

# **INSTALLATION INSTRUCTIONS**

## **MSD 6-Hemi® Controller for Carbureted and EFI Hemi® Engines PN 6013**

**Parts Included:**

1 - Ignition Controller, PN 6013  
1 - Pro-Data+ Software CD  
1 - Parts Bag  
1 - Mounting Template

**Optional Accessories:**

Hand Held Monitor, PN 7550

**Parts Required, Not Supplied:**

A wiring harness is required to install the 6-Hemi Ignition Controller.

For Carburetor Applications:

'03-'05 Engines - PN 88863

'06-'07 Engines - PN 88864

On engines running factory EFI, one of the above harnesses is required along with a Tach Adapter Harness:

'03-'05 - PN 88815

'05-'07 - PN 88816

**WARNING:** During installation, disconnect the battery cables. When Disconnecting, always remove the Negative cable first and install it last.

**Note:** Solid core spark plug wires or non-resistor spark plugs cannot be used with an MSD Ignition Control.

### **CARBURETOR OR EFI**

The PN 6013 Ignition Controller can be used for Hemi engines that have been retro-fit with an intake manifold and carburetor. A Coil Harness must be purchased separately. There are two different style coils used on late model Hemi engines; PN 88863 for '03-'05 models and PN 88864 for '06-'07 applications. For EFI applications, an additional harness will be required, harness PN 88815, for '03-'05 or PN 88816, for '06-'07 applications. This Adapter Kit allows the PN 6013 Controller to tap into the sensor signals without interrupting the OEM ECU. The ECU and coils operate as normal while the PN 6013 controls the timing and rpm.

### **OPERATION**

The 6-Hemi Controller offers several programmable features. This can be achieved through the supplied Pro-Data+ software via a PC or with the optional Hand Held Programmer, PN 7550. Software installation, operation and the programmable features of the Controller are explained in detail in this document. More information can be found in the Pro-Data+ Software Help section.

### **MOUNTING**

The 6-Hemi Controller is designed to be mounted under the hood or on the firewall. Do not mount the unit near exhaust. Find a suitable location, confirm that all of the wires reach their connections. Mark the mounting hole locations using the unit or the template supplied. Drill the holes with a 3/16" bit.

### **WIRING**

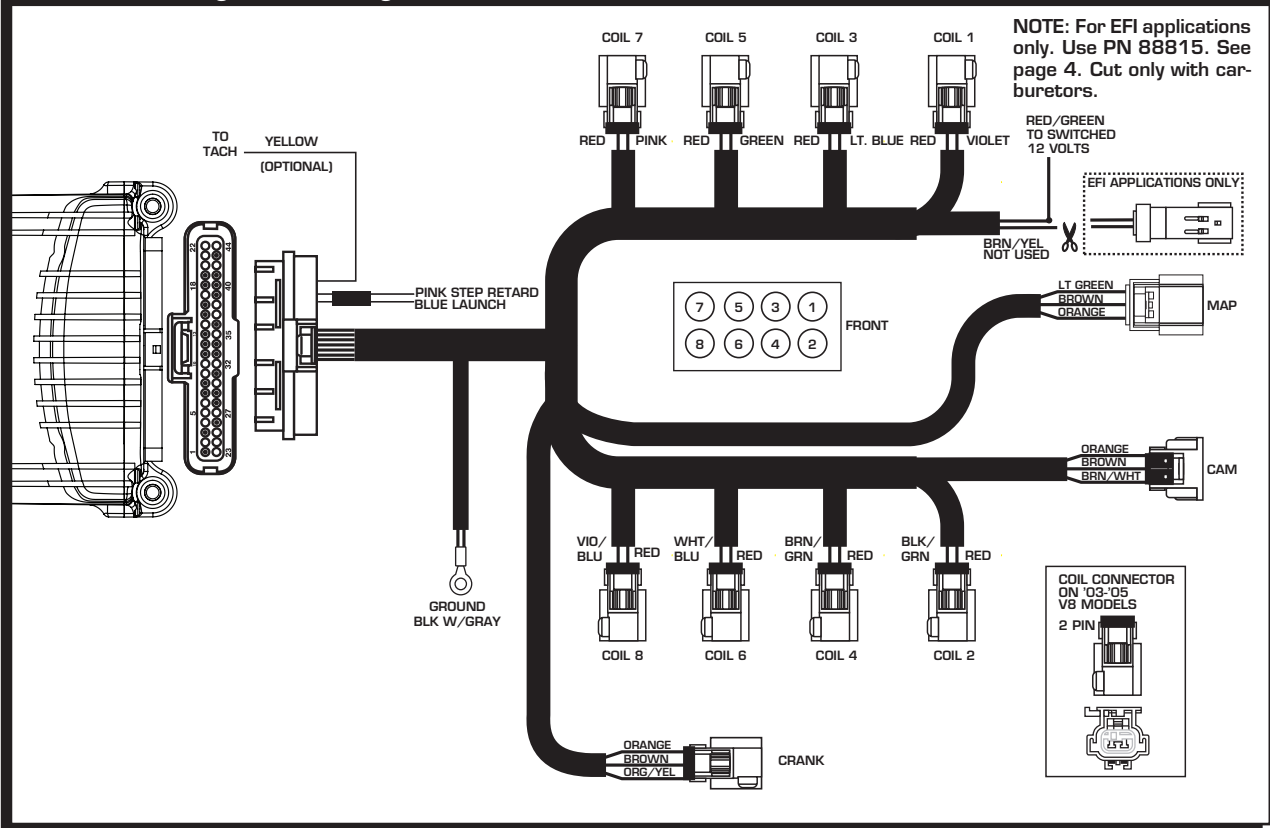
All of the wiring, except four wires, are routed into factory style connectors to ensure an easy installation on a Hemi engine.

