



# INSTALLATION INSTRUCTIONS

## MSD Digital DIS-2 Dual Channel Ignition

PN 6211

## MSD Digital DIS-4 Multi Channel Ignition

PN 6215

The MSD Digital DIS-2 Dual Channel Ignition can be used on 4-cylinder engines equipped with two dual output coils. The MSD Digital DIS-4 Multi Channel Ignition can be used on 4, 6 or 8-cylinder engines equipped with up to four dual output coils. The MSD Digital DIS Ignition will accept trigger inputs from electronic DIS type ignition systems.

### Parts Included

1 - MSD Digital DIS-2 or DIS-4 Ignition  
12 - Connectors, Butt Splice  
2 - Program Switch Covers  
1 - Cable Assembly  
1 - Bypass Plug

### Parts not included but may be needed

Tach/Fuel Adapter(s)  
PN 8912

**NOTE:** It is recommended that you have the Service Manual and wiring diagram for your vehicle before beginning the installation of the MSD Digital DIS Ignition.

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

**NOTE:** 1. Solid Core spark plug wires **cannot** be used with an MSD DIS Ignition.  
2. Vehicles originally equipped with a CD ignition **cannot** use an MSD DIS Ignition.

### IMPORTANT

Read these instructions before attempting this installation!

#### TECHNICAL FEATURES - DIGITAL DIS-2

**Operating Voltage:** 10-18 volts (neg. ground)  
**Operating Current:** 4.0 Amperes @ 10,000 RPM  
**RPM Capability:** 14,000 RPM - 4-Cyl. @ 14 volts  
**Ignition Inputs:** 2 - DIS Type  
**Ignition Outputs:** 2 - DIS Type  
**LED Indicator:** Ign. trigger, low battery voltage  
**Tach Output:** (+) 12 volt square wave, 40° duration  
**Rev Limiter:** High RPM - Adjustable  
Low RPM - Adjustable  
**Spark Duration:** 20°- 4-Cyl. Max Sparks - 12  
**Energy Output Max:** 105-115 milliJoules per spark.  
1540 milliJoules per sequence.  
**Output Voltage:** Primary (Into Coil): 460-480 volts  
Secondary: (w/stock coil)  
40,000 volts  
**Weight & Size:** 3.7 lbs., 8.5"L x 4.5"W x 2.2"H  
**Potting:** Ciba Polyurethane

#### TECHNICAL FEATURES - DIGITAL DIS-4

**Operating Voltage:** 10-18 volts (neg. ground)  
**Operating Current:** 7.4 Amperes @ 10,000 RPM  
**RPM Capability:** 14,000 RPM - 4, 6, 8-Cyl. @ 14 volts  
**Ignition Inputs:** 2, 3, 4 - DIS Type  
**Ignition Outputs:** 2, 3, 4 - DIS Type  
**LED Indicator:** Ign. trigger, low battery voltage  
**Tach Output:** (+) 12 volt square wave, 40° Duration  
**Rev Limiter:** High RPM - Adjustable  
Low RPM - Adjustable  
**Spark Duration:** 20°- 4, 6, 8-Cyl. Max Sparks - 12  
**Energy Output Max:** 105-115 milliJoules per spark.  
1540 milliJoules per sequence.  
**Output Voltage:** Primary (Into Coil): 460-480 volts  
Secondary: (w/stock coil)  
40,000 volts  
**Weight & Size:** 4.5 lbs., 9.5"L x 4.5"W x 2.2"H  
**Potting:** Ciba Polyurethane

## **THEORY OF OPERATION**

### **CAPACITIVE DISCHARGE**

The MSD Digital DIS Series Ignitions feature a capacitive discharge ignition design. The majority of stock ignitions are inductive ignitions. In an inductive ignition, the coil must store and step up the voltage to maximum strength in between each firing. At higher rpm, since there is less time to charge the coil to full capacity, the voltage falls short of reaching maximum energy which results in a loss of power or top end miss.

The MSD Ignition features a capacitor which is quickly charged to 460-480 volts and stores it until the ignition is triggered. With the CD design, the voltage sent to the coil is always at full power even at high rpm.

### **MULTIPLE SPARKS**

The MSD Digital DIS Series Ignition produces full power multiple sparks for each firing of the spark plug. The number of sparks that occur decreases as rpm increases, however the spark series always lasts for 20° of crankshaft rotation. Above 3,000 rpm there is simply not enough time to fire the spark plug more than once, so there is only one powerful spark.

### **REV LIMITER**

The MSD DIS-2 and 4 Ignitions are equipped with a built-in adjustable Soft Touch Rev Control. This rev limit feature can be adjusted in 250 rpm increments using the program switches on the ignition's end panel. The Soft Touch circuitry provides a smooth and accurate rev limit by dropping the spark to individual cylinders. The Soft Touch produces a load-free rev limit that is accurate to within 1% of the selected rpm.

## **GENERAL INFORMATION**

### **BATTERY**

An MSD Digital DIS Series Ignition will operate on any negative ground, 12 volt electrical system without a distributor. The MSD can be used with a 16 volt battery and can withstand a momentary 24 volts in case of a jump start. The ignition will deliver full voltage with a supply of 10 - 18 volts and will operate with a supply voltage as low as 5 volts.

If your application does not use an alternator, allow at least 15 amp/hour for every half hour of operation. If the engine is cranked with the same battery or other accessories such as an electric fuel pump, fan or water pump are used, the amp/hour rating of the battery must be increased.

### **COILS**

The MSD Digital DIS Ignitions can be used with most stock coils and most aftermarket coils that are designed to replace the stock coils. If you have any questions concerning coils, contact our MSD Customer Service Department at (915) 855-7123.

### **TACHOMETERS/FUEL INJECTION**

The MSD Digital Series Ignitions feature a Tach Output Terminal on the side of the unit. This terminal provides a trigger signal for tachometers, fuel injection, a shift light or other add-on devices that require a 12 volt square wave rpm signal with a 40° duration.

Some vehicles may require a Tach Adapter to operate properly with the MSD. For more information on tachometers and MSD Tach Adapters, refer to the Tachometer Section on page 14.

## **MISCELLANEOUS INFORMATION**

**Sealing:** All circuits of an MSD are potted in ResTech compound. This sealant protects the electronics from moisture.

**Welding:** If you plan on welding on your vehicle, to avoid possible damage to the ignition, always disconnect both MSD Heavy Power cables from the battery. It is also recommended that the tach ground wire be disconnected.

## SPARK PLUGS AND WIRES

Spark plug wires are very important to the operation of the DIS Series Ignition. A good quality, helically wound wire and proper routing are required to obtain the best performance from the ignition. MSD recommends using a helically wound suppression type wire such as the MSD 8mm Heli-Core or 8.5mm Super Conductor Spark Plug Wire.

This type of wire provides a good path for the spark to follow while keeping Electro Magnetic Interference (EMI) to a minimum. Excessive EMI, such as the amount that is produced by solid core spark plug wires, will interfere with the operation of the MSD or other electronics on the vehicle.

**NOTE:** Solid Core spark plug wires cannot be used with an MSD Ignition.

**Routing:** Correct routing of the plug wires is also important to performance. Wires should be routed away from sharp edges and engine heat sources. If there are two wires that are next to each other in the engine's firing order, the wires should be routed away from each other to avoid inducing a spark into the other wire.

