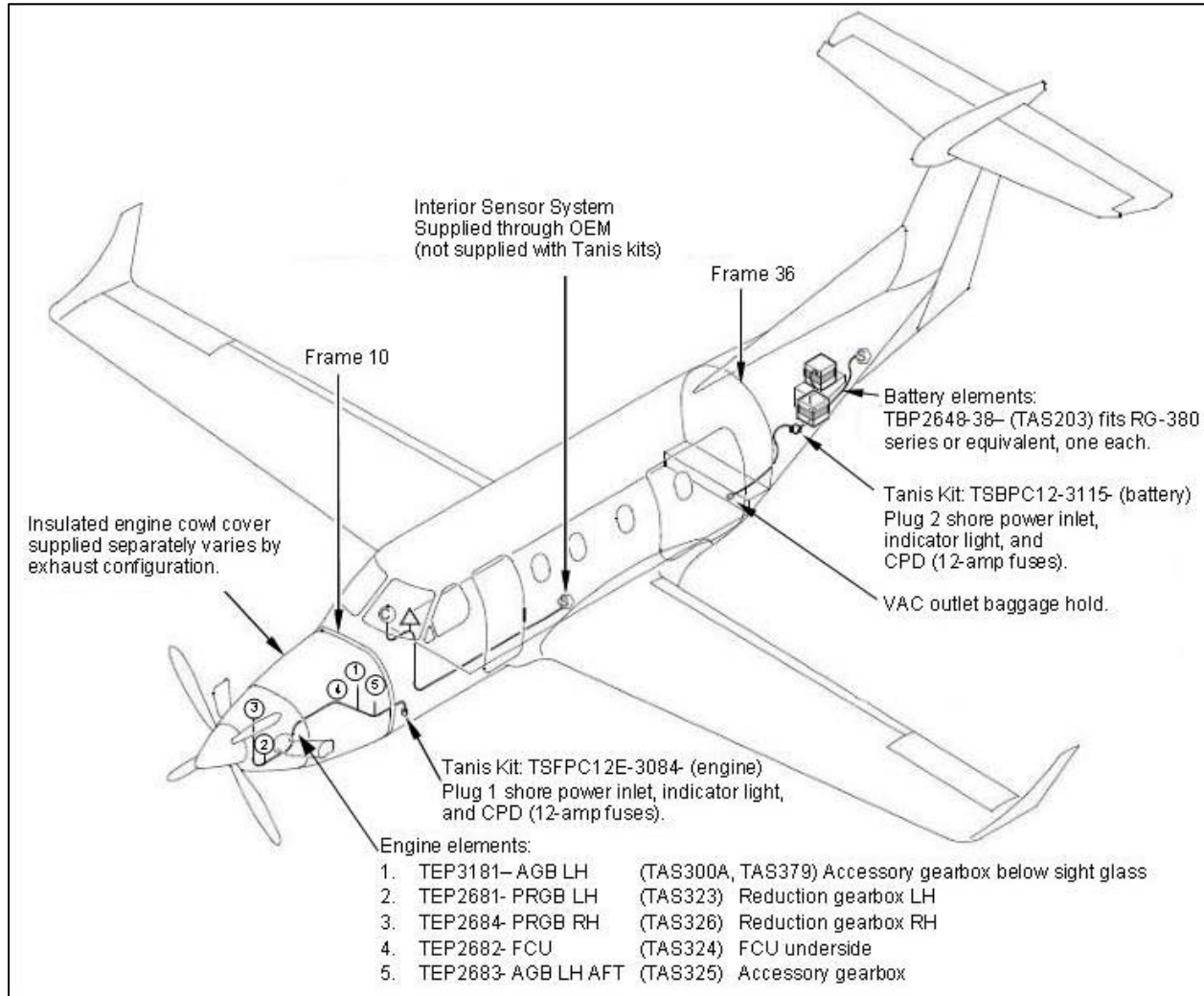


Figure 4.1. Outline: Kit may be installed independently or with reference to Pilatus SB 25-040, refer to Pilatus Service Bulletin Index PC-12 or contact Pilatus Aircraft for applicable SB.

Refer to Table 4.1 for top-level drawings, part numbers, and eligibility.

Additional parts:

Element bonding sealant: TU02788 refer to instruction TN02788.

