INSTALLATION INSTRUCTIONS

NITROUS 6 ELECTRONIC IGNITION CONTROL

PART NO 6865M

GENERAL INFORMATION

The NITROUS 6 includes a single stage RPM limiter and a single stage ignition retard. You can set various settings using the switches that are located in the end bracket. See Figure 1 of this instruction form for more information about the rev limiting and ignition retard features.

Battery
The NITROUS 6 Ignition Control operates on any negative ground, 12 volt electrical system with a distributor. It will also work with 16 volt batteries and can withstand a momentary spike of 24 volts in case of jump starts. This system delivers full voltage with a supply of 10-18 volts, and operates with a supply voltage as low as 8 volts.
If your application does not use an alternator, allow at least 15 amp/hours for every half hour of operation. If you crank the engine with the same battery or other accessories, such as an electric fuel or water pump, increase the amp/hour rating.

Coils
For optimum performance with your NITROUS 6 Ignition Control, we recommend a Mallory PROMASTER® Coil P/N 29440 or 30440 or 30441 Mallory PROMASTER® E. For continuous high rpm use, coil part numbers 29625, 30625 or 30626 can also be used. You may also use most stock coils designed for use with OEM electronic ignitions.
NOTE: Do not use Mallory's PROMASTER® Coil P/N 28880.

Tachometers
The yellow wire on the NITROUS 6 Ignition Control provides a trigger signal for tachometers, shift lights, or other add-on RPM activated devices. This wire produces a 12 volts square wave signal with a 20% duty cycle.

Some vehicles with factory tachometers may require a tach adapter to work with the NITROUS 6 Ignition Control. If your GM vehicle uses an inline filter, it may cause the tach to drop to zero on acceleration. If this occurs, bypass the filter. For more information on tachometers, see page 5.

Spark Plugs
Using the correct spark plug and heat range is important for optimum performance. Because there are so many variables to consider, we suggest starting with your engine manufacturer's spark plug recommendation. From there, you can experiment with small changes in plug gap and heat range to obtain the best performance from your engine. We also recommend non-resistor spark plugs.

Foreign Vehicles
Because of modern fuel injection systems, some foreign vehicles may require a tachometer/fuel injection adapter to work with the NITROUS 6 Ignition Control.
NOTE: Do not install the NITROUS 6 Ignition Control in any vehicle that is originally equipped with a CD ignition control.

Spark Plug Wires

High quality, spiral wound wire and proper routing are essential to the operation of the NITROUS 6 Ignition Control. This type of wire provides a good path for the spark to follow while minimizing electromagnetic interference (EMI).

NOTE: Do not use solid core spark plug wires with the NITROUS 6 Ignition Control.

Routing

Wires should be routed away from sharp edges, moving objects, and heat sources. Wires that are next to each other in the engine's firing order should be separated. For example, in a Chevy V8 with a firing order of 1-8-4-3-6-5-7-2, the #5 and #7 cylinders are positioned next to each other on the engine as well as in the firing order. Voltage from the #5 wire could jump to the #7 wire. This could cause detonation and engine damage. For added protection against cross-fire, Mallory offers PRO SHIELD insulated sleeving. Pro Shield is a glass woven, silicone coated protective sleeve that slides over your plug wires. It also helps reduce damage from heat and sharp objects.

MISCELLANEOUS INFORMATION

Sealing

Do not attempt to seal the NITROUS 6 Ignition Control. All of the circuits of a NITROUS 6 receive a conformal coating of sealant that protects the electronics from moisture. Sealing the NITROUS 6 will not allow any moisture that seeps in through the grommets to drain and may result in corrosion.

Welding

To avoid any damage to the NITROUS 6 Ignition Control when welding on the vehicle, disconnect the positive (red) and negative (black) power cables of the NITROUS 6 Ignition Control. It is also a good idea to disconnect the tachometer ground wire as well.

Distributor Cap and Rotor

We recommend installing a new distributor cap and rotor when installing the NITROUS 6 Ignition Control. Be sure the cap is clean inside and out, especially the terminals and rotor tip. On vehicles with smaller caps, it is possible for the air inside the cap to become electrically charged causing crossfire which can result in misfire. You can prevent this by drilling a couple of vent holes in the cap. Drill the holes between terminals at rotor height, facing away from the intake. If needed, place a small piece of screen over the holes to act as a filter.

NITROUS 6 Diagnostic LED

On the end panel of your NITROUS 6 ignition there is a small hole. Behind this hole is a red LED indicator. This serves two purposes: when you first turn on the ignition switch, the LED will flash rapidly 3 times. This indicates that the ignition system has power, and that the microprocessor is running properly. In addition, the LED will flash when receiving a proper trigger signal from the vehicle. If, after a normal power-up, the LED doesn't flash when cranking the engine, you should check your triggering circuit for problems. If the LED flashes when the engine is cranked, but there is still no spark, the problem lies somewhere else.

MOUNTING

The NITROUS 6 Ignition Control can be mounted in any position. If you mount it in the engine compartment, keep it away from moisture, moving objects and heat sources. Do not mount the unit in an enclosed area, such as the glove box. When you find a suitable location to mount the unit, make sure all wires of the ignition reach their connections. Hold the ignition in place and mark the location of the mounting holes. Use a 1/8" drill bit to drill the holes. Use the supplied self-tapping screws to mount the box. Mounting it horizontally or with the wiring down is preferred.

WIRING

Wire Length

All of the wires of the NITROUS 6 Ignition Control may be shortened as long as quality connectors are used or soldered in place. To lengthen the wires, use one size larger gauge wire (12 gauge for power leads, 16 gauge for all others). Use the proper connectors to terminate all wires. All connections must be soldered and sealed.

Grounds

A poor ground connection can cause many frustrating problems. When a wire is specified to go to ground, connect it to the chassis. Always connect a ground strap between the engine and chassis. Connect any ground wires to a clean, paint-free metal surface.

Ballast Resistor

If your vehicle has a ballast resistor in line with the coil wiring, it is not necessary to bypass it. This is because the NITROUS 6 Ignition Control receives its main power directly from the battery.

WIRE FUNCTIONS

Power Leads – 2 Pin Weatherproof Connector

The two heavy gauge wires (14 gauge) that deliver battery voltage to the ignition:

- **Heavy Red** – Connects directly to the battery positive (+) terminal or to a positive battery junction. It could also be connected to the positive side of the starter solenoid. **NOTE: Never connect this wire to the alternator.**
- **Heavy Black** – Connects to frame or chassis ground.

