



INSTRUCTION – PREHEAT KIT INSTALLATION

Subject: P/N: TSP6CYL-2927-115, Engine Preheat Kit – 115 Volt
TSP6CYL-2927-230, Engine Preheat Kit – 230 Volt

Document No: TNP2927

Revision: G

Date: APR-12-2019

RECORD OF REVISIONS

When updated, this document is changed in its entirety.

REV	DATE	DESCRIPTION	BY	CKD
G	APR-12-2019	Reformat with 1000 series documents	DNE	GDO
F	MAR-26-2018	ECR 2018-0007 (apndx B typo shop note)	GDO	DNE
E	APR-20-2016	ECR 2014-0006	GDO	DNE

Current revision approval: _____

1. PURPOSE

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

2. REQUIREMENTS

Subject kit top-level drawing, 02927-115 or 02927-230, parts and documents as listed.

- a. Tools, hardware, and consumables, power supply and extension cords, not supplied.
- b. Pad element bonding sealant supplied separately refer to TN02788.
- c. Threaded element installation requires tools and OEM torque specs, refer to TN02771.
- d. Shore plug mounting hardware not supplied, refer to TNG1000 for mounting options.

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.

Abbreviations: Alternating current (AC), Center of gravity (CG), Cylinder head thermocouple (CHT), Circuit protection device (CPD), Original equipment manufacturer (OEM), Section (§), Service Bulletin (SB), To be determined (TBD), Top-level drawings (TLD).

- Technicians and users of this instruction should be familiar with Installation Guide TNG1000 and related document listed in TLD

3.1 Inventory

Start with parts and document inventory, refer to subject kit TLD for item list.

3.2 Weight and Balance

Weigh kit and intended installation hardware before installation. Approximate installed weight: 1.0 lb / 0.45 kg. When required use engine arm for calculations. Refer to TNG1000 for change requirements.

PROPRIETARY DATA

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3.3 Elements

-  Pad element: *Only use* approved bonding sealant. Refer to instruction TN02788 for sealant and bonding procedures.
-  Threaded elements: **Do Not** use star, wave, or lock washers of any type. Secure element leads 3in/8cm or less from element. Refer to instruction TN02771 for installation procedures. When required

For additional descriptions by engine make see below and Figures § 4.

- Should operational procedures or environment conditions require alternate or additional elements, contact Tanis engineering.
- Measure resistance of each element with ohmmeter before installing, Table 4.1.

Continental

Common installation descriptions below or additional descriptions refer Figures § 4.

Pad elements TEP2928- Locate one on top left half of crankcase parallel with case split and one on oil sump or tank below nominal oil level, front, back, side or bottom, avoid oil drip point when possible.

Threaded element TTP2771- Locate one per cylinder head replacing intake tube flange fastener (preferred) or lower rocker cover fastener.

Replacing intake tube flange fastener (preferred): **Do Not** allow element to bottom out, space accordingly. *Only use* supplied ¼-inch TU02846 aluminum spacers and/or flat washers. **Do Not** use star, wave, or lock washers of any type.

Replacing lower rocker cover fastener: **Do Not** allow element to bottom out or for more than three threads to extend beyond rear of rocker cover flange, space accordingly. *Only use* supplied ¼-inch TU02846 aluminum spacers and/or flat washers. **Do Not** use star, wave, or lock washers of any type.

Torque to OEM specification for location of installation.

Secure element leads 3 inches / 8 centimeters or less from element.

Note: 360, 520, and 550, cross flow engines with split rockercovers, ungeared or geared, replace fastener on intake valve rocker cover.

Franklin

Common installation descriptions below or additional descriptions refer Figures § 4.

Pad elements TEP2928- Locate one on top of crankcase or cover plate, and one on oil sump or tank below nominal oil level, front, back, side or bottom, avoid oil drip point when possible.

Threaded element TTP2771- Locate one per cylinder head replacing lower rocker cover fastener.

Do Not allow element to bottom out or for more than three threads to extend beyond rear of rocker cover flange, space accordingly. *Only use* supplied ¼-inch TU02846 aluminum spacers and/or flat washers.

Do Not use star, wave, or lock washers of any type.

