

Ignition Installation Troubleshooting Tips/Frequently-Asked Questions

Warning: Reversing the red and black ignition wires will destroy the ignition module and void the warranty. The Hot-Spark module's red wire connects to positive (+ or 15 on Bosch coil). The black wire connects to negative (– or 1 on Bosch coil). Remove the condenser and its wire from vehicle. Connect any other wires to the coil in their original positions. This module is designed for 12V negative ground applications only.

Wiring Installation Basics:

1. Remove the points, condenser and the condenser's wire from the vehicle.
2. Attach the red lead of a multimeter (voltmeter) to the coil's positive (+) terminal. Attach the voltmeter's black lead to engine ground. With the ignition switch on, engine not running, measure the voltage at the coil's positive terminal. The reading should be 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. 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.

To get the ignition running initially, only these wires should be attached to the coil's + and - terminals:

- A. +12 volts from the ignition switch to the coil's + terminal
- B. Red Hot-Spark wire to the coil's + terminal
- C. Black Hot-Spark wire to the coil's - terminal. **DO NOT connect any +12-volt wire to the coil's - terminal.**
- D. The automatic choke and fuel shut-off valve may also need to be attached to the coil's + terminal.
- E. Generally, only the black Hot-Spark wire is attached to the coil's - terminal. If a tachometer wire is usually attached to the coil's - terminal, don't attach it until the timing has been set and engine is running properly. No other wires should be connected to the coil's + and - terminals at this time.
- F. Attach a stroboscopic timing light to the spark plug wire of Cylinder number 1. With engine rotated to TDC (0 degrees) on the firing stroke of Cylinder number 1, ignition switch ON, turn the distributor until the timing light flashes. You may need to turn the distributor left or right a little, a little at a time, until the engine will stay running, so that you can set the timing with the engine running, using a stroboscopic timing light, according to factory specifications.
- G. For testing purposes, no other wires should be attached to the coil terminals, except for the center high-tension lead to the distributor cap.

Attach a stroboscopic timing light to the spark plug wire of Cylinder number 1. With engine rotated to TDC on the firing stroke of Cylinder number 1, ignition switch ON, slowly turn the distributor clockwise or counter-clockwise until the timing light flashes. Tighten the distributor clamp a little, so that you can still turn the distributor by hand, but the distributor won't turn on its own. The rotor should be pointing to number 1 cylinder's spark plug wire.

Start the engine. You may need to turn the distributor left or right a little, until the engine will stay running, so that you can set the timing with the engine running, using a stroboscopic timing light, according to factory specifications.

Test Maximum Charging System Voltage: If the charging system voltage, measured at the coil's positive terminal, is more than 14.2 volts at 2,500+ RPM, the voltage regulator likely needs replacing. Too much voltage can damage the ignition module and other electronic components. A maximum charging system voltage of 13.5 volts or so is plenty.

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.

Jump-starting the Vehicle: Use caution when jump-starting the vehicle. Connect the battery's + terminal to the other vehicle's battery's + terminal. Connect the negative (black) part of the jumper cable to engine ground points, such as a bolt on the engine block, on both vehicles. Do not turn the ignition switch to the ON position while the vehicle at the other end of the jumper cables is running. Charge your vehicle's battery with the other vehicle or with a battery charger and then remove the jumper cables or charger before turning on the ignition switch and starting your vehicle. If the ignition switch is in the ON position while both vehicles are running, the electrical surge resulting from both vehicles' charging systems being connected together with jumper cables could be enough to destroy the ignition module and/or other automotive electronic components.

Air Gap between Magnet Sleeve and Ignition Sensor: If you need to increase air gap slightly, hold ignition base plate away from distributor shaft while tightening set screw and/or loosen the two Allen head screws and retighten screws while lightly prying ignition module away from magnet sleeve. Do not over-torque these Allen screws. Black magnet sleeve should not rub against red ignition module, but exact gap is not critical. In rare instances, it may be necessary to gently pry red ignition module away from black magnet sleeve to keep them from rubbing together.

Turn on the ignition switch. With a stroboscopic light attached to Cylinder No. 1's spark plug wire, point the light at your eye. Have an assistant crank the engine over using the starter motor. The timing light should flash, again and again. If the stroboscopic timing light flashes, then the ignition module is working; the timing is simply out of adjustment.

Timing: Set the timing to factory specifications, engine running, using a stroboscopic light attached to Cylinder number 1's spark plug wire. Because the electronic ignition module is mounted in a slightly different position than the points were, the distributor will possibly have to be turned as much as 20 to 30 degrees from where it was with points. You'll definitely have to reset the timing, using a stroboscopic timing light.

Testing the ignition kit with a stroboscopic light : A simple way to test the ignition kit is to connect the stroboscopic timing light to number one cylinder's spark plug wire and point the light at your eye while someone cranks the engine over. The light should flash every second or more often. If the light flashes, then it's simply a matter of setting the timing with the engine running.