Trigger and Coil Leads – 4 Pin Weatherproof Connector

- **Red** – Connects to a switched 12 volt source, such as the ignition key.
- **Yellow** – Connects to the positive (+) terminal of the coil. **NOTE: This is the only wire that makes electrical contact with the coil positive (+) terminal.**
- **Black** – Connects to the negative (–) terminal of the coil. **NOTE: This is the only wire that makes electrical contact with the coil negative (–) terminal.**
- **Green** – Connects to points, electronic ignition amplifier output or to the green wire of a Mallory timing accessory. When this wire is used, the magnetic pickup connector is not used.

Additional Individual Wires:

- **Yellow** – Connects to the tachometer.
- **Blue** – This wire is used to activate the Nitrous Oxide Ignition Retard. It is activated by applying 12 volts to the wire. Connect to the same 12 volt circuit that activates the Nitrous Oxide solenoids.

Trigger Wires

Either of two circuits will trigger the NITROUS 6 Ignition Control: a points circuit (green wire) or a magnetic pickup circuit (violet and green wires).

NOTE: The two circuits must never be used together.

- **Violet/Green** – These wires are routed together in one harness to form the magnetic pickup connector. The connector plugs directly into a Mallory distributor or crank trigger. It will also connect to factory magnetic pickups or other aftermarket pickups. The violet wire is positive (+) and the green is negative (–). When these wires are used, the white wire is not used. Consult the chart that shows the polarity of other common magnetic pickups.

COMMON COLORS FOR MAG PICKUP WIRES		
Distributor	***Mag +***	***Mag –***
Mallory Crank Trigger	Purple	Green
Mallory Billet Competition Distributor, Series Nos. 81 and 84	Orange	Purple
Mallory COMP® 9000 Series Nos. 96-99	Orange	Purple
Mallory Harness P/N 29040	Red	Black
MSD	Orange/Black	Violet/Black
MSD Crank Trigger	Orange/Black	Violet/Black
Ford	Orange	Purple
Chrysler	Orange/White	Black

ROUTING WIRES

Route all wires away from heat sources, sharp edges, and moving objects. Route the trigger wires separate from the other wires and spark plug wires. If possible, route them along a ground plane, such as the block or firewall, which creates an electrical shield. The magnetic pickup wires should be routed separately and twisted together to help reduce extraneous interference.

WARNING: The NITROUS 6 Ignition Control is a capacitive discharge ignition. High voltage is present at the coil primary terminals. Do not touch these terminals or connect test equipment to them.

PRESTART CHECKLIST

NITROUS 6 Cylinder Selection

Your NITROUS® 6 Ignition comes from the factory set up for 8 cylinder operation. If you want to use this ignition with a 4 or 6 cylinder engine, rotate the center rotary switch, accessible through the end plate, to the proper number of cylinders. To select the 4 cylinder mode, turn the switch to the “4” position. See Figure 1.

RPM Limiter Settings

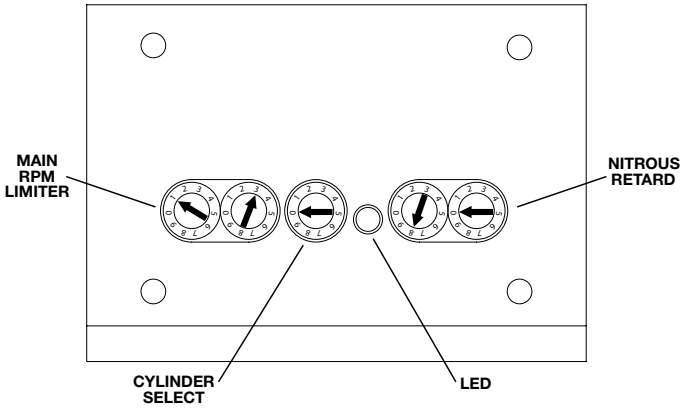
Main RPM Limiter

The main RPM Limiter is adjusted by using the pair of switches on the left side of the end plate. The left switch of the pair is for 1,000’s and right is for 100’s. To eliminate the RPM Limiter, simply rotate the switches to a setting above the engine’s maximum RPM. See Figure 1.

Rotary Switch Position Examples:

Switch #1	Switch #2	RPM Limit
1	0	1,000
2	4	2,400
2	5	2,500
6	0	6,000
7	8	7,800
9	9	9,900

FIGURE 1



Nitrous Ignition Retard System

The Nitrous Ignition Retard System is adjusted using the pair of rotary switches on the right side of the end plate. They are adjusted the same as the Main RPM Limiter, the left switch of the pair is used to adjust whole degrees and the right switch of the pair adjusts in tenths (0.1) of a degree.

Rotary Switch Position Examples:

Switch #1	Switch #2	Ignition Retard
1	0	1.0 Degrees
2	4	2.4 Degrees
2	5	2.5 Degrees
9	9	9.9 Degrees

THEFT DETERRENT

The NITROUS 6 Ignition Control provides an easy way to install a theft deterrent kill switch. See Figure 2.

Green Wire Trigger

When using the white wire to trigger the NITROUS 6 Ignition Control, install a switch to the green wire and the other side to ground. When the green wire is grounded, the vehicle will crank but will not start.

Magnetic Pickup Trigger

When using the mag pickup to trigger the NITROUS 6 Ignition Control, install a switch across the magnetic pickup violet wire to ground. When the violet wire is grounded, the vehicle will crank but will not start.

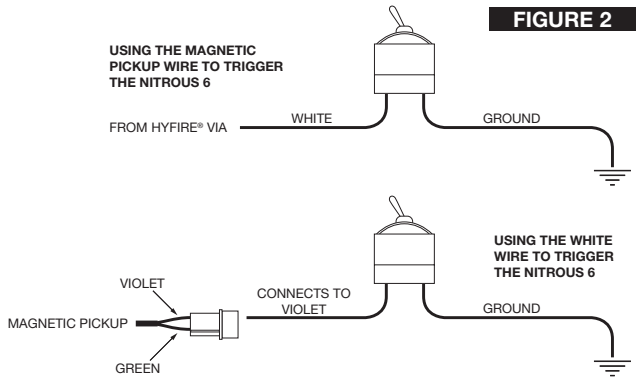


FIGURE 2

TROUBLESHOOTING

This section offers several tests and checks you can perform to ensure proper installation and operation of the NITROUS 6 Ignition Control. If you experience a problem with your NITROUS 6, first check for proper installation and poor connections. You can eliminate many problems by checking these items. If you have any questions concerning your NITROUS 6 Ignition Control contact the Mallory Technical Service Department at 216-688-8300, option 5.

