



# INSTALLATION INSTRUCTIONS

## MSD Pro-Billet Front Mount Ford Flathead Distributor

**2-Bolt, 1942-1948, PN 8351**

**3-Bolt, 1932-1941, PN 8353**

**Important:** Read these Instructions before attempting the installation.

### Parts Included:

- 1 - Pro-Billet Distributor
- 1 - Rotor
- 1 - Distributor Cap, PN 8541
- 2 - 10-32 x 3/4" Socket Head Screws
- 1 - Advance Kit

**WARNING:** Before installing the MSD Distributor, disconnect the battery cables. When disconnecting the battery cables, always remove the Negative (-) cable first and install it last.

**Note:** The terminals of this Distributor require spark plug style terminals. You may need to change the terminals and boots of your wires. MSD offers two kits, PN 8849 or PN 8848 that are supplied with nine boots and terminals.

**Note:** The 2 and 3-bolt front covers of the Flathead are interchangeable but if a stock type camshaft is used with a different cover, an adapter/spacer may be required. These are available at most Flathead engine shops.

**Note:** Contact MSD for ordering information when the rotor needs to be replaced.

## TIMING FUNCTIONS

Before continuing with the installation, here are a few definitions you should be aware of:

**Initial Timing:** This is the base timing (also referred to as idle timing) of the engine before the centrifugal advance begins.

**Centrifugal Advance:** The centrifugal (or mechanical) advance mechanism is made up of weights, springs, advance cams, and an advance stop bushing. The amount and rate of advance that your distributor is capable of is determined by the centrifugal timing. If you ever wish to lock out the centrifugal advance, refer to the centrifugal advance section.

**Total Timing:** This is the total of the initial timing plus the centrifugal advance added together. Example: 10° Initial + 25° centrifugal = 35° Total Timing.

**Note:** MSD Distributors are supplied with the heavy (slow) advance springs installed. This is to prevent detonation in certain applications. Review the information on pages 2-4 to determine the best advance curve for your application.

## **CHOOSING AN ADVANCE CURVE**

The function of the advance curve is to match the ignition timing to the burning rate of the fuel and speed (rpm) of the engine. Any factor that changes the burning rate of the fuel or the engine speed can cause a need for an ignition timing change. Figure 1 shows some of the factors that will affect engine timing.

<b>FACTOR</b>	<b>Advance Timing For</b>	<b>Retard Timing For</b>
Cylinder Pressure	Low	High
Vacuum	High	Low
Energy of Ignition	Low	High
Fuel Octane	High	Low
Mixture (Air/Fuel)	Rich	Lean
Temperature	Cool	Hot
Combustion Chamber Shape	Open	Compact
Spark Plug Location	Offset	Center
Combustion Turbulence	Low	High
Load	Light	Heavy

**Figure 1 Ignition Timing Factors.**

As you can see from the chart, most factors will change throughout the range of the engine operation. The timing mechanism of the distributor must make timing changes based on these factors.

**Example:** An engine has 11:1 compression with a high energy ignition. With the specifications given, you will have to retard the timing for the high compression and high energy ignition. By comparing the engine's specifications against the chart, a usable timing guideline can be found. Engines with a combination of items from both columns will require a timing that is set in the mid range.

Obviously a full technical explanation of correct ignition timing would be very complicated. The best way to arrive at a suitable ignition curve for your engine is to use the Ignition Timing Factors Chart as a guide and compare it to the Advance Graphs in Figure 4 until a suitable curve is found. When selecting your advance curve, use detonation (engine ping) as an indicator of too much advance, and a decrease in power as an indicator of too little advance.

### **TIPS ON SELECTING AN ADVANCE CURVE**

- Use as much initial advance as possible without encountering excessive starter load.
- Start the centrifugal advance just above the idle rpm.
- The starting point of the centrifugal advance curve is controlled by the installed length and tension of the spring.
- How quickly the centrifugal advance (slope) comes in is controlled by the spring stiffness. The stiffer the spring, the slower the advance curve.
- The amount of advance is controlled by the advance bushing. The bigger the bushing, the smaller the amount of advance.