Torque to OEM specification for location of installation.

Secure element leads 3 inches / 8 centimeters or less from element.

Lycoming

Common installation descriptions below or additional descriptions refer Figures § 4

Pad elements TEP2928- Locate one on crankcase parallel with or under starter, and one on oil sump or tank below nominal oil level, front, back, side or bottom, avoid oil drip point when possible.

Threaded elements TTP2771- Locate one per cylinder head replacing intake tube flange fastener (preferred) or lower rocker cover fastener.

Replacing intake tube flange fastener (preferred): **Do Not** use any spacers or washer of any type.

Replacing lower rocker cover fastener: **Do Not** allow element to bottom out or for more than three threads to extend beyond rear of rocker cover flange, space accordingly. *Only use* supplied ¼-inch TU02846 aluminum spacers and/or flat washers. **Do Not** use star, wave, or lock washers of any type.

Torque to OEM specification for location of installation.

Secure element leads 3 inches / 8 centimeters or less from element.

3.4 Electrical

 **Do Not** transition cable leads from engine to airframe unless power plug is located off engine and then *only* power, light, and ground, leads may transition from engine.

Typical system installation below, for additional descriptions refer Figures § 4.

- Electrical routing suggested final routing TBD by installing authority.
- 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. Refer to TNG1000 and AC 43.13-1 (as amended) Chapter 11.
- Only connect power after completing Functional System Check with ohmmeter, § 3.5.

Continental, Franklin and Lycoming

Shore Power Plug (inlet), TP02770-115 or TP02980-230, and Indicator Light TLP3039-: Hard mount plug and light in accessible area on engine, oil filler tube, baffle, or mount. Secure with cushioned clamps and/or bracket.

Plug pinout refer to cable kit wire diagram drawing 03014.

Plug mounting options refer to installation guide TNG1000 and Figures § 4.

Note: 230-volt kit supplied with extension cord plug adaptor refer to instruction TN02829.

Cable Kit TC03014 with CPD: Suggest locating on and routing with ignition leads, on engine, or back side of engine baffle, with power and secondary junctions (J-A and J-B) located near magnetos in area that allows leads to reach corresponding components, locate CPD in serviceable area near plug. Secure with cable-ties and/or clamps. Suggest adjusting length by looping or race-tracking. Leads may be cut and re terminated. Avoid attaching wires to fuel or fuel primer lines.

Note: Interconnect junctions by connecting any output lead, 03, 04, 05, 06, or 07, from power junction (J-A) with input lead 08 (short lead with socket connector) from secondary junction (J-B). Route power plug and light leads accordingly, and route output leads for best fit to elements, refer to cable kit wire diagram drawing 03014.

Verify OEM engine/airframe bonding strap is installed. Attach ground wire from plug to engine or aircraft structure, connection not to exceed .003 ohms, refer to TNG1000.

Placard TU02615-: Affix in visible location near power plug.

3.5 Completion

Inspect: Visually inspect and verify components are connected and secure.

Check: Perform Functional System Check, refer to Installation Guide TNG1000.

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

4. TABLES AND FIGURES

This section contains Tables with electrical values and Figures with examples of general system layout by engine make and model. Refer to § 5 Appendices A and B for additional examples of typical installations. For additional installation information and plug mounting options TNG1000.

Table 1. Electrical Values.

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

TSP6CYL-2927-115		Total:	4.0 Amps	460 Watts	28.8 Ohms
Qty	Element Part Number	Element type and location		Watts	Ohms
1	TEP2928-115/80	Pad, Crankcase	each:	80	165.3
1	TEP2928-115/80	Pad, Oil sump	each:	80	165.3
6	TTP2771-115/50	Threaded, Cylinder head	each:	50	264.5

TSP6CYL-2927-230		Total:	2.0 Amps	460 Watts	115.0 Ohms
Qty	Element Part Number	Element type and location		Watts	Ohms
1	TEP2928-230/80	Pad, Crankcase	each:	80	661.3
1	TEP2928-230/80	Pad, Oil sump	each:	80	661.3
6	TTP2771-230/50	Threaded, Cylinder head	each:	50	1058.0

Continental

Refer to Appendix A Shop Notes for additional depiction of Continental installation.

