



## INSTALLATION INSTRUCTIONS

# MAX-FIRE AND E-FIRE ELECTRONIC DISTRIBUTORS

**NOTE:** This product is applicable to pre-1966 California and pre-1968 federally certified passenger cars. It is also applicable to non-emission controlled trucks and similar vehicles. It is not applicable or intended for use on any emission-controlled vehicles operated on highways or roads, unless otherwise noted.

### IMPORTANT

This distributor requires 12 volts to operate correctly. If the vehicle is equipped with an ignition ballast resistor (or loom resistance wire) in the wire between the ignition switch and the coil (+) terminal, you will need to run a new wire from the ignition switch which will supply 12 volts. Check a service manual for your vehicle to locate the ignition ballast resistor (or loom resistance wire). These are most common in vehicles that were originally equipped a point type or some early electronic distributors.

### WARNING

Mallory's Max-Fire and E-Fire distributors are not compatible with positive ground or 6-volt vehicle electrical systems.

### PARTS INCLUDED IN THIS KIT:

- 1 Electronic Distributor
- 1 Distributor Wire Harness
- 1 12-Volt Power Supply Harness

### GENERAL INFORMATION

#### Advance Curves

This distributor is equipped with 7 pre-programmed RPM based advance curves. Changing the advance curve is accomplished by accessing the switches on the circuit board once the cap is removed. You also have the ability to design your own custom advance curve by utilizing the optional software available from Mallory. You may also adjust the vacuum advance utilizing the same software.

#### Ignition Coils

The Max-Fire and E-Fire distributors are designed to work with most aftermarket high performance ignition coils. For optimum performance, we recommend using one of Mallory's performance coils such as part numbers 29440 and 30440.

#### Capacitive Discharge or Inductive Ignition Amplifiers (boxes)

The Max-Fire Distributor is equipped with its own internal capacitive discharge system and

does not need any additional ignition accessories. The E-Fire is compatible with most popular Mallory HyFire Ignitions.

#### Spark Plug Gaps

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

#### Electric Welding

Unplug the distributor wire harness before welding on the vehicle.

#### Spark Plug Wires

**YOU MUST USE** suppression type (carbon core; spiral core; radio 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 the possibility of 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. Solid core spark plug wire causes radio frequency interference (ignition noise; static). Radio frequency interference causes false triggering (preignition; spark scatter) and premature ignition or accessory failures.

## OLD DISTRIBUTOR REMOVAL

### Step 1

Disconnect the trigger wire from the coil negative (-) terminal.

### Step 2

Locate the spark plug wire on the original distributor cap that the engine timing is set from. See a service manual for these locations. Mark the distributor cap and the distributor housing, in line with this spark plug wire position on the distributor cap.

### Step 3

Turn the engine crankshaft in the direction of rotation until the timing mark lines up with the top dead center (TDC) mark on the timing tab. See a service manual for these locations.

**NOTE:** Removing the spark plugs may make it easier to turn the crankshaft.

### Step 4

Remove the distributor cap from the distributor. Do not remove the spark plug wires or coil wire at this time. The rotor blade should point to the mark made on the distributor housing (from Step 2). If it is not, turn the engine crankshaft in the direction of rotation one full turn (repeating Step 3) until the timing mark lines up (again) with the TDC mark on the timing tab.

**NOTE:** Once you are finished with Step 4, **DO NOT** turn the crankshaft until the new distributor is installed.

### Step 5

Note the direction the rotor is pointing. Remove the distributor hold down clamp and remove the distributor from the engine.

## DISTRIBUTOR INSTALLATION

### Step 1

Prepare the distributor by removing the distributor cap.

### Step 2

Place the distributor in the engine with the rotor pointing in the same general direction as the original distributor.

**NOTE:** The distributor must be fully seated into the engine. It may be necessary to turn the oil pump drive, or turn the engine crankshaft in the direction of rotation **two full turns** until the timing mark lines up (again) with the TDC mark on the timing tab, to allow the distributor to seat fully.

### Step 3

Rotate the distributor housing in the opposite direction of rotor rotation until the leading edge of the blade portion of the trigger wheel is centered in the Hall sensor pickup gap. This will generally put timing close enough for starting purposes. Put the distributor hold down clamp in place and tighten slightly, leaving it loose enough to turn the distributor. Make a mark on the distributor housing where the rotor points.

