



**HYFIRE® VI Series Electronic Ignition Controls**  
**Instruction Manual**  
Part#: 685, 6851



# INSTALLATION INSTRUCTIONS

## HYFIRE® VI SERIES OF ELECTRONIC IGNITION CONTROLS

HYFIRE® VI Ignition System Part No. 685, Advanced  
HYFIRE® VI Ignition System Part No. 6851, Basic

For applications triggered by points, Mallory Electronic Ignition Distributor (all models), original equipment electronic ignition amplifiers and magnetic trigger pulses (magnetic pickup distributor or crank trigger ignition). Optional adapters are available for easy connection to early model Delco/GM HEI Systems, late model GM HEI/EST Systems, Ford TFI Systems, and OEM magnetic pickup (non-computer; Ford DuraSpark, GM HEI and Mopar/Chrysler Electronic Systems).

*This product is legal to sell, distribute or install on vehicles in California. C.A.R.B. Executive Order D-70-26.*

**NOTE: Mallory HYFIRE® VI Electronic Ignition Controls are not compatible with distributorless systems or positive ground applications. The RPM Limiter in the HYFIRE® VI (Part No. 685) will not work properly with odd-fire or semi-even fire V6 applications.**

Parts included in this kit:

- |   |   |   |                             |
|---|---|---|-----------------------------|
| 1 | HYFIRE® VI Electronic Ignition Control - Part No. 685 or 6851 | 8 | Ring Terminals, 1/4"        |
| 1 | Ignition Control Harness - Part No. 29348                     | 1 | Ring Terminal, 3/8"         |
| 2 | Terminal Connectors - Part No. 450                            | 5 | Spade Receptacle Terminals  |
| 1 | Bypass Connector  | 4 | 10-32 Screws                |
| 4 | Cable Ties  | 4 | 10-32 Nuts with Lockwashers |
| 2 | Spade Terminals   |   |                             |

**WARNING: DO NOT USE NON-SUPPRESSOR SPARK PLUG WIRES WITH THE HYFIRE® VI IGNITION CONTROL.**

**KEEP ALL IGNITION SYSTEM WIRES AS FAR FROM SPARK PLUG WIRES AS POSSIBLE.**

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## GENERAL INFORMATION

### *The HYFIRE® VI Ignition System Part Nos. 685 and 6851 are not for marine use.*

The RPM limiter in the HYFIRE® VI is not recommended as an engine speed governor. The use of the RPM limiters is not recommended for applications equipped with a catalytic converter. Similarly, forcing engine RPM past the RPM limiter continuously for long sustained intervals can cause fuel build up in the exhaust system that may adversely affect your application. The RPM limiting systems will not work properly with odd-fire V6 applications.

### *Ignition Ballast Resistor / Loom Resistance Wire*

The performance of the HYFIRE® VI is not affected by the presence of the factory ignition resistors or ignition ballast resistors in the wire from the ignition switch.

### *Standard Ignition Bypass (Bypass Connector)*

The Bypass Connector (supplied) fits into the Ignition Control Harness to convert back to standard ignition. If you use the Bypass Connector, use ignition ballast resistors designed for your vehicle's distributor and coil (see diagrams for more information). This bypass method does not work with magnetic pickup distributor or crank trigger ignition. Racing Applications: It is not necessary to install ignition ballast resistors. However, do not use the Bypass Connector until the ignition ballast resistors are installed in the wire from the ignition switch.

### *Ignition Coils*

The HYFIRE® VI Electronic Ignition Controls are designed to work with most original equipment ignition coils. For optimum performance use the Mallory PROMASTER® Coil Part No. 29440 (up to 7,500 RPM) or Part No. 29625 (up to 10,000 RPM).

### *Fuel Injection*

Some fuel injection systems need a voltage spike signal from the ignition coil before they will operate properly. This signal changes once HYFIRE® VI Electronic Ignition Controls are installed. The Mallory Fuel Injection and Tachometer Adapters Part Nos. 29074 and 29078 supply the proper signal to the vehicle computer to operate the fuel injection system. Installation procedure and diagrams are supplied with these adapters.

### *Spark Plug Wires*

YOU MUST USE suppression type (carbon core, spiral core, suppression core) spark plug wire. We recommend spiral core ignition wire, such as Mallory PRO SIDEWINDER® Ignition Wire. Suppression type spark plug wires prevent false triggering and possible premature ignition or accessory failures. **DO NOT USE solid core (copper core; stainless steel core) spark plug wire with any electronic ignition system or accessory.**

### *Spark Plug Gaps*

For street applications, use your engine manufacturer's specifications. For racing applications, start with your engine manufacturer's specifications, then experiment with, and closely monitor, various gaps to achieve maximum performance.

### *Electric Welding*

Unplug the Ignition Control Harness from the HYFIRE® VI Electronic Ignition Control and unplug any distributor harnesses (if possible) before any welding is done on the vehicle.

### *External RPM Limiters*

Mallory Proportional RPM Limiter Part Nos. 641-4, 641-6, 641-8, 642, 643 and 644 WILL NOT function with the HYFIRE® VI Electronic Ignition Controls.

### *Mallory PRO TACH® I, IV and VI*

The RPM needle and shift light will work with the HYFIRE® VI. However, the tach's proportional controller that limits RPM WILL NOT function with the HYFIRE® VI. Turn the LIMIT RPM knob slightly past 11,000 to prevent the limiter from interfering with the tach's other functions. See Optional Ignition Accessories for more information.

## MOUNTING PROCEDURE

### **Step 1**

Disconnect the battery (-) cable to cut power to the system. Computerized vehicles: Disconnect the battery (-) cable and let the vehicle sit overnight before proceeding. This allows the computer to calibrate for the new ignition.

### **Step 2**

Select a convenient location to mount the HYFIRE® VI Electronic Ignition Control. Keep the unit away from hot engine components or extreme heat such as the exhaust system and manifolds. Also, keep it away from moving devices, such as fans, belts and linkages. The location must be dry. Moisture will damage components inside the unit.

### **Step 3**

Choose one mounting method listed below for mounting the HYFIRE® VI Electronic Ignition Control (3a, 3b, or 3c).

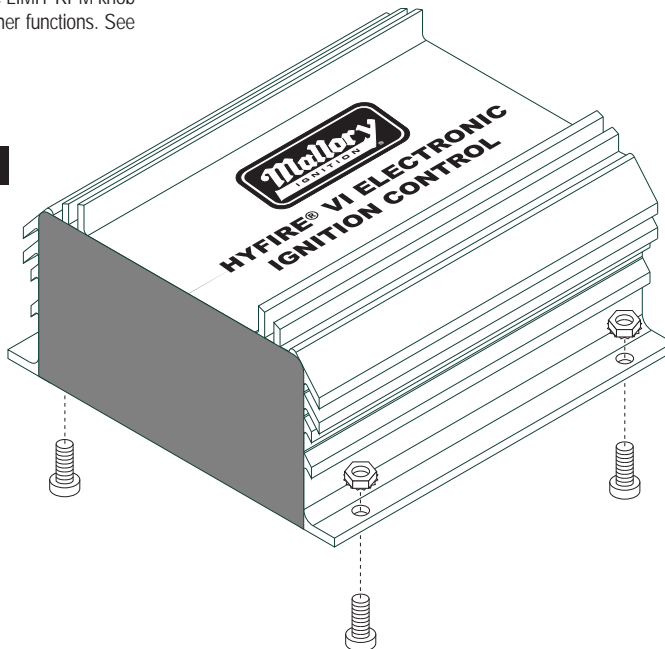
#### *(3a) Mounting to a flat surface*

- Center punch the mounting pattern on the mounting surface using the housing holes to mark locations for drilling mounting holes. Drill holes using a 7/32" drill bit.
- Hold the HYFIRE® VI Electronic Ignition Control in position over the mounting holes.
- From the backside of the mounting surface, insert the 10-32 screws with lock washers through the mounting holes and attach with the 10-32 nuts supplied.

#### *(3c) Mounting to a flat surface with shock mounts (available separately, PN 29069)*

- Center punch the mounting pattern on the mounting surface using the housing holes to mark locations for drilling mounting holes. Drill holes using a 7/32" drill bit.
- Install the shock mounts into the side flanges of the HYFIRE® VI and tighten nuts. Hold the unit in position where it will be mounted.
- From the backside of the mounting surface, insert the 10-32 nuts with lock washers onto the shock mount studs. Tighten each nut until snug.

FIGURE 1



# BASIC WIRING PROCEDURE

## Step 1

### Refer to Figure 2

Ensure that your vehicle is equipped with a ground cable between the engine block and firewall (10 gauge or larger is required). Locate the harness with the LONG RED WIRE and one LONG BLACK WIRE at the end plate of the HYFIRE® VI Electronic Ignition Control.

- Connect the LONG RED WIRE to the battery (+) post or battery (+) terminal on the starter solenoid.
- Connect the LONG BLACK WIRE to engine ground or chassis ground.
- Plug into 2-pin connector with red and black wires coming from the end plate on the HYFIRE® VI.
- Connect the Ignition Control Harness to the Ignition Control Plug at the end plate of the HYFIRE® VI Electronic Ignition Control.

## Step 2

Choose one method listed below for wiring the HYFIRE® VI Electronic Ignition Control (2a, 2b, or 2c)

### (2a) Wiring method using Adapters and Harnesses (sold separately)

Special wiring Adapters and Harnesses simplify the installation of the HYFIRE® VI Electronic Ignition Control into newer vehicles. These adapters and harnesses allow you to connect the HYFIRE® VI Electronic Ignition Control between the ignition coil and the factory coil connector. They reduce installation time and wiring errors. Also, converting back to the factory ignition is easy because there is no need to cut the original wiring. These instructions cover:

**PART NO. 29042** – Connecting to GM HEI Systems (coil-in-cap, with OEM ignition module)

**PART NO. 29068** – Connecting to Late Model GM HEI/EST Systems (external coil)

**PART NO. 29062** – Connecting to Ford TFI Systems.

**PART NOS. 29039 and 29040** – Connecting to Ford DuraSpark Systems (non-computer type, without ignition module).

**PART NOS. 29040 and 29043** – Connecting to Early Model GM HEI Systems (non-computer type, without ignition module)

**PART NO. 29040** – Connecting to Mopar/Chrysler Electronic Systems (non-computer type, without ignition module).

Connecting to: GM HEI Systems (coil-in-cap, with OEM ignition module), use Adapter PART NO. 29042; Late Model GM HEI/EST Systems, use Adapter PART NO. 29068; Ford TFI Systems, use Adapter PART NO. 29062.