# CENTRIFUGAL ADVANCE CURVE

## SELECTING THE ADVANCE SPRINGS

The rate, or how quick the advance comes in is determined by the type of springs which are installed on the distributor. The MSD distributors are equipped with two Heavy Silver springs installed. These will give you the slowest advance curve possible (Figure 2). The parts kit contains two additional sets of springs which can be used to match the advance curve to your particular application. Refer to the Spring Combination Chart (Figure 3) for combinations that can be achieved.

To change the springs, remove the cap and rotor and use needlenose pliers to remove the springs. Be sure the new springs seat in the groove on the pin.

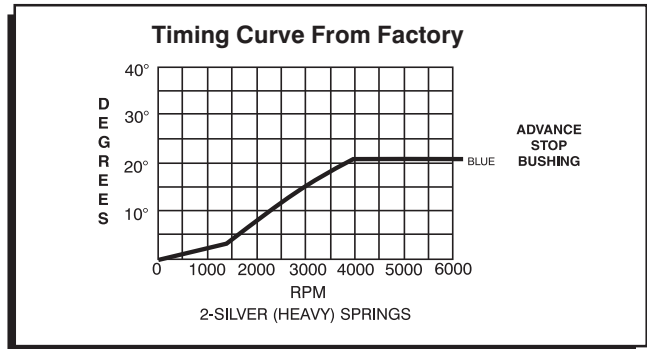


Figure 2 The Factory Equipped Curve.

SPRING COMBINATION	RATE OF ADVANCE	FIGURE 4
2- Heavy Silver	SLOWEST	A
1- Heavy Silver		B
1- Light Blue		C
1-Heavy Silver		D
1-Light Silver		E
2- Light Blue		F
1- Light Silver		FASTEST
1- Light Blue		
2- Light Silver		

Figure 3 Spring Combination Chart.

