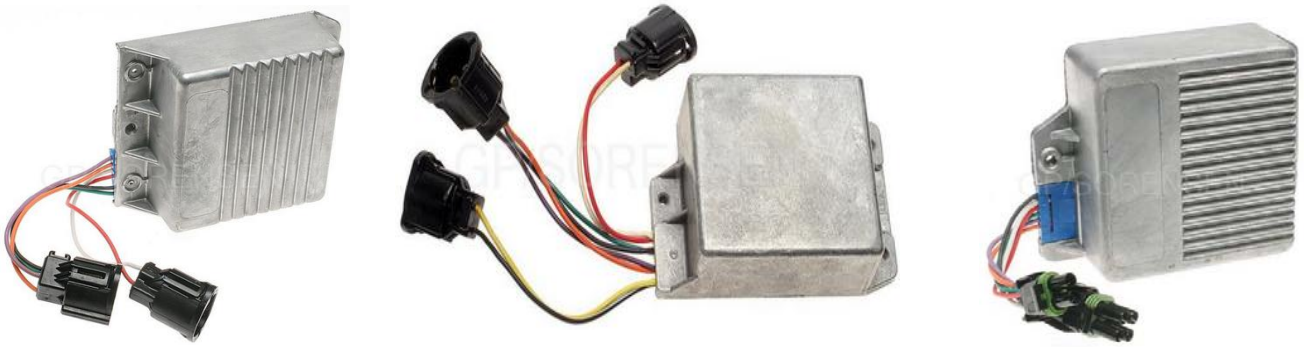
Motorcraft Ignition Upgrade (MIU)

One of the most inexpensive ways to improve your 258 is to give it a hotter spark which will result in some modest performance gains. This an easy upgrade as basically all it amounts to is a tune-up; and it is less expensive and easier to do than an HEI Upgrade. According to those who have done both the MIU and the HEI they have found the results are about the same.

The MIU upgrade is considered by many the second thing you should for your Eagle's 4.2 engine after your replace the plastic valve cover. It has been reported the MIU upgrade will add 800 to 1,000 additional useable RPM and a slight improvement in your MPG. The best part is, that it uses off the shelf parts for virtually a plug and play installation.

Why should you do this? Your stock AMC coil puts out about a measly 18,000 volts. To run much more efficiently you will benefit from a hotter coil that puts out 35,000 - 40,000+ volts. However just replacing the coil will not do much for you. This is because since the small diameter original equipment type distributor cap married to a hotter coil will result in arcing inside the cap and possible spark plug cross firing. That is not good. The parts you will replace during the MIU will decrease the possibility of that happening.

The parts you will need are from 1980's Ford applications with the 300 Inline-6 engine. Since AMC used a Motorcraft distributor and ignition module (IM) these parts interchange without any modifications whatsoever. And the best thing is you don't have to remove your present distributor to do this.



Motorcraft style ignition modules -- AMC applications:

Left 1980 - '81 and '83 - '86 **Center 1982 Only** **Right 1988 Only**

The parts reference source you may use for the MIU are, except for the spark plugs, is a 1985 Ford F-150 with a 300 CID engine.

For the distributor a new larger diameter cap

an adapter for the cap to fit on your current distributor

and a rotor for the new cap

Six new spark plugs of your choice that fit the AMC 258

8mm Ignition Wire Set which fits the new cap

and, a new higher voltage coil. More about coil selection later.

To carry all the new spark from your new coil (described below) you will also need to upgrade to 8 mm plug wires with the correct ends to fit your new cap. You probably need new wires anyway -- especially if your present ones have the AMC logo on them. This is also a good time to get new spark plugs; unless you just put some in. You can use the brand you prefer. Just make sure to get ones for an AMC 258. **Gap these to .045**.

The heart of your MUI upgrade is of course a new hotter coil. Most high energy coils have only 0.4 to 0.7 Ohms primary resistance and will cause the IM to get hot and "mysteriously" fry after some time. The Motorcraft IM is reliable, but it cannot switch low resistance loads. It needs "to see" at least 2.7 Ohms like the original system has (1.35 Ohm primary coil + 1.35 Ohm resistor wire). You have a couple options of "Motorcraft IM safe coils.

The first option is to use the Accel 8140 1.4 ohm coil. This is the only nearly "plug and play coil" , but will only deliver a few thousand more volts over your original coil.