Doublers and bracket required for shore power plugs (inlets) and interior AC outlet. Parts may be sourced through Pilatus: P/N: 553.10.12.779 forward Plug-1 doubler. P/N: 553.26.12.373 aft Plug-2 doubler. P/N: 553.14.12.591 AC outlet bracket, field-fabricated or substituted with Tanis door kits or equivalent approved door.

For plug and door options refer to Appendix A and TNG1000.

TBD: Cable routing, passthrough type and location, refer to Figure 4.2.

Insulated Engine Cowl Cover: Supplied separate from Tanis Preheat Kit. Cover may vary due to exhaust or other aircraft configurations.

Interior Sensing System: supplied through Pilatus and installed per SB.

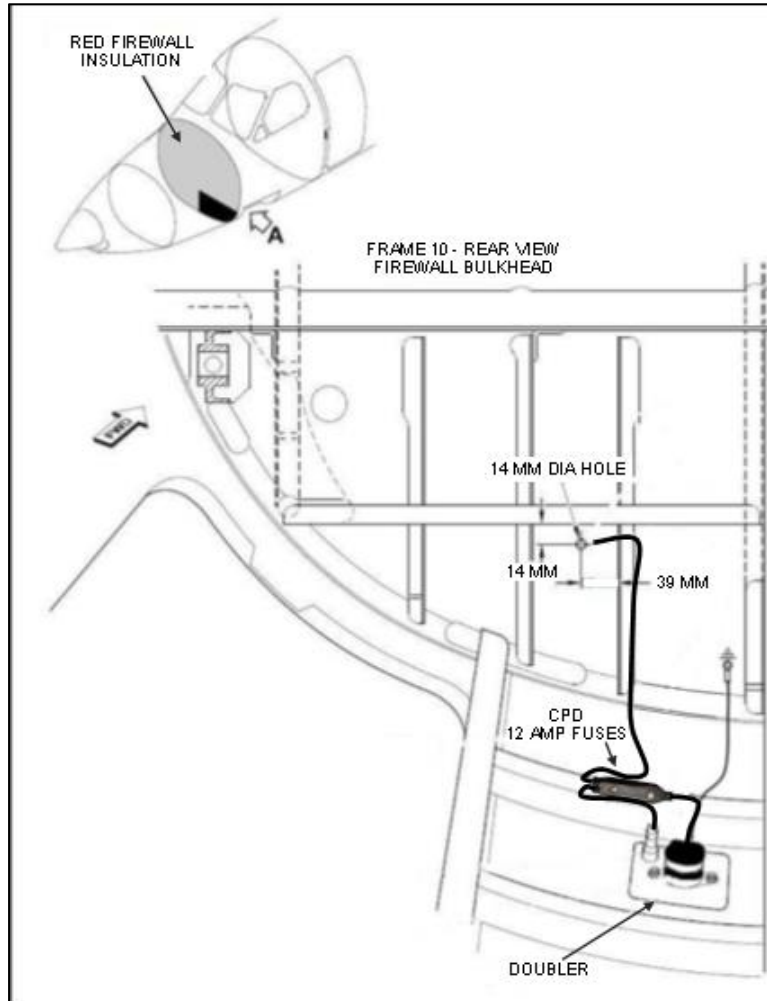


Figure 4.2. Plug 1, shore power plug Frame 10. Access installation site through door 11 AL. Locate plug (P/N: TP02070-M-115 or TP02839-S-230), and light (TLP3039-06-115 or TLP3039-06-230) between Frames 10 and 11 with Pilatus doubler (P/N: 553.10.12.779) or field-fabricated equivalent or use Tanis doubler TD02838 and/or door kit TD02840 (supplied separately). Use AN or NAS rivets (NAS1097AD4), assemble wet and seal with PS 870 (PR 1422B-2) or OEM equivalent. 2-place door kit TD03152 dwg 03152, available separately, may be used to co-locate Plug 1 and 2 in tail section forward of rear access panel refer to Appendix A.

Attach ground wire to existing ground lug or on airframe adjacent to shore plug.

Note: Wire routing TBD (Pilatus Bushing may be used, P/N: 533.10.12.780. Locate in firewall Frame 10 from the engine side, with longer portion to rear of aircraft. Use Monel Rivets (MS20615-4MX), assemble wet and seal with PS 700, Alt: DAPCO 2100 (BMS 5-63 TYP 2 CL B 1/2.) or equivalent.