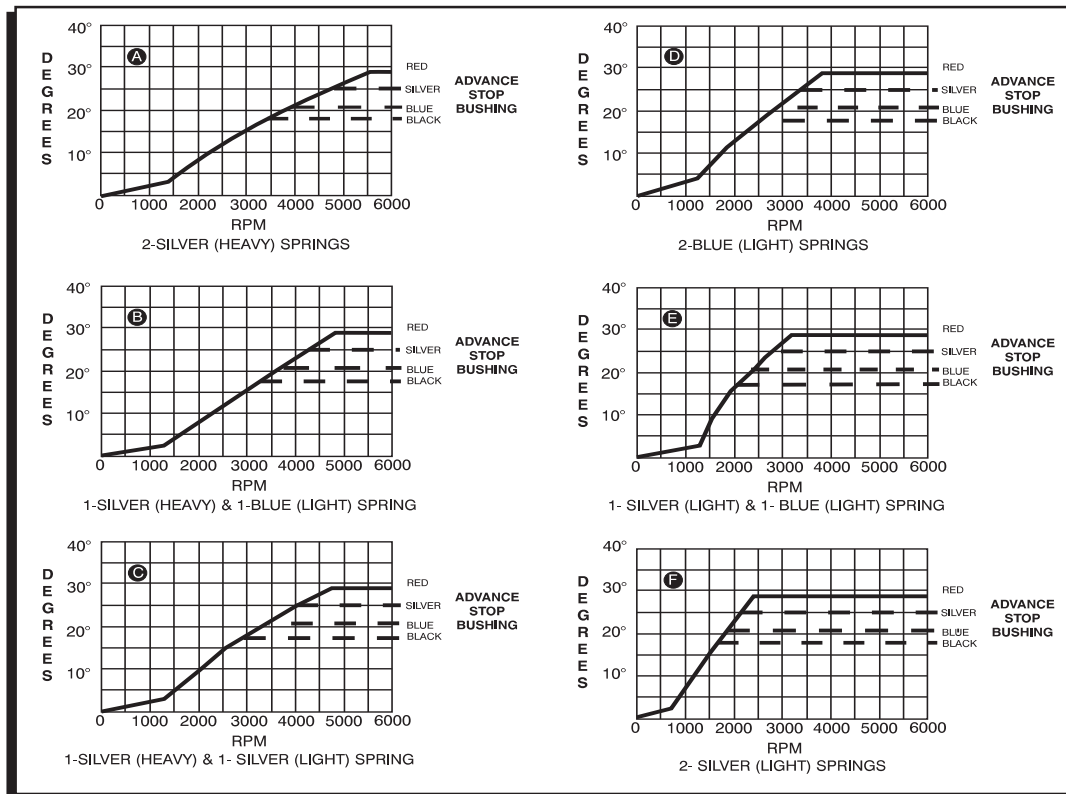


Figure 4 Advance Curves.

## SELECTING THE ADVANCE STOP BUSHING

Three different advance stop bushings are supplied in the distributor kit. The distributor comes with a Blue (21°) bushing already installed. If a different amount of centrifugal advance is desired, follow the next procedure to change the bushings. The chart in Figure 5 gives the size and approximate degrees for the corresponding bushings.

## CHANGING THE ADVANCE STOP BUSHINGS

1. Remove the distributor cap and rotor.
2. Note the position of the coupling drive in relation to the rotor tip. Remove the coupling drive and slide the distributor shaft up.
3. Remove the locknut and washer on the bottom of the advance assembly (Figure 6).
4. Remove the bushing and install the new one. Install the washer and locknut. Do not overtighten.

## LOCKING OUT THE CENTRIFUGAL ADVANCE

1. Remove the advance components including the springs, weights and the advance stop bushing from the advance assembly.
2. Note the position of the coupling drive in relation to the rotor tip. Remove the coupling drive and slide the distributor shaft up.
3. Rotate the shaft 180° and insert the advance stop bushing pin into the small hole on the advance plate (Figure 7).
4. Install the locknut and washer to the advance stop bushing pin. This locks the advance in place.
5. Install the retaining screw in the shaft.

BUSHING SIZE	APPROXIMATE CRANKSHAFT DEGREES
Red-Smallest	28
Silver	25
Blue	21
Black-Largest	18

Figure 5 Advance Stop Bushing Chart.

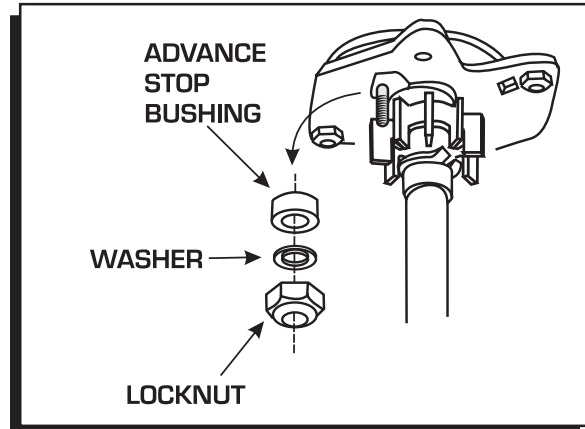


Figure 6 Changing the Advance Stop Bushing.

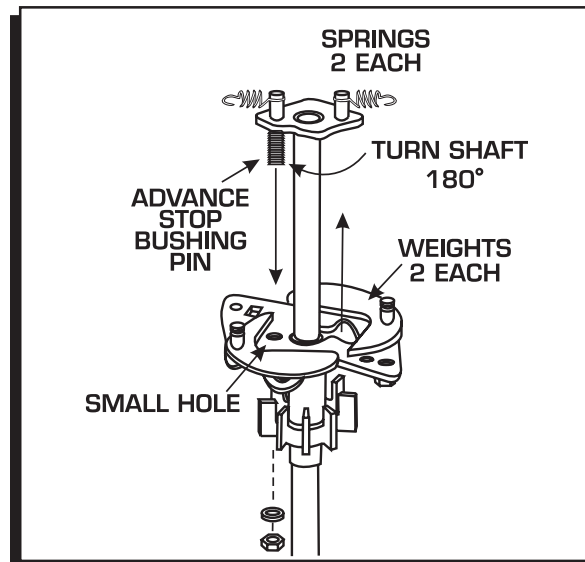


Figure 7 Locking Out the Advance.