**Power wires:** The power wires of the 6-Hemi are routed in a three wires sleeve, with Black connecting to ground and a Red/Green and Brown/Yellow going to a 2-pin connector. For carburetor installations, the Brown/Yellow will not be used and can be cut and sealed while the Red/Green wire is connected to switched 12 volts. The Red/Green wire can be removed from its sleeve close to the ground wires for easier routing to a 12 volt source. On EFI installations the 2-pin connector will plug into the OEM adapter (PN 88815, PN 88816).

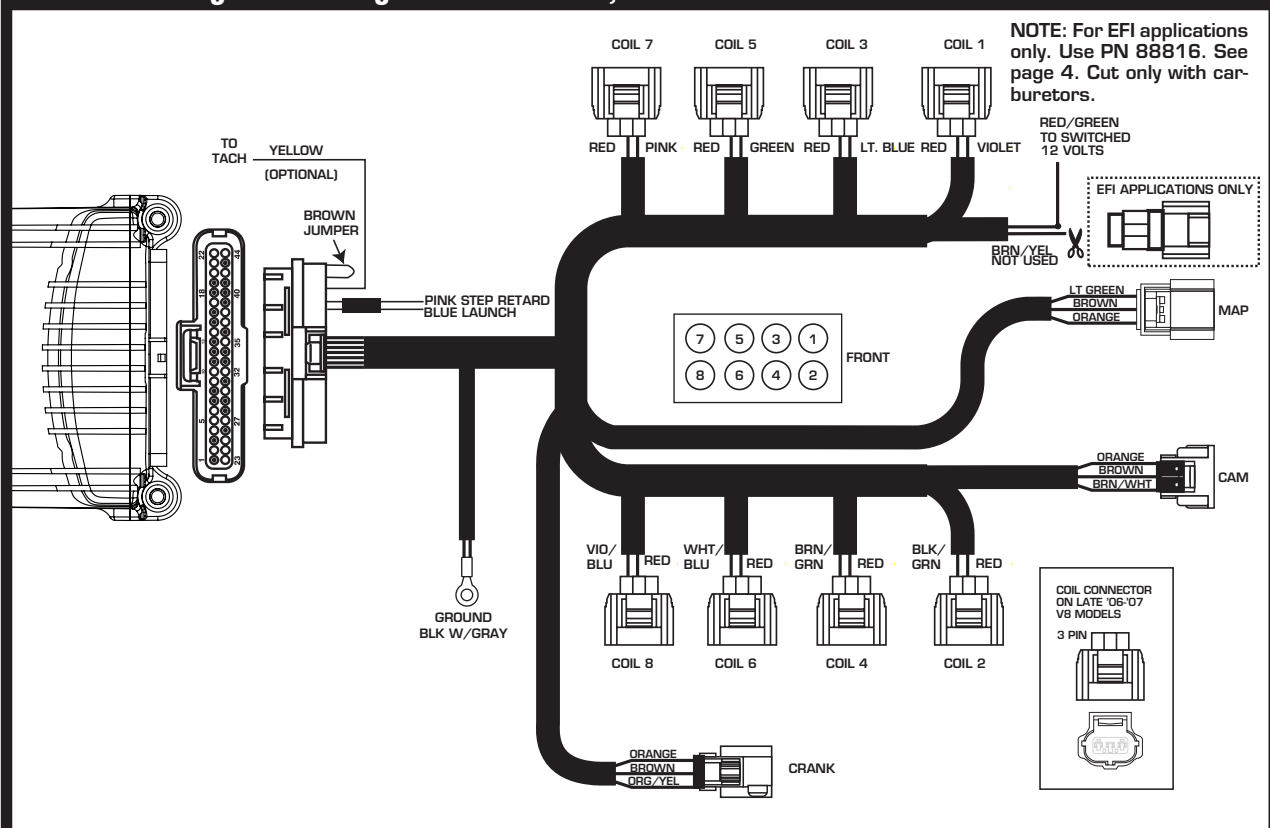
*Hemi is a registered trademark of Chrysler LLC.*

