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SERVICE INSTRUCTION

DATE: January 7, 2019

Service Instruction No. 1042AG
(Supersedes Service Instruction No. 1042AF)
Engineering Aspects are
FAA (DER)-Approved

SUBJECT: Approved Spark Plugs
MODELS AFFECTED: All Lycoming piston aircraft engines
TIME OF COMPLIANCE: As required for replacement

REASON FOR REVISION Added new engine models, TEO-540-A1A and TEO-540-C1A Series to Table 5.

NOTICE: Incomplete review of all the information in this document can cause errors. Read the entire Service Instruction to make sure you have a complete understanding of the requirements.

This Service Instruction identifies the various short reach (Figure 1) and long reach (Figure 2) spark plugs (Tables 2 through 5) approved for installation on Lycoming engine models as well as guidelines for correct spark plug installation.

Cylinders that use short reach spark plugs have gray paint or no other special identifying color on the cylinder fins between the spark plug hole and the rocker covers (Figure 1). Engines with long reach spark plugs are identified by yellow paint on the cylinder fins between the spark plug hole and the rocker covers where shown in Figure 2.

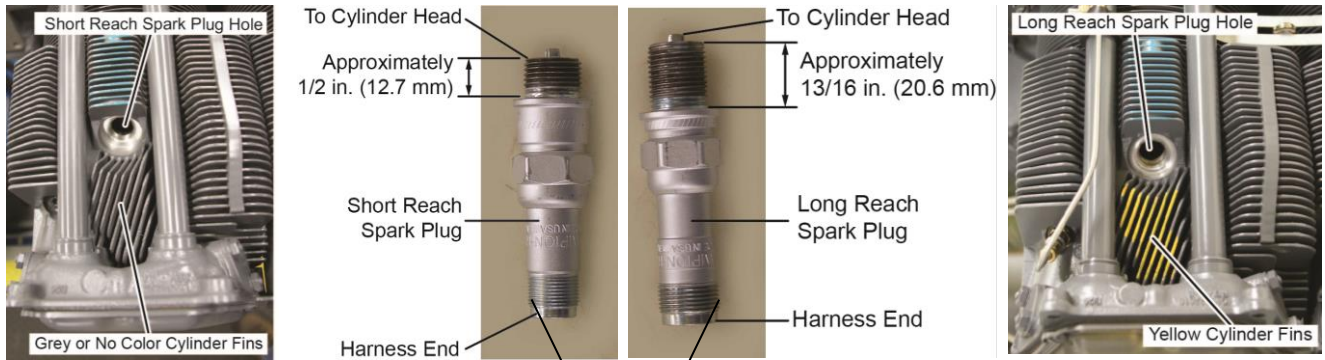


Figure 1

Short Reach Spark Plug Thread Dimensions and Spark Plug Hole (Gray or No Color Cylinder Fins)

Figure 2

Long Reach Spark Plug Thread Dimensions and Spark Plug Hole (Yellow Cylinder Fins)

To identify the approved spark plug for your engine in Tables 2 through 5, you must know:

- Lycoming engine model number
- Whether it is a long reach or short reach spark plug
- Spark plug thread pitch (Figures 1 and 2)



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NOTICE: Figure 3 shows spark plug electrode end types, structure, and part number designations. The term UNEF indicates that the diameter-pitch combination is from the extra fine series of Unified Thread Standard (UTS) thread. The standard designation for a UTS thread is a number indicating the diameter of the thread in inches (e.g. 5/8) followed by the pitch measured in threads per inch (e.g. 24).

Since the same engine models can use either short or long reach spark, do not use the engine model as the only basis to identify the spark plugs to be installed on the engine per Tables 2 through 5.

If an approved spark plug is not available, Lycoming can supply an equivalent substitute spark plug.

Tempest has acquired the Unison AutoLite spark plug line. This Service Instruction identifies the new Tempest spark plug part numbers in Tables 2 through 5.