## INSTALLING THE DISTRIBUTOR

1. Position the engine with cylinder number one at Top Dead Center.
2. Position the new distributor so the drive and camshaft index align together. Note the position of the rotor.
3. Hold the cap on the distributor. Whatever cap terminal the rotor tip points to is the number one terminal (Figure 8). Mark this terminal.
4. Install the hold down bolts to secure the distributor housing. Ensure that the distributor is indexed with the camshaft. If not, you will need an adapter/spacer (see Note on page 1).
5. Install the distributor cap and spark plug wires.

**Note:** The MSD Distributor cap **IS NOT** a correct-a-cap and the wires must be installed to match the firing order of the engine.

6. Connect the magnetic pickup to the MSD Ignition.

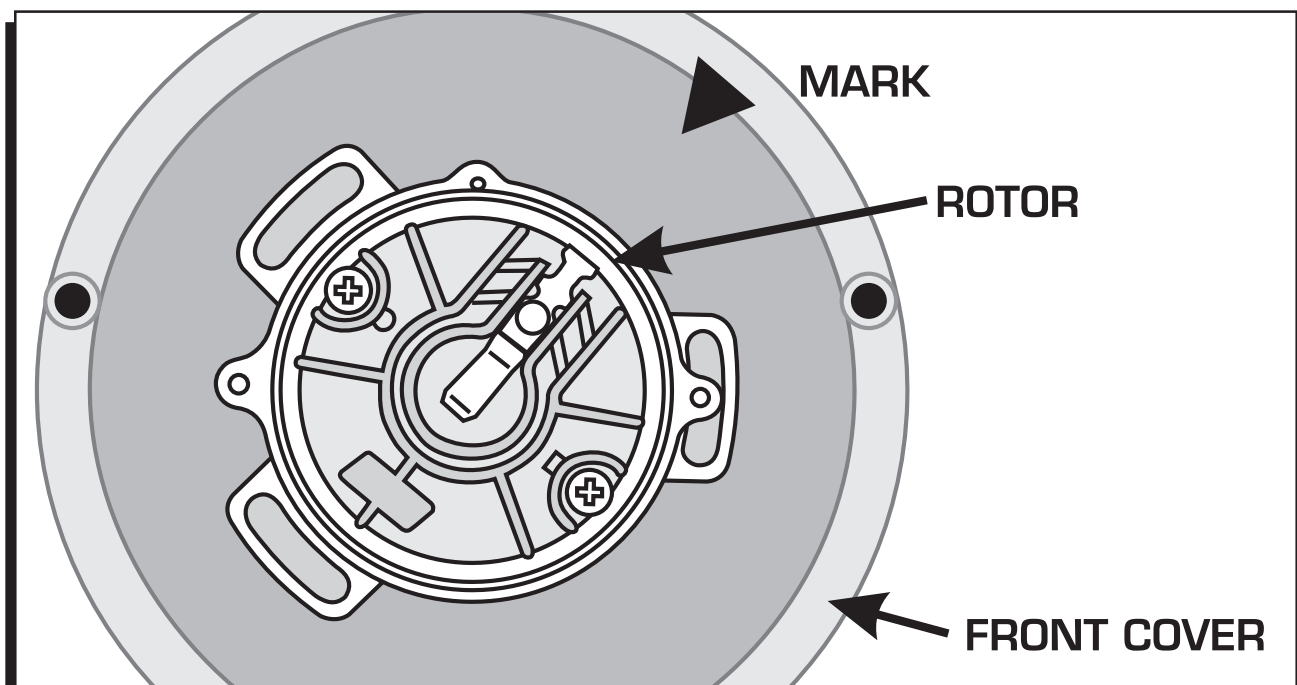


Figure 8 Marking the Rotor Location.

