If you could..

On a Distributor-less ignition system

Confirm within 15 seconds, before starting the engine, that:

- **Crank/Cam sensor is OK**
- **Coil output is good**
- **Compression is OK**
- **There is no fouled plug.**
- **There is no cross-fire**
- **There is no secondary leakage**

Would you...

Spend 5 minutes to make the following hook-up:

And if it did fail...

The cylinder or defective coil is identified.
From this point on, further analysis can be targeted by comparison between one good and the bad cylinders.

Next... 3 Min. running test,

is to isolate, at any speed or any load, mechanical failure from electrical malfunction by means of
POWER PERFORMANCE PER CYLINDER.
Even dual spark plugs in one cylinder can be effectively killed without loading the primary,
Test results can be displayed on the scan tool by observing RPM loss or fuel trim behavior.

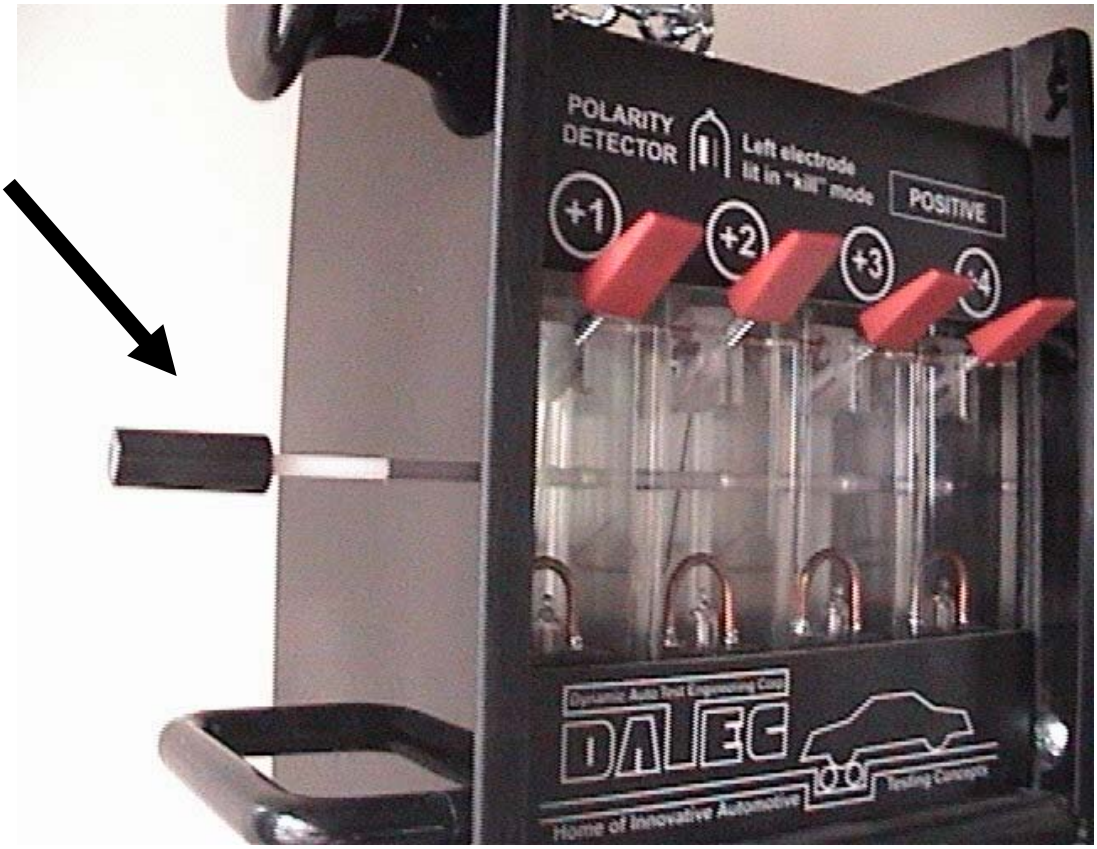
How the running test works

The plug wire is removed from the coil tower and a short extension wire is inserted with a "T" connected to the FIRE-BOX. Inside the box is a +/- 22 KV gap to ground. Any KV demand greater than 22 KV will trigger a neon light, whether caused by a defective plug wire, or during a snap-test to identify a lean injector, or by disconnecting a wire to test for coil output. The spec 22 is based on a 14 volt input with the engine running, which is an acceptable minimum for all driving condition, to maintain a firing time of at least 1 Millie-Second.

Cylinder kill is achieved with a switch paddle which closes the gap to zero. Since shorting out the secondary winding affects the primary current, the kill is inhibited until the coil induced at least a 70 volt level, well beyond the module shutoff. This 70 volt trigger in kill position is also used to indicate, not only whether or not the Crank/Cam sensor is functional, but also to verify that each cylinder is hit in a sequential order. A skipping neon is a clear indicator of a problem.

How the cranking test works

Hook up all wires and run the engine to check for open plug wires. Replace if needed.
The cranking voltage is about 30% lower than charging voltage, Therefore coil input is lower and KV demand need adjustments. This is accomplished by reducing the gap inside the FIRE-BOX. With all the paddles in the UP^ position, insert the nylon needle in the access hole as illustrated, one side at a time.
Close all paddles (down).
Hang the FIRE-BOX in a position so it can be viewed through the windshield.
Crank the engine with the accelerator paddle floored. This will shuts the fuel off and a wide open throttle allows for maximum air volume. Not recommended on vehicles without that feature.
Move the nylon needle to the other side and repeat test.



Test Results.

The objective is to create a high KV demand in the combustion chamber, which is achieved with ionizing the plug under high compression (near TDC) and absence of fuel (HC= a conductor) All neon lights flashing indicates good compression, good coil output, no cross-firing and ready for further scope analysis. If one cylinder does not light up, determine if it is INTERNAL or EXTERNAL of the combustion chamber by removing the plug wire at the "T" and repeat test. If the neon now flashes the problem was internal. It is just that simple.

What ..... if ?

WEAK COIL OUTPUT **Hard starting – Misfire under load**	No flash & 2 Cylinders, same coil Verified external with plug wire off
LOW COMPRESSION **Erratic cranking speed**	Verified internal – Low power output compared to other cylinders.
OPEN PLUG WIRE **Misfire any speed**	Flashing in running test - With the switch in the UP position
NO CRANK SIGNAL **Dead engine**	No flash on any cylinder with all switches closed.
FOULED PLUG **Engine misfire**	Verified internal – No RPM loss when killed at any speed..
LEAN INJECTOR **No complaint - poor gas mileage**	Running Test Flashing only on snap-test
DEFECTIVE COIL (internal arcing **Hard starting – Misfire under load**	Verified external – one cylinder only OK Running. – Fail when cranking.
CROSSFIRE plug or boot **Misfire under load –Hard start**	Verified internal – Neon flash OK when plug wire disconnected at "T"