

GM HEI Ignition Conversion

by: Mike Fissel

Most everyone has experienced the drawbacks of the Ford and other pieced together low power ignition systems AMC put on Jeeps. There are a number of choices out there to upgrade to a more reliable and higher voltage system. Some of these can range from \$100 or so to a thousand dollars or so.

Most Jeeps with V8 engines have one of two distributor systems. A Ford Duraspark system or a Motorcraft points system. The points system is relatively reliable and very simple. It requires periodic adjustment and maintenance using special tools. The Ford Duraspark system is all electronic. The distributor contains a magnetic trigger that sends signal to the controller and spark is distributed to the spark plugs from the coil. The Ford system is fairly reliable but failure is usually instant with no warning and no recovery except with replacement of the controller module. It is always a good idea to take a new replacement module along on the trail because these things always fail at the wrong time.

When my AMC/Motorcrap controller went out again, stranding me 90 miles from home and costing me a \$90 tow, I decided that it was time to make a change. I did a lot of research on many Jeep and AMC sites on ignition upgrades. People seemed to like a number of different systems, Petronix (seemed to be cheap and simple but there were enough people that seemed to have problems with it), Ford TFI (still lots of external stuff), after market stuff from MSD, ACCEL and others (very expensive and lots of parts that you would have a hard time getting emergency parts) and GM HEI.

I chose the GM HEI conversion for several reasons, among those being recommendations from people whose advice I value and the overall satisfaction of those who have already done this conversion. While all my Jeeps have V-8 engines, you can get an HEI system for your 6cyl too so this article applies to all such Jeeps.

The GM HEI system was used in GM vehicles for a approximately 20 years. It is a simple design using a magnetic trigger, electronic controller inside the cap, and a coil. A nice feature of the HEI is the coil is integrated right into the distributor cap, meaning no coil wire. This feature allows for a much hotter spark and increased gap on the spark plugs. There are many aftermarket high-performance HEI coils available too. The fact that any replacement parts I might need in the future, can easily be picked up at AutoZone or the neighborhood parts store as they are factory GM parts makes this conversion a plus. For those that like to carry essential emergency parts, the few parts you would need would take up little room in your parts/tool box. Another reason I chose the HEI is due to the easy 1 wire hook up (or 2 wire if you have a tach) and the elimination of the pesky ignition module, the coil and my anemic Ford distributor. And, the end result is not only better horsepower, torque, engine response and mileage in addition to a much cleaner engine compartment with this system.

When I try something new that I perceive is an excellent value, increases my engines response and gives me better gas mileage, I feel the need to tell others so here is the rest of the story as they say.

After searching many websites and talking to many sellers and actual customers I chose the DUI

(Davis Unified Ignition) HEI Distributor (www.performancedistributors.com). They use all USA parts, a GM top housing, billet aluminum shaft with new hardened USA gear, 100% new electronics, 50K volt built in coil, low saturation ignition module, brass terminal cap and wire harness. All of this together nearly doubles your spark power and the chance of cross fires is nearly nil due to the increased distance the GM top housing puts each output from one another. The unit uses easy to replace GM parts and HEI ignition wires. A new Gasket and 2-connectors are included for Power and Tach hook-up.. Each unit is tested on a distributor machine for proper curve and spark output before shipped.

Now you do need to trash your old wires and replace them with good HEI 8mm or better wires and a new set of quality plugs. For my upgrade I went all the way and used Performance Distributor Live Wires and Bosch platinum plugs that I gapped to .050.

The best part of this is the cost, under \$300 for the AMC Jeep V8 Street/Strip model with your choice of cap color (black, blue, red, yellow or clear). So you don't have a Jeep V8? Not a problem as Performance Distributor carries HEI systems for your Jeep 6 cyl too and high performance DUI replacements for Chevy and other GM models, Ford, Chrysler/Dodge and even Toyota Land Cruisers!

The question I always get is "Can I install this myself". Are you mechanically inclined? Can you follow instructions in a "Chiltons" repair manual? I have had no automotive training other than what my dad taught me when I was young but I do have "Chilton" manuals for EVERY Jeep I own. There are no special tools but a distributor wrench can make thing easier. So can you install it yourself? The answer is, probably yes. But if you are the least bit uncomfortable, it can be installed easily by your local mechanic.

Installation is pretty straight forward. Disconnect the battery. Remove all the old Duraspark - Motorcraft components. Remove the plug wires making note of the firing order. Remove the bolt and bracket that holds the distributor in and pull it out. Now locate the start of the firing cycle.

Its easier with a helper who, with a big wrench on the harmonic balancer/crankshaft pulley (the bottom one) nut, slowly turns it clockwise until the line on the harmonic balancer lines up with the "0" on the timing cover. You can also remove the spark plug from the #1 cylinder and crank the engine (tapping the key to engage the starter) in short bursts. Put your finger over the plug hole and feel for the compression stroke to force air out of the plug hole. Look down at the timing cover marking and line up the line on the harmonic balancer to the 0 line on the cover. This can be DANGEROUS so watch out for the fan and make sure the Jeep is in neutral on a manual or Park if you have an auto! Once your number one cylinder is at "top dead center" you install a new gasket onto the shaft and re-insert the distributor making sure the rotor position will point directly to the number one plug wire terminal. Make sure any vacuum advance will not interfere with your PS pump or any belts. Make sure the distributor is fully seated. You may need to crank the engine 2 full turns to allow the distributor gear to engage the oil pump drive shaft located below the bottom of the distributor. It is important to make sure the distributor is fully seated ! If you don't, you wont have any oil pressure (yep I did it one time, freaked me out 'til I figured what I did or should I say didn't do).

Once the distributor is fully seated lightly tighten the securing bracket so that you can properly set ignition timing after the engine is running. Wiring up the HEI is easy. All that is

required is 2 wires. One from a switched 12V circuit and the other from the START side of the starter coil. For me I just soldered the red wire that I attached to the + terminal of the distributor to the RED wire that came from the starter solenoid to the + side of the coil. This wire provides power to the distributor during engine cranking and when the key is in the ON position. The 2nd wire goes to your tachometer if you have one.

Now all that is left to do is to install the cap and wires. Starting from the #1 cylinder and moving clockwise through the firing order. **AMC V8 Firing Order 1-8-4-3-6-5-7-2** The spark plug gap can be increased due to the hotter spark provided by the new distributor. Recommended gap is .050 - .055. After all of the wires are installed check all connections and make sure everything is cleaned up and out of the way of moving parts.. Reconnect the battery and start the engine. If you installed everything correctly, the engine should fire right up. Rotate the distributor until the engine runs smooth and then fine set the timing using a timing light. The recommended ignition timing is 8 degrees BTC with distributor vacuum advance disconnected and the engine at idle. I set my Jeep a bit higher about 10 degrees, just before I encountered any engine ping.

Now if engine doesn't start or run correctly you may have the distributor out of time, your plug wires not connected correctly or your + wire is not providing voltage. 1st check and make sure that ALL of your plug wires are properly run from the correct terminal on the distributor to the correct plug. Check and make sure the + wire to the distributor is getting 12V during cranking and when the key is sitting in the "ON" position. If all that is correct then you will probably have to remove the distributor and re-time it.

If all is right, enjoy the quicker starts, the smoother idling and running, increased torque/power and better gas mileage.