### Connecting Adapter PART NO. 29042, 29062 or 29068

Refer to Figures 3, 4, and 7 when connecting to GM HEI Systems; Figure 5 when connecting to Late Model GM HEI/EST Systems; Figure 6 when connecting to Ford TFI Systems.

- Match wires by color from the Adapter to the Ignition Control Harness. Crimp all wires together.
- Disconnect the factory harness(es) at the ignition coil. Connect them to the Adapter that has the RED and GREEN WIRES.
- Connect the Adapter that has the YELLOW and BLACK WIRES to the ignition coil. NOTE: When using an aftermarket ignition coil with post type terminals, discard the Adapter that has the YELLOW and BLACK WIRES. Install ring terminals on the Ignition Control Harness YELLOW and BLACK WIRES. Connect the YELLOW WIRE to the ignition coil (+) terminal. DO NOT allow any wire except the YELLOW WIRE to make contact with the ignition coil (+) terminal. Connect the BLACK WIRE to the ignition coil (-) terminal.
- Go to Step 3, page 9.

FIGURE 2

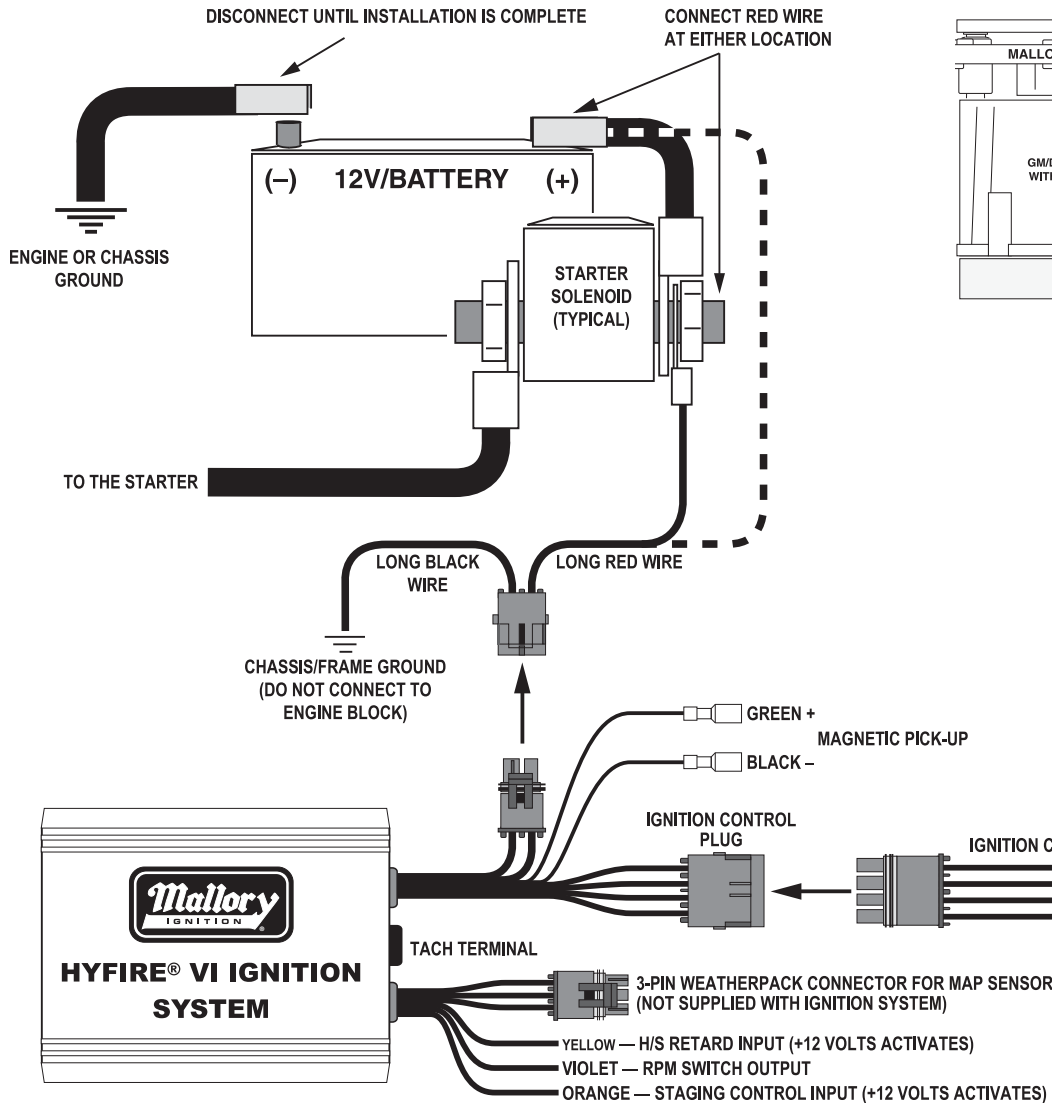
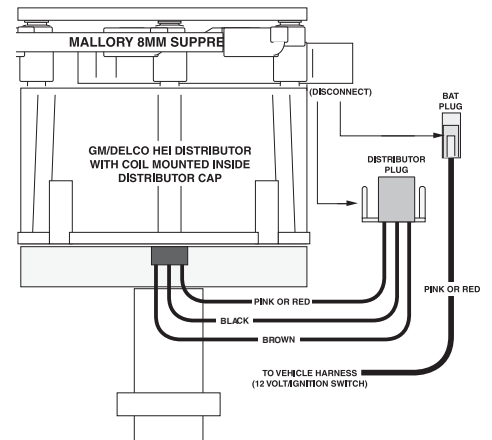