<b>POWER WIRES</b>		
<b>Note:</b> For carburetor applications this connector is cut off and the Brown/Yellow is not used. For EFI applications, this connector connects to the Coil-1 connector (See note on diagram).		
<b>RED/GREEN</b>		12-volt input. Connect to switched 12 volts.
<b>BROWN/YELLOW</b>		Use only with EFI. Coil-1 input wire (See note on EFI diagram).
<b>BLACK/GRAY</b>		Ground. Connect eyelet to ground.
<b>LOOSE WIRES</b>		
<b>YELLOW</b>		Tach Signal. Provides a 12 volt square wave source.
<b>PINK</b>		Step Retard. When 12 volts are applied, the step retard is activated.
<b>BLUE</b>		2-Step. When 12 volts are applied, the RevLaunch rpm value is active.
<b>BROWN</b>		'06-'07 Harness, PN 88864 only: Waste Spark Control. To disable waste spark, cut the wire loop.
<b>MAP SENSOR</b>		
<b>LIGHT GREEN</b>	Pin-1	Map Signal
<b>BROWN</b>	Pin-2	Ground
<b>ORANGE</b>	Pin-3	5-volt supply
<b>CRANKSHAFT SENSOR</b>		
<b>ORANGE</b>	Pin-1	5-volt supply
<b>BROWN</b>	Pin-2	Ground
<b>ORANGE/YELLOW</b>	Pin-3	Crank Signal
<b>CAMSHAFT SENSOR</b>		
<b>BROWN/WHITE</b>	Pin-1	Cam Signal
<b>BROWN</b>	Pin-2	Ground
<b>ORANGE</b>	Pin-3	5-volt supply
<b>COIL CONNECTORS</b>		
<b>Note:</b> PN 88864, '06-'07 applications with 3-pin coil connector. Pin 1 is signal and Pin 2 is 12 volt supply.		
<b>RED</b>	Pin-1	12-volt supply (for all cylinders)
<b>VIOLET</b>	Pin-2	Coil-1 Trigger
<b>BLACK/GREEN</b>	Pin-2	Coil-2 Trigger
<b>LIGHT BLUE</b>	Pin-2	Coil-3 Trigger
<b>BROWN/GREEN</b>	Pin-2	Coil-4 Trigger
<b>GREEN</b>	Pin-2	Coil-5 Trigger
<b>WHITE/BLUE</b>	Pin-2	Coil-6 Trigger
<b>PINK</b>	Pin-2	Coil-7 Trigger
<b>VIOLET/BLUE</b>	Pin-2	Coil-8 Trigger