**WARNING:** High voltage is present on the coil terminals. Do not touch the terminals or coil tower when the engine is cranking or running.

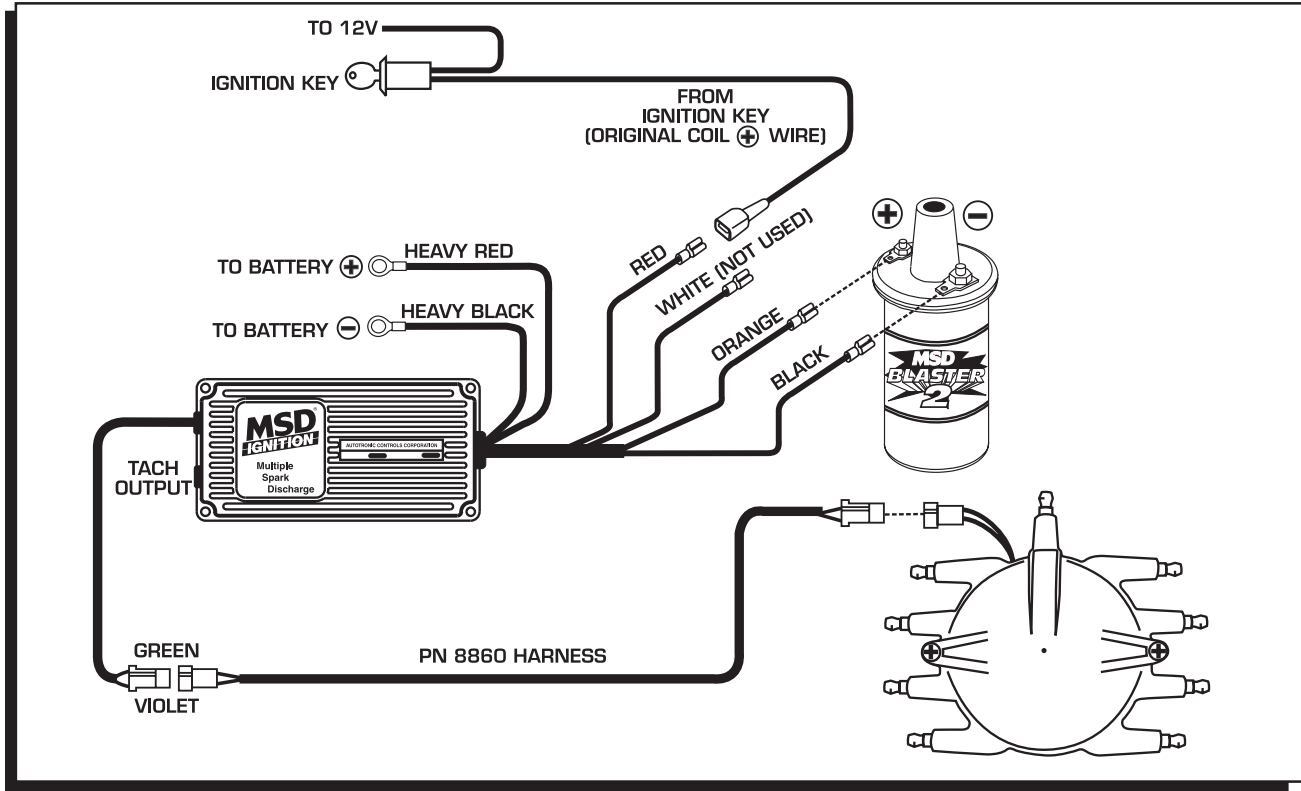


Figure 9 Wiring to an MSD 6-Series Ignition Control.