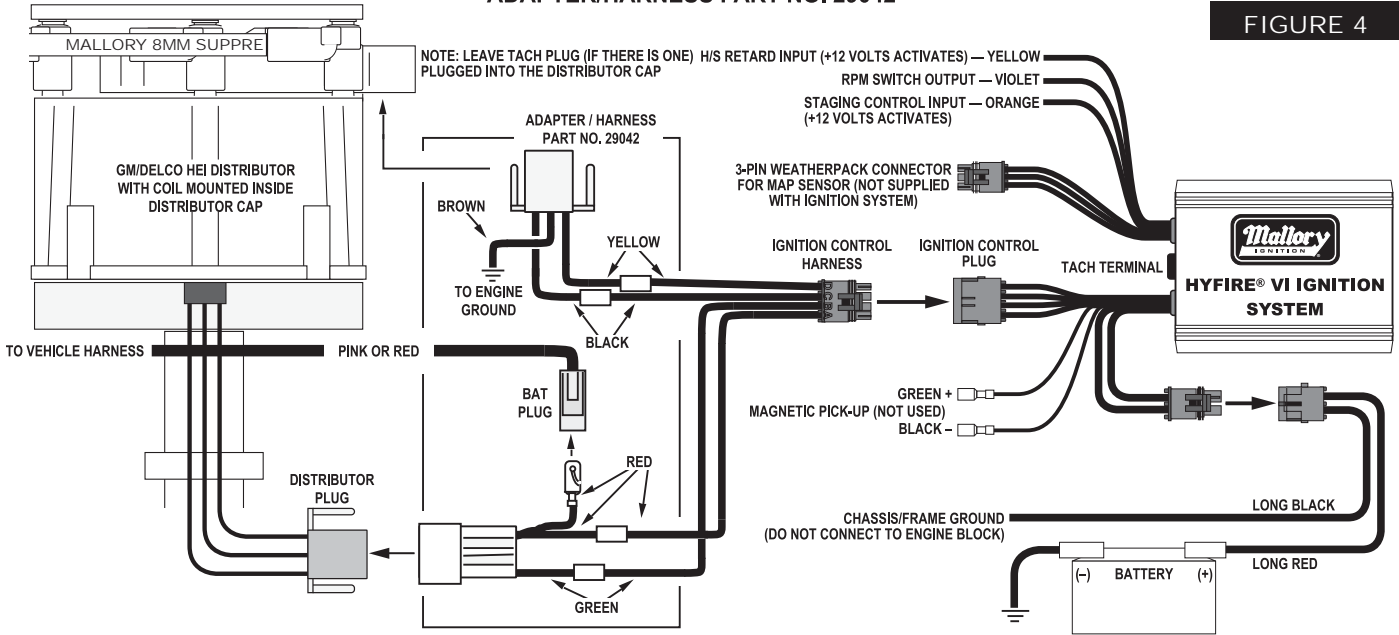
FIGURE 3



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

ADAPTER/HARNESS PART NO. 29042

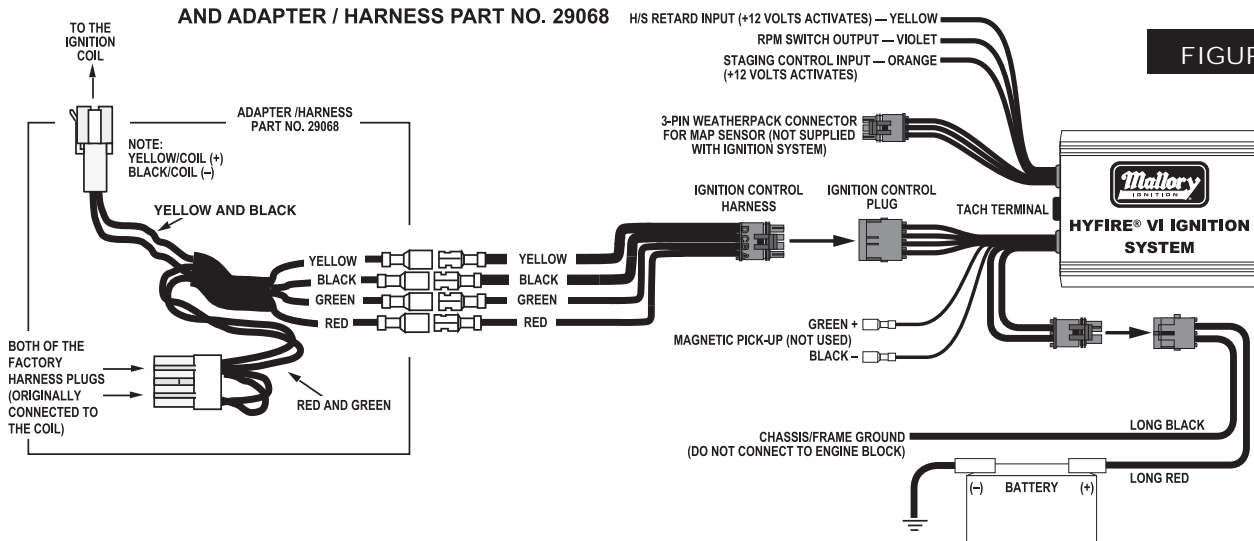
FIGURE 4



# GM HEI/EST DISTRIBUTOR – EXTERNAL IGNITION COIL

AND ADAPTER / HARNESS PART NO. 29068

FIGURE 5



# FORD TFI SYSTEMS

ADAPTER / HARNESS PART NO. 29062

FIGURE 6

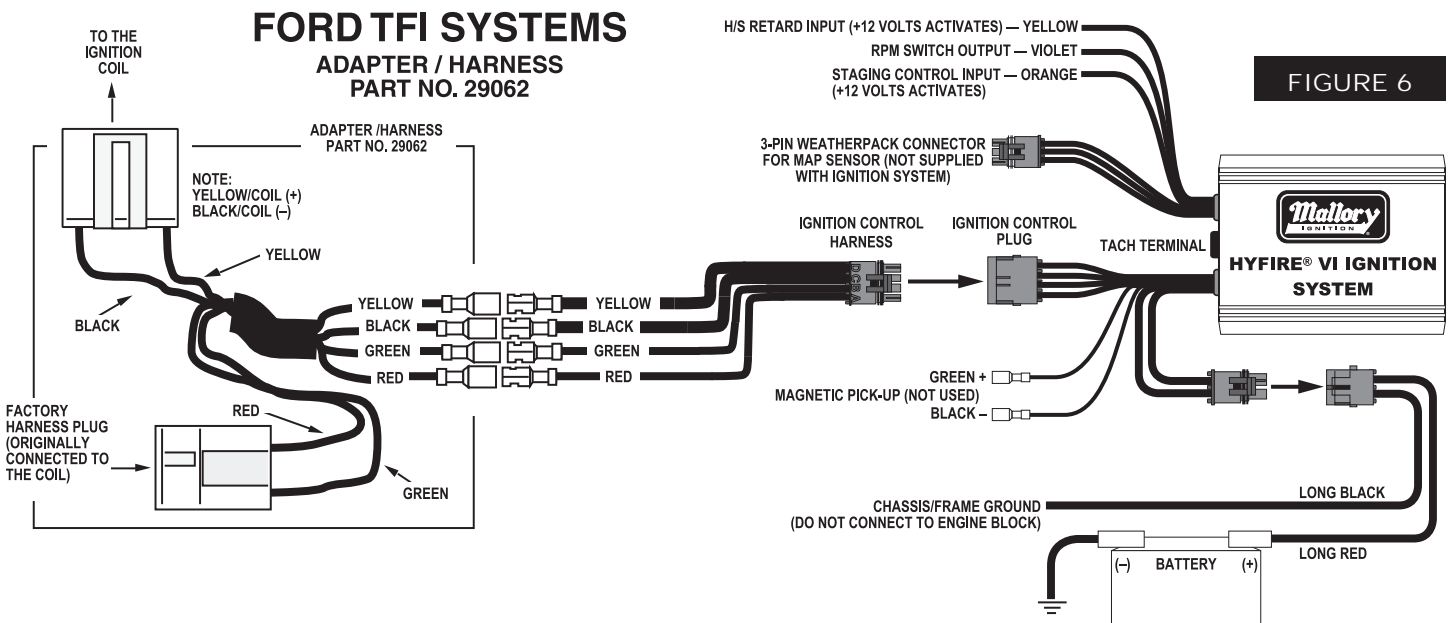
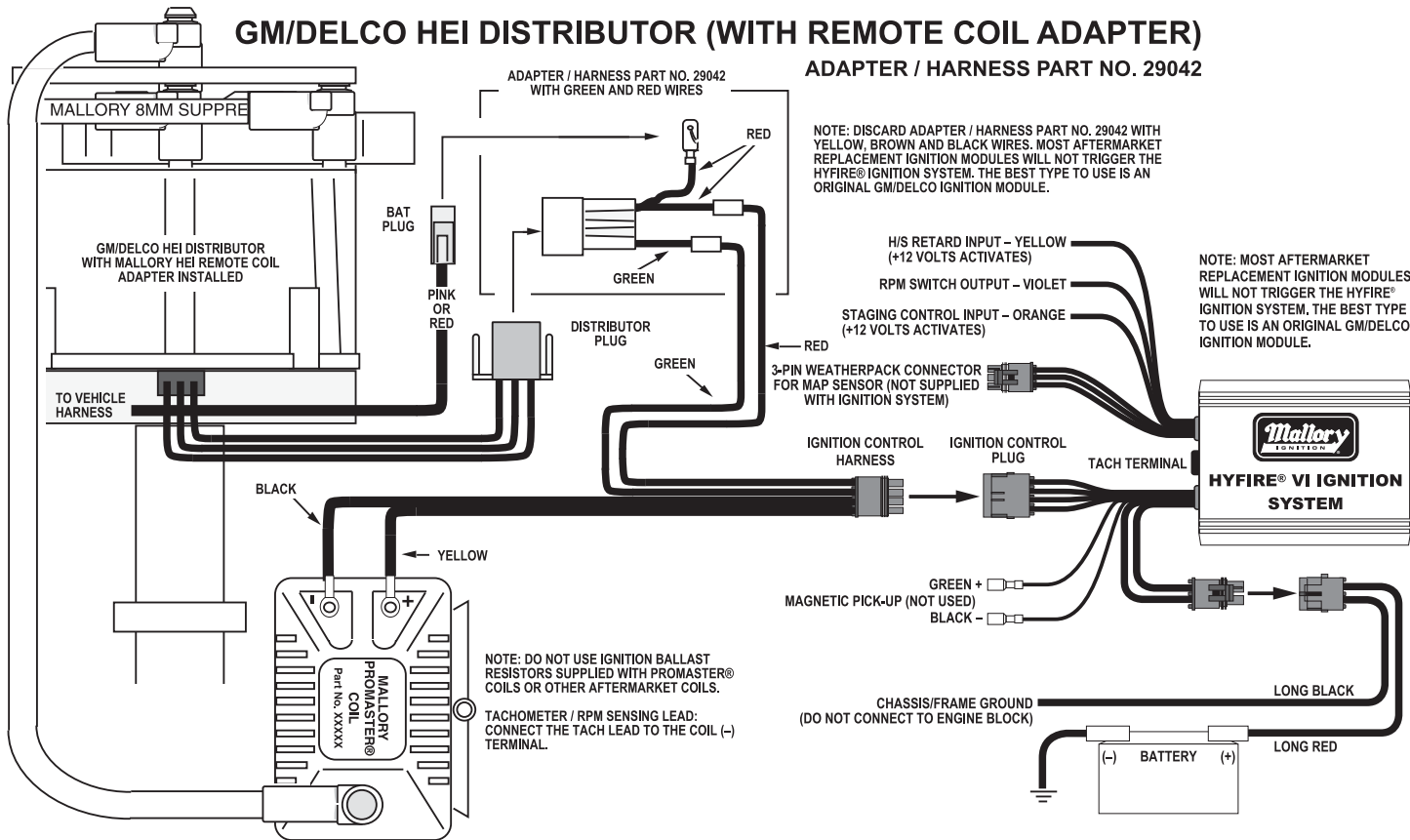
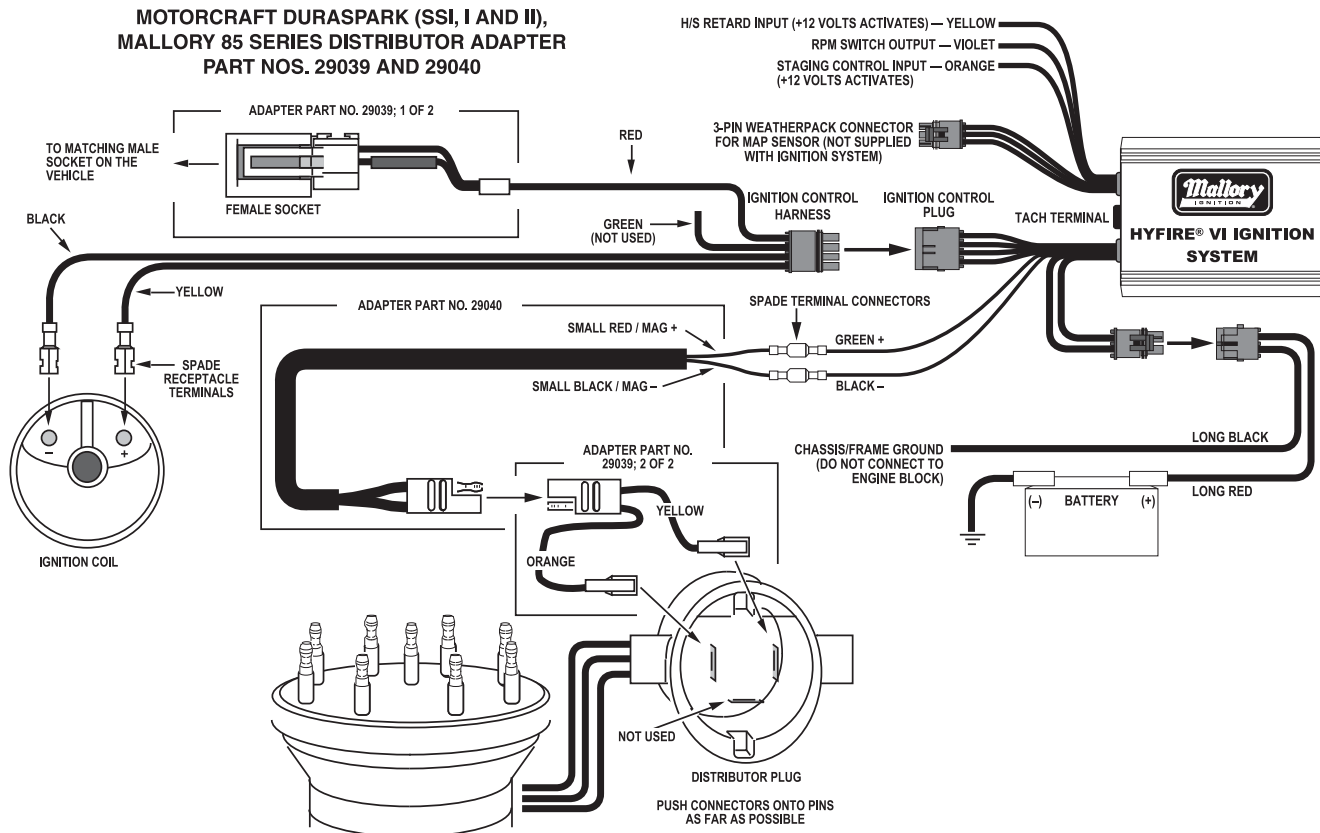


FIGURE 7



## FORD AND AMERICAN MOTORS

FIGURE 8



**Connecting to Ford DuraSpark Systems (non-computer type) using Adapter PART NO. 29039 and Harness PART NO. 29040 for OEM magnetic pickup**

Refer to Figure 8 while performing the following steps.