Tach/Fuel Adapters

If your tachometer does not operate correctly, you probably need a Mallory tach adapter. Consult the Tachometer Compatibility List at right for common tachometers and compatible tach adapters.

TACHOMETER COMPATIBILITY LIST

Aftermarket Tachometer	White Wire Trigger	Magnetic Trigger Connector
Autogage	29074	29078
Autometer	—	—
Ford Motorsport	—	—
Moroso	—	—
Stewart	29074	29078
S.W. & Bi Torx	—	—
Sun	29074	29078
VDO	8910	29078
AMC (Jeep)	29074	29078
Chrysler	29074	29078
Ford (Before 1976)	29074	29078
Ford (After 1976)	29074	29078
GM	Bypass in-line filter	Bypass in-line filter
Imports	29074	29078

No-Run on Foreign Vehicles

Some foreign vehicles with fuel injection systems may require a tachometer/fuel injection adapter to run with the NITROUS 6 Ignition Control. Often, the same trigger source is used to operate an ignition, tachometer, and fuel injection. This results in a voltage signal that is too low to trigger the fuel injection. A tach/fuel injection adapter will usually solve this problem.

Inoperative Tachometers

If your tachometer fails to operate with the NITROUS 6 installed, you may need a Mallory tach adapter. Before purchasing a tach adapter, try connecting your tachometer trigger wire to the yellow wire of the NITROUS 6 Ignition Control. This output produces a 12 volt, square wave. If the tach still does not operate, you will need a tach adapter. Two different tach adapters are available:

PN 29078 - If you are using the magnetic pickup connector (green and violet wires) to trigger the NITROUS 6, you will need this adapter.

PN 29074 - If your tach was triggered from the coil negative terminal (voltage trigger) and you are using the green wire to trigger the NITROUS 6, you will need this adapter.

Ballast Resistor

If you have a current trigger tach (originally connected to coil (+) positive) and use the green wire of the NITROUS 6 for triggering, you can purchase a Chrysler Dual Ballast Resistor (1973-76 applications).

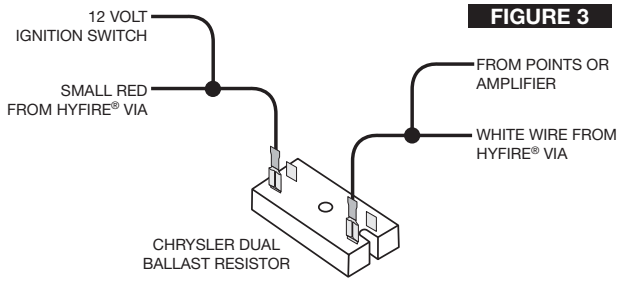


FIGURE 3

Engine Run-On

If your engine continues to run even when the ignition is turned off, you are experiencing engine run-on. Usually, older vehicles with an external voltage regulator are susceptible to this condition. Because the NITROUS 6 Ignition Control receives power directly from the battery, it does not require much current to keep the unit energized. If you are experiencing run-on, it is due to a small amount of voltage going through the charging lamp indicator and feeding the small red wire (even if the key is turned off).

Early Ford and GM: To solve the run-on problem, a diode is supplied with the NITROUS 6 Ignition Control. By installing this diode in-line of the wire that goes to the charging indicator, the voltage is blocked from entering the NITROUS 6 Ignition Control. Figure 4 shows the proper diode installation for early Ford and GM vehicles. **NOTE: Diodes are used to allow voltage to flow only one way. Make sure the diode is installed facing the proper direction, as shown in Figure 4.**

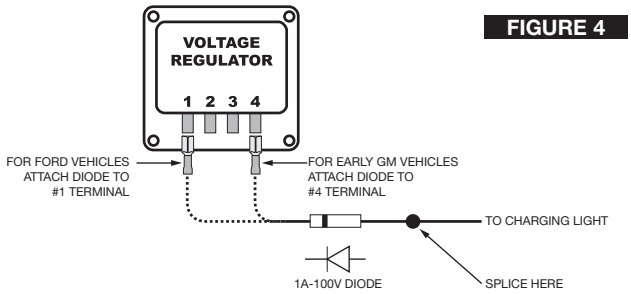


FIGURE 4

Ford: Install the diode inline to the wire going to the #1 terminal.

GM: Install the diode inline to the wire going to the #4 terminal.

GM 1973-83 with Delcotron Alternators
GM Delcotron alternators use an internal voltage regulator. Install the diode inline on the smallest wire exiting the alternator (see Figure 5). It is usually a brown wire.

Most other applications: To eliminate run-on, place a resistor in-line to the NITROUS 6 small red wire to keep voltage from leaking into the NITROUS 6 Ignition.

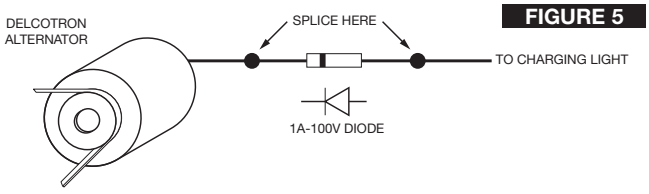


FIGURE 5

Misses and Intermittent Problems

Experience has shown that if your engine is misfiring or hesitating at higher RPM, it is usually not an ignition problem. Most common causes include a coil or plug wire failure, arcing from the cap or boot plug to ground or spark ionization inside the cap. Perform the following checks:

- Inspect the plug wires at the cap and at the spark plug for a tight connection. Visually inspect for cuts, abrasions, or burns.

- Inspect the primary coil wire connections. Because the NITROUS 6 Ignition Control receives a direct 12 volt source from the battery, there will not be any voltage at the coil positive (+) terminal, even with the key turned on. During cranking, or while the engine is running, very high voltage will be present and no test equipment should be connected. **WARNING: Do not touch the coil terminals during cranking or while the engine is running.**
- Make sure that the battery is fully charged and the connections are clean and tight. If you are not running an alternator, this is an imperative check. If the battery voltage drops below 10 volts during a race, the NITROUS 6 Ignition Control output voltage will drop.
- Is the engine running lean? Inspect the spark plugs and the entire fuel system.
- Check all wiring connections for corrosion or damage. Remember to use proper connections followed by soldering, then seal the connections completely.

If everything checks positive, use the procedure below to test the ignition for spark. Mallory also offers an Ignition Tester (PN 28357) that allows you to check the entire ignition system while it is installed in the vehicle. This tool also checks operation of RPM limits, activated switches, and shift lights.