Locate plug and light with refer to instructions TN02070 and TN03039. Note: CPD, locate in serviceable area near rear of plug location.

For additional plug and door options refer to Appendix A.

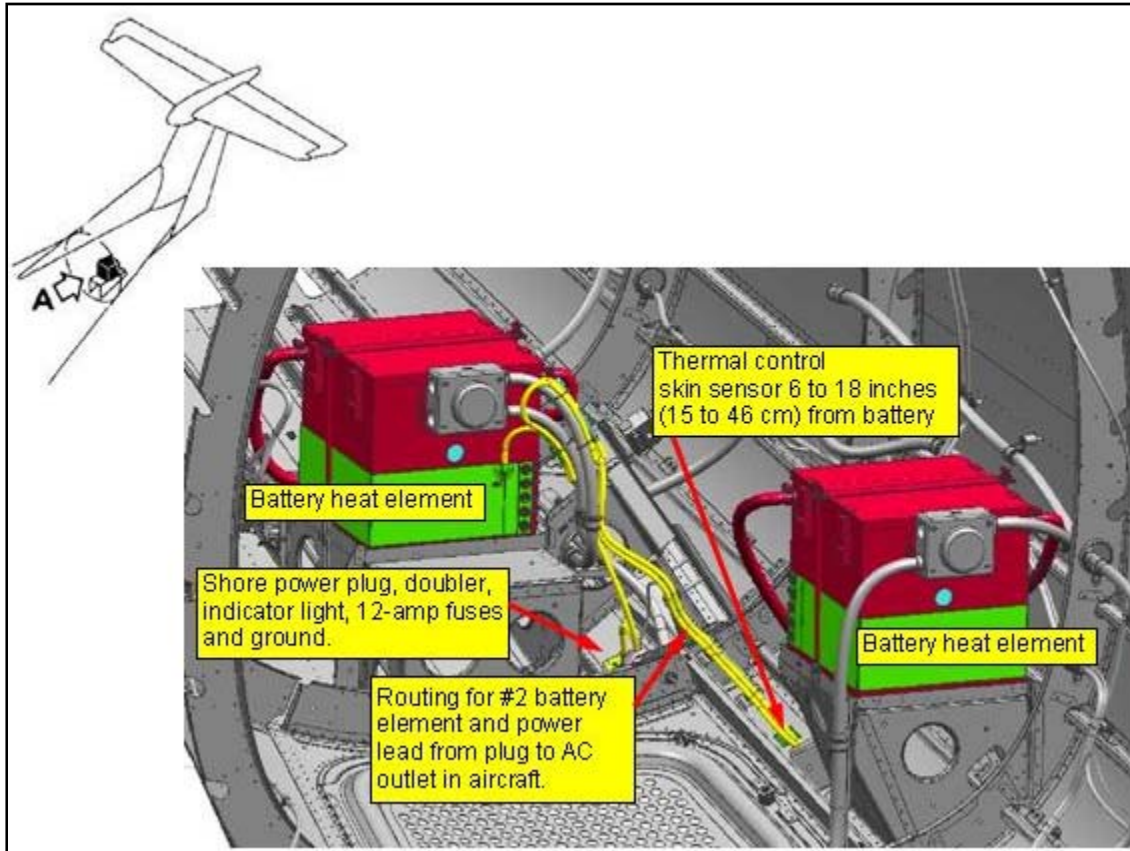


Figure 4.3. Plug 2, shore power plug for battery and interior outlet, Frame 38. Locate plug (P/N: TP02070-M-115 or TP02839-S-230), and light (TLP3039-06-115 or TLP3039-06-230) aft of Frame 38 in rear left side with Pilatus doubler (P/N: 553.26.12.373) or field-fabricated equivalent or use Tanis doubler TD02838 and/or door kit TD02840 (supplied separately). Use AN or NAS rivets (NAS1097AD4), assemble wet and seal with PS 870 (PR 1422B-2) or OEM equivalent. 2-place door kit TD03152 dwg 03152, available separately, may be used to co-locate Plugs 1 and 2 in tail section forward of rear access panel refer to Appendix A.

Ground: Attach ground wire to existing ground lug or on airframe adjacent to shore plug.

Thermal control cable assembly: Secure cable assembly with existing wiring, on battery cables or as required. Position element connector for disconnect during maintenance.

Thermal control: TLP3046-, Locate 6 to 18 inches from battery using cable anchor TU02782 or secure with existing cabling, refer to instructions TN03046 and TN02782.