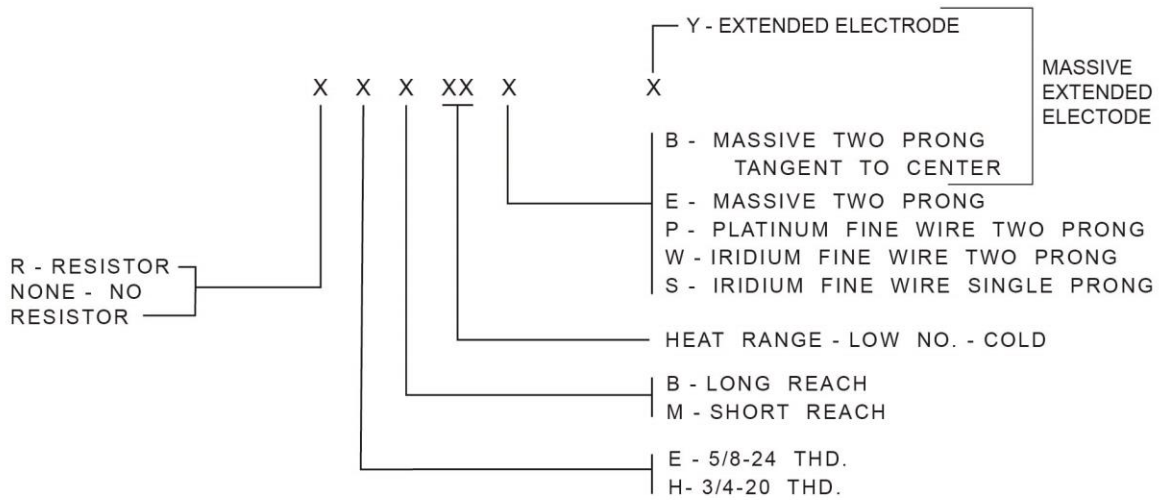
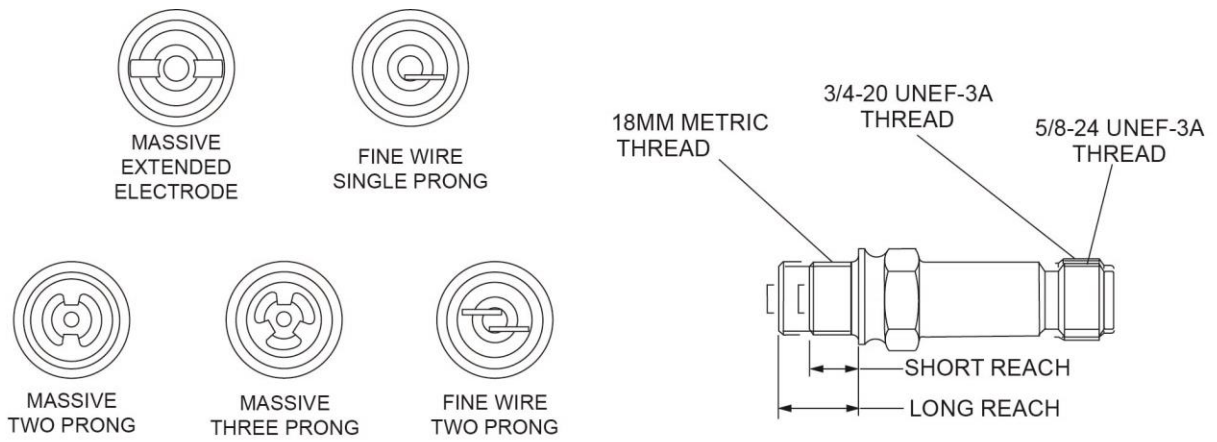
Spark Plug Installation Guidelines

1. Spark plug gap must be set at 0.016 to 0.022 in. (0.40 to 0.60 mm).
2. Always install a spark plug with a new gasket (P/N STD-295).
3. Use a copper-based anti-seize compound or engine oil on spark plug threads starting two full threads from the electrode, but DO NOT use a graphite-based compound.
4. Use installation torque values shown in Table 1.

**Table 1
Installation Torque Values**

| | Torque Value |
|-----------------------------|---|
| All spark plugs | 420 in.-lbs. (or 35 ft.-lbs.) (47.5 Nm) |
| 5/8-24 (16 mm-24) lead nuts | 80 to 90 in.-lbs. (9 to 10 Nm) |
| 3/4-20 (19 mm-20) lead nuts | 110 to 120 in.-lbs. (12 to 13.6 Nm) |

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CHAMPION PART NO. DESIGNATION