Coil: 4-Cylinder: Coil must have a minimum of 3 Ohms primary resistance. **6- and 8-cylinder:** Coil must have a minimum of 1.5 Ohms primary resistance. To measure primary resistance: Label and remove all wires to coil (+ or -). Using a common digital multimeter in the 200 Ω mode, cross the red and black leads of the Ohmmeter. Allow a few seconds 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 multimeter'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. **Using a coil with too little primary resistance can cause the ignition module to overheat and misfire until it cools down again or fail, voiding the warranty.**

Check the voltage reading at the coil's + terminal, engine running, at 2,500+ RPM. If the voltage measures more than +14.2 volts, you'll need to replace the voltage regulator, install a coil with 3 Ohms or more internal primary resistance or install a 1.4 Ohm external ballast resistor between the ignition switch and the coil's + terminal.

For best performance, the coil should also have a 7,000 Ohms or more secondary resistance (measured from coil's + or - terminal to center high tension terminal, in the 20K Ω mode of the Ohmmeter).

3BOS4U1 (supersedes 3BOS4V1 and 3BOS4C1): Universal ignition kit for 4-cylinder Bosch distributors with one-piece, right-hand points. Fits both vacuum-advance and centrifugal-advance-only distributors with right-hand points. If the magnet sleeve is rubbing against the ignition module, you can increase the air gap slightly, by holding the ignition base plate away from distributor shaft while tightening set screw and/or loosening the two Allen head screws and retightening the screws while lightly prying ignition module away from magnet sleeve. Do not over-torque these Allen screws.

3BOS4U2L: Ignition kit for 4-cylinder Bosch distributors with 1-piece, left-hand points Installation is similar to 3BOS4U1.

3BOS4C2: Ignition kit for Bosch 010 and other early, 4-cylinder, non-vacuum-advance Bosch distributors with two-piece, right-hand points. Installs similarly to 3BOS4U1.

3BOS4V2: Ignition kit for early 4-cylinder Bosch vacuum-advance distributors with two-piece, right-hand points. Installs similarly to 3BOS4U1.

3BOS6U1 (supersedes 3BOS6V1): Universal ignition kit for 6-cylinder Bosch distributors with 1-piece, right-hand points. Fits both vacuum-advance and centrifugal-advance-only distributors with right-hand points. Installation is similar to 3BOS4U1. Once the points are removed, a 16mm box-end wrench (ring spanner) should fit easily over the distributor shaft lobes.

3BOS6U3: Same as 3BOS6U1, but with magnet sleeve with larger inside diameter to fit 18.6mm distributor shaft lobes.

3BOS6U2L: Ignition kit for 6-cylinder Bosch distributors with 1-piece, left-hand points Installation is similar to 3BOS4U1.

3BOS6C2: Fits early Bosch 6-cylinder, non-vacuum-advance Bosch distributors with two-piece, right-hand points. Installs similarly to 3BOS4U1.

3BOS6V2: Fits early 6-cylinder Bosch vacuum-advance distributors with two-piece, right-hand points. Installs similarly to 3BOS4U1.

3BOS6V3: Fits early 6-cylinder Bosch vacuum-advance distributors with two-piece, right-hand points, 18.6mm distributor shaft lobes. Installs similarly to 3BOS4U1.

3DEL4U1: Fits 4-cylinder GM/Delco distributors WITHOUT vacuum advance. Replaces entire breaker plate. For distributors with screw-down distributor caps.

3DEL6U1: Fits 6-cylinder GM/Delco distributors WITHOUT vacuum advance. Replaces entire breaker plate. For distributors with screw-down distributor caps.

3DEL4V1: Fits 4-cylinder GM/Delco distributors with vacuum advance. Replaces entire breaker plate. For distributors with screw-down distributor caps.

3DEL6V1: Fits 6-cylinder GM/Delco distributors with vacuum advance. Replaces entire breaker plate. For distributors with screw-down distributor caps.

3FOR4V3: Fits 4-cylinder Ford Motorcraft distributors WITH vacuum advance. Installs similarly to 3BOS4U1.

3FOR6U1: Fits 1949-74 6-cylinder Ford/FoMoCo/Motorcraft/Autolite distributors WITH vacuum advance. Installs similarly to 3BOS4U1.

3FOR8U1: Fits 1957-74 8-cylinder Ford/FoMoCo/Motorcraft/Autolite distributors WITH vacuum advance. Installs similarly to 3BOS4U1.

3HIT4U1: Fits 4-cylinder Hitachi distributors.

3HIT6U1: Fits 6-cylinder Hitachi distributors with points secured by two screws.

3LUC4-25D: Fits 4-cylinder Lucas 23D and 25D distributors.

3LUC4-45D: Fits 4-cylinder Lucas 43D4, 45D4 and 59D4 distributors.

3LUC6-22D: Fits 6-cylinder Lucas 22D6 and 25D6 distributors with single points and condenser.

3LUC8-35D: Fits 8-cylinder Lucas 35D8 distributors with single points and condenser.

3MAL8U1: Fits 8-cylinder Mallory non-vacuum-advance marine distributors with points and condenser.

3ND4U1: Fits 4-cylinder Nippondenso distributors.

3ND6U1: Fits 6-cylinder Nippondenso distributors with points that are secured to breaker plate with two screws.