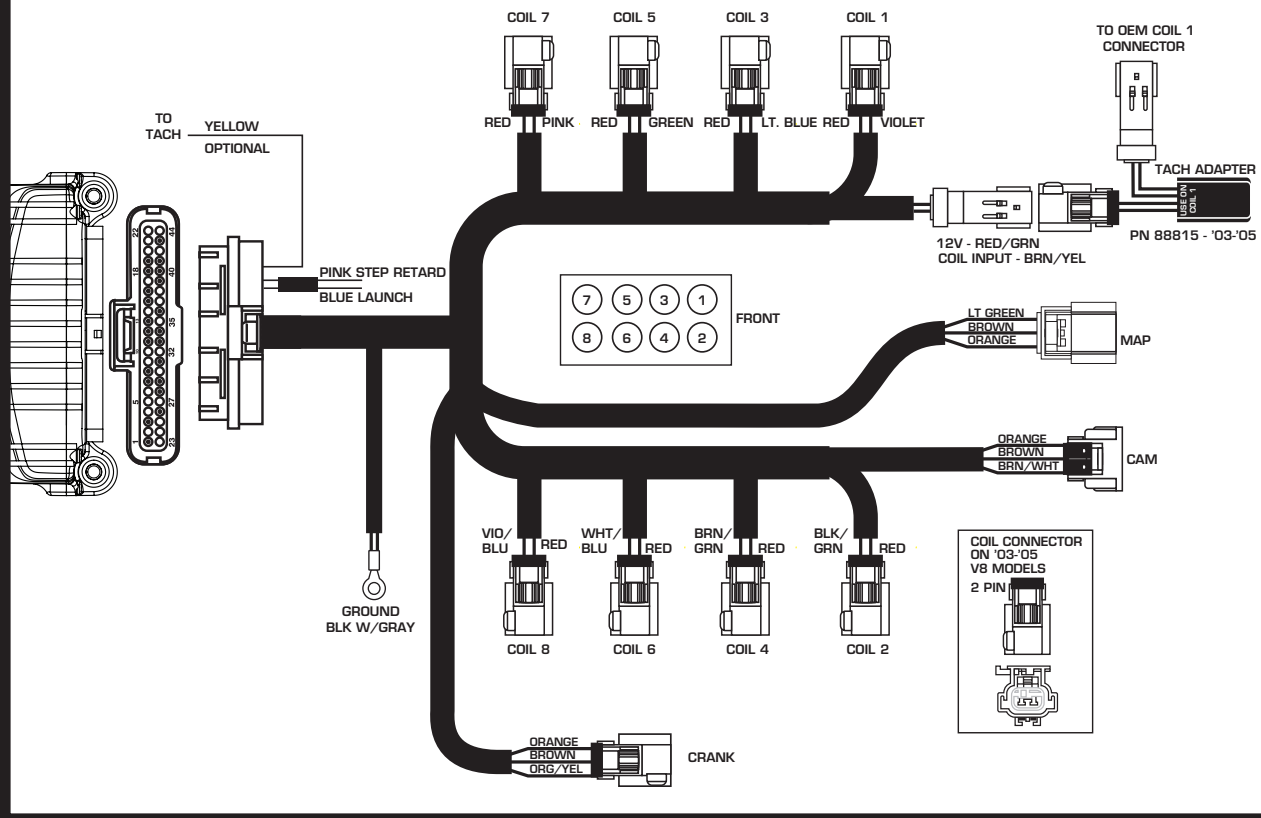
**Figure 1 Wiring with the '03-'05 PN 88863 Harness for Carburetors.**