Accel 8140 Coil with screw stud terminals

The Accel coil pictured above requires removal of the original "horseshoe" connector. Accel does have a coil which **may** work with OE connector, but the terminals may be reversed and the coil is about $5 more. Our suggestion is to remove the horseshoe adapter and hard wire the wires to the 8140 coil. That way you are assured of a good connection to the correct posts. Green wire to the negative post and yellow wire to the positive post.

The second and better coil option and the **only** true high voltage coil presently available with 3 Ohm primary resistance is the Pertronix 40511 (black) or the 40501(chrome) coil. This is a coil with an ignition voltage of 40.000V.

Pertronix 40511 (black) or the 40501(chrome) coil.

The Pertronix high voltage coil needs a 12V power supply. The AMC wiring harness has a resistor wire of 1.35 Ohm to supply the ignition coil. This reduces the voltage to the coil to 6V, so we need to bypass the resistor wire to get full advantage of the new coil.

Performing the Motorcraft Ignition Upgrade

Disconnect your battery (safety first).

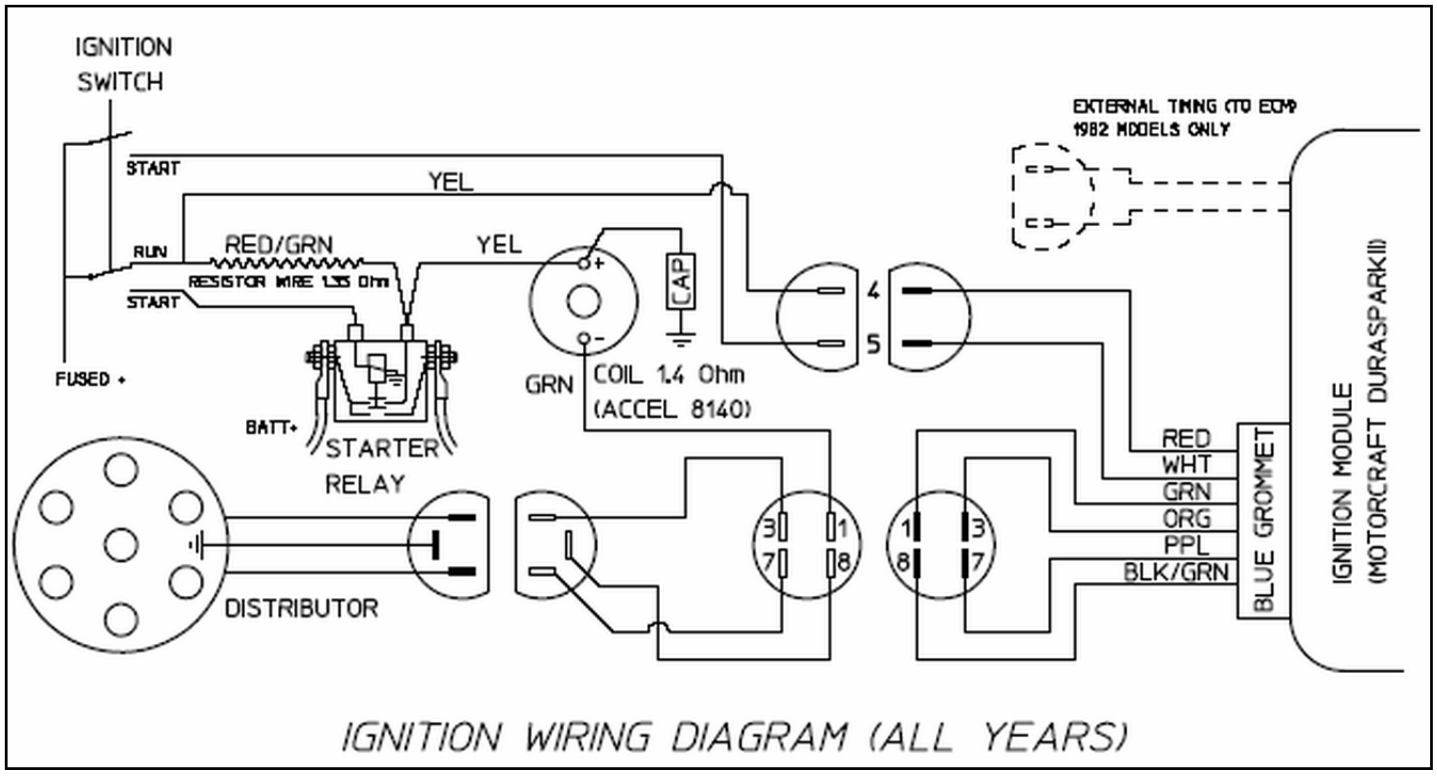
Now remove the coil wire from the top of your coil and let it dangle.