**Connecting Adapter PART NO. 29039:**

- Disconnect all connectors at the ignition module, ignition coil and distributor. Remove the ignition module. Remove the distributor and coil harnesses.
- Connect the Adapter ORANGE WIRE to the distributor plug's ORANGE WIRE.
- Connect the Adapter YELLOW WIRE to the distributor plug's PURPLE WIRE.
- Connect the other Adapter female socket to the vehicle's matching male socket. (The matching male socket was originally connected the ignition module.)

**Connecting the Harness PART NO. 29040:**

- Connect the HYFIRE® VI Electronic Ignition Control's SMALL GREEN WIRE to the Harness RED WIRE.
- Connect the HYFIRE® VI Electronic Ignition Control's SMALL BLACK WIRE to the Harness BLACK WIRE.
- Connect the mating plug of the Harness to the mating plug of the Adapter Part No. 29039 from the distributor.

**Connecting the Ignition Control Harness:**

- Route the Ignition Control Harness to the coil so that its wires do not make contact with extreme heat, sharp objects or moving devices such as fans, belts and linkages.
- Crimp the Ignition Control Harness RED WIRE to the slice connector on the Adapter Part No. 29039 female socket.
- Crimp a spade receptacle terminal on the Ignition Control Harness YELLOW WIRE. Connect the YELLOW WIRE to the ignition coil (+) terminal. DO NOT allow any wire except the YELLOW WIRE to make contact with the coil (+) terminal.
- Crimp a spade receptacle terminal on the Ignition Control Harness BLACK WIRE. Connect the BLACK WIRE to the ignition coil (-) terminal.
- NOTE: Do not connect the GREEN WIRE of the Ignition Control Harness to anything. Tape the end of the wire to insulate it.
- Go to Step 3, page 9.

**Connecting to Early Model GM HEI Systems (non-computer type) using Adapter PART NO. 29043 and Harness PART NO. 29040 for OEM magnetic pick-up. Refer to Figures 11 and 12 while performing the following steps.**

**Connecting Adapter PART NO. 29043:**

**For coil-in-cap distributors only**

- Disconnect the (RED or PINK) BAT PLUG/wire from the distributor cap.
- Disconnect the tachometer wire from the TACH terminal on the distributor cap.
- Disconnect the distributor plug from the distributor cap. For coil-in-cap distributors and external coil
- Remove the distributor cap.
- Disconnect the pickup plug from the ignition module.
- Remove the ignition module, radio noise filter/capacitor and distributor plug harness.
- Slide the Adapter ORANGE and YELLOW WIRES through the grommet (supplied).
- Connect the Adapter ORANGE WIRE to the pickup plug's WHITE WIRE.
- Connect the Adapter YELLOW WIRE to the pickup plug's GREEN WIRE.
- Position the grommet into the slot on the edge of the distributor housing. Use cable ties and 8-32 screws to hold wires in place.
- Install the distributor cap.

**Connecting the Harness PART NO. 29040:**

- Connect the HYFIRE® VI Electronic Ignition Control's SMALL GREEN WIRE to the Harness RED WIRE.
- Connect the HYFIRE® VI Electronic Ignition Control's SMALL BLACK WIRE to the Harness BLACK WIRE.
- Connect the mating plug of the Harness to the mating plug of the Adapter Part No. 29043 from the distributor.

**Connecting the Ignition Control Harness:**

- Route the Ignition Control Harness to the coil so that its wires do not make contact with extreme heat, sharp objects or moving devices such as fans, belts and linkages.
- Crimp a spade terminal on the Ignition Control Harness RED WIRE.

**For coil-in-cap distributors only**

Refer to Figure 10 while performing the following steps.

- Connect the BAT PLUG/wire to the RED WIRE.
- Crimp the YELLOW WIRE to the YELLOW WIRE of the Adapter Part No. 29043 3-pin connector.
- Crimp the BLACK WIRE to the BROWN WIRE of the Adapter Part No. 29043 3-pin connector.
- Plug the Adapter Part No. 29043 3-pin connector into the distributor cap.
- Note: DO NOT connect the GREEN WIRE of the Ignition Control Harness to anything. Tape the end of it to insulate it.
- Go to Step 3, page 9.

**For external coil only**

Refer to Figure 11 while performing the following steps.

*(Replace the words "spade receptacle terminal" with "ring terminal" when aftermarket coils with post type terminals are used.)*

- Disconnect the BAT wire from the ignition coil BAT/(+) terminal. Connect the BAT wire to the RED WIRE.
- Disconnect the tachometer wire from the ignition coil TACH/(-) terminal.
- Crimp a spade receptacle terminal on the Ignition Control Harness YELLOW WIRE. Connect the YELLOW WIRE to the ignition coil BAT/(+) terminal. DO NOT allow any wire except the YELLOW WIRE to make contact with the ignition coil BAT/(+) terminal.
- Crimp a spade receptacle terminal on the Ignition Control Harness BLACK WIRE. Connect the BLACK WIRE to the ignition coil BAT/(-) terminal.
- Discard the adapter plug with the yellow and brown wires from the Adapter PART NO. 29043. It is not used on external ignition coil HEI systems.
- Note: DO NOT connect the GREEN WIRE of the Ignition Control Harness to anything. Tape the end of it to insulate it.
- Go to Step 3, page 9.

**Connecting to Mopar/Chrysler Electronic Systems (non-computer type) using Harness PART NO. 29040 for OEM magnetic pickup**

Refer to Figure 12 while performing the following steps.

- Disconnect all connectors at the ignition module, ignition coil and distributor. Remove the ignition module. Take notice of a DARK GREEN/RED WIRE connected to the ignition ballast resistor. Remove the distributor and coil harnesses.

**Connecting the Harness PART NO. 29040:**

- Connect the HYFIRE® VI Electronic Ignition Control's SMALL GREEN WIRE to the Harness RED WIRE.
- Connect the HYFIRE® VI Electronic Ignition Control's SMALL BLACK WIRE to the Harness BLACK WIRE.
- Connect the mating plug of the Harness to the distributor plug.

**Connecting the Ignition Control Harness:**

- Route the Ignition Control Harness to the ignition coil so that its wires do not make contact with extreme heat, sharp objects or moving devices such as fans, belts and linkages.
- Connect the RED WIRE to the terminal on the ignition ballast resistor that previously had the DARK GREEN/RED WIRE connected to it (or to a 12-volt wire from the ignition switch). NOTE: The RED WIRE must get voltage when the ignition switch is in the START and RUN positions.
- Connect the YELLOW WIRE to the ignition coil (+) terminal. DO NOT allow any wire except the YELLOW WIRE to make contact with the ignition coil (+) terminal.
- Connect the BLACK WIRE to the ignition coil (-) terminal.
- DO NOT connect the GREEN WIRE of the Ignition Control Harness to anything. Tape the end of it to insulate it.
- Go to Step 3, page 9.

**(2b) Wiring method without adapters; all breaker point distributors; Mallory Electronic Ignitions (three wire/red, brown, green); OEM electronic ignition amplifiers.**

Refer to: Figure 13 for breaker point distributors; Figure 15 for Mallory UNILITE® Distributors, Magnetic Breakerless Distributors or Electronic Advance Distributors (three wire/red, brown, green); Figure 16 for OEM electronic ignition amplifiers

**Connecting the Ignition Control Harness**

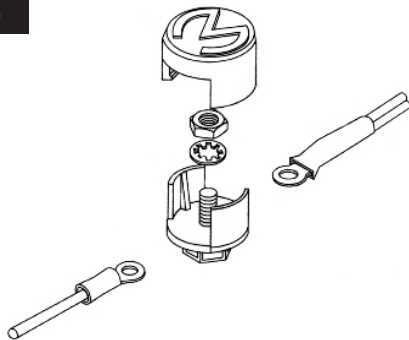
- Route the Ignition Control Harness to the ignition coil so that its wires do not make contact with extreme heat, sharp objects or moving devices such as fans, belts and linkages.
- Disconnect ALL wires located on the ignition coil (+) terminal. These include the wires from the ignition switch/ignition ballast resistor, start/ignition bypass and any other wires normally connected to the ignition coil (+) terminal. Connect these wires to the RED WIRE. NOTE: The RED WIRE must get voltage when the ignition switch is in the START and RUN positions. If you are using a Mallory Electronic Ignition, connect its BROWN WIRE to engine ground and add its RED WIRE to the Ignition Control Harness RED WIRE. Use Ring Terminal Connectors to join wires together (See page 2 - Ignition Ballast Resistor / Loom Resistance Wire and Standard Ignition Bypass).
- Similarly, disconnect ALL wires located on the ignition coil (-) terminal. Connect these wires to the GREEN WIRE. If you are using a Mallory Electronic Ignition, add its GREEN WIRE to the Ignition Control Harness GREEN WIRE. Use Ring Terminal Connectors to join wires together.
- Connect the YELLOW WIRE to the ignition coil (+) terminal. DO NOT allow any wire except the YELLOW WIRE to make contact with the ignition coil (+) terminal.
- Connect the BLACK WIRE to the ignition coil (-) terminal.
- Go to Step 3, page 9.