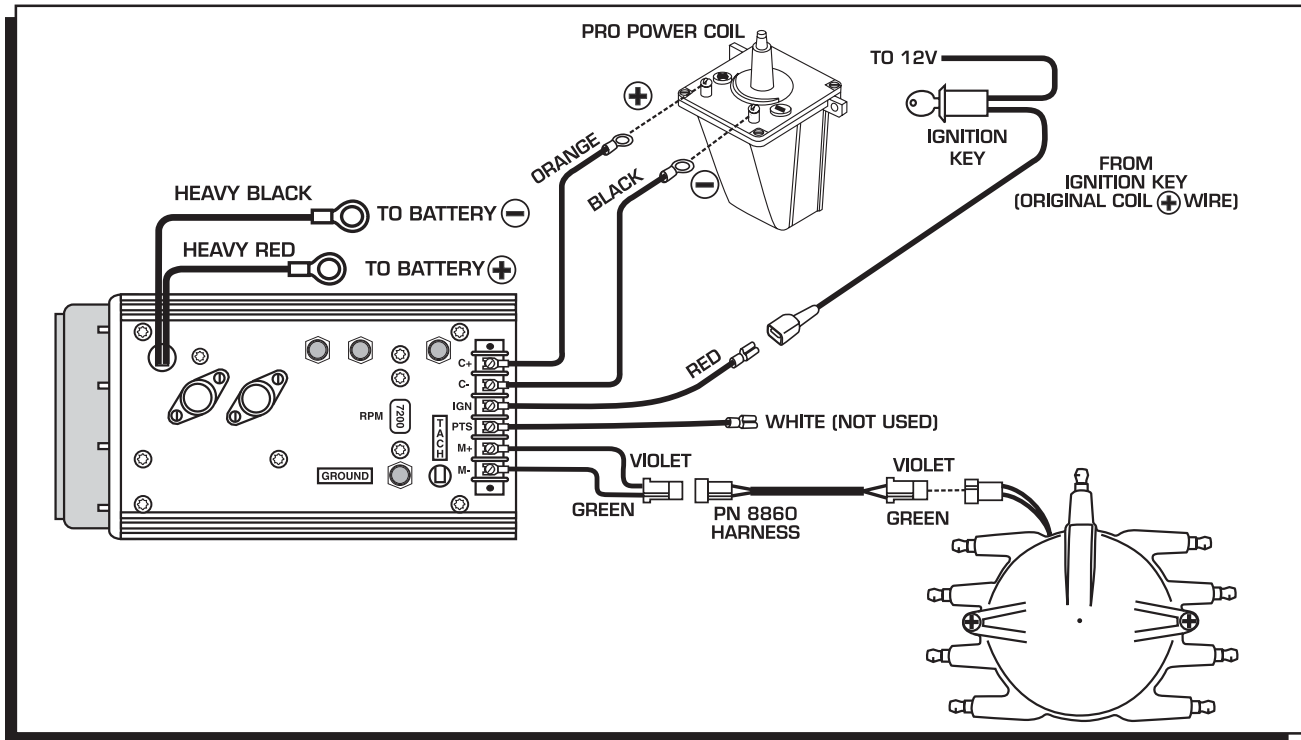


Figure 10 Wiring to an MSD 7-Series Ignition Control.