To add more heat protection to the wires, MSD offers Pro Heat Guard, PN 3411. This is a glass woven and silicone coated protective sleeve that can be slid over the plug wires. For extra protection to the spark plug boots, MSD also offers Pro-Boot Guard, PN 3412.

**Spark Plugs:** Choosing the correct spark plug design and heat range is important when trying to get the best performance possible. Since there are so many engine combinations and manufacturers, MSD does not recommend which plug or gap is exactly right for your application. Platinum style spark plugs are not recommended. MSD suggests that you follow the engine builder or manufacturer's specification for spark plugs. With that, you can then experiment with the plug gap to obtain the best performance. The gap of the plugs can be opened in 0.005" increments, then tested until the best performance is obtained. MSD judges the plug gap by compression and other variables. Every application is different and should be tested and tuned.

## MOUNTING

The MSD Ignition may be mounted in any location except on the engine or near the exhaust manifold. Excessive heat at these locations may cause damage to the ignition. It can be mounted in any position. It is not recommended to mount the unit in an enclosed area such as the glovebox. When selecting a mounting location, make sure the cable harness will reach the battery and coils. When a suitable location is found, hold the ignition in place and mark the location of the mounting holes. Using a 13/64" drill bit, drill a hole in each of the locations marked and use the supplied hardware screws to mount the ignition unit (Figure 1).

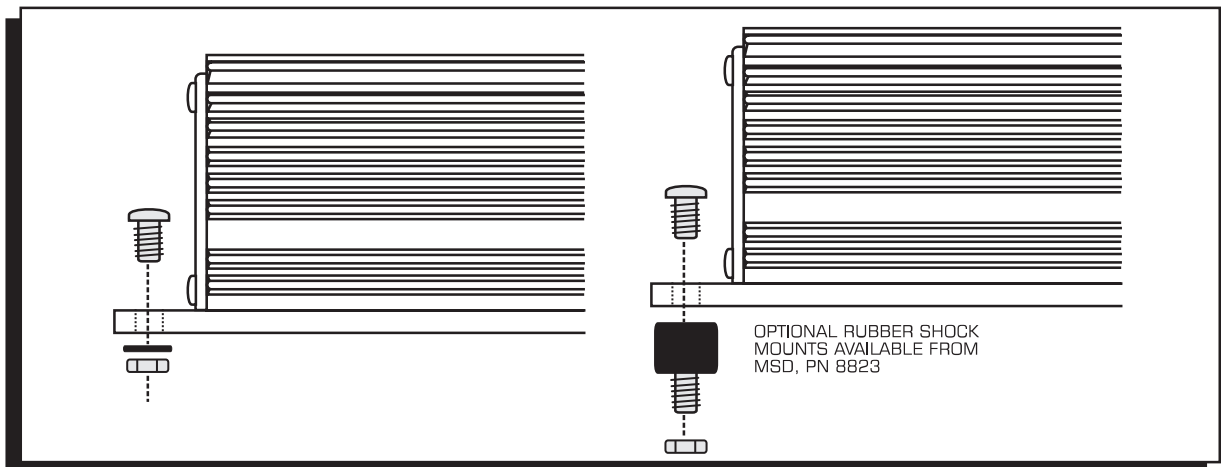


Figure 1 & 2 Mounting the MSD Ignition.

## WIRING

### GENERAL WIRING INFORMATION

**Wire Length:** All of the wires of the MSD Ignition may be shortened as long as quality connectors are used or soldered in place. To lengthen the wires, use one size bigger gauge wire (12 gauge for the power leads and 16 gauge for all other wires) with proper connections. 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, it should be connected to the battery negative terminal, engine block or chassis. There should always be a ground strap between the engine and the chassis. Always securely connect the ground wire to a clean, paint free metal surface.

### ROUTING WIRES

The MSD wires should be routed away from direct heat such as the exhaust manifolds/headers and any sharp edges. The trigger wires should be routed separate from the other wires and spark plug wires. It is best if they are routed along a ground plane such as the block, fender well or firewall which creates an electrical shield.

### WIRE FUNCTIONS

The following chart describes what each wire of the MSD DIS Ignition is used for.

<b>Power Leads</b>	These are the two heavy gauge wires (14 gauge) and are responsible for getting direct battery voltage to the ignition.
<b>Heavy Red</b>	This wire connects directly to the battery positive (+) terminal, to a positive battery junction or the positive side of the starter solenoid. <b>Note:</b> <b>Do not</b> connect to the alternator.
<b>Heavy Black</b>	This wire connects to a good ground, either at the battery negative (-) terminal or to the engine.
<b>Red</b>	Connects to a switched 12 volt source, such as the ignition key or switch.
<b>Brown/Orange</b>	Connects to the positive (+) terminal/wire of the coil. <b>Note:</b> This is the only wire that makes electrical contact with coil positive (+).
<b>Brown/White</b>	Connects to the negative (-) terminal/wire of the coil (Channel 1). <b>Note:</b> This is the only wire that makes electrical contact with channel 1 coil negative (-).
<b>Brown/Green</b>	Connects to the negative (-) terminal/wire of the coil (Channel 2). <b>Note:</b> This is the only wire that makes electrical contact with channel 2 coil negative (-).
<b>Brown/Yellow</b>	Connects to the negative (-) terminal/wire of the coil, (Channel 3 available on DIS-4 only). <b>Note:</b> This is the only wire that makes electrical contact with channel 3 coil negative (-).
<b>Brown/Violet</b>	Connects to the negative (-) terminal/wire of the coil, (Channel 4 available on DIS-4 only). <b>Note:</b> This is the only wire that makes electrical contact with channel 4 coil negative (-).
<b>Trigger Wires</b>	There is a trigger input wire for each channel from the factory electronic amplifier.
<b>White</b>	This wire is used to connect to the electronic ignition amplifier output of channel 1.
<b>Green</b>	This wire is used to connect to the electronic ignition amplifier output of channel 2.
<b>Yellow</b>	This wire is used to connect to the electronic ignition amplifier output of channel 3.
<b>Violet</b>	This wire is used to connect to the electronic ignition amplifier output of channel 4.
<b>Brown</b>	Ignition interrupt feature. To activate, connect this wire to ground.
<b>Blue</b>	Two Step feature. To activate low rpm limit, connect this wire to ground.

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

## WIRING TO THE FACTORY IGNITION SYSTEM

**NOTE:** The factory rev limiter and all timing functions will still function as normal with the MSD Digital DIS Ignition installed.

1. Locate the ignition coils and identify which wire leading to the coil(s) has 12 volts on it with the ignition key in the On position. If available, refer to the vehicle's service manual wiring diagram to assist you in identifying the 12 volt wire(s).

**NOTE:** On some vehicles the starter must be engaged to provide +12 volts to the positive wire leading to the coils. If none of the wires indicate 12 volts, have someone engage the starter while testing each of the wires.

If a service manual is not available, follow this procedure (Figure 3).