Battery elements: TBP2648-38-. Use cable-ties or appropriate lacing, secure around battery, position clear of bracketing, connectors, and chafe points. Gently lace in place alternating tension between ties. Excessive tension may cause damage or result in pulling grommets through element edge. Installation does not use bonding sealant.

Plug, light, and fused link (CPD) refer to drawing 03079, instructions TN02070 and TN03039. Note: Locate CPD in serviceable area near rear of plug or location TBD by installing authority. For additional plug and door options refer to Appendix A and TNG1000.

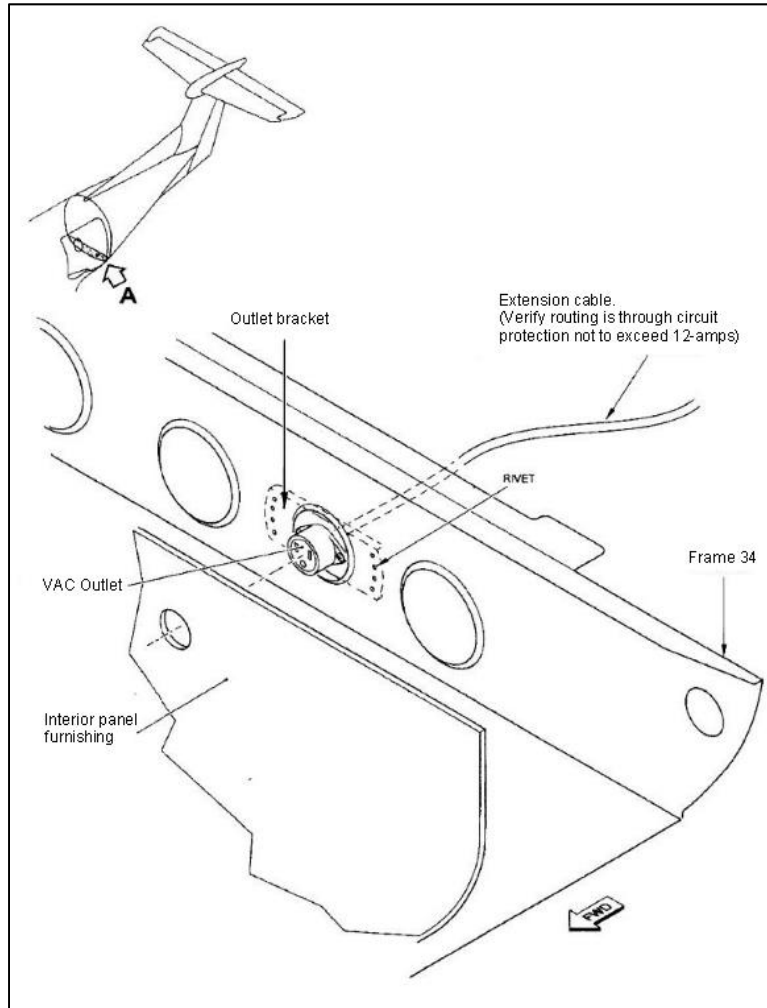


Figure 4.4. Interior outlet Frame 34, Baggage compartment. Install Tanis AC outlet (P/N: TP02989-115 or TP02988-230) or alternate Pilatus Outlet (P/N: 968.2013.906), and Pilatus outlet bracket/holder (P/N: 553.14.12.591), or field-fabricated equivalent bracket, rivet on rear side of small lower foot-wall structure of Frame 34, second lightening/manufacturing hole from left. Use AN or NAS rivets (NAS1097AD4), assemble wet and seal with PS 870 (PR 1422B-2) or equivalent. Note: when installing Tanis outlet configure bracket center hole accordingly refer to instruction TN02533.

Route cable through rear pressure bulkhead using existing connector refer to Appendix A or install Pilatus Pressure Bushing (P/N: 533.28.12.123) Frame 36 refer to AMM 12-B-11-00-00-00A-920A-A and Figure 4.1 and 4.3. Install in rear pressure bulkhead at approximately 7 o'clock position in 50-millimeter reinforcement blank located to right/starboard of control cables. Install from passenger cabin-side with longer portion protruding aft. Use AN or NAS Rivets (NAS1097AD4), assemble wet and seal with PS 870 (PR 1422B-2) or equivalent.