**RING TERMINAL CONNECTORS:**

Furnished with the HYFIRE® VI Electronic Ignition Controls are two Ring Terminal Connectors for the convenience of getting a neat installation when the HYFIRE® VI Electronic Ignition Control is added to an existing ignition system. These Ring Terminal Connectors allow the existing ignition system wiring to remain in the area of the ignition coil.

- Move wires onto the stud that is inside the Ring Terminal Connector body.
- Secure these wires to the stud with the nut and washer.
- Install the Ring Terminal Connector cap.

**FIGURE 10**



**(2c) Wiring Method without adapters for Magnetic Pickup Trigger Pulses (Non-Computer Type); Magnetic Pickup Distributors or Crank Trigger Ignition**

Connecting to Magnetic Pickup Distributors and Crank Trigger Ignition – Refer to Figure 17.

- Connect the magnetic pickup (+) wire to the SMALL GREEN WIRE from the HYFIRE® VI Electronic Ignition Control.
- Connect the magnetic pickup (-) wire to the SMALL BLACK WIRE from the HYFIRE® VI Electronic Ignition Control.

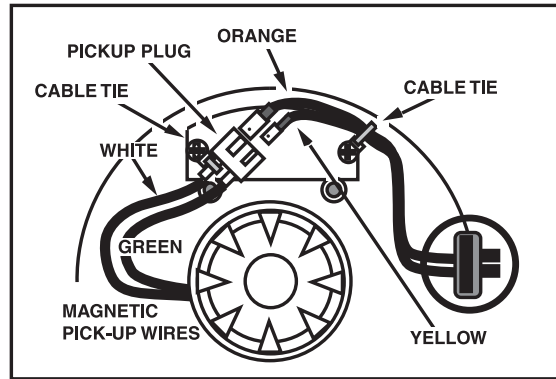
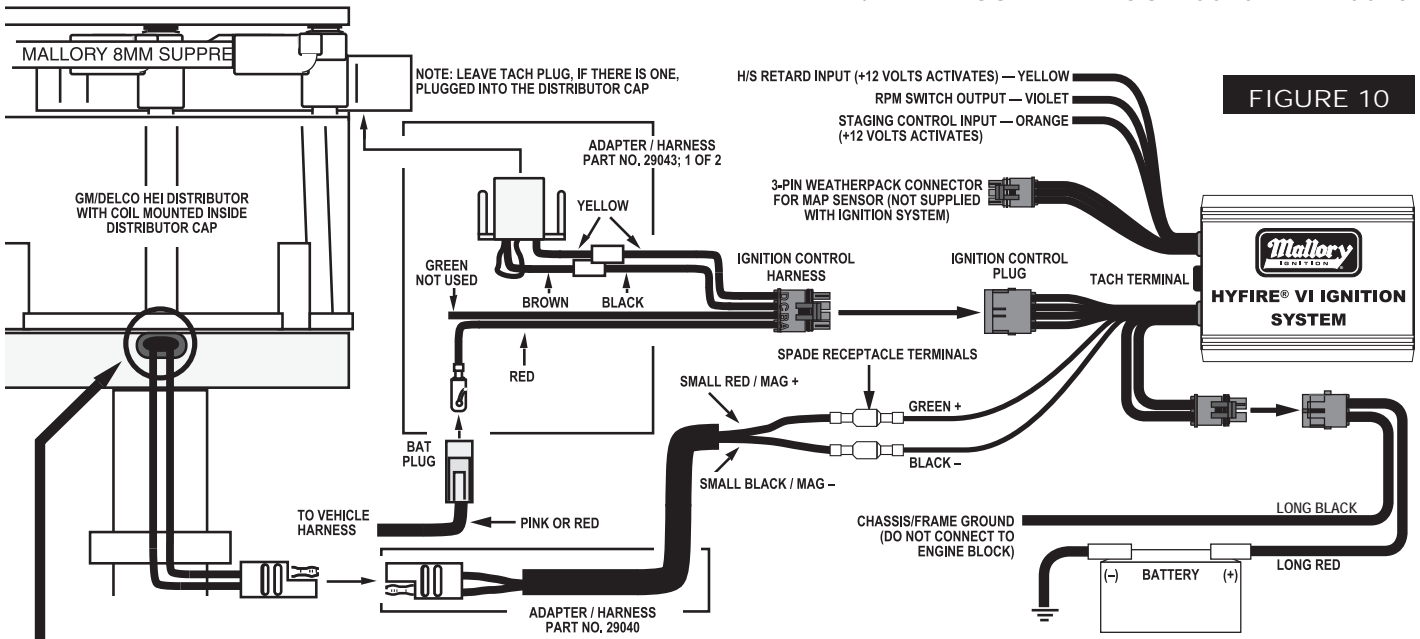
**Connecting the Ignition Control Harness:**

- Route the Ignition Control Harness to the ignition coil so that its wires do not make contact with extreme heat, sharp objects or moving devices such as fans, belts and linkages.
- Connect the RED WIRE to the 12-volt wire from the ignition switch. NOTE: The RED WIRE must get voltage when the ignition switch is in the START and RUN positions. Use a Ring Terminal Connector to join wires together.
- Connect the YELLOW WIRE to the ignition coil (+) terminal. DO NOT allow any wire except the YELLOW WIRE to make contact with the ignition coil (+) terminal.
- Connect the BLACK WIRE to the ignition coil (-) terminal.
- DO NOT connect the GREEN WIRE of the Ignition Control Harness to anything. Tape the end of it to insulate it.
- Go to Step 3, Page 9.

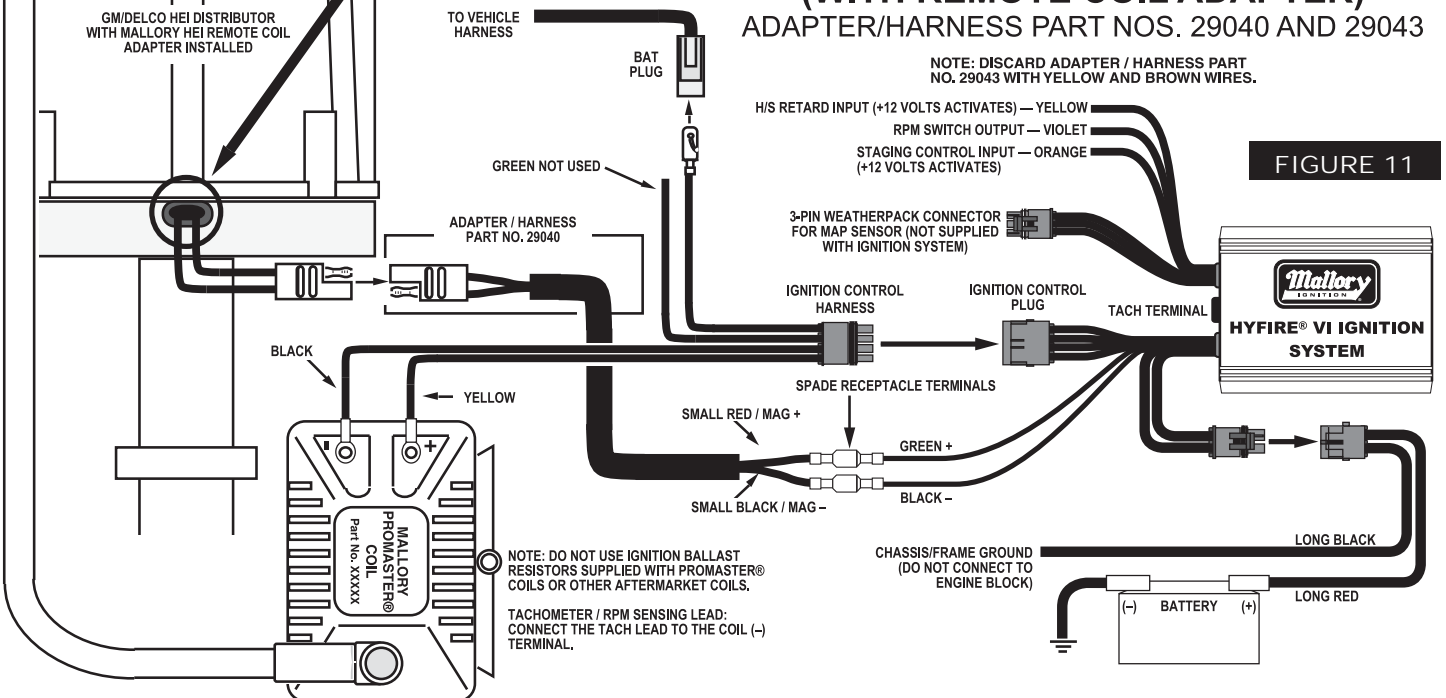
MAGNETIC PICKUP/CRANK TRIGGER COLOR CODES		
BRAND/TYPE	MAG+	MAG-
MALLORY CRANK TRIGGER	PURPLE	GREEN
MALLORY BILLET COMPETITION DISTRIBUTOR, SERIES NOS. 81 AND 84	ORANGE	PURPLE
MALLORY COMP 9000® SERIES NOS 96-99	ORANGE	PURPLE
MALLORY HARNESS PART NO. 29040	RED	BLACK
MSD™ CRANK TRIGGER	PURPLE	GREEN
MSD™ CRANK TRIGGER (OLD STYLE)	ORANGE	BLACK
MSD™ DISTRIBUTOR	ORANGE	PURPLE
MOROSO™ CRANK TRIGGER	BLACK	WHITE
ACCEL® CRANK TRIGGER	BLACK	WHITE
CHRYSLER ELECTRONIC DISTRIBUTOR	ORANGE	BLACK
FORD DURASPARK DISTRIBUTOR	ORANGE	PURPLE
DELCO/GM HEI DISTRIBUTOR	WHITE	GREEN