- A. Disconnect all wires leading to the coil(s). Note: on some applications it may require that the harness leading to the coil be cut to access the wires.
- B. Turn the ignition switch On. Using a voltmeter, probe each of the wires on the harness to determine which wire has 12 volts on it. Note: Make sure the wires do not contact any engine components.
- C. The wire that shows 12 volts is the positive feed to the coil. Turn the ignition switch Off and connect the DIS Red wires to the harness and the DIS Brown/Orange wires to the positive (+) side of the coil.
- D. The remaining wires on the harness are the trigger wires. On a 4-cylinder you should have two, on a 6-cylinder three, and on a 8-cylinder there should be four. Each of these wires needs to be connected to one of the trigger input wires of the DIS Ignition. Using Figure 4 and 5 as a guide, connect the DIS trigger input and coil (-) wires as follows.
  1. Connect the DIS White wire, Channel 1, to the first factory trigger wire and then connect the DIS Brown/White Coil (-) wire to the corresponding wire on the coil.
  2. Connect the DIS Green wire, Channel 2, to the second factory trigger wire and then connect the DIS Brown/Green Coil (-) wire to the corresponding wire on the coil.
  3. Connect the DIS Yellow wire, Channel 3, (available on the DIS-4 only) to the third factory trigger wire and then connect the DIS Brown/Yellow Coil (-) wire to the corresponding wire on the coil.
  4. Connect the DIS Violet wire, Channel 4, (available on the DIS-4 only) to the fourth factory trigger wire and then connect the DIS Brown/Violet Coil (-) wire to the corresponding wire on the coil.

**IMPORTANT:** If you are using the DIS-4 on a 4 or 6-cylinder application where all the DIS channels are not used, you must ground the unused trigger input wires. On a 6-cylinder application, ground the DIS Violet wire and on a 4-cylinder, ground the DIS Violet and Yellow wires.

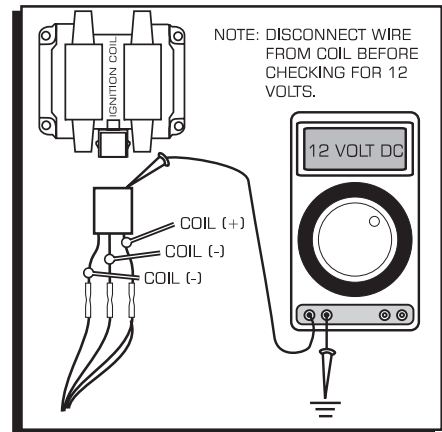
At this point all the DIS harness wires should be connected. Review your wiring with the Figures on pages 11-13 and make any corrections if required. To verify that all wires are connected to their proper locations, plug the supplied bypass plug into the DIS harness and then start the vehicle. If the vehicle does not start then the harness was not installed properly. Check all your connections to ensure that they are secure and connected in the proper order.

The only wires that should be connected directly to the coil are the BRN/ORG, BRN/WHT, BRN/GRN, BRN/YEL and the BRN/VIO. Do not hook any other wires to the coil.

The Red wires should be connected to a switched 12 volt source, allowing the ignition to be switched On and Off by the vehicles ignition switch.

If the vehicle starts then the harness is correctly installed. Connect the DIS heavy Red wire to the positive (+) battery terminal and the heavy Black wire to the negative (-) battery terminal. Remove the bypass plug from the harness and plug the DIS Ignition into the harness. Start the vehicle to verify that all functions are operating.

**NOTE:** Timing set up switch S4 of switch 3 must be in the Off position in order to start the engine.



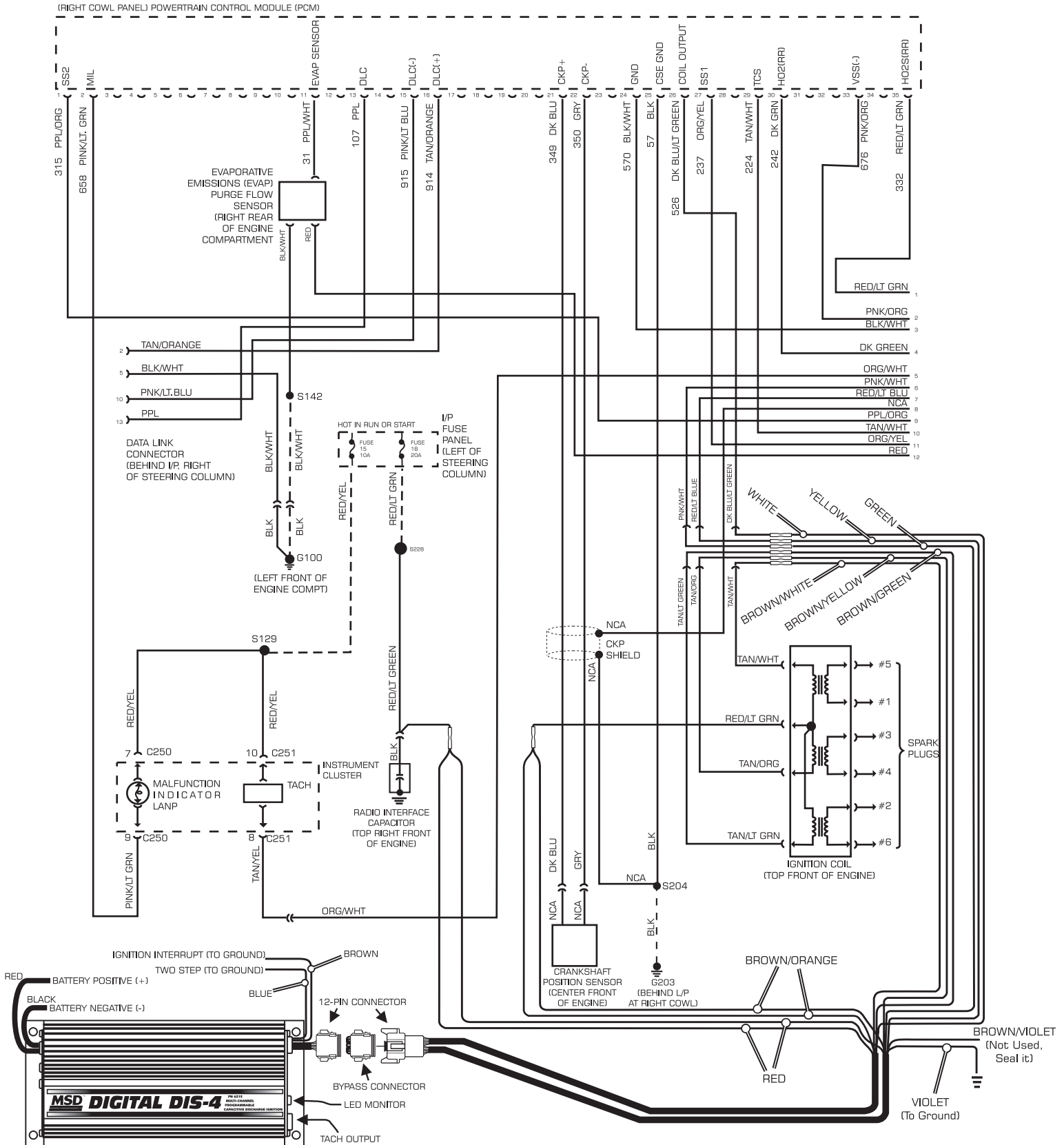
**Figure 3**





# Wiring after installation of the MSD.

Figure 5



### STAGING REV LIMIT (TWO STEP)

The Two Step feature provides the capability of switching between two rpm limits - High and Low. The limits are set using the Staging Rev Limit and the Max Speed Rev Limit. To activate the Staging Rev Limit function, connect the Light Blue wire to a momentary switched ground (Figure 6). When the Light Blue wire is grounded, the low rpm limit is engaged. When the Light Blue wire is not grounded (open), the high rpm limit is engaged. To adjust the low rpm limit, position S1, S2, S3 and S4 of Switch 2 to the desired configuration. To adjust the high rpm limit, position S5, S6, S7 and S8 of Switch 3 to the desired configuration.