Bypass connector

The Bypass Connector (standard ignition bypass) fits into the mating plug of the Ignition Control Harness to convert back to standard ignition. This will allow the vehicle to run on the standard ignition and bypasses your Nitrous 6 ignition. If you use the Bypass Connector, use ignition ballast resistors designed for the particular distributor and coil in the wire from the ignition switch. Use the Power Plug to convert back to standard ignition. Also, if you are using a Mallory Fuel Injection/Tachometer Adapter (Part No. 29074), disconnect it (and its diode if used) as part of converting back to standard ignition. The Bypass Connector (standard ignition bypass method to convert back to standard ignition) does not work with magnetic pickup distributors or crank trigger ignition.

FIGURE 6

MALLORY UNILITE DISTRIBUTORS, MAGNETIC BREAKERLESS DISTRIBUTORS, OR ELECTRONIC ADVANCE DISTRIBUTORS (3-WIRE: RED, BROWN, GREEN)

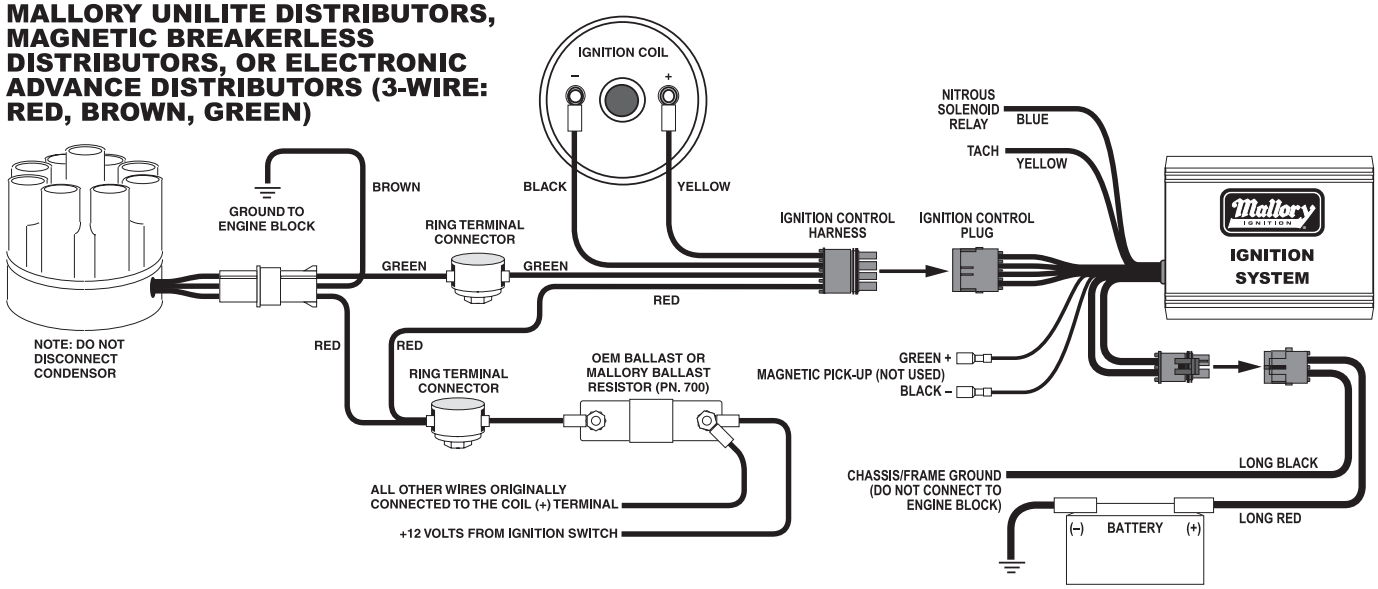


FIGURE 7

MAGNETIC PICK-UP DISTRIBUTOR OR CRANK TRIGGER IGNITION

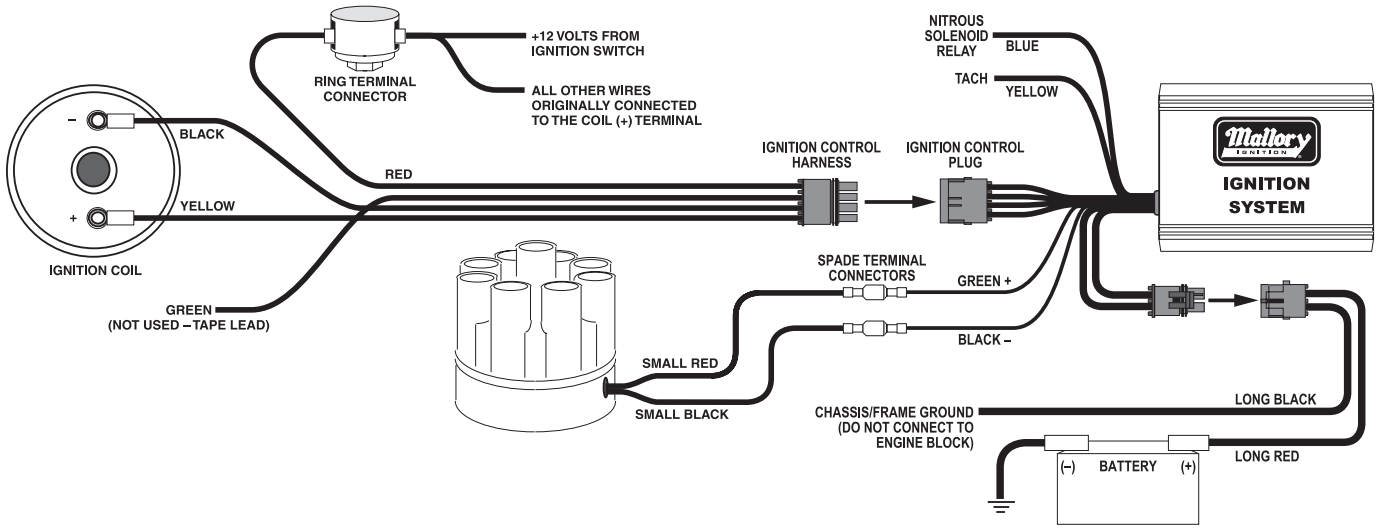


FIGURE 8

OEM IGNITION AMPLIFIER

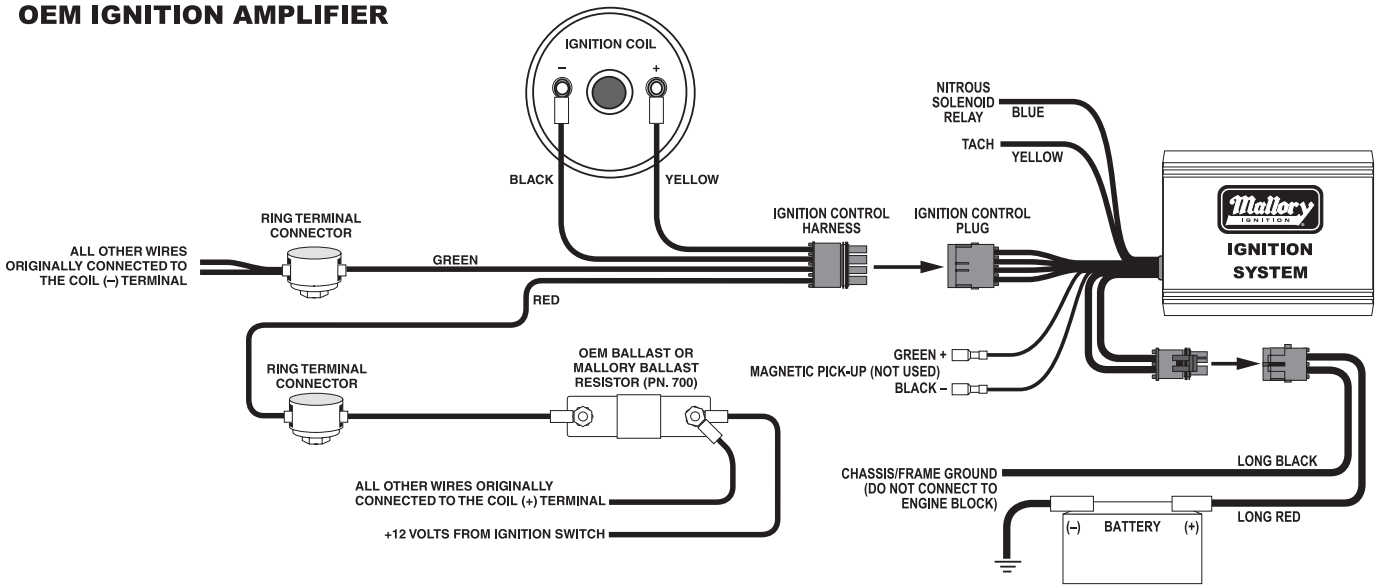


FIGURE 9

GM/DELCO HEI DISTRIBUTOR (WITH COIL MOUNTED INSIDE DISTRIBUTOR CAP)

ADAPTER/HARNESS PART NOS. 29040 AND 29043

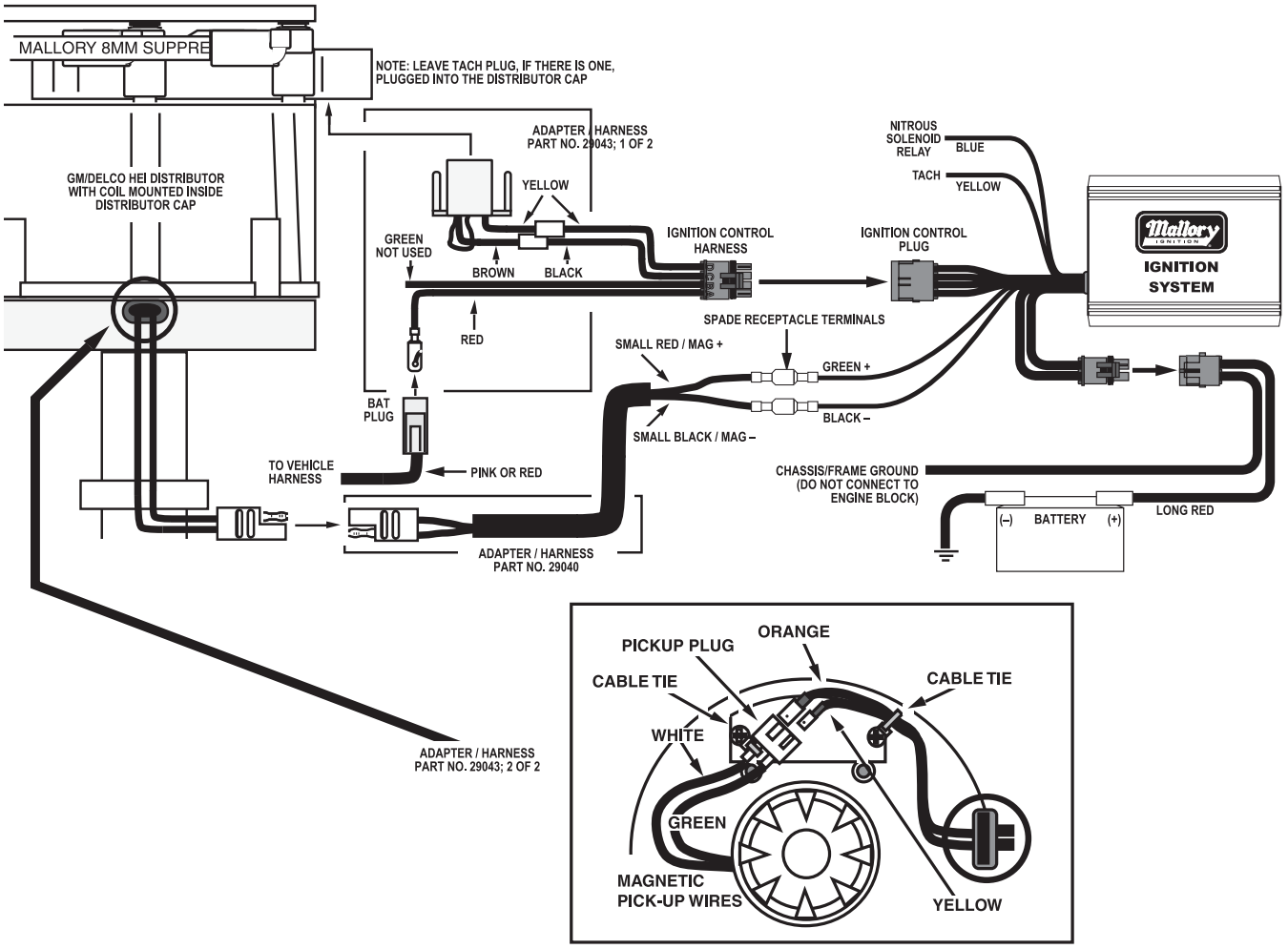


FIGURE 10

GM/DELCO HEI DISTRIBUTOR (WITH REMOTE COIL ADAPTER)