### Step 4

Install the distributor cap. Remove the spark plug wire on the original distributor cap that the engine timing is set from, and install it onto the distributor cap post above the mark on the distributor housing where the rotor had pointed. Continue installing each remaining spark plug wire, one at a time, from the original distributor cap to the distributor cap in the same sequence.

**NOTE:** It may be necessary to purchase and install distributor boots and terminals for the spark plug wires to correctly fit the distributor cap.

## DISTRIBUTOR WIRING

There are three harnesses coming from the distributor body:

**4-PIN SQUARE CONNECTOR** – this is the data connector for the PC or external handheld programmer. It is only used when adjusting the distributor with an external controller or PC.

**3 PIN FLAT CONNECTOR** – this is the power connector.

**BLACK WIRE**- connects to the vehicle ground (engine block). Make sure the surface is free of dirt, grease and paint.

**RED WIRE**- connects to the 12 volt ignition wire from the key switch (there should not be any ballast resistors or loom resistance wire in this wire). Refer to a service manual's wiring diagram to determine the correct wire. Make sure the wire supplies 12 volts when the switch is in the start position and the run position.

**WHITE WIRE**- this wire is NOT USED with the 22 Series E-Fire inductive storage distributor. It is used as a 12v square wave tach output with the 12 Series MAX-Fire. Verify the series you have by the first 2 digits of the distributor part number.

**2 PIN FLAT CONNECTOR**–this is the coil connector  
**ORANGE WIRE**-connects to the coil + terminal  
**BLACK WIRE**-connects to the coil – terminal

## Additional Connections

There is a brass fitting extending from the bottom of the distributor bowl. This fitting should be attached to the ported vacuum source so that the vacuum advance and boost retard features will work. If you are NOT using either of these, this fitting does not need to be connected. If you are using the existing vacuum hose from the original distributor, check it for cracks or an oily coating on the inside. Replace it as necessary.

## SETTING THE DISTRIBUTOR

### 12 Series MAX-Fire Distributors

There are three ways of setting up the distributor: The switches on the circuit board, using a PC with the EA\_Comm software, or the optional hand held LCD display control (HHC) part number 29124.

PHOTO #1



The MAX-Fire Distributor allows you to select advance curve, vacuum advance sensitivity, and RPM limiter with a combination of rotary and DIP switches on the PC board. See Photo #1. The rotary switch selects the RPM limiter, where "1" is 4500 RPM, and "F" is 8000 RPM in 250 RPM steps.

**NOTE:** Setting the rotary switch to "0" allows the rev limiter to be set by using either a PC with the EA\_Comm software or using the hand held controller.

The DIP switches are located just to the right of the RPM rotary switch. DIP switch #1 is located at the left next to the RPM rotary switch. DIP switch #4 is located on the far right next to distributor bowl. For the DIP switches, the UP position is "ON" and the down position is "OFF".

The DIP switches only move about 1/16" between the UP and DOWN positions. These DIP switches are VERY delicate and you do NOT need to use a crow bar to move them – a very small eye glass type screw driver and very light pressure works well. DIP switches 1-3 select one of the seven pre-programmed curves, according to the table below.

DIP switch 4 selects a high or low vacuum advance sensitivity. DIP switch 4 "OFF" results in a vacuum advance where advance starts at 4" of vacuum, and reaches a maximum of 10 degrees at 10" of vacuum. If DIP switch 4 is "ON", the vacuum advance starts at 8" of vacuum, and reaches a maximum of 10 degrees at 16" of vacuum.

**NOTE:** To use either the external programming methods, the RPM limiter rotary switch needs to be set at "0" position and all four DIP switches need to be "OFF" position.

The EA\_Comm software allows you to use the drop down menu to select a preprogrammed advance curve or design you own 3 segment custom advance curve by simply filling in the open windows in the program. In addition, you can design you own vacuum advance curve by inputting the total number of degrees of advance you desire, the inches of vacuum at which you have full advance, and the inches of vacuum you want zero vacuum advance.

You can also utilize the Boost Retard feature by selecting the number of degrees of retard (in 10ths of a degree) per pound of boost. The rev limiting feature is used by inputting your desire rev limit.