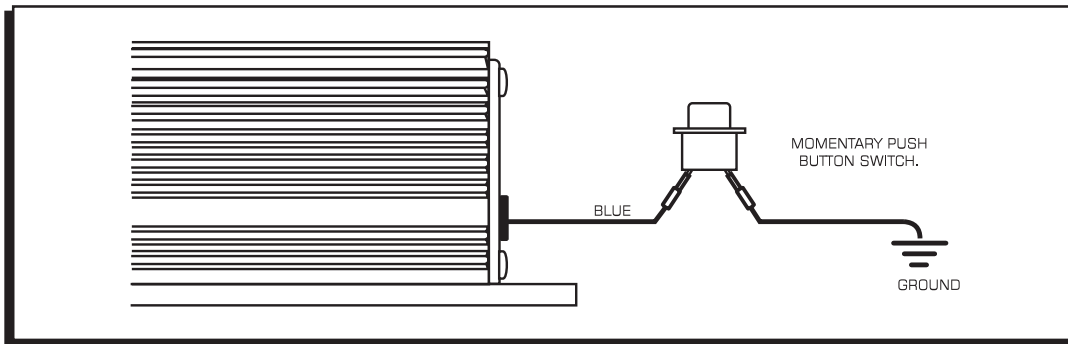


Figure 6 Connecting the Staging Rev Limit.

### THEFT DETERRENT

The MSD DIS Ignition provides the opportunity to easily install a theft deterrent kill switch, Figure 7. Attach the Brown wire to one side of a single pole throw (On/Off) switch and the remaining side to ground. When the Brown wire is grounded, the vehicle will crank but not start.

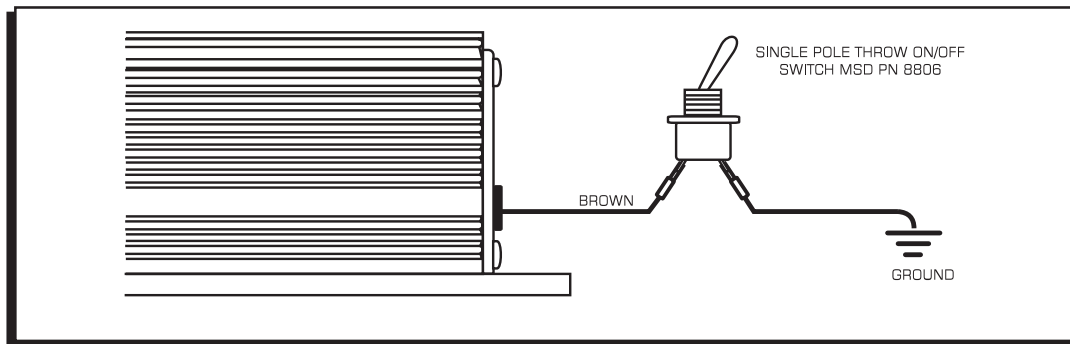


Figure 7 Connecting a Theft Deterrent Switch.

### PROGRAMMING THE DIS IGNITION

The MSD DIS Ignitions have several programming options to “tune” the ignition to meet specific engine requirements. Three switch assemblies located on the end panel are for programming the ignition. The MSD DIS Ignition are programmed at the factory for operation on most 4, 6, and 8-cylinder engines equipped with a distributorless ignition system. It is recommended to install and run the DIS Ignition before making any adjustments. The diagram on page 10 shows the switch assemblies and the factory default settings along with their corresponding adjustment ranges.



**PROGRAMMABLE FEATURES**

Below is a list of the DIS 2 and 4's programmable features. As illustrated in figure 8, the factory ECU max timing and rev limit setting cannot be overridden.

**SWITCH 1**

**Max/Min Rev Limit** - Selector S1 raises the Staging Rev Limit and Max Speed Rev Limit by 4000. This feature allows the DIS Ignitions to be used on both low and high rpm engines.

**HSR Curve** - Selector S2 activates the High Speed Retard function. This feature retards the ignition timing at a rate of 20°/1000 rpm beginning 1000 rpm below the selected Max Speed Rev Limit setting. The HSR Curve can be used for traction control or on nitrous equipped engines to prevent detonation.

**Electric Start** - Selector S3 programs the DIS Ignition for use on either starter equipped engines or kick/pull start engines.

**Waste Spark** - Selector S4 programs the ignition for use on engines equipped with a single coil per cylinder (720 firing S4 - Off), or dual output coil feeding 2 cylinders (360 firing S4 - On).

**Max Timing** - Selectors S6, S7 and S8 are preprogrammed prior to shipping to revert to the factory ECU max timing setting. Changing these selectors will not affect the performance of this ignition.

**SWITCH 2**

**Staging Rev Limit** - Selectors S1, S2, S3 and S4 set the rpm point at which the Staging Rev Limit feature limits the engine rpm. The Staging Rev Limit is used to provide a lower rpm limit for use on the starting line for consistent launches.

**Max Speed Retard** - The Max Speed Retard sets the amount of ignition retard that occurs between the Retard Begin Speed and the Max Speed Rev Limit. Selectors S5, S6, S7 and S8 set the amount of retard.

**SWITCH 3**

**Retard Begin Speed** - The Retard Begin Speed determines the rpm point at which the ignition's retard function will begin to retard the timing. Selectors S1, S2 and S3 set the desired rpm point.

**Timing Setup** - When the Timing Setup selector, S4, is activated (ON), the ignition's spark output is disabled and the built-in LED indicator is turned on. This feature can be used to monitor the ignition's functions or as a timing setup device.

**Max Speed Rev Limit** - Selectors S5, S6, S7, and S8 determine the rpm point at which the engine over-rev limiter is activated. Note: If the DIS Rev Limiter value is set at a greater value than the vehicle's ECU rev limit, the engine speed will rev limit at the lower value of the ECU.

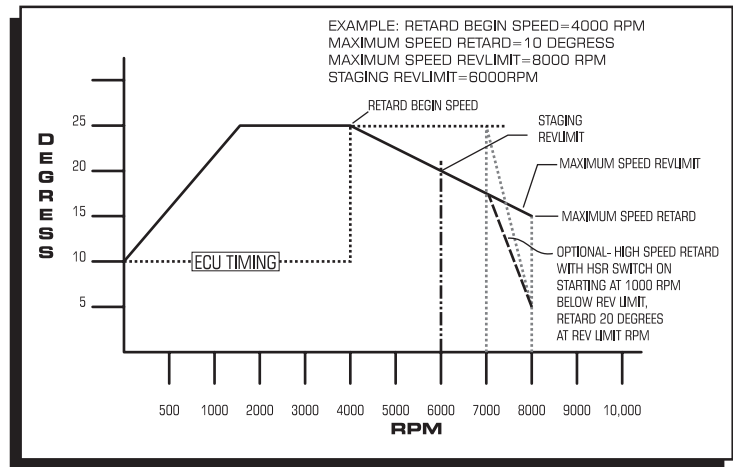


Figure 8

**MAX/MIN REV LIMIT (+)**

Selector, S1, extends the range of the Max Speed Rev Limit and the Staging Rev Limit by 4000 rpm. Set selector S1 to ON to increase the indicated Rev Limit points by 4000 rpm.

