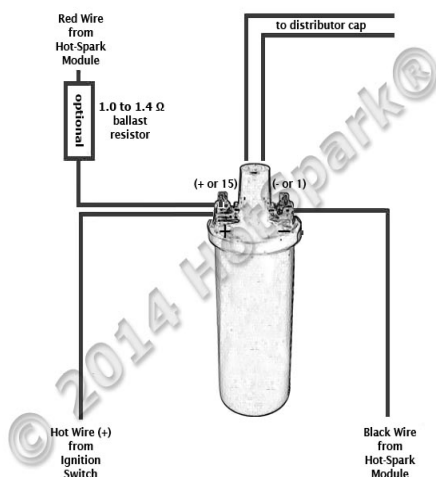


## Instructions for Replacing a Lucas 4-Cylinder Centrifugal/Vacuum-Advance Distributor with the Electronic HS25D4 or HS45D4 Centrifugal/Vacuum-Advance Distributor

**Warning: Reversing the red and black ignition wires will destroy the ignition module.** The Hot-Spark module's red wire connects to the coil's positive ( + ) terminal. The black wire connects to the coil's negative ( - ) terminal. Connect any other wires to the coil in their original positions. This module is designed for 12V negative ground applications only.

**Test Maximum Charging System Voltage:** If the charging system voltage, measured at the coil's positive terminal, is more than 14.0 volts at any RPM level, the voltage regulator likely needs replacing. Too much voltage can destroy the ignition module and other electronic components. A maximum charging system voltage of 13.7 volts or so is plenty. A quick fix is to wire a **1.4 Ohm external ballast resistor** between the coil's + terminal and the HotSpark ignition's red wire. Adding the ballast resistor is cheap insurance against voltage surges, etc.

Make sure that the ignition wires have plenty of slack inside the distributor and are not rubbing on any moving parts. If you need to extend the length of the ignition wires, use 20-gauge (AWG) wire. Crimp tightly or solder and insulate all connections.



### Installing the HS45D4 Distributor

Rotate the engine by hand, until the rotor is pointing at No.1 Cylinder's spark plug wire. Remove each spark plug wire from the old distributor cap, one-at-a-time, and insert it into the new distributor cap in the same location and order (HS45D4: cylinders 1-3-4-2, counter- or anti-clockwise). Remove the old distributor.

Coat the new distributor's shaft and O-Ring with motor oil before sliding it into its hole. Look down into the engine's distributor hole to see how the distributor drive slot is oriented and turn the distributor shaft to match it. You might need to push the distributor down with a little force to get the O-Ring started into the hole. Work the shaft down all the way, turning the rotor gently, as needed, until the distributor shaft gear settles into its slot and the rotor will no longer turn.

Turn the new distributor's body until the rotor points to the spark plug wire of No.1 Cylinder. Place the cap on the new distributor. Tighten the distributor clamp enough so that the distributor can't turn on its own, but you can still turn it by hand.

## Timing the HS45D4 Distributor

**Static timing, using an ordinary 12-volt test lamp, will not work.** Use a stroboscopic timing light. Timing should be set initially to about 36° BTDC at 3,500+ RPM, vacuum hose connected, depending on the car and engine. HS45D4 firing order is 1-3-4-2, counter-clockwise (anti-clockwise). The ignition timing should be checked with the engine running, using a stroboscopic timing light. Painting a small line of white paint on both the reference pointer and the appropriate mark on the timing scale makes them more easily seen. With the engine running at the specified speed, the appropriate timing mark should be in line with the reference pointer. Rotate the distributor body clockwise to advance the timing, or counter-clockwise to retard it. Tighten the distributor clamp. Reconnect the vacuum line to the distributor's vacuum canister port.