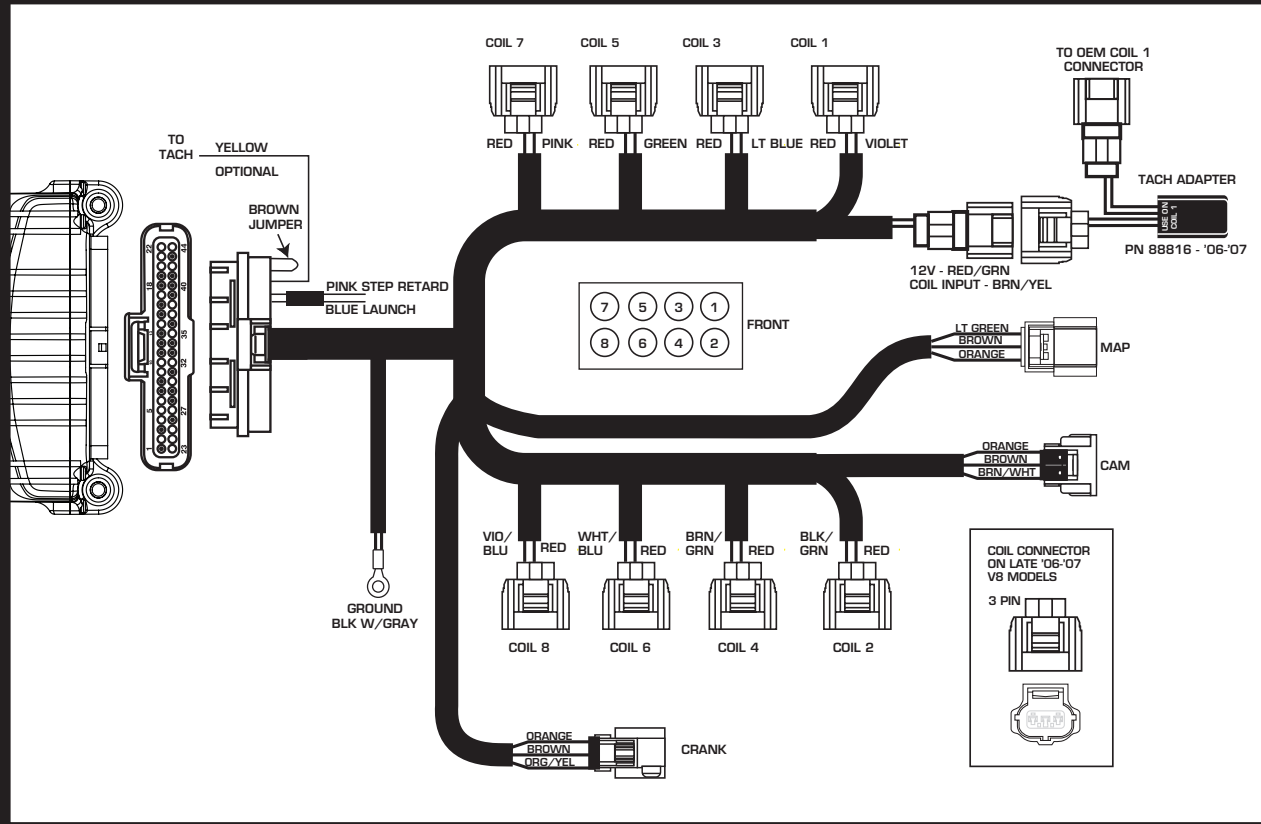
**Figure 2 Wiring with the '06-'07, PN 88864 Harness for Carburetors.**



**Figure 3 Wiring with the '03-'05 PN 88863 Harness with Factory EFI.**



**Figure 4 Wiring with the '06-'07, PN 88864 Harness with Factory EFI.**



**PRO-DATA+**

Installation of the Pro-Data+ Software

1. Insert the installation CD into your PC or download from [www.msddignition.com](http://www.msddignition.com).
2. In Windows, click on Start then select Run.
3. In the box type, "D: Setup" and press Enter (or corresponding drive).
4. The screen will walk you through several steps.
5. Once loaded, your monitor will have an MSD Graph View logo. Click on it to open the software.
6. A program will open. Go to the upper left corner of the screen and click on File, then Open.
7. This will open a menu of part numbers. Select "6013".
8. This will open another menu of versions. Highlight and open the "6013vxx.IGN" (xx determines the versions, such as 02). This will open the Pro-Data+ software for the Ignition Controller.

**Saves and Transfers**

Whenever a change is made to a program, it either must be saved to a file in your PC or it needs to be transferred to the Controller. You will notice that whenever you make a change to a program, the bullet next to the modified value will turn red. It will remain red until you save it to a file or to the MSD. There are two ways to save your files.

**Save to MSD:** This step will save any changes directly into the Controller. If you are only making one or just a couple modifications this works well.