3PRE8U1: Fits 8-cylinder Prestolite distributors WITHOUT vacuum advance, with clip-on distributor cap. Has magnet sleeve with inside diameter of 25mm.

3PRE8U2: Fits 8-cylinder Prestolite distributors WITHOUT vacuum advance, with screw-down distributor cap. Same kit as 3PRE8U1, but with magnet sleeve having inside diameter of 23.75 mm.

3PRE6U2: Fits 6-cylinder Prestolite distributors WITHOUT vacuum advance, with screw down distributor cap.

3PRE4U2: Fits 4-cylinder Prestolite distributors WITHOUT vacuum advance, with screw down distributor cap.

3AUT4U1: Replaces entire breaker plate of 4-cylinder Autolite/Prestolite distributors. Use the two existing vertical screws to secure replacement breaker plate to distributor.

3AUT4U2: Replaces entire breaker plate of 4-cylinder Autolite/Prestolite distributors. Has two upright tabs to secure replacement breaker plate to sides of distributor body. Use two short bolts with lock washers and nuts.

3AUT6U1: Replaces entire breaker plate of 6-cylinder Autolite/Prestolite distributors. Use the two existing vertical screws to secure replacement breaker plate to distributor.

3AUT6U2: Replaces entire breaker plate of 6-cylinder Autolite/Prestolite distributors. Has two upright tabs to secure replacement breaker plate to sides of distributor body. Use two short bolts with lock washers and nuts.

Vacuum-advance Distributors: Check to see if the vacuum advance is working properly by sucking on the vacuum canister port. The breaker plate should move smoothly and freely.

Magnet sleeve positioned too high: Situation: The fit between the distributor shaft and the magnet sleeve is especially tight and you can't slide the magnet sleeve down onto the distributor shaft all the way. The rotor rides too high, causing the distributor cap to wobble when you rotate the distributor shaft by hand. Fix: Rotate the magnet sleeve so that it lines up with the lobes of the distributor shaft cam and the magnet sleeve can slide down a bit. Install the rotor and tap, with a small plastic mallet, *very gently*, on the center of the rotor, until the magnet sleeve seats firmly onto the distributor shaft, over the distributor cam lobes. With the rotor and distributor cap installed, you should be able to rotate the distributor shaft without the distributor cap wobbling. The shaft should turn freely, without any feeling of drag. If the distributor cap still wobbles, you may need to adjust the number or thickness of the distributor shaft shims.

With some Chinese-made, knockoff 009 distributors, once the magnet sleeve and rotor have been installed and tapped down as far as they'll go, the rotor rides too high, causing the distributor shaft to turn stiffly and/or the distributor cap to wobble. In this case, the distributor needs to be disassembled, a distributor shaft shim removed from inside and a shim added to the outside of the distributor, onto the shaft, between the distributor body and the dog gear. Or a simpler solution would be to, using a belt sander or a piece of coarse sandpaper on a perfectly flat surface, sand off about 1 mm from the bottom of the rotor. You should use a micrometer to measure the before and after rotor height.

Magnet sleeve fit too loose: If the fit between the distributor shaft lobes and the magnet sleeve is too loose, the distributor shaft may be worn down from years of the points block rubbing on the distributor cam lobes, with accumulated dirt and grit, and/or insufficient lubrication. If the fit is especially loose, the only solution, short of replacing the distributor, may be to clean the distributor cam lobes thoroughly with alcohol and wrap the lobes with a single wrap of high-quality electrical tape, before pressing the magnet sleeve down over the lobes. Too loose a fit between magnet sleeve and distributor cam lobes may result in erratic timing.

Testing the Hot-Spark Red Ignition Module with an Ohmmeter

To test the Hot-Spark red ignition module, you'll need a digital multi meter capable of measuring 20K Ohms. Almost any inexpensive digital multi meter should work. Harbor Freight sells them for US \$3 to \$10.

Disconnect the two ignition module wires from the coil. Remove the magnet sleeve from the distributor and away from the ignition module.

Set the multi meter to the 20K Ohms setting. Connect the red Ohmmeter lead to the red ignition module wire. Connect the black Ohmmeter lead to the black ignition module wire. The Ohmmeter should not register a connection (no change in reading, usually a reading of "1").

Set the Ohmmeter to the 20K Ohms mode. Connect the red Ohmmeter lead to the red ignition module wire and the black Ohmmeter lead to the ignition module's base plate (press firmly to ensure a good connection). The readout should be somewhere between 9.25K (9,250 Ohms) and 9.75K (9,750 Ohms).

If there is any resistance between the red ignition module wire and the black ignition module wire, the ignition is likely defective or has been "fried" from reversed polarity or excess voltage or amperage. The digital Ohmmeter should read "1."

Probable causes for ignition module failure include too much charging system voltage (more than 14.2 volts at 2,500+ RPM), using a coil with too little primary resistance (less than 3 Ohms for 4-cylinder, or less than 1.5 Ohms for 6- and 8-cylinder engines), reversing the red and black ignition wires on the coil or touching a +12 volt wire to the coil's - terminal while the ignition kit is connected to the coil.

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.

Click [here](#) for *Hot-Spark Ignition Installation Instructions*

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