**NOTE:** We recommend you hit "Read Distributor" to verify the current adjustments prior to making changes. Once you hit the send button the new adjustments will appear on the graph.

The optional Hand Held Controller or HHC has 4 buttons: Mode up/down, and Value up/down. To adjust a particular setting, press the Mode up or down switch until that area is displayed on the LCD readout, then use the Value up or down buttons to change the value. If you hold the buttons down, after a short interval they will auto-repeat.

### 22 Series E-Fire Distributors

The E-Fire distributor can be adjust 3 different ways- The switches on the circuit board, using a PC with the EA\_Comm software, or the optional hand held LCD display control (HHC) part number 29124. Please see Photo #2.

**PHOTO #2**



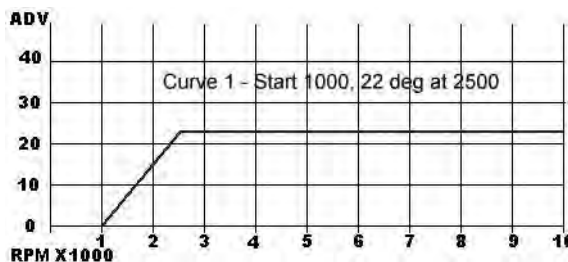
**NOTE:** The DIP switches are located just to the right of the Hall Effect trigger. DIP switches are labeled #1, #2 and #3. For the DIP switches, the forward position is “ON” as labeled and the backward position is “OFF”. The DIP switches only move about 1/16” between the forward and backward positions. These DIP switches are delicate and you do NOT need to use a crow bar to move them – a very small eye glass type screw driver or a pick tool and very light pressure works well.

The E-Fire Distributor has a 3 position DIP switch on the circuit board. When all of the switches are off, the advance curve can be set by using the external HHC or PC software. If any of the switches are set to “ON”, then the selected curve will be one of the seven pre-programmed curves, according to the table below:

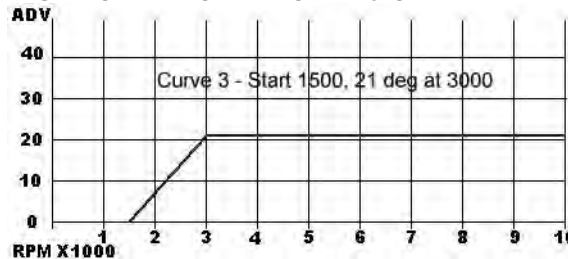
**Advance Curve Theory And Setup**

These distributors have a total of 8 selectable advance curves. Seven are preprogrammed, and can't be changed, and there is the “custom” selection, which allows you to select up to three separate curve segments. Each segment has a start RPM, an end RPM, and an advance amount. For segments two and three, the start RPM is automatically set to the end RPM of the previous segment, so the settings will show only an end RPM and an advance amount.