Note: Ensure cable and ground secured with cushioned clamp adjacent to outlet and are routed and secured under control cables.

Locate Tanis AC outlet (TP02989-115 or TP02988-230) refer to TN02533.

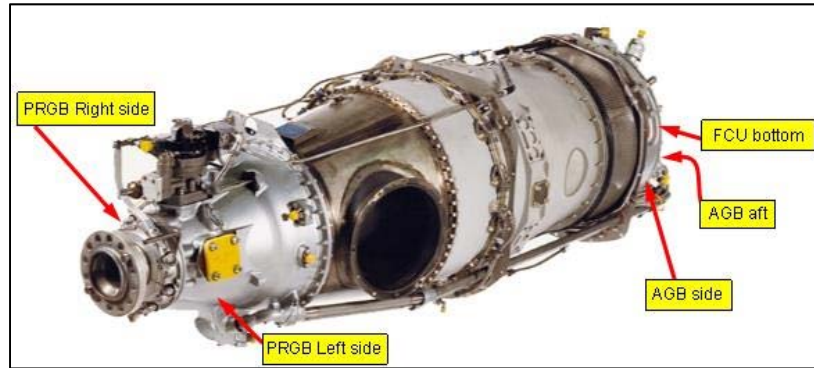


Figure 4.5. General depiction of element locations.

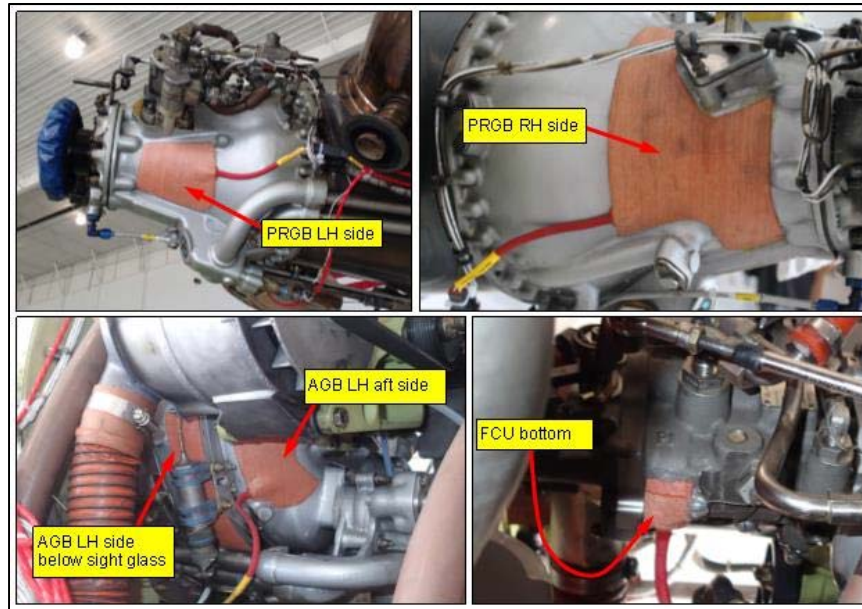


Figure 4.6. Engine elements:

- AGB LH P/N: TEP3181- locate on left side below sight glass lead up.
- PRGB LH P/N: TEP2681- locate on left side lead aft.
- FCU P/N: TEP2682- locate bottom of FCU.
- AGB LH PN: TEP2683- locate on left aft tank section.
- PRGB RH P/N: TEP2684- locate on right side lead aft.

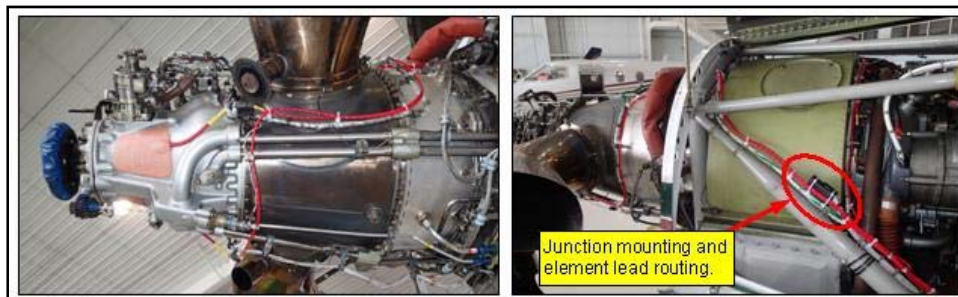


Figure 4.7. Examples of junction J-A and cable routing with existing wiring junction on engine mount, final routing and junction location may vary.