ADAPTER / HARNESS PART NO. 29042

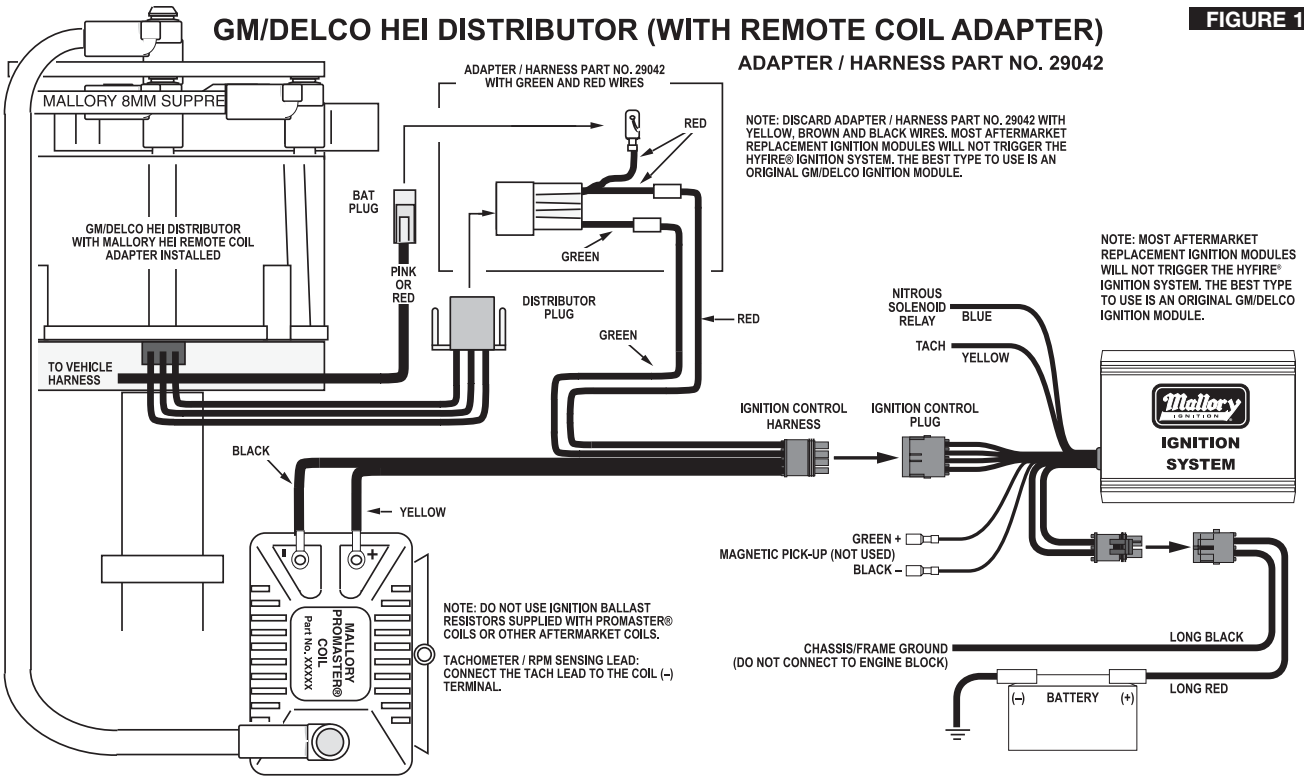


FIGURE 11