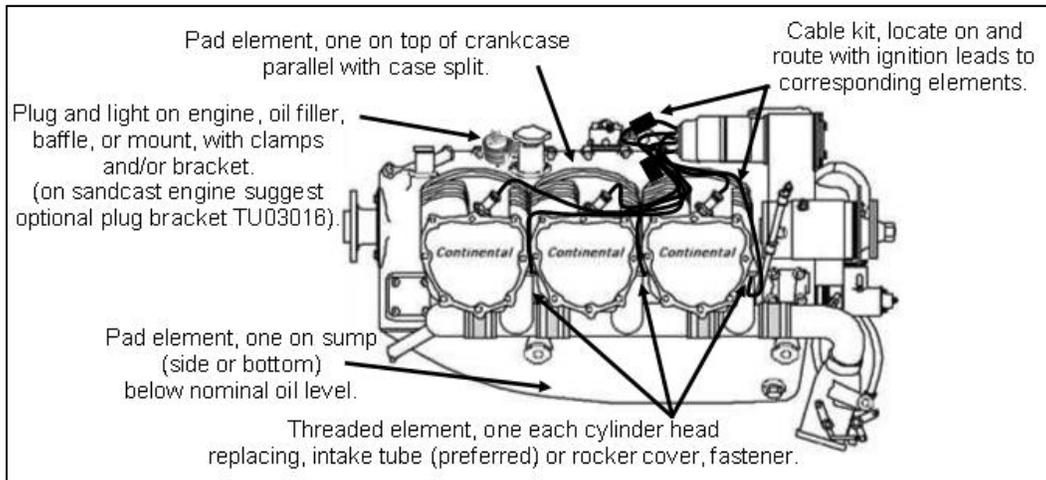


Figure 4.1. Continental engine kit layout (470/520 sand cast shown).

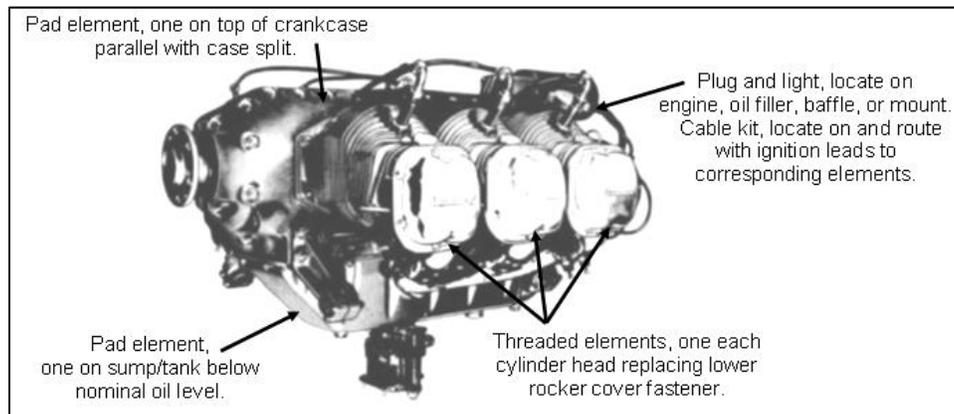


Figure 4.2. Continental C125, O-280, C145 and O/GO-300 engines.