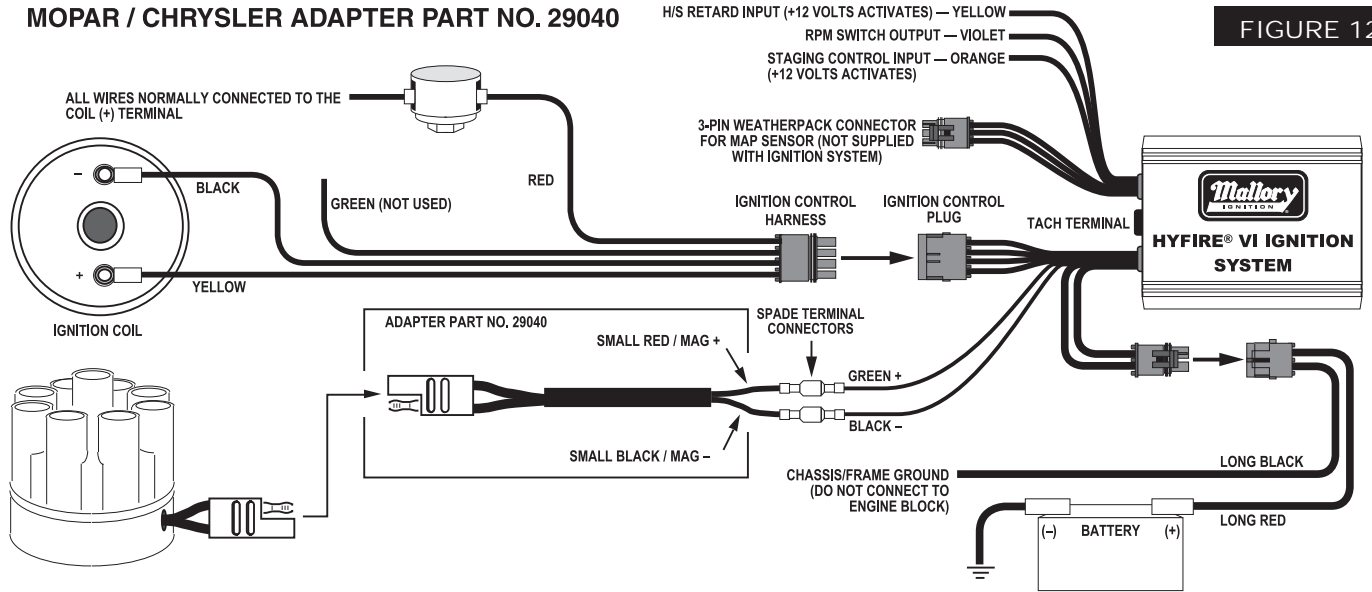
# GM/DELCO HEI DISTRIBUTOR (WITH COIL MOUNTED INSIDE DISTRIBUTOR CAP) ADAPTER/HARNESS PART NOS. 29040 AND 29043



# GM/DELCO HEI DISTRIBUTOR (WITH REMOTE COIL ADAPTER) ADAPTER/HARNESS PART NOS. 29040 AND 29043

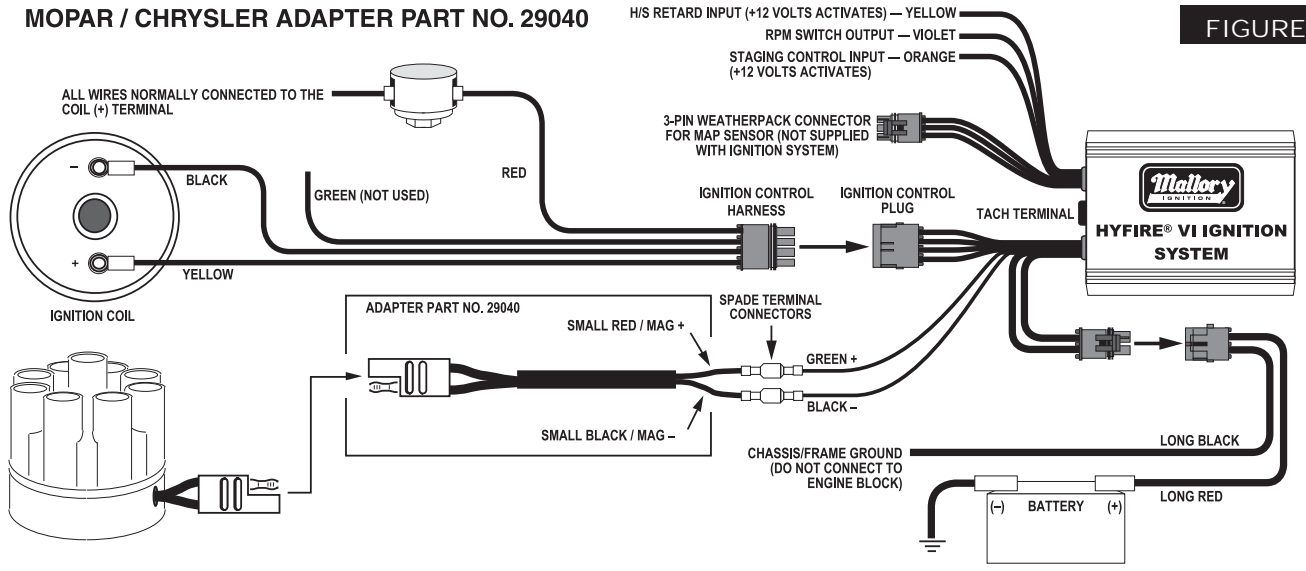


**MOPAR / CHRYSLER ADAPTER PART NO. 29040**



**FIGURE 12**

**MOPAR / CHRYSLER ADAPTER PART NO. 29040**



**FIGURE 13**

**Step 3**

**Tachometer Operation:**

If a tachometer is used, connect tachometer ignition sensing lead to the TACH terminal on the HYFIRE® VI Electronic Ignition Control.

If the tachometer does not work after being connected to the TACH terminal, connect the tachometer ignition sensing lead to the GREEN WIRE from the Ignition Control Harness. If this does not work, your tach is a high voltage trigger tach and will require the Mallory Fuel Injection and Tachometer Adapter Part No. 29074 or 29078 to supply the proper signal for the tachometer to operate.

**Step 4**

Secure all wires with cable ties to prevent contact extreme heat, sharp objects or moving devices such as fans, belts and linkages.

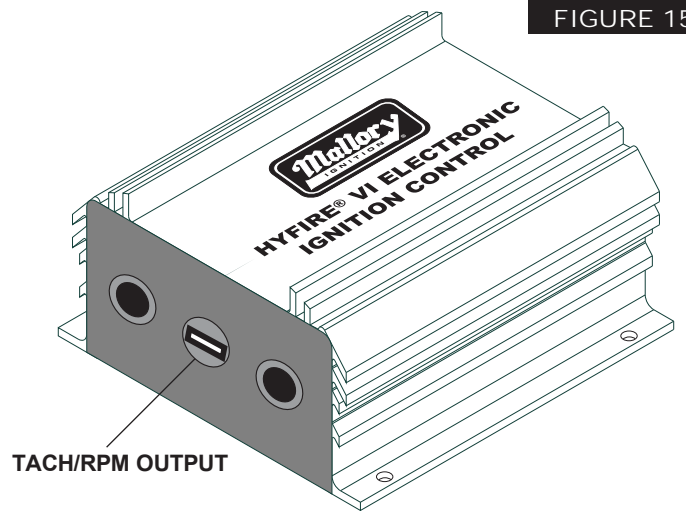
**Step 5**

Recheck all wire and connections to ensure they are correct before applying power.

**Step 6**

Connect the battery (-) terminal cable. Start engine and check operation of the ignition system.