**HIGH SPEED RETARD**

When the High Speed Retard selector, S2, is ON the ignitions high speed retard feature will retard the ignition timing 20° starting at 1000 rpm before the Max Speed Rev Limit point.

**ELECTRIC START**

Selector S3 programs the ignition spark to occur after one revolution for electric starter equipped engines or immediately for hand crank/kick start type engines. Set selector S3 to ON for hand crank/kick start engines only.

**WASTE SPARK**

Selector S4 programs the ignition for use with single (coil per cylinder) or dual output (coil pack) type coils. Set selector S4 to OFF for engines equipped with one coil per cylinder (720° firing) or to ON for all coil pack (360° firing) equipped engines.

**MAX TIMING**

The Max Timing selectors, S6, S7 and S8 are for a feature which is not programmed into this model. Changing the position of the Max Timing selectors will not affect the operation of this ignition.

**STAGING REV LIMIT**

Selectors S1, S2, S3 and S4 set the rpm point at which the Staging Rev Limit feature limits the engine rpm at. Position the selectors to the desired rpm below.

RPM	S1	S2	S3	S4
3000	OFF	OFF	OFF	OFF
3250	ON	OFF	OFF	OFF
3500	OFF	ON	OFF	OFF
3750	ON	ON	OFF	OFF
4000	OFF	OFF	ON	OFF
4250	ON	OFF	ON	OFF
4500	OFF	ON	ON	OFF
4750	ON	ON	ON	OFF
5000	OFF	OFF	OFF	ON
5250	ON	OFF	OFF	ON
5500	OFF	ON	OFF	ON
5750	ON	ON	OFF	ON
6000	OFF	OFF	ON	ON
6250	ON	OFF	ON	ON
6500	OFF	ON	ON	ON
6750	ON	ON	ON	ON

**MAX SPEED RETARD**

The Max Speed Retard sets the amount of ignition retard that occurs between the Retard Begin Speed and the Max Speed Rev Limit. Position selectors S5, S6, S7 and S8 to the amount of retard desired.

DEG	S5	S6	S7	S8
0	OFF	OFF	OFF	OFF
1°	ON	OFF	OFF	OFF
2°	OFF	ON	OFF	OFF
3°	ON	ON	OFF	OFF
4°	OFF	OFF	ON	OFF
5°	ON	OFF	ON	OFF
6°	OFF	ON	ON	OFF
7°	ON	ON	ON	OFF
8°	OFF	OFF	OFF	ON
9°	ON	OFF	OFF	ON
10°	OFF	ON	OFF	ON
11°	ON	ON	OFF	ON
12°	OFF	OFF	ON	ON
13°	ON	OFF	ON	ON
14°	OFF	ON	ON	ON
15°	ON	ON	ON	ON

**RETARD BEGIN SPEED**

The Retard Begin Speed, S1, S2 and S3 of Switch 3 determines the rpm point at which the ignition's retard function will begin to retard the timing. Position the switches to the desired rpm point shown in the graph below.

RPM	S1	S2	S3
4000	OFF	OFF	OFF
4500	ON	OFF	OFF
5000	OFF	ON	OFF
5500	ON	ON	OFF
6000	OFF	OFF	ON
6500	ON	OFF	ON
7000	OFF	ON	ON
7500	ON	ON	ON

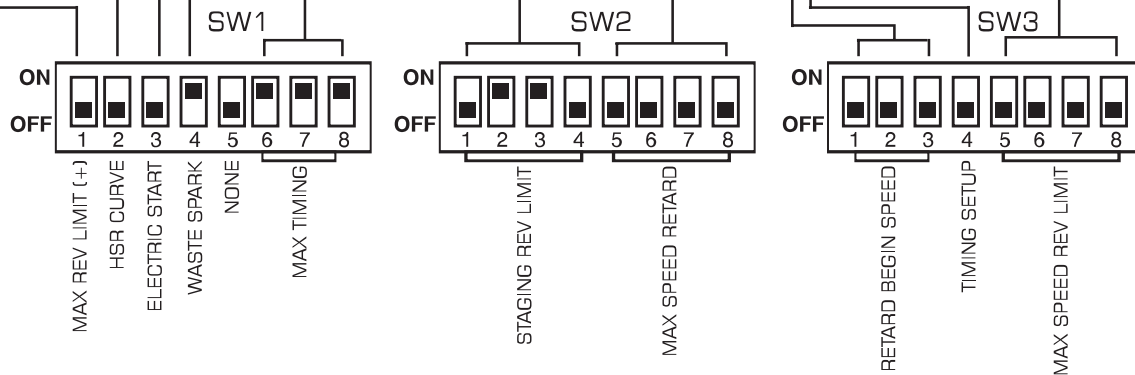
**TIMING SETUP**

When the Timing Setup function, S4, is ON the ignitions spark output is disabled and the built-in LED indicator is turned on. Note: the Timing Setup switch must be set in the Off position in order for the ignition to fire.

**MAX SPEED REV LIMIT**

Selectors S5, S6, S7, and S8 determine the rpm point at which the engine over-rev limiter is activated. Position the selectors to the desired rev limit indicated below.

RPM	S5	S6	S7	S8
6250	OFF	OFF	OFF	OFF
6500	ON	OFF	OFF	OFF
6750	OFF	ON	OFF	OFF
7000	ON	ON	OFF	OFF
7250	OFF	OFF	ON	OFF
7500	ON	OFF	ON	OFF
7750	OFF	ON	ON	OFF
8000	ON	ON	ON	OFF
8250	OFF	OFF	OFF	ON
8500	ON	OFF	OFF	ON
8750	OFF	ON	OFF	ON
9000	ON	ON	OFF	ON
9250	OFF	OFF	ON	ON
9500	ON	OFF	ON	ON
9750	OFF	ON	ON	ON
10000	ON	ON	ON	ON