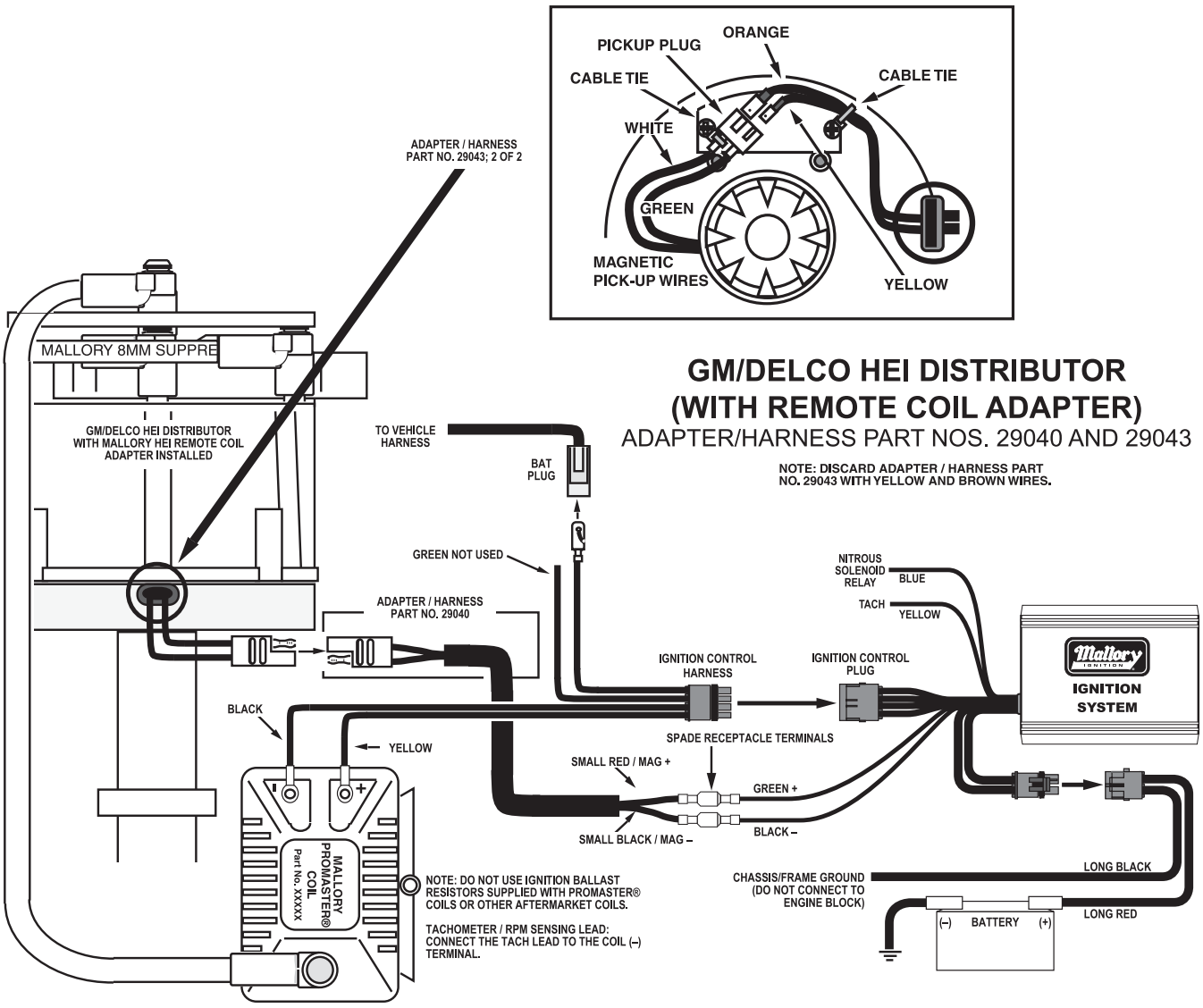
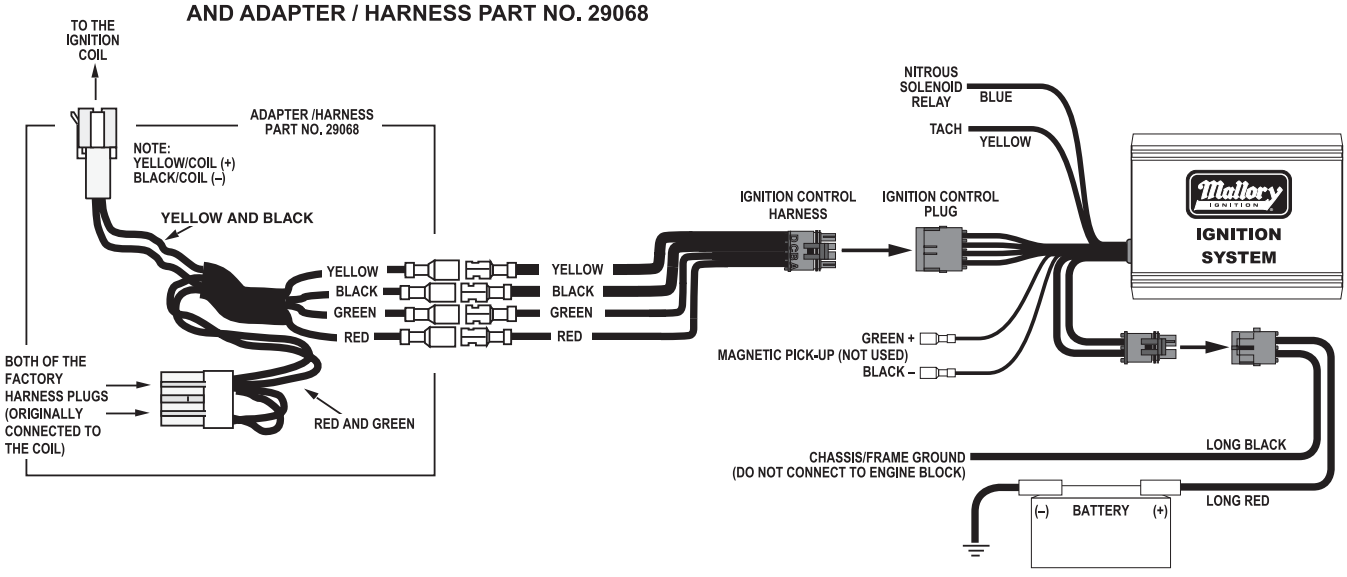