**Save to PC:** This will save your changes to only show on the PC screen (indicated by a red bullet point next to any altered values). These modifications will not be active or saved until you save the file or transfer the information to the MSD.

You can create numerous files on your PC and download them for testing purposes or save programs you used at different races or events.

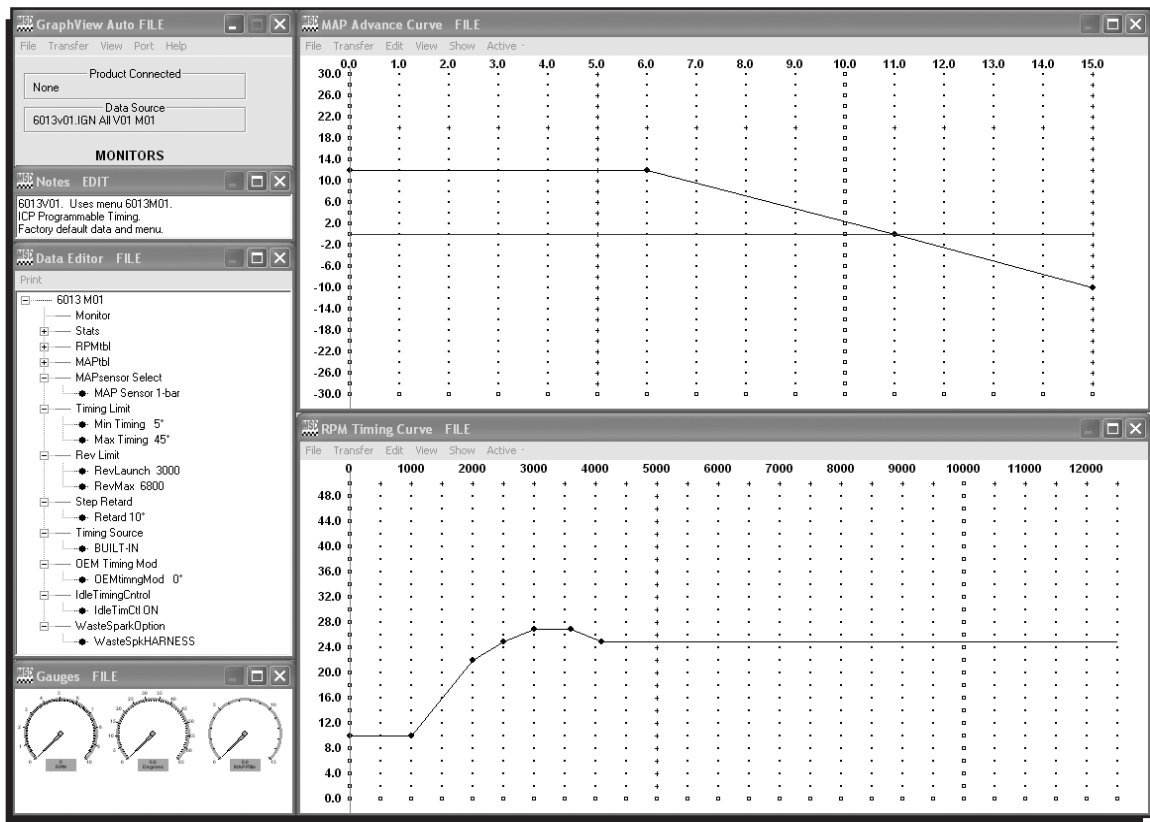


Figure 5 Pro-Data+ Screen and Programming Windows.

## PROGRAMMABLE FEATURES

The following explains the programmable features of the PN 6013 Controller. The features are listed in the same order shown on the Data Editor list in the software. Note that the Help pull down menu of the software offers explanations of all the features.

**Note:** **STATS Stat 1** or **SCAN** are display features only used with the Hand Held Monitors, PN 7550 or PN 7553.

### RPM TABLE (RPMtbl)

This setting can only be modified from the RPM Timing Curve edit graph on the lower right of the screen (It can also be set with the Hand Held Monitor). The chart allows you to map out an entire timing curve, much like the centrifugal advance of a mechanical distributor.