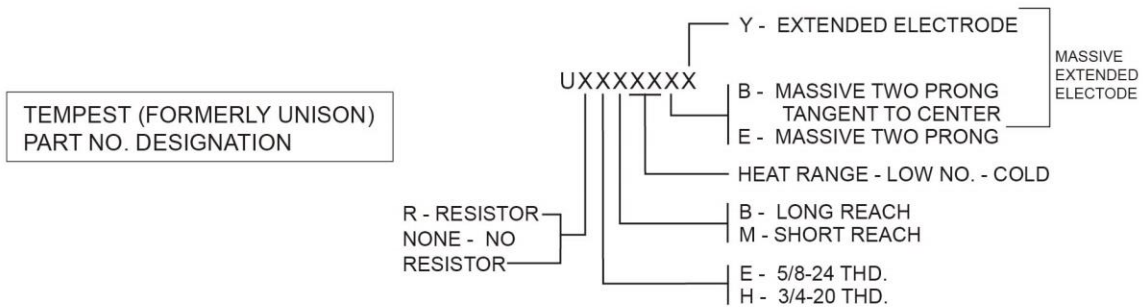


Figure 3
Spark Plug Characteristics

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Table 2
Short Reach Spark Plugs, 5/8-24 Lead Nut Threads

| ENGINE MODEL | MASSIVE | | | | | | FINE WIRE | |
|----------------------------------|----------|---------|----------|-----------|----------|-----------|-----------|-----------|
| | CHAMPION | | | TEMPEST** | | | CHAMPION | TEMPEST** |
| | REM 40E | REM 38E | REM 37BY | UREM 40E | UREM 38E | UREM 37BY | REM 38S | UREM 38S |
| O-235-C,-E,-H | A | A | A | A | A | A | A | A |
| O-235-N,-P | A | A | A | A | A | A | A | A |
| O-235-K,-L,-M | A | A | A | A | A | A | A | A |
| O-235-F,-G,-J | - | - | - | - | A | - | A | A |
| O-290 | A | A | A | A | - | A | A | A |
| O-320-A,-E | A | A | A | A | A | A | A | A |
| O-320-C | A | A | A | A | - | A | A | A |
| O-320-B,-D | A | A | A | A | A | A | A | A |
| O-320-H* | A | A | A | A | A | - | A | A |
| IO-320-A | A | A | A | A | - | A | A | A |
| IO-320-E | A | A | A | A | A | A | A | A |
| IO-320-B,-C,-D,-F | A | A | A | A | A | A | A | A |
| LIO-320-B | A | A | A | A | A | A | A | A |
| AEIO-320-A,-D | A | A | A | A | A | A | A | A |
| AEIO-320-E | A | A | A | A | A | A | A | A |
| *O-360-A,-C,-F,-J | A | A | A | A | A | A | A | A |
| O-360-B,-D | A | A | A | A | - | A | A | A |
| *IO-360-A,-C,-D,-J | - | A | A | A | A | A | A | A |
| *IO-360-B,-E,-F,-L,-M,-N,-P | A | A | A | A | A | A | A | A |
| HO-360-A,-B,-C | A | A | A | A | A | A | A | A |
| *LO-360-A | A | A | A | A | A | A | A | A |
| HIO-360-A,-B,-G | A | A | A | A | A | A | A | A |
| HIO-360-C,-D | - | A | - | - | A | - | A | A |
| *LIO-360-B | A | A | A | A | A | A | A | A |
| LIO-360-C | - | A | A | A | A | A | A | A |
| LIO-360-M | A | A | A | A | A | A | A | A |
| LHIO-360-C | - | A | - | - | A | - | A | A |
| AIO-360-A,-B | - | A | A | A | A | A | A | A |
| *AEIO-360-A | - | A | A | A | A | A | A | A |
| AEIO-360-B,-H | A | A | A | A | A | A | A | A |
| VO-360-A,-B | A | A | A | A | A | A | A | A |
| *GO-435-C | A | A | - | A | A | - | A | A |
| VO-435-A | A | A | - | A | A | - | A | A |
| *GO-480-B,-D,-F | A | A | - | A | A | - | A | A |
| GSO-480-A,-B | A | A | - | A | A | - | A | A |
| IGSO-480 | A | A | - | A | A | - | A | A |
| *O-540-A | A | A | A | A | A | - | A | A |
| *O-540-B | A | A | A | A | A | - | A | A |
| *O-540-E,-F,-G,-H | A | A | A | A | A | - | A | A |
| O-540-J | A | A | A | A | A | - | A | A |
| *IO-540-A,-B,-E,-G,-K,-L,-AB,-AE | - | A | A | A | A | - | A | A |
| *IO-540-C | A | A | A | A | A | - | A | A |

“A” identifies approved spark plugs; the hyphen (-) identifies spark plugs that are neither recommended nor approved.

* May also have 3/4-20 wire end.