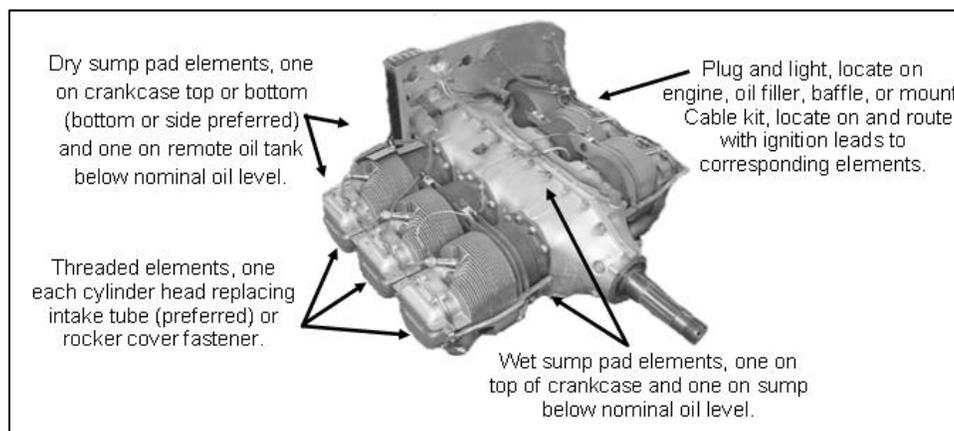


Figure 4.3. Continental E165, E185, and E225 engines, wet sump and dry sump with remote tank.

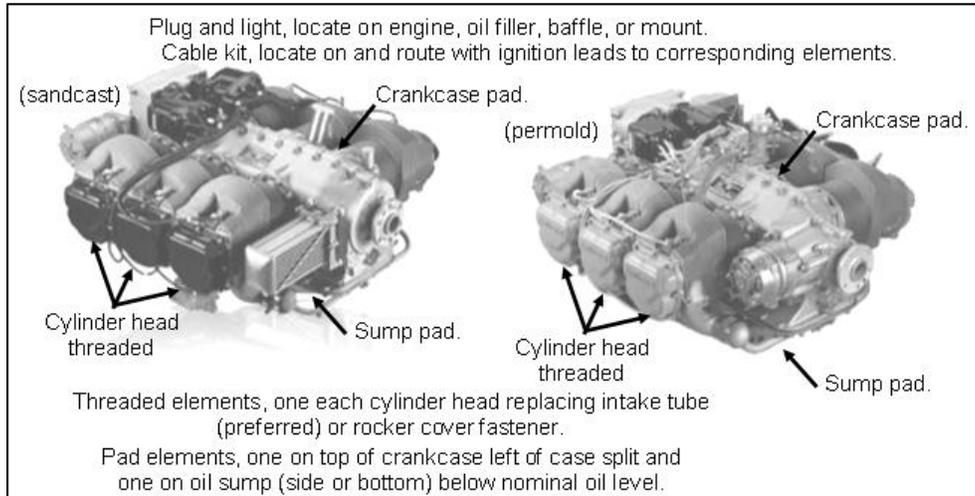


Figure 4.4. Continental 470, 520, and 550 series (TU03016 bracket available for mounting plug on sandcast series engines).

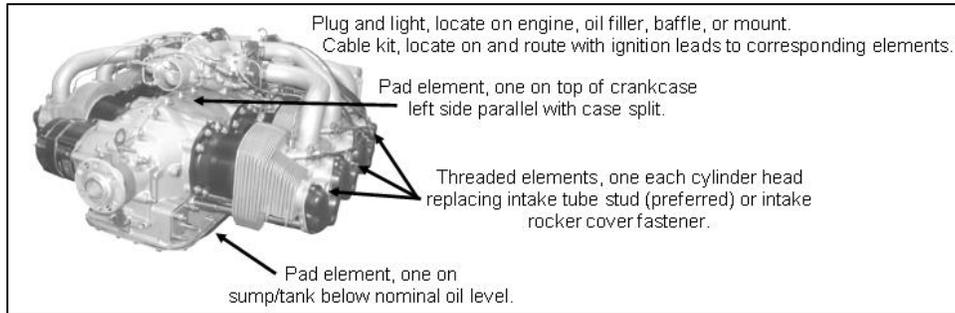


Figure 4.5. Continental 520 and 550 cross flow series ungeared or geared.