To create a map, simply position the mouse at a point on the chart and right click to add a dot. Up to 10 points can be programmed. By moving the mouse over this point and a left click, the dot changes to red (active) and you can move it around the map by clicking and dragging.

**Note:** The timing has minimum and maximum limits that are set in the Data Editor Menu. These settings include the cumulative value of any vacuum advance or retard as well as the Step Retard if activated.

### MAP TABLE (MAPtbl)

**Note:** In order to take advantage of a vacuum advance, a MAP sensor is required.

This is a Manifold Absolute Pressure (MAP) chart. It gives you the capability of modifying the timing curve based on manifold pressure (vacuum or boost). A curve can be created from the MAP Advance Curve graph on the upper right of the screen (It can also be set with the Hand Held Monitor). The chart allows you to map out an advance curve based on manifold vacuum (much like the vacuum advance on a mechanical distributor).

To create a map, simply position the mouse at a point on the chart and right click to add a dot. Up to 10 points can be programmed. By moving the mouse over this point and a left click, the dot changes to red (active) and you can move it around the map by clicking and dragging.

**Note:** The timing has minimum and maximum limits that are set in the Data Editor Menu. These settings include the cumulative value of any vacuum advance or retard as well as the Step Retard if activated.

### MAP SENSOR SELECT

Allows the selection of a 1, 2 or 3-bar MAP sensor. This setting should be set to match the MAP Sensor in use: 1-bar (15 psia), 2-bar (30 psia), 3-bar (45 psia).

### TIMING LIMIT

There are two adjustments that set the limits of ignition timing. These settings are meant as safety targets to keep the timing in check. Both the Minimum and Max values include any timing retards or advancements.

**Min Timing** The minimum timing setting. It is adjustable from -5°-20° BTDC with a default of 5°.

**Max Timing** The maximum timing setting. It is adjustable from 25°-65° BTDC with a default of 45°.

**Note:** These features are active when operating in OEM Advance or Built-In timing mode.

**REV LIMITS**

The Controller allows you to program two rev limits; RevMax for an over-rev safety and RevLaunch that provides a low limit for use as a launch, or two step limit.

- RevLaunch** This is the low rpm limit that is designed to be used while staged at the starting line. It is activated when the Blue wire is connected to 12 volts. When there is no 12 volts on this wire, the RevMax Limit is active. It is adjustable in 100 rpm increments from 2,000 - 12,500 rpm.
- RevMax** This is the over-rev rpm limit. It is active when the Blue wire (RevLaunch) is **not** connected to 12 volts. It is adjustable in 100 rpm increments from 2,000 - 12,500 rpm.

**STEP RETARD**

A step retard will provide an adjustable amount of retard at a specific moment. This is ideal when using nitrous oxide. The amount of retard is adjustable from 0° - 15° in 1° increments. The retard is activated when the Pink wire is switched to 12 volts. Default is 10°.

**TIMING SOURCE**

This adjustment allows you to select a timing curve. The 6-Hemi lets you run a Built-In default curve that can easily be modified by using the RPM Table chart. On engines using the factory EFI, you can select OEM Advance to use the factory ECU's timing map.

- Built-In:** This is a general timing curve that is designed to work well with most stock type engines. This chart is shown in the RPM Table and MAP Table charts. These can easily be modified by clicking and dragging on the dots, or by adding a dot (right click) and saving to the ignition (The built in timing curve is designed for 91+ octane fuel).
- OEM Advance:** This selection is used with a factory EFI equipped engine. The 6-Hemi will use the factory ECU's timing curve. By using the OEM Timing Mod option below, the entire timing curve will be advanced the amount you set. A negative value retards the timing.

**OEM TIMING MOD**

This option is available only when running the factory ECU's timing curve on EFI equipped engines (Selected as OEM Advance or Retard). Here you set the total amount of advance or retard for the factory timing curve (Negative value will retard the timing). The default is 0°.