Disconnect the horseshoe connector from the coil.

Remove the coil bracket from the engine (this makes it easier to remove the old and install the new coil). Either two Torx bolts (Torx T40) or SAE Hex head bolts hold it to the block.. The coil will come with it so hang on to it when you take the last bolt out.

Swap out your coils -- make sure to tighten screw on bracket that holds coil in place.

Cut the wires (yellow and green) from the original horseshoe style coil connector and crimp on ring type connectors for the new coil. Once you have the connectors on check to make sure the crimp holds. Connect the yellow wire to the positive (+) side of the coil and the green wire to the negative (-) side of the coil. There may be an unused green wire on your horseshoe connector. That is a tachometer lead.



IGNITION WIRING DIAGRAM (ALL YEARS)

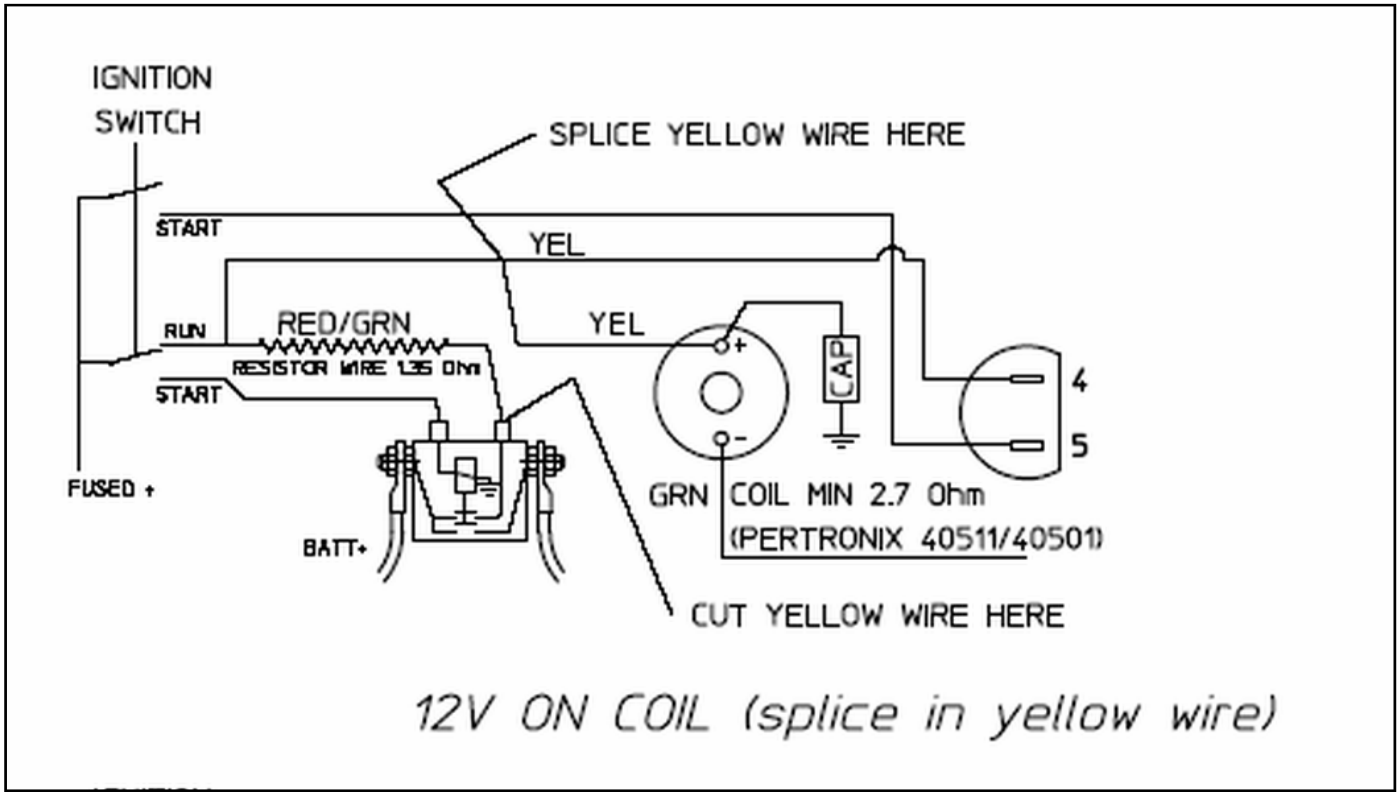
Pertronix Only: To get full 12V to the coil's positive (+) connection we have to make a small modification in the wiring. On top of the starter relay is a spade connector with a yellow wire (coil +) combined with a red/green wire (resistor 1,35 Ohm). Cut the yellow wire close to the connector. This is the wire that needs the full 12V for the coil.