**FIGURE 15**



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

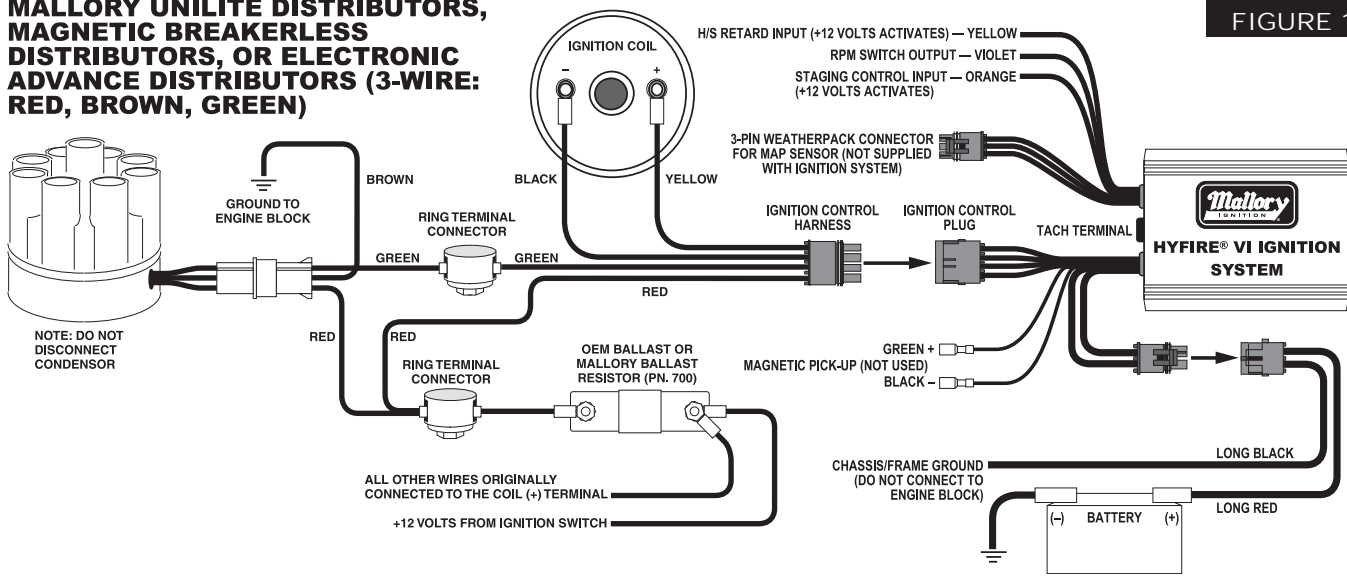


FIGURE 15

**OEM IGNITION AMPLIFIER**

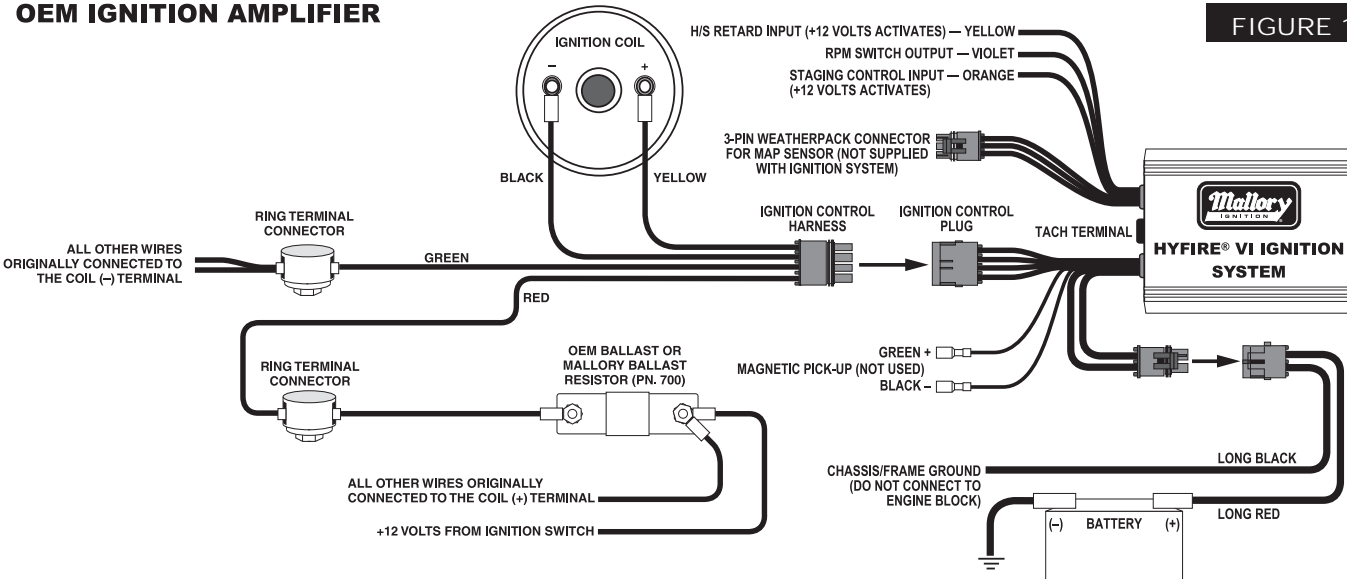


FIGURE 16

**MAGNETIC PICK-UP DISTRIBUTOR OR CRANK TRIGGER IGNITION**

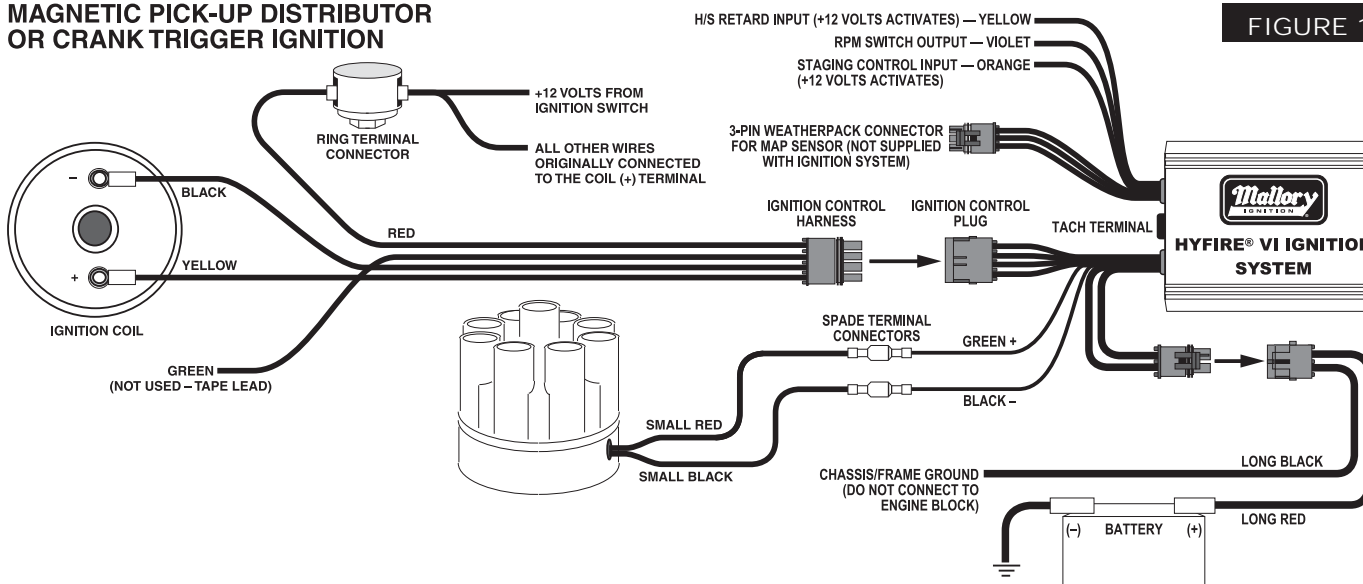


FIGURE 17

## Top Panel Operation and Features

### Mallory HYFIRE® VI 685 CD Ignition System

The Mallory HYFIRE® VI 685 ignition system has a number of features that are set up by using the top panel display and switches. Here is a list of the different features (or modes):

Mode 1 – This is the normal engine protection RPM limit. It is active if no other RPM limit is selected. The range of this limiter is 1000 to 12800 in steps of 100 RPM.

Mode 2 – This is the auxiliary RPM limiter, and it is activated when 12 volts is applied to the ORANGE wire coming out of the end panel. The range is the same as the Mode 1 RPM limiter. This RPML will over-ride the Mode 1 RPML when it is active.

Mode 3 – This is a selectable high-speed timing retard. It is selected when the YELLOW wire coming out of the end panel has 12 volts applied. The range is 1 to 15 degrees in .1 degree steps.

Mode 4 – Start retard value. This amount of retard is applied whenever the engine RPM is below 500. The range is .1 to 10 degrees in .1 degree steps.

Modes 5 and 6 – These two control the built-in RPM activated “window” switch. Mode 5 sets the RPM where the switch activates, and mode 6 sets the RPM where the switch de-activates. This is useful if, for example, you want to have your nitrous system only work within a certain RPM range. The output wire for the RPM switch is the VIOLET wire coming out of the end panel. It is connected to ground when the switch is active, and has a maximum current rating of 10 amps. NOTE: The RPM range for this switch is 1000 to 12, 8000 and the *off* RPM (mode 6) must be at least 100 RPM higher than the *on* RPM (mode 5).

Mode 7 – Tach test. This feature allows you to check the accuracy of your tachometer and any accessories connected to the tach output terminal. It also will activate the built-in RPM switch in the Hyfire. To use the tach test feature, turn the ignition switch on without starting the engine. Select mode 7. Turn the ignition switch off briefly, then back on again. The HYFIRE® will be generating a signal at the tach output terminal at the RPM displayed on the top panel. You can use the UP and DOWN arrow keys to change the RPM to the desired value.

To return to normal operation, select mode 1. Turn the ignition switch off. The next time the ignition switch is turned on, the HYFIRE® will be out of the tach test mode.

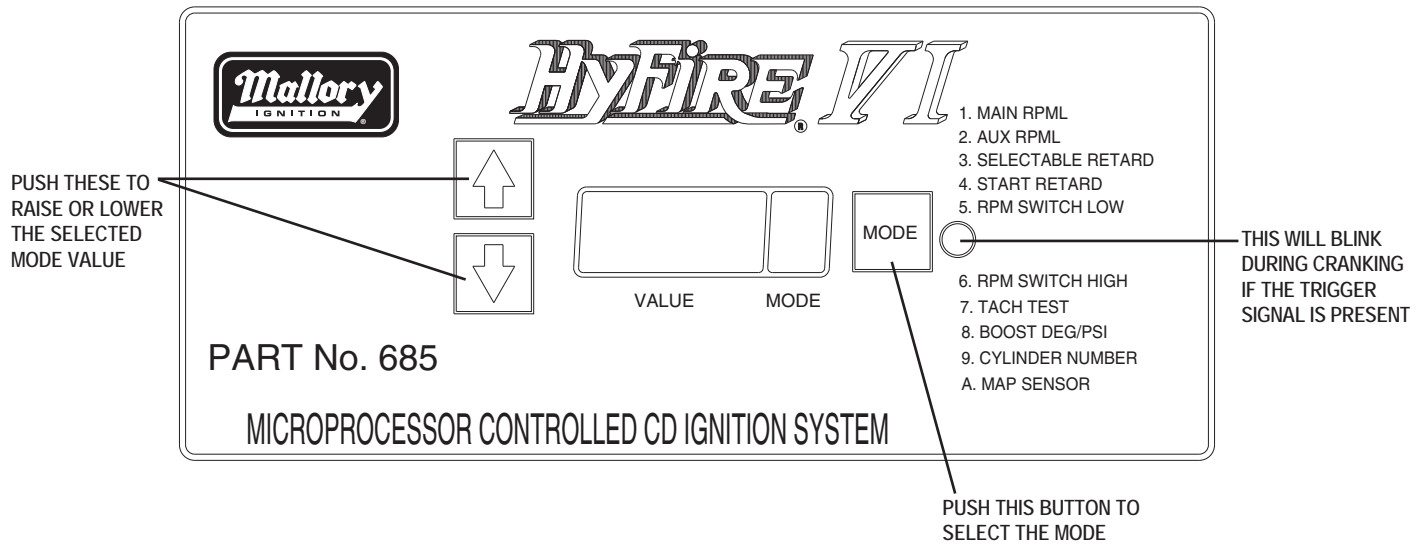
Mode 8 – Boost timing retard degrees per PSI of boost. If you have an optional MAP sensor connected, the HYFIRE® 685 will retard the timing as the boost pressure increases. Mode 8 tells the system how many degrees to retard the timing for each pound of boost. The MAP sensor plugs into the 3 wire connector that comes out of the front panel. If you don't have a MAP sensor installed, this function has no effect.