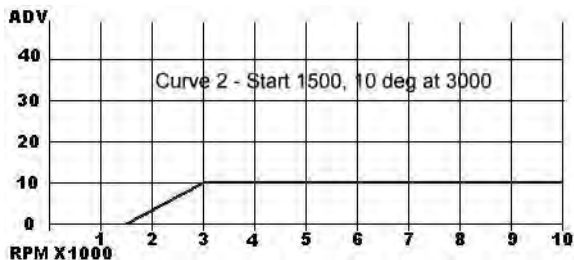
SWITCH #1-ON #2-OFF #3-OFF



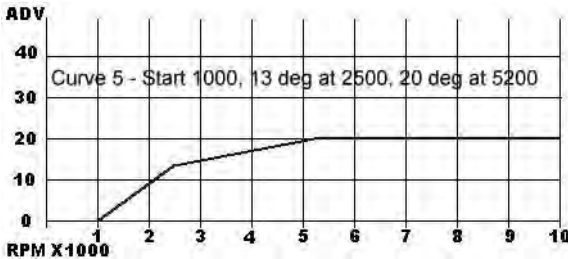
SWITCH #1-ON #2-ON #3-OFF



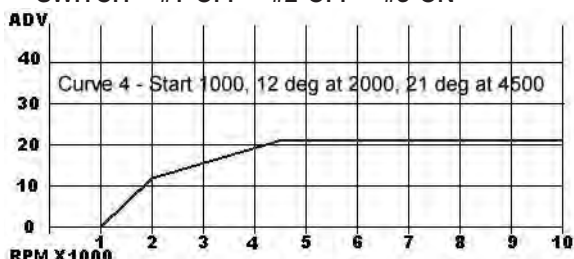
SWITCH #1-OFF #2-ON #3-OFF



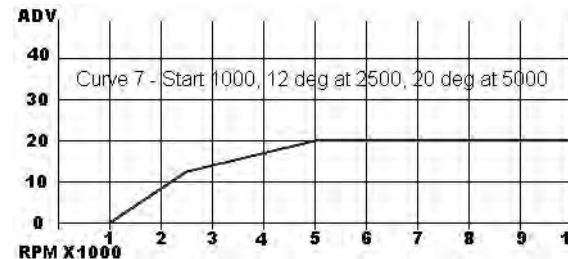
SWITCH #1-ON #2-OFF #3-ON



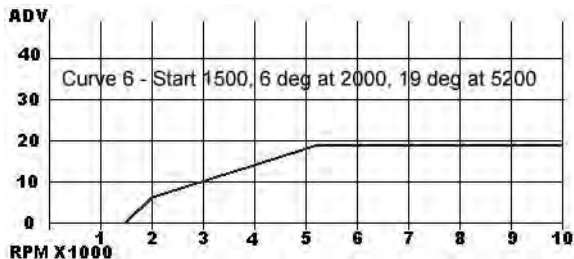
SWITCH #1-OFF #2-OFF #3-ON



SWITCH #1-ON #2-ON #3-ON



SWITCH #1-OFF #2-ON #3-ON

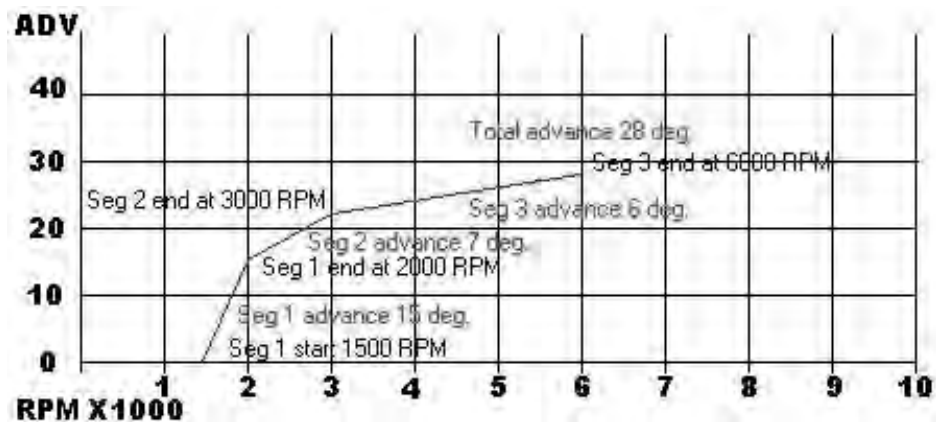


To make a custom curve, first sketch out what you want your advance curve to look like, showing advance vertically, and RPM horizontally. You can have up to three straight line segments in the curve. After doing this, note the RPM and change of advance for each segment. Select "Manual" from the Advance curve mode. Then, starting at the "Seg 1 start" mode, enter the RPM and change of advance for each segment. Remember that the start RPM of segments 2 and 3 will be the end RPM of the previous segments. See the example picture, below:

**NOTE:** For reference purposes only, noted below is the standard "street performance" mechanical advance curve that most Mallory distributors come with from the factory;

- 0 degrees @ 1200 RPM
- 12 degrees @ 1600 RPM
- 18 degrees @ 2400 RPM
- 24 degrees @ 3200 RPM

The maximum recommended total advance (RPM based and vacuum) is 45 degrees, so keep this in mind when determining advance curves.