**OEMtimingMod:** Adjustable from retard10° to advance 10°.

**Caution:** Too much advance can cause damage to engine!

**IDLE TIMING CONTROL**

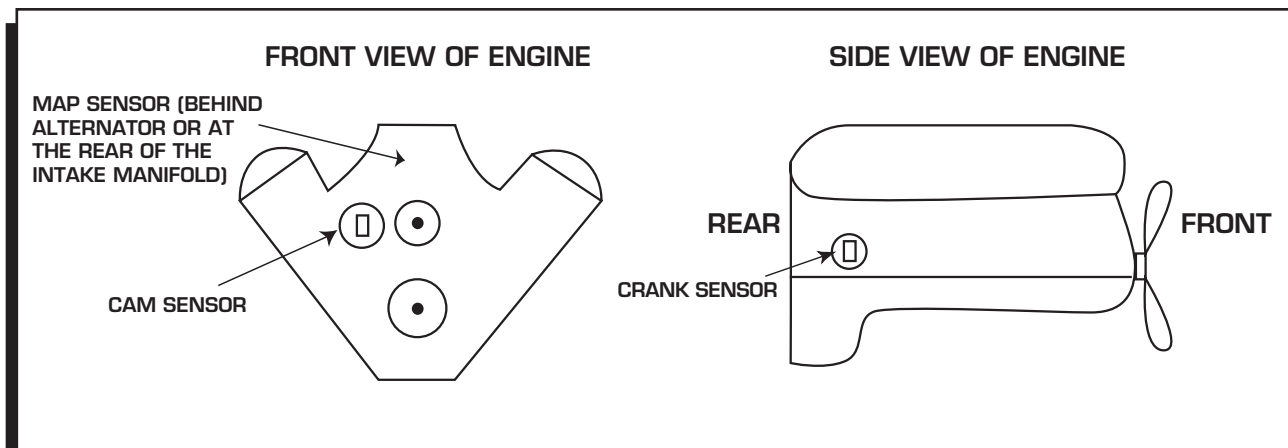
When this feature is On, the timing will fluctuate during idle to improve the idle quality. This is only used during the "Built-In" timing mode.

- On:** Idle timing will vary to produce a more stable idle RPM.
- Off:** Timing will be fixed, based on the timing tables.

**WASTE SPARK OPTION**

When this feature is On, each coil will fire every 360°. When turned Off, each coil will fire every 720° of crankshaft rotation.

- Harness:** When harness PN 88864 is used, waste spark is Off.  
When harness PN 88863 is used, waste spark is On.
- On:** Coil firing order = 1 and 6, 8 and 5, 4 and 7, 3 and 2.
- Off:** Coil firing order = 1, 8, 4, 3, 6, 5, 7, 2.



**Figure 6 Cam, Crank and Map Sensor locations.**

### Service

In case of malfunction, this MSD component will be repaired free of charge according to the terms of the warranty. When returning MSD components for warranty service, **Proof of Purchase** must be supplied for verification. After the warranty period has expired, repair service is based on a minimum and maximum fee.

**All returns must have a Return Material Authorization (RMA) number** issued to them before being returned. To obtain an RMA number please contact MSD Customer Service at 1 (888) MSD-7859 or visit our website at [www.msperformance.com/rma](http://www.msperformance.com/rma) to automatically obtain a number and shipping information.

When returning the unit for repair, leave all wires at the length in which you have them installed. Be sure to include a detailed account of any problems experienced, and what components and accessories are installed on the vehicle. The repaired unit will be returned as soon as possible using Ground shipping methods (ground shipping is covered by warranty). For more information, call MSD at (915) 855-7123. MSD technicians are available from 7:00 a.m. to 5:00 p.m. Monday - Friday (mountain time).

### Limited Warranty

MSD warrants this product to be free from defects in material and workmanship under its intended normal use\*, when properly installed and purchased from an authorized MSD dealer, for a period of one year from the date of the original purchase. This warranty is void for any products purchased through auction websites. If found to be defective as mentioned above, it will be repaired or replaced at the option of MSD. Any item that is covered under this warranty will be returned free of charge using Ground shipping methods.

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

\*Intended normal use means that this item is being used as was originally intended and for the original application as sold by MSD. Any modifications to this item or if it is used on an application other than what MSD markets the product, the warranty will be void. It is the sole responsibility of the customer to determine that this item will work for the application they are intending. MSD will accept no liability for custom applications.