Mode 9 – Cylinder number select. Set this to however many cylinders your engine has. The range is 3 to 12, *even-fire ONLY!*

Mode A – MAP sensor select. There are two MAP sensors available that are compatible with the HYFIRE® 685. One is a 2 Bar sensor (Accel P/N 74776), which is good for about 15 PSI of boost, and the other is a 3 Bar sensor (Accel P/N 74777), good for about 30 PSI of boost. Use mode A to tell the HYFIRE® 685 which sensor you are using. If you don't have a MAP sensor installed, this function has no effect.

To use the boost retard feature, you must use the Mallory P/N 29785 harness and appropriate MAP sensor, as referenced above. Both the harness and the MAP sensors are available separately.

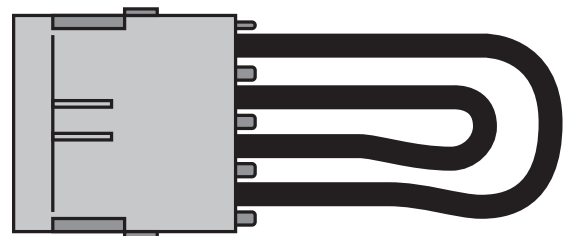
FIGURE 19



### BYPASS CONNECTOR

The Bypass Connector (standard ignition bypass) fits into the mating plug of the Ignition Control Harness to convert back to standard 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. DO NOT put the Bypass Connector into the mating plug of a Mallory HYFIRE® VI RPM Limiting Adapter, or Single or Multi Stage High Speed Retard. DO NOT put the Bypass Connector into the mating plug of a Mallory Electronic Advance Computer or Remote Timing Control. 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 20



## HYFIRE® 6851 IGNITION SYSTEM

The Mallory HYFIRE® 6851 ignition system has the same basic connections as the 685 ignition system. However, the only accessory included is an RPM activated switch. This RPM switch is controlled by two rotary DIP switches that are located behind an access plate on the top of the unit (see the illustration below). Loosen the two screws to gain access to the switches.

You can select 4 or 6 cylinder operation, and an RPM switch value from 1000 to 9900 RPM. Use a small screwdriver or similar to select 4 or 6 cylinder mode, if desired. If both these switches are off, the unit is in 8 cylinder mode. Use a screwdriver to set the 1000 RPM and 100 RPM switches to the desired setting. When you reach this RPM, the violet wire coming out of the end panel will be connected to ground (10 amp maximum).

## OPTIONAL IGNITION ACCESSORIES

### *Multi Stage High Speed Retard – Part No. 618-3*

This is a finger tip adjustable 3-stage timing retard control with an adjustment range for the first and second stage of 0°-15° and a range of 0°- 20° for the third stage. Each succeeding stage overrides the previous stage to allow you to reduce (or add) ignition timing on a succeeding stage. This retard is designed to be easily added to the HYFIRE® VI Electronic Ignition Control.

### *Mallory Electronic Advance Computer – Part Nos. 600-04, 600-06 and 600-08*

This is a user programmable advance curve system using a CMOS microprocessor for advance calculations. This allows you to select from 256 different advance curve combinations! It is designed with matching mating plugs so it can be added between the HYFIRE® VI Electronic Ignition Control and the Ignition Control Harness.

### *Mallory Remote Timing Control – Part No. 631*

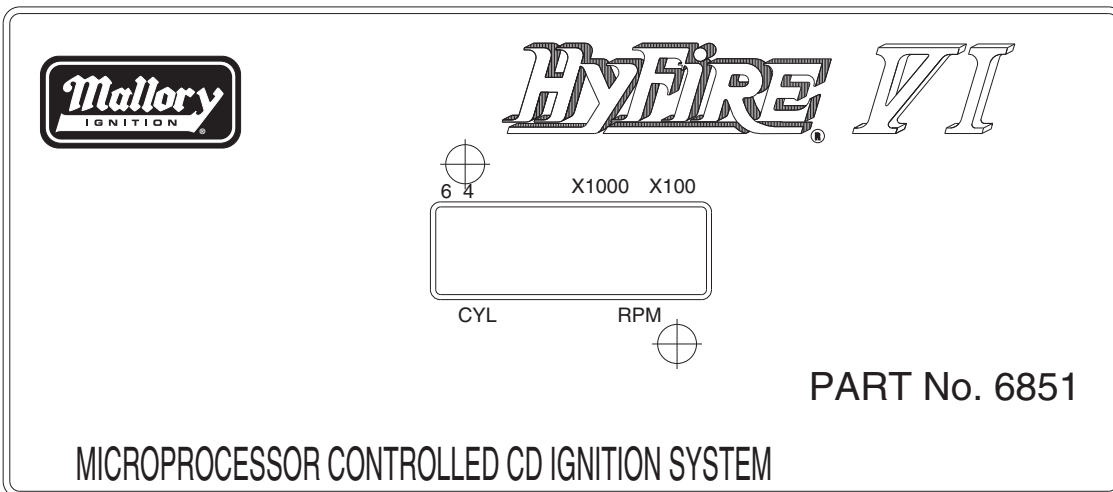
Mallory's Remote Timing Control allows you to change the ignition timing as you drive for maximum performance, for better fuel economy or to avoid engine knock.

**NOTE: The accessories listed above will not work properly with odd-fire V6 applications or point trigger distributors. They are not designed for marine use.**

### *Mallory Fuel Injection and Tachometer Adapter – Part No. 29074 and 29078*

Some applications with fuel injection or a tachometer need a voltage spike signal from the negative side of the coil before they will operate properly. This signal changes once the HYFIRE® VI Electronic Ignition Control is installed. Mallory's adapter provides the proper signal to trigger most fuel injection systems and voltage/current triggered tachometers.

FIGURE 21





## TROUBLESHOOTING GUIDE FOR CAPACITIVE DISCHARGE (CD) IGNITION SYSTEMS

Most CD boxes operate the same way, making for common basic test procedures. Most CD ignition boxes have two separate triggering circuits in them. One is for a regular points driver signal, which is a square wave, and one for 2 wire magnetic, which is a sine wave, and the two have slightly different test procedures.

Before beginning any testing, start with the basics. Using your ignition instructions as a guide, recheck all of the connections and terminals, and make sure the wires are routed correctly and are free from abrasions or other damage. Some ignitions also are equipped with indicator lights that can check the power source and some internal circuits.

### IGNITION BOXES USING SINGLE WIRE POINTS TYPE TRIGGERING

If the box powers up but does not fire the coil and the white wire is being used as the trigger source, the following tests should be done:

1. With the key off, remove the coil wire from distributor cap and get it where you can jump a spark to the block, with a gap of about 1/2 inch. Separate the triggering wire that connects the box and the distributor together, the wire colors will differ between boxes and distributor combinations, for example: MSD, Crane, ACCEL and Mallory boxes are white. On the Mallory Hyfire I's to IV's and the new Hyfire VI (6) P/N 685, this wire is green. Refer to your ignition's instruction sheet to confirm the color of the wire.
2. Turn the ignition switch to the "ON" position. While holding the coil wire close to the engine block, tap the white wire to an engine ground. This will trigger the box and should fire the coil, jumping a spark to ground through the coil wire. If there is no spark from the coil wire and no audible snap comes from the box, the box is bad. If you hear a snap in the box but no fire at the coil wire, then the coil or the coil wire could be bad and they need to be tested.
3. If the test comes out positive and the box, coil and coil wire are working, the distributor is either not working or is improperly wired into the system and the installation instructions should be revisited.

### IGNITION BOXES USING TWO WIRE MAGNETIC TYPE TRIGGERING

1. With the key off, remove the coil wire from the distributor and position the wire so a spark can be jumped to the block, with a gap of about 1/2 inch. Disconnect the 2 magnetic wires from the box and lay them aside. Next take a short piece of wire and bend it in the shape of a "U". This wire will be used to short the 2 wires of the magnetic connector on the box together.
2. With the key in the "ON" position, the coil wire where you can jump a spark to the engine block, and using the "U" shaped wire you have made up, short the two wires in the connector of the box together and then disconnect the shorting wire.
3. Each time you disconnect the shorting wire the box should fire the coil and should jump a spark to ground. If the coil does not fire then either the magnetic circuit in the box is inoperative or the coil or coil wire are bad. Magnetic distributor pickups are generally 400 to 650 ohms of resistance. If it is a crank trigger, the pickup is rated at about 80 ohms resistance.
4. With any of the larger MSD, Crane, and Mallory 7 and 8 boxes the tests are similar. The difference is that they have a terminal strip instead of a wire harness but have the same two circuits in them and test as follows.
5. To test the magnetic circuit in the box simply disconnect the two wire from the "MAG + and MAG -" terminal on the box. Connect a short piece of wire to one of the terminals. With the key on and coil wire ready to jump a spark to the block, rapidly tap the other end of the short jumper wire to the other magnetic terminal. The box should fire the coil.
6. If the trigger is points or Unilite then disconnect the distributor from the box. Connect a long piece of wire to the "Points" terminal of the box. With the key on, rapidly tap this wire to ground and the box should fire the coil.

7. If both of these tests prove out, then the problem is either in the distributor, crank trigger, or the wiring is incorrect.

### TESTING THE COIL

**NOTE:** This test should only be done on "stock type" coils. DO NOT try this test with "CD Only" coils, such as the Mallory 28880 or ACCEL 140019 and 140010.

This test is also helpful in testing the coil when used with just a distributor and you are having a "No Spark" to the plugs condition. When doing this test you must disconnect the distributor from the coil (-) terminal, taking it out of the loop and allowing the test to be done properly.

1. Disconnect the wires coming from the CD box to the coil (+ and -) terminals and connect the ignition switch 12 volts wire to the coil (+) terminal of the coil.
2. Connect a 24" piece of wire to the coil (-) of the coil.
3. Pull the coil wire out of the distributor cap and get it to where you can jump a spark to ground with it.
4. Turn the ignition to the "ON" position.
5. Rapidly tap the 24" wire to ground. This will fire the coil. You should get a 1/4" to 3/8" spark out of the high voltage coil wire to ground. If you do then the coil and coil wire are good and working.
6. If no spark to ground, change out the coil wire and do the test again. If still no spark, the coil is bad and needs to be replaced.