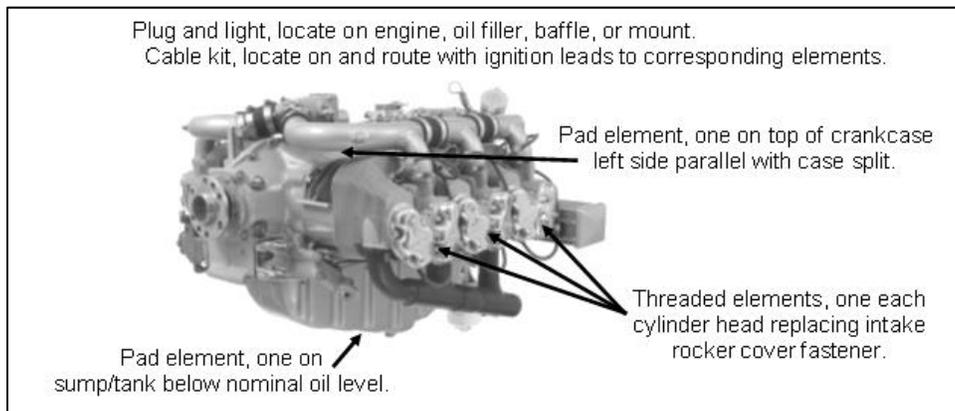


Figure 4.6. Continental 360 series (flush plugs available for mounting in front engine baffle).

Franklin

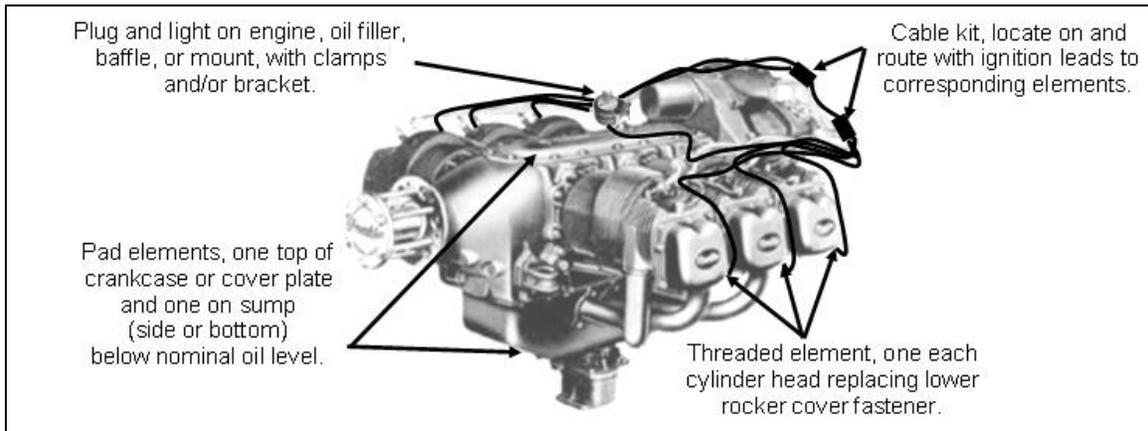


Figure 4.7. Franklin engine kit layout.

Lycoming

Refer to Appendix B Shop Notes for additional depiction of Lycoming installation.

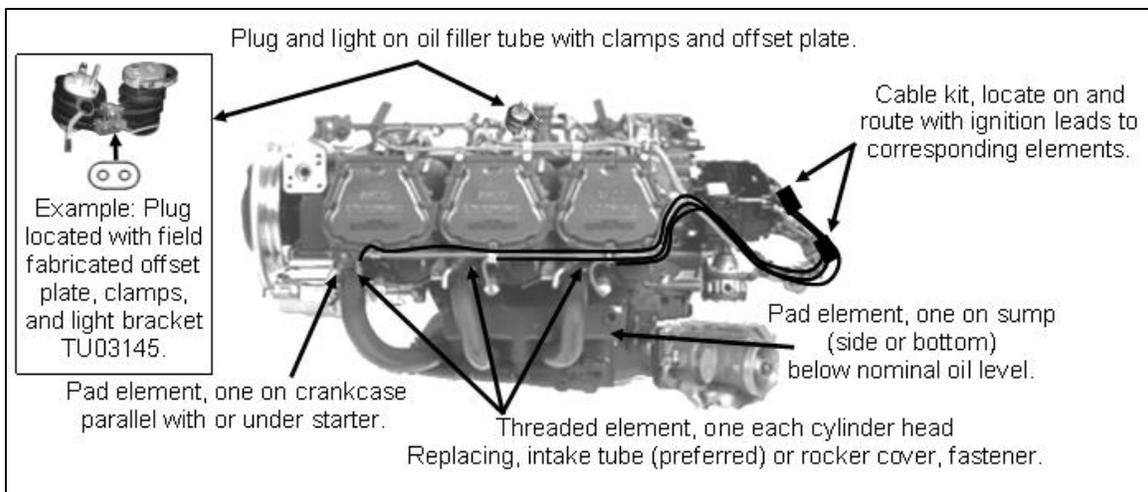


Figure 4.8. Lycoming engine kit layout.

