

HOT-SPARK™ IGNITION PRODUCTS

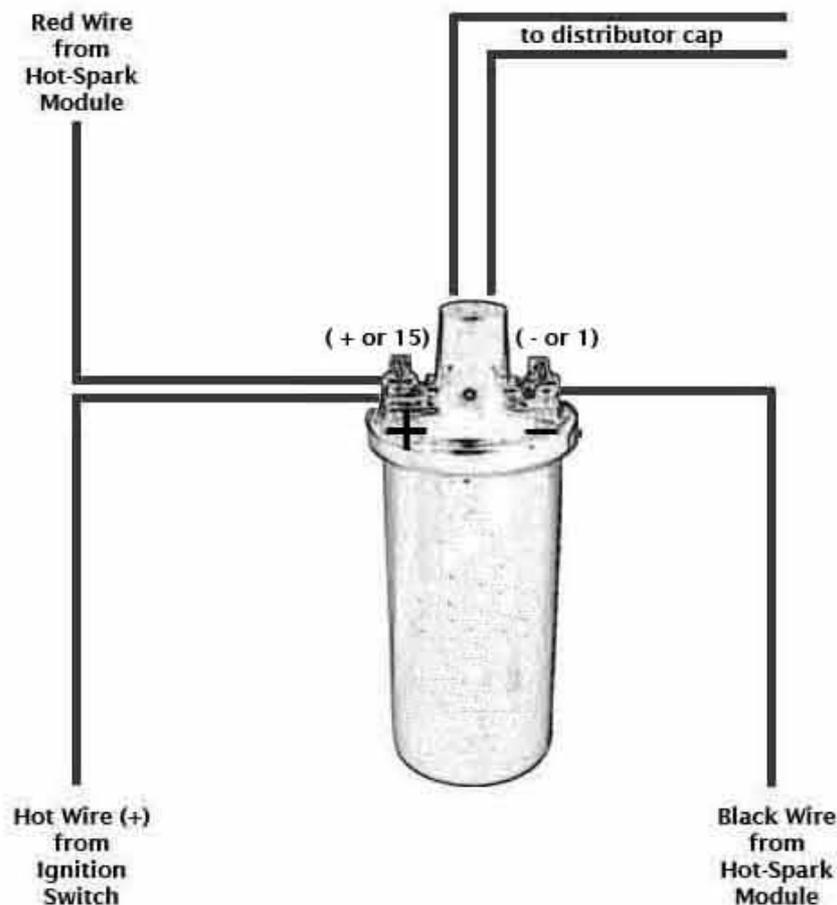
Installing the Hot-Spark 009 Distributor

NOTE:

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 requires a 12V negative ground electrical system.

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 all connections.



Installation

Coil to use: Stock Bosch coil or **HS15HEC** high-energy coil OK. Coil should have 1.5 Ohms or more primary resistance. To measure primary resistance: Label and remove all wires to coil. Using a common digital multimeter in the 200 Ω mode, measure between coil's + and - terminals. Allow a few seconds for the reading to settle downward, until it stabilizes. Subtract about 0.3 Ohms from the reading to compensate for multimeter's inherent resistance.

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

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.

Lubricating Distributor: Lubricate the distributor shaft and its bushing and the swinging centrifugal advance weights in the bottom of the distributor. You can access the centrifugal advance weights easily by removing the curved metal plug on the outside of the distributor, near the bottom. A somewhat sharp, flat-bladed putty knife is handy for prying off this plug. A small amount of heavy oil, such as 90W hypoid, synthetic heavy transmission oil or heavy motor oil works well for lubricating the distributor. Don't use a thin solvent, such as WD-40, for lubrication, as its lubricating qualities won't last for long. Clean up any excess oil or grease.

Make sure that engine oil level is on the full mark before revving engine!

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 all connections.

Which is Number One Cylinder? You can rotate the position of the spark plug leads in the distributor cap, as needed, so that the arrangement of the ignition wires and the position of the vacuum canister best suits your particular application. Any of the distributor cap's four spark plug wire positions can be for number one cylinder, as long as the firing order remains 1-4-3-2, clockwise. Cylinder number 1 for Type I VW engines is normally at about the eleven o'clock position, when looking down on the engine from above. For VW Type IV engines (1972-83 USA VW bus), Cylinder No. 1 is normally at about the five o'clock position.