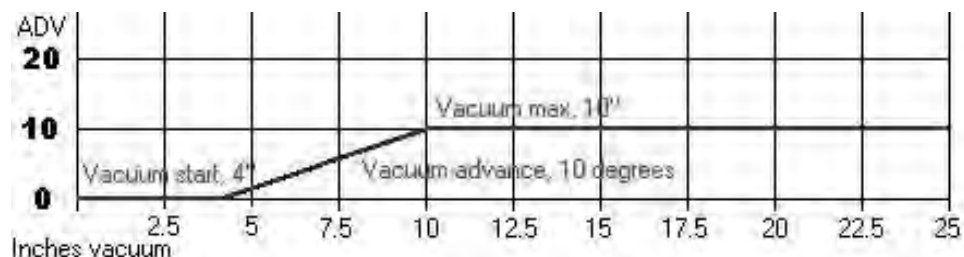
### Vacuum Advance Setting

The vacuum advance is set up with three modes:

Vacuum start tells the distributor where to start advancing the timing.

Vacuum max tells the distributor where to stop advancing the timing.

Vacuum advance tells the distributor how many degrees to advance the timing at the vacuum max setting. See the example, below:



### Boost Retard Setting

Boost retard will retard the timing by the number or degrees shown, per pound of boost. For example, if you set the boost retard to .5, then for every pound of boost, you will retard the timing by 1/2 degree. 10 psi boost would cause 5 degrees of retard. If you are not using boost, this setting has no effect.

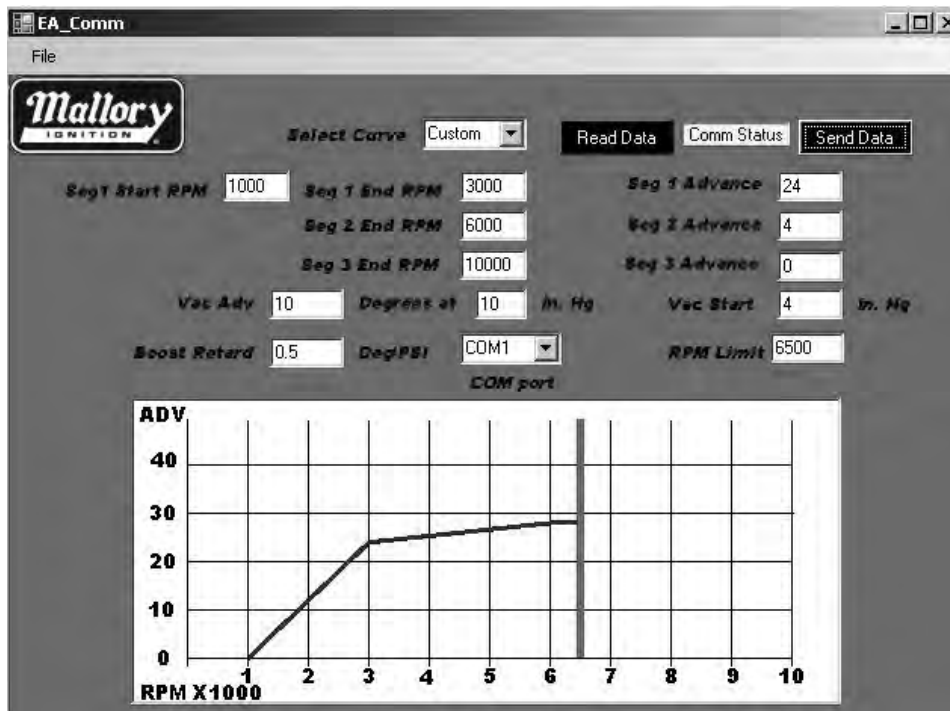
### PC Software

The PC software, EA\_Comm, allows you to set the distributor and see the advance curve on a graph. You can also save and recall different advance curves. EA\_Comm has an advance curve graph that shows the result of changes made in the curve settings. The Screen Shot #1 below shows the user interface:

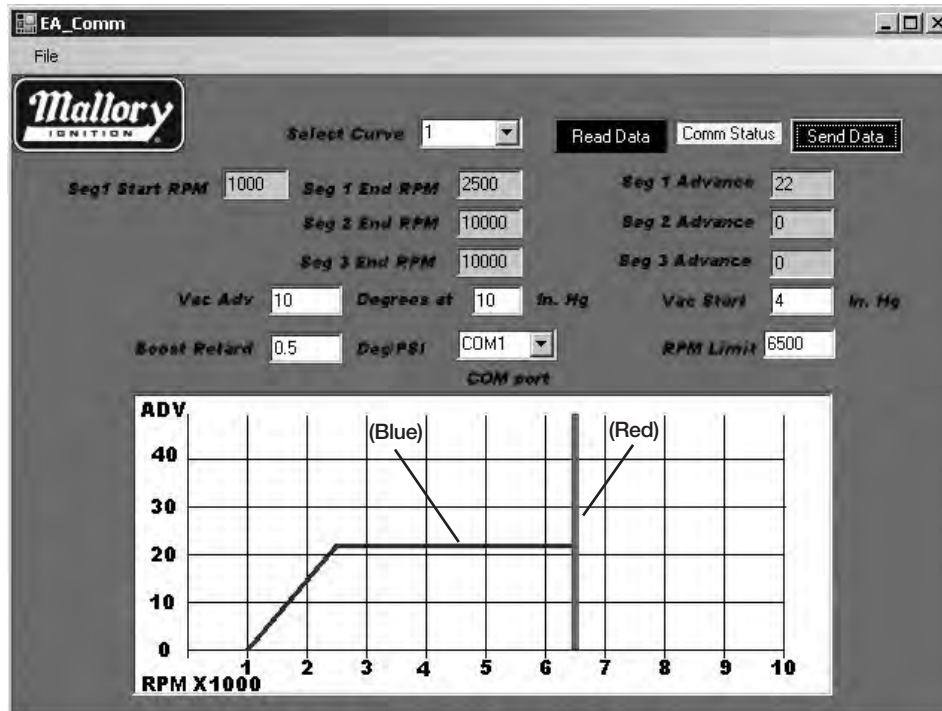
When you first start the software, the values boxes will be blank. Make sure that your distributor is connected to a COM port on your computer, and powered up.

**NOTE:** Many laptops do not have external COM ports. If this is your situation, there are readily available USB to COM port adapters that will work. Once the adapter is plugged into a USB port and recognized by the computer, the COM port will show up in the list in EA\_Comm. Click on the “COM port” arrow, and select the COM port that is connected to your distributor. Then, click “Read Data” to get the current distributor program information. A progress bar will show up over the curve graph as data are being read. Once the distributor has been read, the screen should look similar to Screen Shot #1.

SCREEN SHOT #1



## SCREEN SHOT #2



The blue lines indicate the advance curve, and the red line shows the RPM limiter setting. The vacuum advance and boost retard are not shown on the graph, but the programmed values are shown in the boxes above. If the distributor is set to one of the “built-in” advance curves, the values in the boxes will be “grayed out”, which means that they can’t be changed. See Screen Shot #2.

If you want to set the distributor to a preset curve, select the curve from the “Select Curve” box. Enter the desired RPM limit and vacuum advance settings, then click the “Send Data” button. This will transfer the data to the distributor, then read it back and show the graph to confirm the transfer. If you want to put in a custom curve, select “Custom” from the “Select Curve” box, and click the “Send Data” button. This will

tell the distributor that you want the custom curve settings, and read the data presently programmed in. Once the graph shows the existing distributor programming, you can enter the custom curve settings you want, then click the “Send Data” button to update the distributor.

### **Saving and Opening Distributor Curve Files**

In the upper left corner of the EA\_Comm window is the “File” menu bar item. Clicking on this brings down a menu with a choice of “Open”, “Save”, or “Quit”.

Selecting “Quit” closes the EA\_Comm application. Selecting “Save” brings up a standard Windows dialog box that allows you to save a custom distributor file. These files have an .ead suffix. The “Open” dialog box allows you to read a file in. Once the file has been read into EA\_Comm, the graph will show

the curve. Click the "Send Data" button to send these new settings to the distributor. One area where this feature comes in handy is if you see that there is a pre-programmed curve that is almost what you want. By selecting that and saving it, you can then recall it and treat it as another custom curve.

**NOTE:** *The pre-programmed curves in the distributor cannot be changed. File saving and recalling allow you to use the "Custom" curve select option to load a modified version of the pre-programmed curve.*

While it is possible to run the EA\_Comm software with the distributor while the engine is running, we DO NOT recommend this, as the electrical noise from the spark plug wiring can cause errors in communication. It is best to have the engine stopped when modifying the distributor programming.



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FORM 1330  
(REV. A) 6/08  
Made in U.S.A.  
Printed in U.S.A.