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## Mandatory Service Bulletin

**Date:** 2 / 12 / 2007

**Topic:** Quick-Set Activation Boundaries

**Models Affected:** Series 113 Ignitions with firmware versions 21 thru 23 loaded in late December, 2006 thru February 11, 2007

**Urgency:** See below

### **Immediate Action:**

A convenience feature that E-MAGs are equipped with, "Quick-Set", lets the operator set ignition timing with two puffs (0.5 psi for a duration of one second) into the manifold pressure tube. While Quick-Set has been trouble-free for most customers, difference in field elevation, buss conditions at start-up, operator over/under "puffing", etc. can complicate this seemingly simple task. E-MAG has successfully addressed such issues as they come up by offering refinements to the operating code (firmware).

One such recent modification assists with Quick-Set sensitivity when it's being used at lower field elevations. This firmware revision inadvertently made another change that was NOT intended. It allows the Quick-Set pressure triggers to be set by negative pressures as well as positive pressures. This has the potential to defeat two of the three safety boundaries that were created to guard Quick-Set against accidental activation. Under normal conditions, Quick-Set has three safety gates that operate as follows:

1. Quick-Set will ONLY work when the ignition is in Set-Up mode. Set-Up mode is entered by powering (12 volt) the ignition ON while the p-lead switch is OFF (grounded). Once you unground the p-lead, you leave Set-Up mode. Set-Up mode is one-way gated so you cannot re-enter by simply turning your p-lead switch OFF again. You must power OFF and then back ON while the p-lead switch is OFF, as described above. Even so, Set-Up mode is routinely entered in the normal course of powering up an aircraft. Set-up mode is then exited as soon as the ignitions are turned ON.
2. Puff pressure. The manifold pressure line is normally exposed to negative pressure, not positive pressure. Quick-Set is intended to respond to positive pressures of 0.5 psi or greater.
3. Puff duration. Continuous pressure with a duration of one second is also required. The chances of encountering the required positive pressure for 1 second make accidental activation even more remote.

Ignitions with firmware versions 21 thru 23 (loaded from late December thru February 8 2007) can be operated in a way that defeats two of the three Quick-Set safety gates. In these units, Quick-Set will accept (activate) with negative pressures from the manifold pressure line (a running engine does this), and these pressures will be of a duration in excess of one second. The remaining safety gate (Set-Up mode) can be defeated by operator action that, while not typical in normal operation, could nevertheless be encountered.

If an ignition is left in Set-Up mode when the engine is started, it is very likely the timing set point will be lost and/or reset to some arbitrary point. A normal starting routine using both ignitions will not be at risk. Systems with a functioning key type OFF/Left/Right /Both/Start switch (with the bypass jumper REMOVED) cannot start without taking both ignitions out of Set-Up mode. Systems with toggle switches, however, could more easily inadvertently start on only one ignition and encounter the condition described.

Operators can easily test for the presence of this firmware version by following the instructions for setting timing, but instead of “puffing” on the MAP tube, you can draw (create negative pressure) on the tube and see if the LED indicator lights in a manner that indicates it’s accepted an instruction.

### **Actions Required:**

Obtain firmware updated to version 24 or greater (recommended). Firmware updates to correct this condition are provided free of charge by E-MAG. Or you can:

1. Adhere to normal starting procedures and always start with both ignitions ON.
2. Cycle the p-lead switch(s) to run-mode at least once after 12 volt power- up (before starting) to make certain you have exited Set-Up mode.
3. When the engine is running:
  - a. Never power cycle (12 volt from OFF to ON) E type (non-self-powered) models while the p-lead switch is OFF (grounded)
  - b. Never power cycle (12 volt from OFF to ON) P type (self-powered) models while the p-lead switch is OFF (grounded) and engine speed is below safe internal alternator speed (typically 900 rpm).