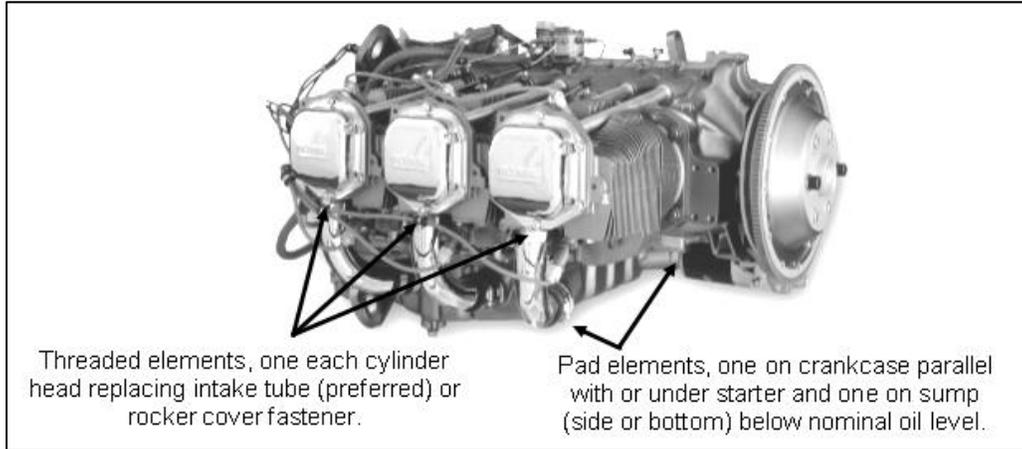


Figure 4.9. Lycoming, generic example applicable to all models direct drive and geared. (435, 480, 540, 541, and 580).

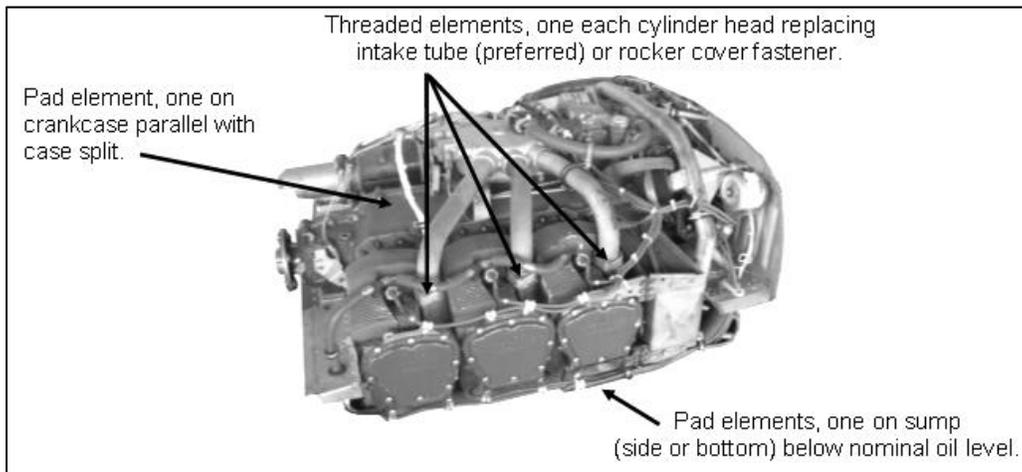


Figure 4.10. Lycoming, generic example with pleum, bottom cam and intragrated tank. For engines with remote tank application (wing or other) contact Tanis engineering.

APPENDIX A

CONTINENTAL SHOP NOTES

Generic Example (TSIO-550-K)

Standard kit shown with rocker cover fastener installation



APPENDIX B

LYCOMING SHOP NOTES

Generic Example (IO-540-K1A5)

Standard kit shown with intake tube fastener installation.