**DEFAULT SWITCH POSITIONS SHOWN**

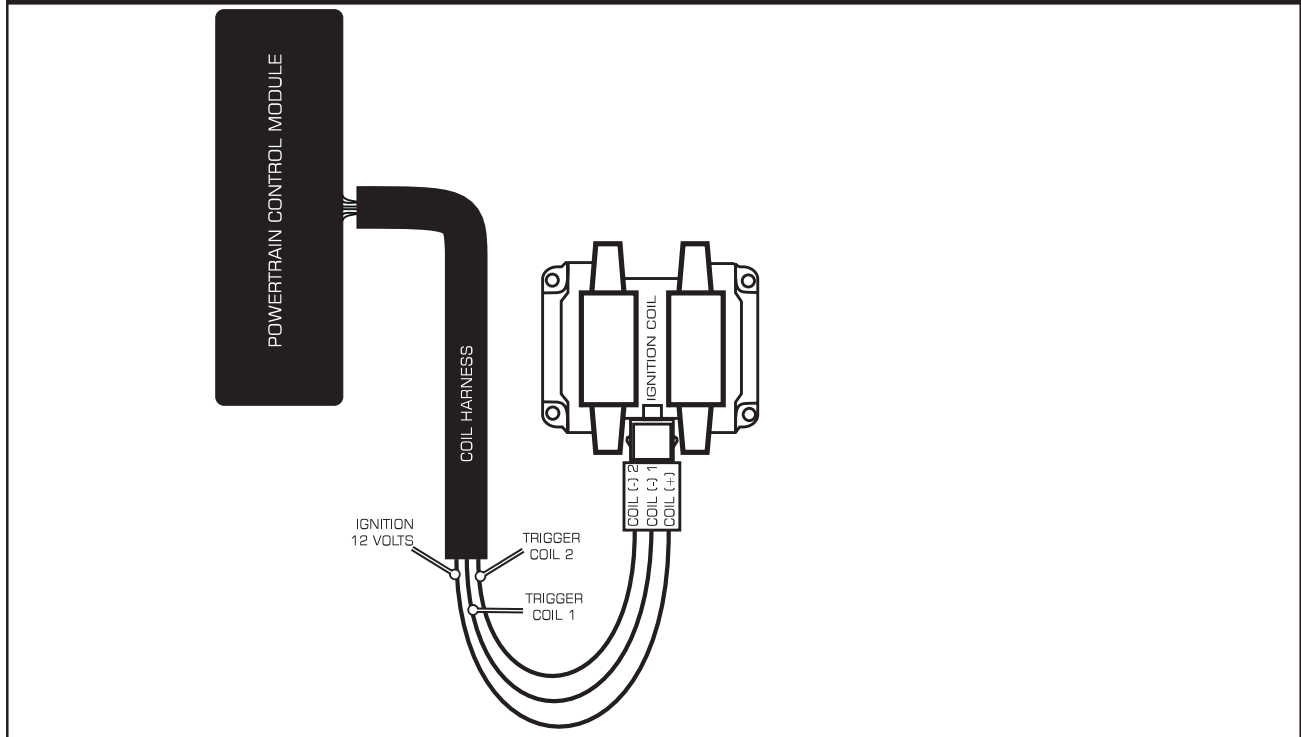
**NOTE:** The ignition switch must be turned ON then OFF before new program changes will take effect.

**Figure 9 Switch Position and Controls**

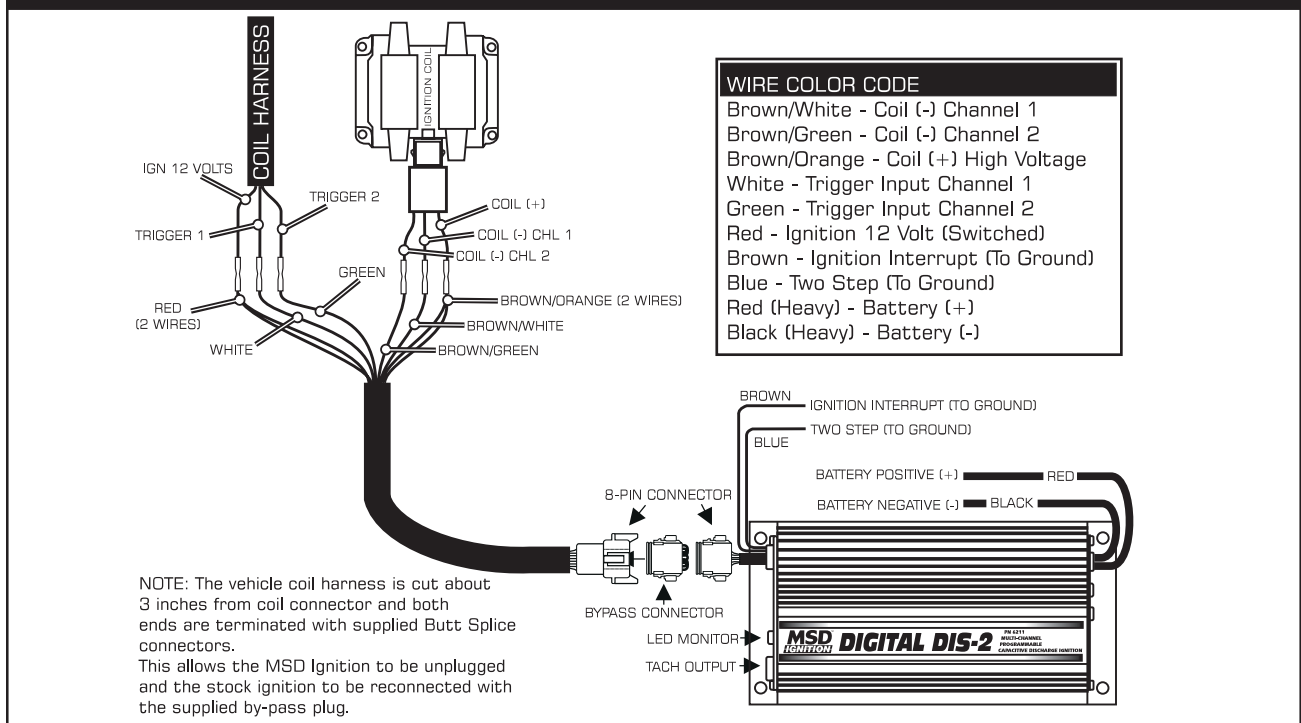
**WIRING DIAGRAMS**

The following wiring diagrams illustrate numerous installations on different vehicles and applications. If you experience difficulties when installing your MSD DIS-2 or DIS-4 Ignition, contact our Customer Service Department at (915) 855-7123 Monday - Friday, 8am - 5pm mountain time or e-mail us at: msdtech@msdignition.com.

