

Note 1: RMSD, if active, will delay firing for “X” number of TDC index counts – see below.

b. The other PAIR of plugs will fire 180 degrees later.

This “pull-thru” test also verifies a number of operating elements, so it is a handy tool for troubleshooting. It verifies:

1. Plug wire assignments.
2. Both ignition firing circuits.
3. Ignition timing.
4. Plug wires and the plugs themselves.
5. Drive gear engagement.
6. 12 volt and ground connection.
7. P-lead wiring and p-lead switch.

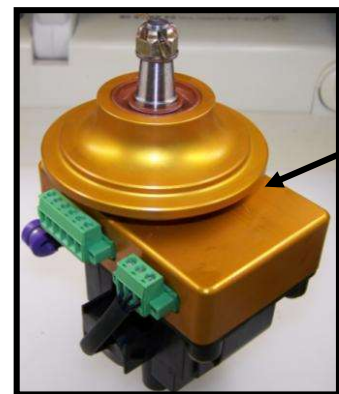
Blast Tube Cooling (mandatory):

E-MAGs are designed for a high-heat environment, but even so there are practical thermal limitations. Air blast (cooling) tubes are a common and inexpensive way to reduce the ignition operating temperatures. We consider them mandatory. Blast tubes should be directed at:

[Lycoming] The narrow (round) portion of the nose section, and not at the rectangular electronics case itself.

[Continental] The flat case section that is opposite the connector plug or opposite the MAP/LED end, which ever is more convenient.

Note 1: Late series 113 ignitions (and after) have a feature that records the maximum temperature seen at the ignition circuit board. The large majority of ignitions we’ve serviced in our shop have a recorded “Max Temp” in the range of 175 to 185 degrees (F). This is within our recommended limit of 190 (the same limit specified for some, if not all, magnetos). This shop reading will not tell us when the Max Temp was recorded (heat soak after shut-down, early break-in procedures, etc.), so we don’t know if the reading reflects the current operating environment. **Also please note: Our temperature signal has NOT been calibrated, and serves as a general temperature indicator ONLY.**



Continental
Blast Tube

Ignitions operating at exceptionally high temperatures can experience thermal shut down. Such instances can be aided by the addition of (or improvements to) blast

tube cooling, as is required by the current manual. Experience has also shown the mere presence of blast-tubes does not guarantee they are operable and/or effective. So we encourage builders (soon after installation) to **verify the ignitions are operating within acceptable temperature limits**. E-MAG's built-in temperature signal can be displayed by one or more of the free configuration and control programs that are available on our web site (see our "Downloads" page at www.emagair.com). Other, more accurate, readings can be made with thermal reactive labels or with a thermal probe secured in a manner to measure ignition case temperature.

The most frequent cause of inhibited blast tube cooling (we suspect) relates to exit air restrictions. Blast tube air "blasts" because of the pressure differential across the baffle partition. If accessory side exit-air is restricted, pressure on the back side can rise, and the pressure differential is reduced. We don't claim to be authorities in this area, but we have enough reports from customers who were able to significantly reduce ignition temperatures (as well as oil temperatures and accessory case temps overall) by improving exit-air flow, that we are confident this is, at a minimum, one of the primary causes.

Run Mode Starting Delay – for engines using composite sumps:

Note: The factory default has Run Mode Start Delay DISABLED. See EICAD below for instructions on how to enable Run Mode Start Delay.

Series 114 ignitions can be programmed with a Run Mode Starting Delay ("RMSD"). RMSD is a ONE-TIME firing delay that will suspend plug firing until the ignition sees "X" number passes of the TDC index. At start up, RMSD can help ventilate the intake and exhaust chambers and minimize the accumulation of fuel vapor left over from a prior run (a hot start), or other causes. At the time of this writing, this only known to be an issue for those using composite oil sumps.

After the RMSD (one time) delay routine has been executed, the plugs will fire every revolution. If the engine fails to start on the first attempt and if the operator wants to re-enable RMSD the unit must be powered OFF and then ON in order to reset the RMSD delay.

Background - Wasted spark systems avoid the weight, mechanical complexity, and high altitude issues associated with traditional magneto distributors. All EI systems that don't have a distributor, use wasted spark. In these system, plugs are fired in pairs at A) the charged cylinder that's ready to ignite, as well as B) the opposing cylinder during its exhaust stroke. This second spark is not intended to ignite, hence the name "wasted spark". At startup, E-MAGs will fire plugs slightly after TDC, at which time the "wasted" side will be in a period of valve overlap. [Valve overlap is when the intake and exhaust valves are open at the same time.] When starting an engine where vapor has accumulated in the "wasted" cylinder, this vapor can be ignited by the wasted side spark. Vapor accumulation might be due to a) improper shut down, b) over priming, c) a hot start, or d) other reasons. In the test cell