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**Table 2 (Cont.)
Short Reach Spark Plugs, 5/8-24 Lead Nut Threads**

| ENGINE MODEL | MASSIVE | | | | | | FINE WIRE | |
|------------------|----------|---------|----------|-----------|----------|-----------|-----------|-----------|
| | CHAMPION | | | TEMPEST** | | | CHAMPION | TEMPEST** |
| | REM 40E | REM 38E | REM 37BY | UREM 40E | UREM 38E | UREM 37BY | REM 38S | UREM 38S |
| *IO-540,-J | A | A | A | A | - | - | A | A |
| *IO-540-D,-N, -T | A | A | A | A | A | - | A | A |
| IO-540-R | - | A | A | - | A | - | - | - |
| *IO-540-V | A | A | A | A | A | - | A | A |
| IO-540-W | - | A | A | A | A | - | - | - |
| AEIO-540-D | A | A | A | A | A | - | A | A |
| *AEIO-540-L | - | A | A | A | A | - | A | A |
| VO-540-C2A | - | A | A | - | A | - | - | A |

“A” identifies approved spark plugs; the hyphen (-) identifies spark plugs that are neither recommended nor approved.

* May also have 3/4-20 wire end.

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**Table 3
Short Reach Spark Plugs, 3/4-20 Lead Nut Threads**

| ENGINE MODEL | MASSIVE | | | | FINE WIRE | |
|--------------------------|----------|---------|-----------|----------|-----------|-----------|
| | CHAMPION | | TEMPEST** | | CHAMPION | TEMPEST** |
| | RHM 40E | RHM 38E | URHM 40E | URHM 38E | RHM 38S | URHM 38S |
| O-320-H | A | A | A | A | A | A |
| *O-360-A,-F | A | A | A | A | A | A |
| O-360-E | A | A | A | A | A | A |
| *IO-360-A,-J | - | A | - | A | A | A |
| *IO-360-B | A | A | A | A | A | A |
| *LO-360-A | A | A | A | A | A | A |
| LO-360-E | A | A | A | A | A | A |
| LIO-360-A | - | A | - | A | A | A |
| *LIO-360-B | A | A | A | A | A | A |
| *AEIO-360-A | - | A | - | A | A | A |
| *GO-435-C | A | A | A | A | A | A |
| *GO-480-B,-D,-F | A | A | A | A | A | A |
| *O-540-B | A | - | A | - | A | A |
| *O-540-E,-G,-H,-J | A | A | A | A | A | A |
| *IO-540-A,-B,-G-K,-L,-AE | - | A | A | A | A | A |
| IO-540-AF | - | A | - | A | - | - |
| *IO-540-C,-N,-T,-V, -W | A | A | A | A | A | A |
| *AEIO-540-L | - | A | A | A | A | A |
| IO-720-A,-B,-C,-D | - | A | - | A | A | A |

“A” identifies approved spark plugs; the hyphen (-) identifies spark plugs that are neither recommended nor approved.

* May also have 5/8-24 wire end.

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| Table 4 Long Reach Spark Plugs, 5/8-24 Lead Nut Threads | | | | |
|--|----------|--------|-----------|-----------|
| ENGINE MODEL | MASSIVE | | | FINE WIRE |
| | CHAMPION | | TEMPEST** | CHAMPION |
| | REB37E | REB32E | UREB37E | REB36S |
| O-360-C4P | A | - | - | |
| IO-320-C1A,-C1B,-F1A | A | - | A | |
| LIO-320-C1A | A | - | A | |
| *IO-360-A1B6,-C1A,-C1F | A | - | A | |
| IO-360-F1A | A | - | A | |
| *IO-390-A,-C | A | - | A | A |
| *HIO-390-A | A | - | A | A |
| *AEIO-390-A | A | - | A | A |
| O-540-E4A5 | A | - | - | |
| *IO-540-E,-J,-K,-P,-R,-AE | A | A | A | |
| IO-540-M | A | - | A | |
| *IO-540-R | A | A | A | |
| *AEIO-540-L | A | A | A | |
| *TIO-540-C1A,-E,-H | A | A | A | |
| *IO-580; AEIO-580 | A | - | A | A |

“A” identifies approved spark plugs; the hyphen (-) identifies spark plugs that are neither recommended nor approved.

* May also have 3/4-20 wire end.