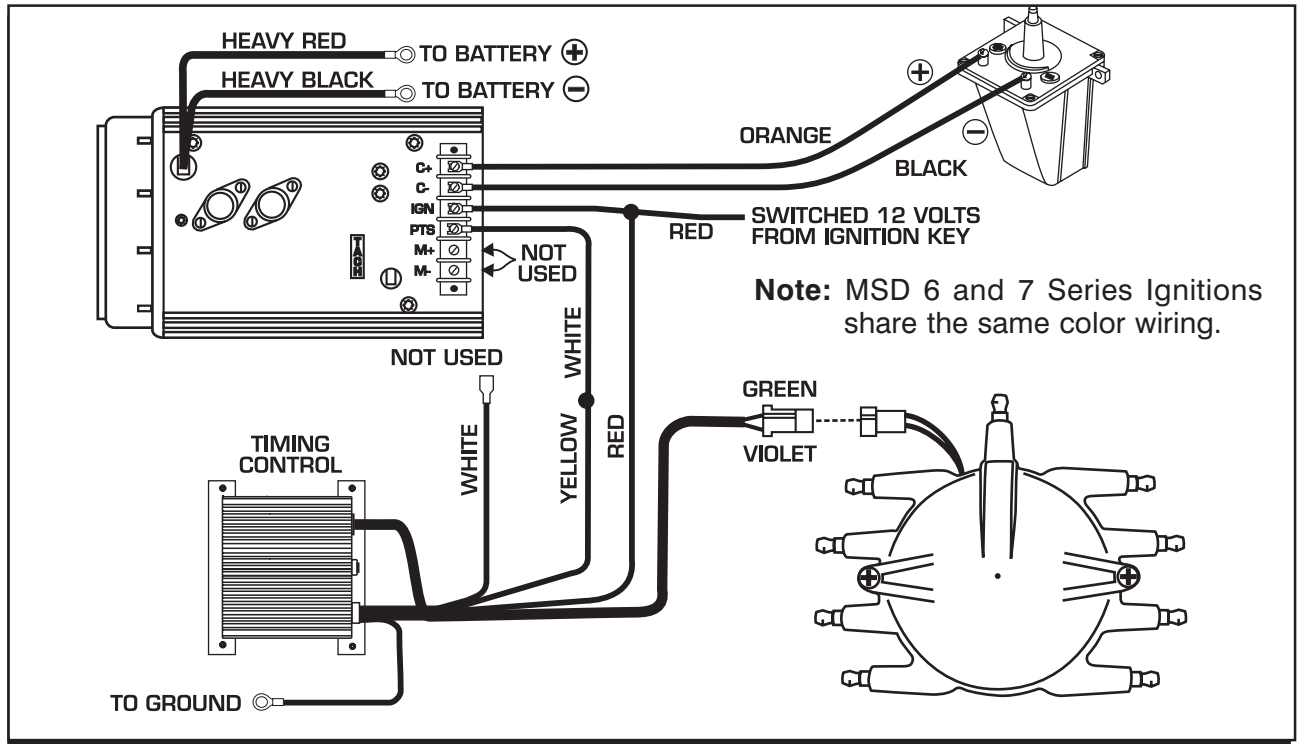


Figure 11 Wiring with an MSD 7-Series Ignition and Timing Control.

## TECH NOTES

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# INSTALLATION INSTRUCTIONS

## TECH NOTES

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### 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 service, Proof of Purchase must be supplied for warranty verification. After the warranty period has expired, repair service is charged based on a minimum and maximum charge.

Send the unit prepaid with proof of purchase to the attention of: **Customer Service Department, Autotronic Controls Corporation, 12120 Esther Lama, Suite 114, El Paso, Texas 79936.**

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 after receipt, COD for any charges. (Ground shipping is covered by warranty). All units are returned regular UPS unless otherwise noted. For more information, call the MSD Customer Service Line (915) 855-7123. MSD technicians are available from 8:00 a.m. to 5:00 p.m. Monday - Friday (Mountain Time).

### Limited Warranty

Autotronic Controls Corporation warrants MSD Ignition products to be free from defects in material and workmanship under normal use and if properly installed for a period of one year from date of purchase. If found to be defective as mentioned above, it will be replaced or repaired if returned prepaid along with proof of date of purchase. This shall constitute the sole remedy of the purchaser and the sole liability of Autotronic Controls Corporation. To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations whether expressed or implied, including any implied warranty of merchantability or fitness. In no event shall Autotronic Controls Corporation be liable for special or consequential damages.