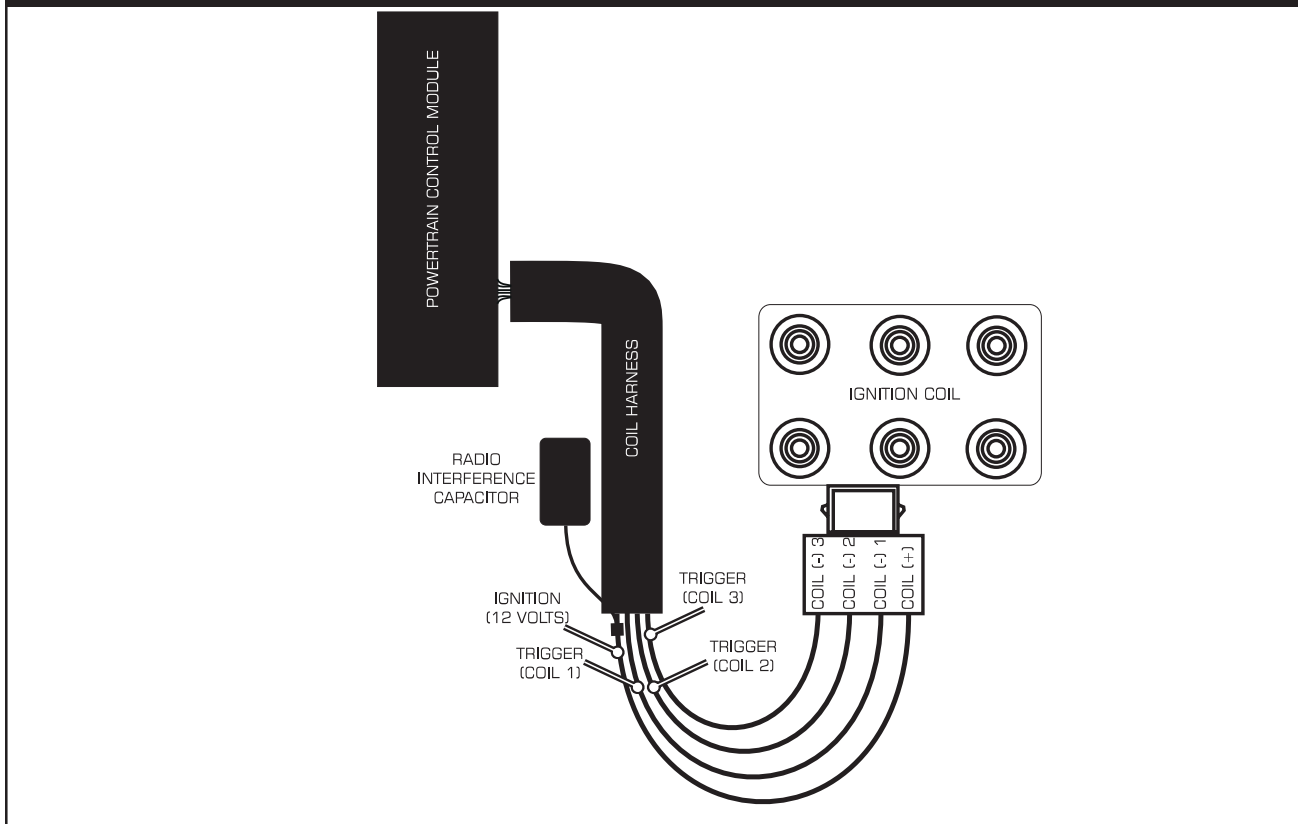
**Figure 10 GENERAL DIS WIRING Typical 4-cylinder application (factory wiring)**



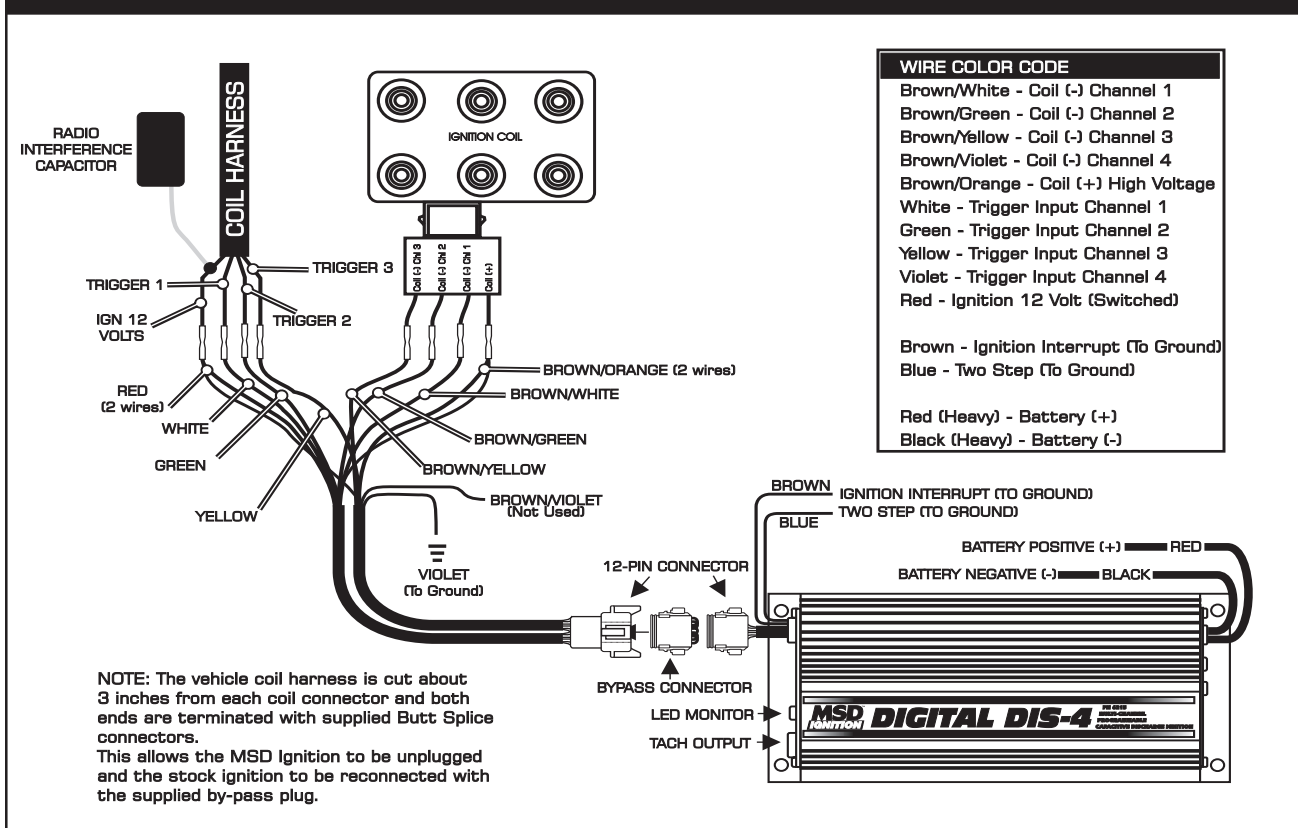
**Figure 11 GENERAL DIS WIRING Typical 4-cylinder application with DIS-2 Ignition.**



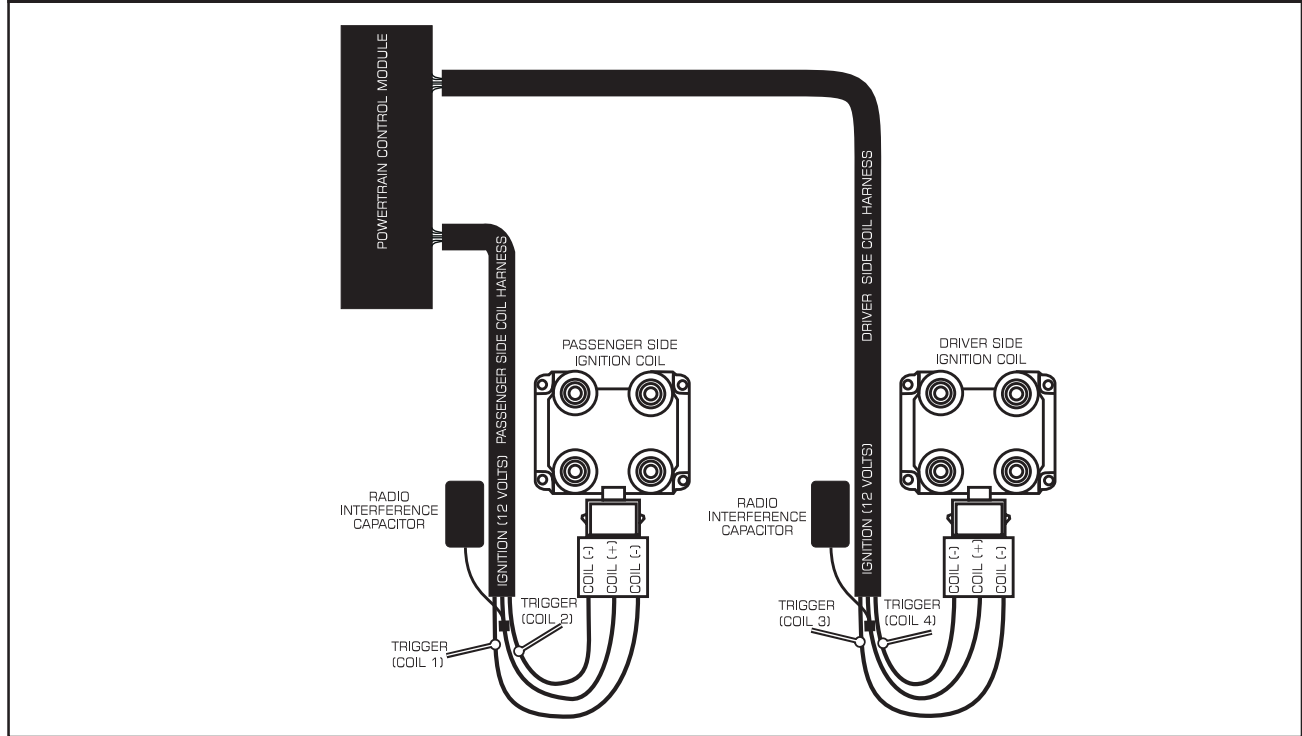
**Figure 12 GENERAL DIS WIRING Typical 6-cylinder application (factory wiring)**