5. APPENDIX A

This section depicts plug and cable routing options.

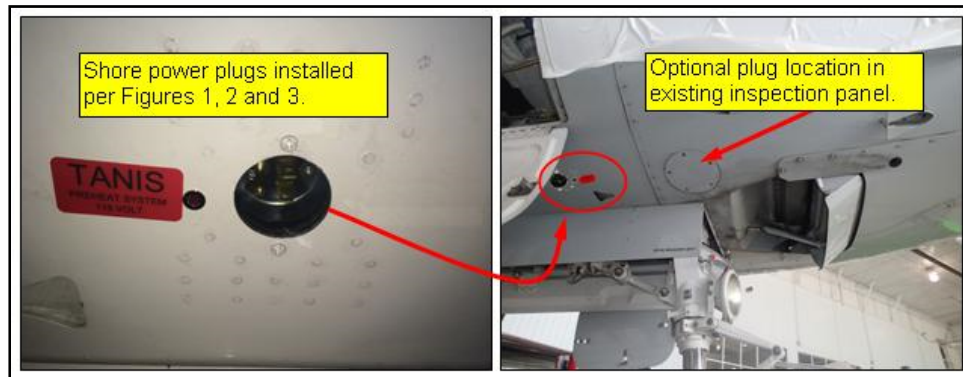


Figure 5.1. Example optional locations for Plug 1, engine system. Left or right of nose wheel, located with Tanis doubler TD02838 or door kit TD02840, dwg 02840. Complete door kit may be installed in this location and used for rear plug(s). 2-place door kit TD03152 dwg 03152, available separately, may be used to co-locate Plug 1 and Plug 2 in tail section forward of rear access panel refer to Figure 5.2.

Affix supplied TU02615- placard or alternate that states at a minimum, *Tanis*, voltage requirement (115 Volt or 230 Volt) or Pilatus SB placards.

Refer to TNG1000 for additional plug options.

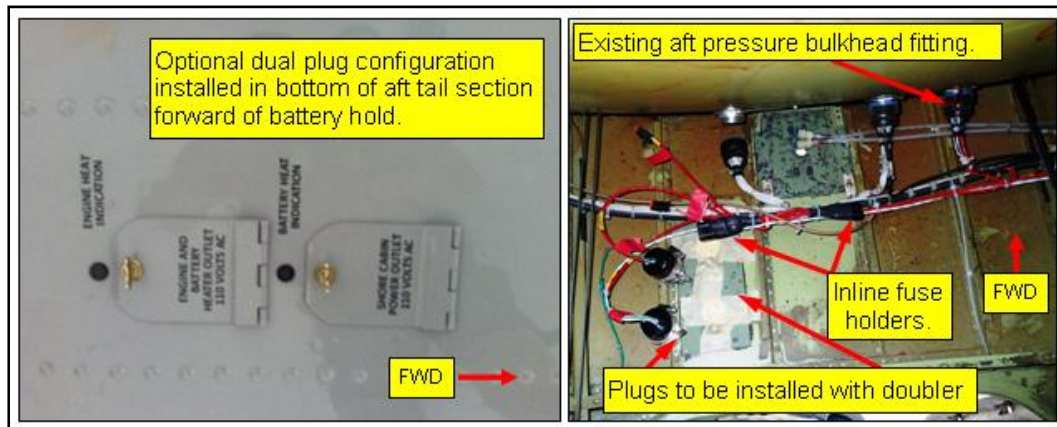


Figure 5.2. Example of option plug mounting location in tail section forward of battery hold access panel, aft of pressure bulkhead. Plug 1 for engine and battery and Plug 2 dedicated to interior AC outlet(s). Reconfigure cabling accordingly (requires additional cabling and connectors). Route engine lead and lead for interior cabin plug outlet forward through pressure vessel bulkhead using spare pinouts in existing bulkhead fittings when available. Shown above with 2 each TD02840 door kits dwg 02840, 2 place door kit TD03152 available for co-locating plugs in this area aft access panel.

Affix supplied TU02615- placard or alternate that states at a minimum, *Tanis* and *voltage* requirement (115 Volt or 230 Volt) or Pilatus SB placards.

Refer to TNG1000 for additional plug options.

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