We will take the 12V wire from the ignition switch, this is a yellow wire that can be found on the 2-wire plug to the IM. The yellow wire from the ignition switch is connected to red wire on the IM. The modification is shown in the schematic found below.

Pertronix Only continued: The yellow wire from the coil and the yellow wire from the ignition can be spliced by using a "Scotch Lock":

Scotch Lock (Wire colors in image are not correct for this application. Both of yours will be yellow)

Over time, this may not be a reliable connection, it is better to solder the wire ends together and isolate it with a piece of shrink hose (don't forget to slide the shrink hose over the wire before soldering). If you do use a Scotch Lock spray it with WD40 or fill it up with Vaseline afterwards. The resistor wire is bypassed now and we will have full 12V on the coil (with ignition on).



Continued for both coil types:

Next remove your coil wire. That is the one in the middle of the distributor cap that goes to the present coil. Loosen the screws on your present cap and remove cap along with the spark plug wires.
Remove old rotor from distributor.

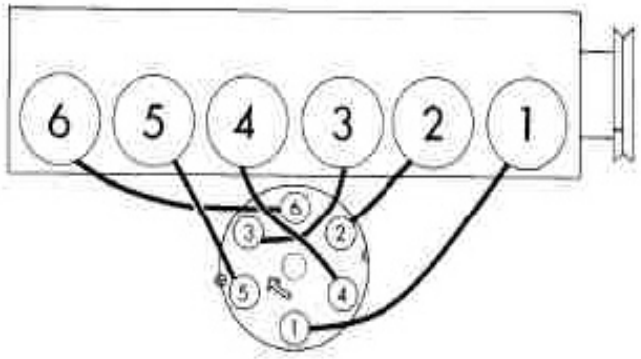
Install spacer adapter. You will notice the screws are tightened from the inside of the spacer. The spacer adapter is notched and only goes on one way. Tighten screws.

Install new rotor. It too is notched and only goes on one way.

Install cap. Again notched and goes on only one way. Snap the attaching clips into position to secure cap. Remove old spark plugs -- if you are using them regap to .045 **OR** gap the new plugs you bought to the same specs. Install plugs.

Un box your new spark plug wires. There should be six plug wires and maybe two coil wires. Lay them out by length. The two longest will go to the very front and very rear plugs (cylinders 1 & 6) -- the two shortest ones will go to the inside plugs (cylinders 3 & 4).

Using the Six Cylinder Firing Order diagram begin installing your plug wires starting with the number one wire on the cap. **Note some caps are marked with a #1 this may or may not be correct for our application. Our number one plug when looking down at the cap from the fender is close to the 6:00 position (Reference the diagram) -- some of these caps may have #1 in the 7:00 position you do not want to start there.** Work clockwise until all are done. Make sure all connections are tight.



AMC 258 6-cyl
Engine firing order 1-5-3-6-2-4
Distributor rotation: clockwise

If the firing order numbers on the distributor diagram is hard to read the firing order is as follows: **1 - 5 - 3 - 6 - 2 - 4**. Plug wire number 1 on the distributor (the hole nearest you when looking down on the cap from over the fender) goes to the very front spark plug. The next position clockwise on the distributor is #5 and it goes to the next to last plug on the engine. So just keep going until all six are done.

Now install the coil wire. If more than one is supplied use the one that looks to be the appropriate length without being too long.

Now, double check everything -- especially that your plug wires go to the correct plugs.

Reconnect your battery.

Start car. If everything was done right it should purr like a kitten.

Test drive your AMC Eagle and see if you notice the difference.