Installing Distributor in VW Type I Engine - Beetle, Ghia, Thing, 1950-71 Bus (USA)

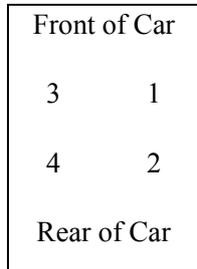
Before removing the old distributor, rotate the crankshaft to TDC (0°) on the compression stroke for Cylinder number 1. You can locate Cylinder number 1's firing position like this:

Remove the right-side valve cover, exposing the valves of Cylinders number 1 and 2 (Cylinder 1 is closest to the front of the car). The exhaust valves for Cylinders number 1 and 2 are closest to the front and rear of the car, respectively (on the outside). Cylinders number 1 and 2 intake valves are next to each other (on the inside). Rotate the engine clockwise, by hand, until you see Number 1 cylinder's exhaust valve open. Keep rotating the engine until the intake valve opens and then closes. Turn the engine by hand, clockwise, until the TDC (0°) notch in the crankshaft pulley wheel is lined up with where the two engine case halves join. The Woodruff key that fastens the pulley to the crankshaft should be at the nine o'clock position. The old distributor's rotor should be pointed to Cylinder number 1's spark plug wire. That is TDC (0°) on the compression stroke for Cylinder number 1.

Another method of finding Cylinder number 1's compression stroke is by removing the spark plug from Cylinder number 1, and holding your finger or thumb over the empty spark plug socket. Turn the crankshaft

pulley clockwise, by hand, until you can feel compressed air rushing from spark plug hole (it's now on the compression stroke). Turn the pulley a little, until the TDC (0°) notch lines up with where the two engine case halves join or the crankshaft pulley's Woodruff key is at the nine o'clock position. The rotor should be pointing at the spark plug wire for Cylinder number 1.

The air-cooled VW's cylinders are arranged as follows:



As you look head-on at the exhaust and intake valves from the car's right side:



Make a note of to which spark plug wire the rotor is pointing. Note the location of the tab on the rim of the distributor cap and orient it so that it aligns with the notch in the rim of the old distributor's body. 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 order and location (1-4-3-2, clockwise for air cooled VW).

Remove the old distributor and remove its clamp. Slide the distributor clamp onto the new distributor, before you fit the O-Ring to the distributor shaft. Now slide the O-Ring onto the distributor shaft and into its groove. Coat the distributor 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. Make sure that the anti-chatter spring is in place, down in the center of the hole. Insert the distributor shaft into the hole. You might need to tap the distributor's rim gently 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.

Place the cap on the new distributor. The rotor should point to Cylinder number 1. If not, move the spark plug wires in the distributor cap around, until the rotor points to the spark plug wire for Cylinder number 1. For air cooled VW: Cylinders 4, 3 and 2 spark plug wires should follow, in a clockwise direction (1-4-3-2 firing order). If the rotor doesn't point to number 1 cylinder, the distributor drive pinion may be installed incorrectly. It will need to be removed from the distributor shaft hole with a special extraction tool and reinstalled so that its slot is oriented correctly (see VW repair manual for illustration).

Timing the 009 Centrifugal-Advance Distributor

TDC = Top Dead Center (0°) BTDC = Before Top Dead Center ATDC = After Top Dead Center

Set the ignition timing, with a stroboscopic light, to 28° to 30° BTDC @ 3,200+ RPM.

You can use the Hot-Spark-SVDA009-Template:

www.hot-spark.eu/docs/Hot-Spark-SVDA009-Template.pdf

Use a stroboscopic timing light, regardless of whether the distributor is equipped with points or an electronic ignition module. Although the initial timing can be set roughly, final timing settings need to be set using a stroboscopic timing light.

Static timing at around 0° (TDC) is suitable only for the initial adjustment, in order to get the engine running. To set the timing accurately, you must use a stroboscopic light connected to No. 1 cylinder's spark plug wire. Set the timing with the engine running at 3,200+ RPM, so that the centrifugal advance is fully in. The 009's timing should be set no further advanced than 30-32° BTDC at 3,200+ RPM.

You can locate the 30° BTDC spot on a stock VW Type I crankshaft pulley, which has a 175 mm (6-7/8 in.) diameter, by measuring, clockwise, from top dead center, around the circumference of the pulley, 45.8 mm, or 1-13/16 in. Make a small white paint mark there. That's about 30° BTDC.

Limited Warranty: Hot-Spark Ignition Products warrants its electronic ignition conversion kits to be free from defects in material and workmanship under normal use and if properly installed for a period of three years from date of purchase. If found to be defective as mentioned above, it will be replaced or repaired if returned prepaid along with proof of date of purchase. Warranty shall be null and void if it is determined that said electronic ignition conversion kit has been connected improperly, if it is used with an ignition coil which has insufficient resistance in its primary circuit or if the polarity of the electrical wiring of the ignition kit has been reversed.

This shall constitute the sole remedy of the purchaser and the sole liability of Hot-Spark Ignition Products. To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations whether expressed or implied, including any implied warranty of merchantability or fitness. In no event shall Hot-Spark Ignition Products be liable for special or consequential damages.

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