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| Table 5 Long Reach Spark Plugs, 3/4-20 Lead Nut Threads | | | | | | | | |
|--|----------|---------|-----------|----------|-----------|---------|-----------|----------|
| ENGINE MODEL | MASSIVE | | | | FINE WIRE | | | |
| | CHAMPION | | TEMPEST** | | CHAMPION | | TEMPEST** | |
| | RHB 37E | RHB 32E | URHB 37E | URHB 32E | RHB 36S | RHB 32S | URHB 36S | URHB 32S |
| *IO-360-A,-C | A | A | A | A | A | A | A | - |
| IYO-360 | A | - | A | - | A | - | A | A |
| HIO-360-E,-F | A | A | A | A | - | A | A | A |
| LHIO-360-F | A | A | A | A | - | A | A | A |
| TO-360-C,-F | A | A | A | A | A | A | A | A |
| TO-360-E | A | A | A | - | A | - | A | A |
| LTO-360-E | A | A | A | - | A | - | A | A |
| *TIO-360-A | A | A | A | A | A | A | A | - |
| TIO-360-C | A | A | A | A | A | A | A | A |
| *IO-390-A,-C | A | - | A | - | A | - | A | - |
| *HIO-390-A | A | - | A | - | A | - | A | - |
| *AEIO-390-A | A | - | A | - | A | - | A | - |
| TVO-435-A,-B,-C,-D,-E,-G | A | A | A | - | A | A | A | A |
| TVO-435-F | A | A | A | - | A | A | A | A |
| VO-435-A,-B | A | A | A | - | A | A | A | A |
| GO-480-G1,-G2 | A | A | A | - | A | A | A | A |
| IGO-480-A | A | A | A | - | A | A | A | A |
| GSO-480 | A | A | A | - | A | A | A | - |
| IGSO-480 | A | A | A | - | A | A | A | - |

“A” identifies approved spark plugs; the hyphen (-) identifies spark plugs that are neither recommended nor approved.

* - May also have 5/8-24 wire end.

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Table 5 (Cont.)
Long Reach Spark Plugs, 3/4-20 Lead Nut Threads

| ENGINE MODEL | MASSIVE | | | | FINE WIRE | | | |
|--|----------|---------|-----------|----------|-----------|---------|-----------|----------|
| | CHAMPION | | TEMPEST** | | CHAMPION | | TEMPEST** | |
| | RHB 37E | RHB 32E | URHB 37E | URHB 32E | RHB 36S | RHB 32S | URHB 36S | URHB 32S |
| O-540-9 | A | - | A | - | A | A | A | - |
| O-540-L | A | A | A | - | A | A | A | - |
| *IO-540-E,-G, K,-M,-P,-S | A | A | A | A | A | A | A | A |
| *IO-540-J,-R | A | A | A | - | A | A | A | A |
| *IO-540-AA,-AC | A | A | A | A | A | A | A | A |
| IGO-540-A,-B | A | A | A | A | A | A | A | A |
| IGSO-540-A,-B | A | A | A | A | A | A | A | A |
| IVO-540-A | A | - | A | - | A | A | A | - |
| AEIO-540-L | A | A | A | A | A | A | A | A |
| TIO-540-A | A | A | A | A | A | A | A | A |
| *TIO-540-C,-K,-W,-AA, -AB,-AF,-AG,-AH,-AJ, -AK | A | A | A | - | A | A | A | A |
| *TIO-540-E | A | A | A | A | A | A | A | A |
| TIO,LTIO-540-F | A | A | A | A | A | A | A | A |
| TIO-540-G,-AE | A | A | A | - | A | A | A | A |
| *TIO-540-H | A | A | A | A | A | A | A | A |
| TIO,LTIO-540-J,-N,-R | A | A | A | A | A | A | A | A |
| TIO-540-S | A | A | A | A | A | A | A | A |
| TIO-540-T | A | A | A | A | A | A | A | A |
| TIO,LTIO-540-U,-V | A | A | A | A | A | A | A | A |
| TIVO-540-A | A | A | A | A | A | A | A | A |
| VO-540-A,-B,-C | A | - | A | - | A | A | A | - |
| TIO-541-A,-E | A | A | A | A | A | A | A | - |
| TIGO-541-E | A | A | A | A | A | A | A | - |
| *IO-580; AEIO-580 | A | - | A | - | A | - | A | - |
| IO-720-A,-B,-D | A | A | A | A | A | A | A | A |
| TEO-540-A1A | A | A | A | A | A | A | A | A |
| TEO-540-C1A | A | A | A | A | A | A | A | A |

“A” identifies approved spark plugs; the hyphen (-) identifies spark plugs that are neither recommended nor approved.

* May also have 5/8-24 wire end.

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