### Typical Timing Specifications (depends on car and engine):

Static Ignition Timing: 10 deg. BTDC

Dynamic Ignition Timing: 15 deg. @ 600 RPM

Dynamic Ignition Timing: 36 deg. @ 3,500+ RPM

**Coil Required:** Do not use a low-resistance coil that does not have the minimum primary resistance required by the ignition module, as stated in the instructions (minimum 3 ohms for 4- and 6-cyl or 1.5 ohms for 8-cyl, assuming a 12-Volt electrical system). The coil resistance regulates the current in the ignition module/coil circuit. Too little coil primary resistance results in too much amperage going to the ignition module, which can overheat the electronics. The failure may not happen immediately, but the excess heat will shorten the life of the ignition module electronics. How long the electronics will last depends on how much heat is generated. It could be a matter of a couple of hours to a few hundred hours, depending on temperature.

To measure primary resistance: Label and remove all wires to coil ( + or - ). Using a common digital multimeter in the 200 O mode, cross the red and black leads of the Ohmmeter. Allow 10 seconds or more for the reading to settle and write down the reading. Still in the 200 Ohm mode, measure between coil's + and - terminals. Allow a few seconds for the reading to settle, until it stabilizes. Subtract the previous reading, taken with the leads crossed, to compensate for Ohmmeter's inherent resistance. Do not use a low-resistance coil, such as the MSD or Accel coil; they don't have enough primary resistance for this application.

**Ballast Resistor:** If the coil's primary resistance is not quite enough or is borderline, you can wire an external ceramic ballast resistor (with 1.0 to 1.4 Ohms resistance) between the coil's + terminal and the red HotSpark ignition wire: [www.Hot-Spark.com/1-HS14BR.htm](http://www.Hot-Spark.com/1-HS14BR.htm) . Adding the ballast resistor is cheap insurance against voltage surges, etc.

### Compatible Coils:

Lucas HA12 (3.0 Ohms primary)

Bosch 00012 (3.0 Ohms primary)

Beru Blue Coil (ZS-172, with 3.3 Ohms primary)

**This distributor requires a 12-volt, negative ground electrical system.**

**Test Battery Voltage to Coil:** With ignition switch ON, engine not running, check voltage at coil's + terminal. The voltmeter should read somewhere around +11 to +13 volts. If voltage is too low or there's no reading, the battery's terminals or ground connection may be corroded and need cleaning or the battery may need charging. Some vehicles have a resistor wire running from the ignition switch to the coil's + terminal. If this resistor wire drops the voltage below 9 volts or so, you may need to run a non-resistor wire from the ignition switch to the coil's + terminal or run a +12V wire directly from the ignition switch to the red Hot-Spark ignition wire.

Make sure that the ignition switch terminal to which you connect this wire has power only when the ignition switch is in the ON position. Or, you can, for temporary testing purposes only, run a wire directly from the battery's + terminal to the coil's + terminal, the Hot Spark ignition's red wire to the coil's + terminal and the black Hot-Spark wire to the coil's - terminal. Do not leave the wire from the battery connected to the coil's + terminal for more than a minute or so without the engine running.

**The HS45D4 distributor is compatible with these standard Lucas parts:**

**Distributor: Lucas 45D4 (41427)**

Rotor: Lucas 54422803

Distributor Cap: Lucas 54427109

See [www.Hot-Spark.com/Installing-Hot-Spark.pdf](http://www.Hot-Spark.com/Installing-Hot-Spark.pdf) for more detailed information.

**Using Hot-Spark Ignition with VDO Tachometer:** Connect a diode #1N4005 between the negative terminal (- or 1) of the coil and the wire that goes to the tachometer. The cathode end (silver band) should be nearest the tachometer side, not the coil side. You should be able to buy a diode #1N4005 at Radio Shack or other electronic supply store.

**Hot-Spark Ignition and MSD 6 Series Wiring Diagram:** [www.Hot-Spark.com/Hot-Spark-MSD-6-series.jpg](http://www.Hot-Spark.com/Hot-Spark-MSD-6-series.jpg)

**Troubleshooting/FAQ: Having installation problems? Click [here](#)**

**Email Us: [info@Hot-Spark.com](mailto:info@Hot-Spark.com)**

© 2005-2018 Hot Spark®