FIGURE 12

GM HEI/EST DISTRIBUTOR – EXTERNAL IGNITION COIL

AND ADAPTER / HARNESS PART NO. 29068



FORD AND AMERICAN MOTORS

FIGURE 13

MOTORCRAFT DURASPARK (SSI, I AND II),
MALLORY 85 SERIES DISTRIBUTOR ADAPTER
PART NOS. 29039 AND 29040

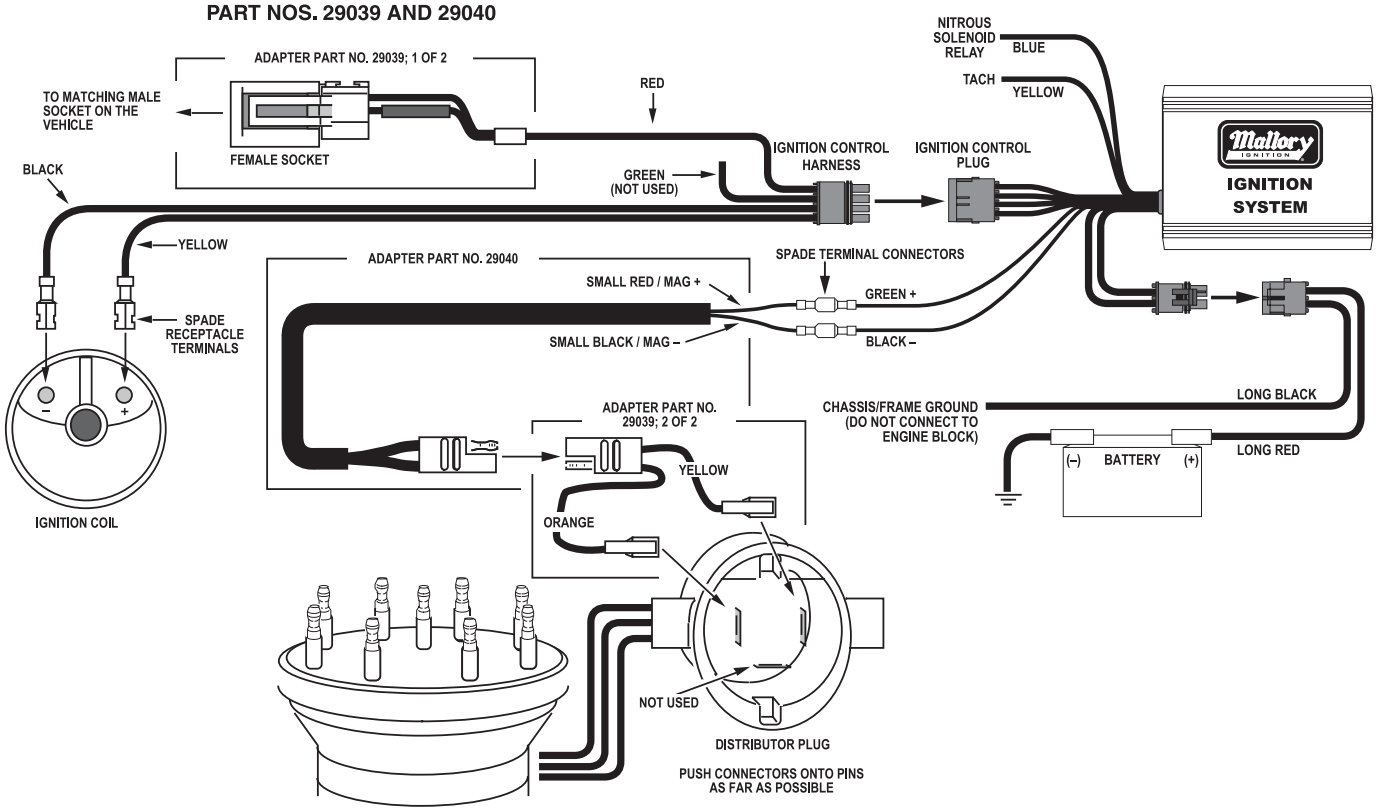


FIGURE 14

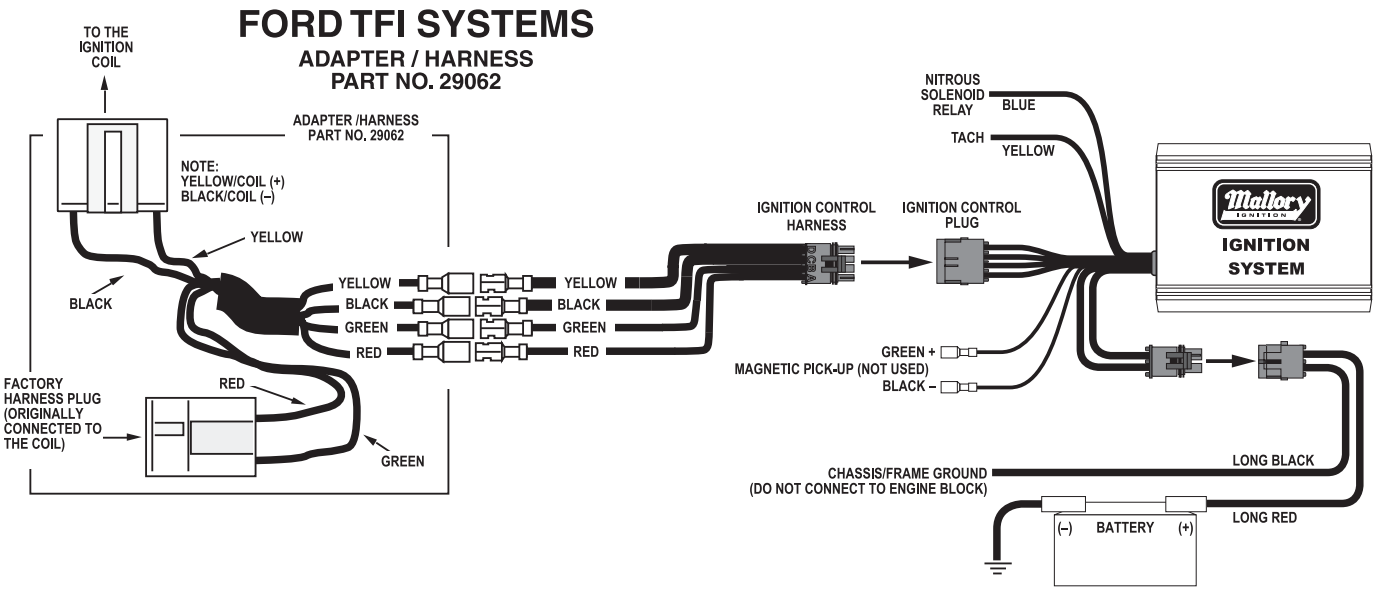
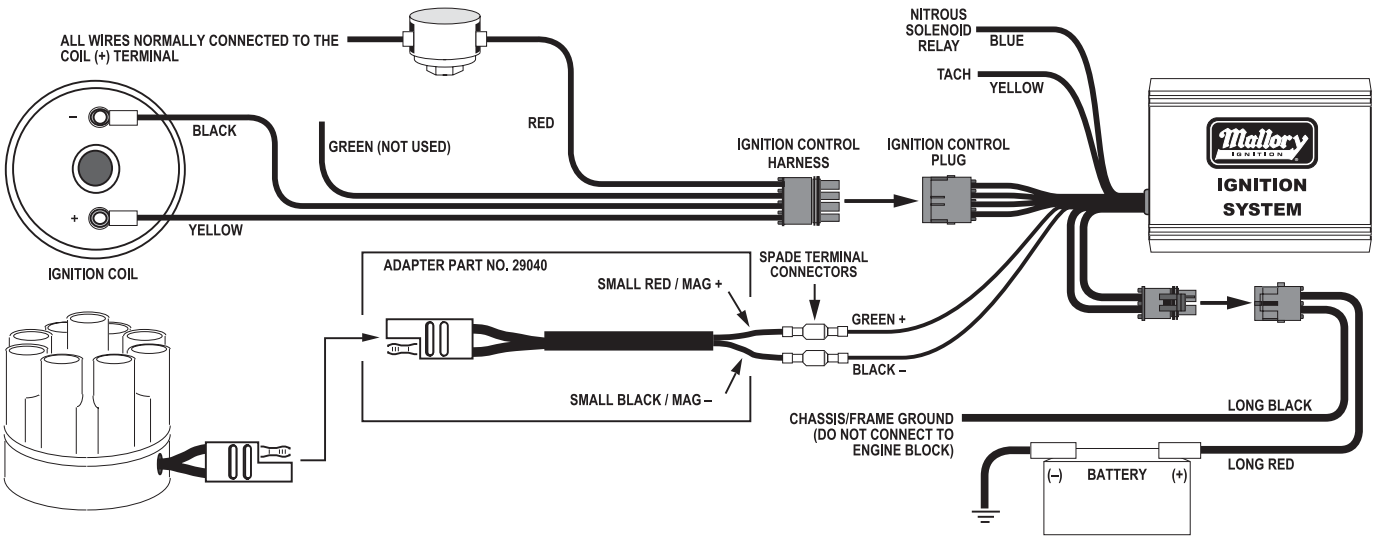


FIGURE 15

MOPAR / CHRYSLER ADAPTER PART NO. 29040



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10601 MEMPHIS AVE. #12, CLEVELAND, OH 44144
216.688.8300 FAX 216.688.8306

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