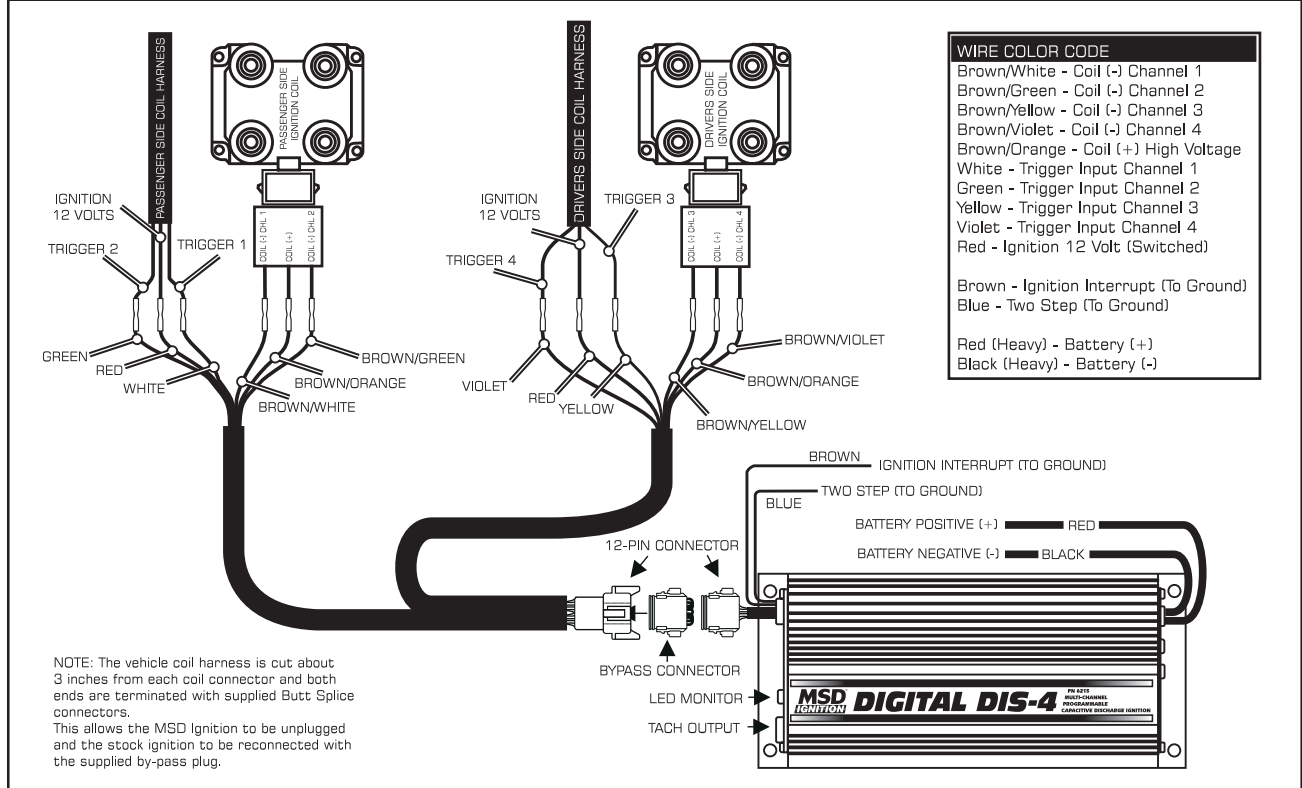
**Figure 13 GENERAL DIS WIRING Typical 6-cylinder application with DIS-4 Ignition**



**Figure 14 GENERAL DIS WIRING Typical 8-cylinder application (factory wiring)**



**Figure 15 GENERAL DIS WIRING Typical 8-cylinder application with DIS-4 Ignition**



**PRESTART CHECK LIST**

- The only wires connected to the coil negative (-) terminals/wires are the MSD Brown/White, Brown/Green, Brown/Yellow, Brown/Violet.
- The only wire connected to the coil positive (+) terminals/wires is the MSD Brown/Orange.
- The only wires connected to the factory harness wires (trigger input) are the MSD White, Green, Yellow, Violet.
- The small Red wire of the MSD is connected to a switched 12 volt source (factory harness).
- If using a MSD Digital DIS Ignition on a 4-cylinder engine equipped with single coils per cylinder, the firing cycle select must be programmed for no wastespark (720° firing S4 - Off).
- The MSD power leads are connected directly to the battery positive and negative terminals.
- The battery is connected and fully charged if not using an alternator.
- The engine is equipped with at least one ground strap to the chassis.

**WARNING:** The MSD Digital DIS Series Ignitions are capacitive discharge ignitions. High voltage is present at the coil primary terminals. Do not touch the coil or connect test equipment to the terminals.

**TACH/FUEL ADAPTERS**

If your vehicle does not operate correctly or if you experience a no-run situation you probably need an MSD Tach/Fuel Adapter.

Some vehicles with electronic fuel injection systems may require an MSD Tach/Fuel Injection Adapter to run properly. This is because many of these systems use the same trigger source to operate the MSD, the tachometer and the fuel injection. This results in a voltage signal that is too low to accurately trigger the fuel injection. If your vehicle's engine starts and then shuts off after a short period of time or the check engine light turns on then your vehicle will require a Tach/Fuel Injection Adapter. An MSD Tach Adapter, PN 8912, will usually remedy the problem.

The chart below lists most of the vehicles that require a tach/fuel injection adapter. It is very important that the tach/fuel adapters be installed at the same time that the DIS Ignition is installed to prevent activation of the check engine light. On OBD II equipped vehicles resetting of the check engine light requires special computer diagnostic equipment. On vehicles not listed install the DIS before purchasing the adapter, to see if the ignition will operate properly without the adapters.

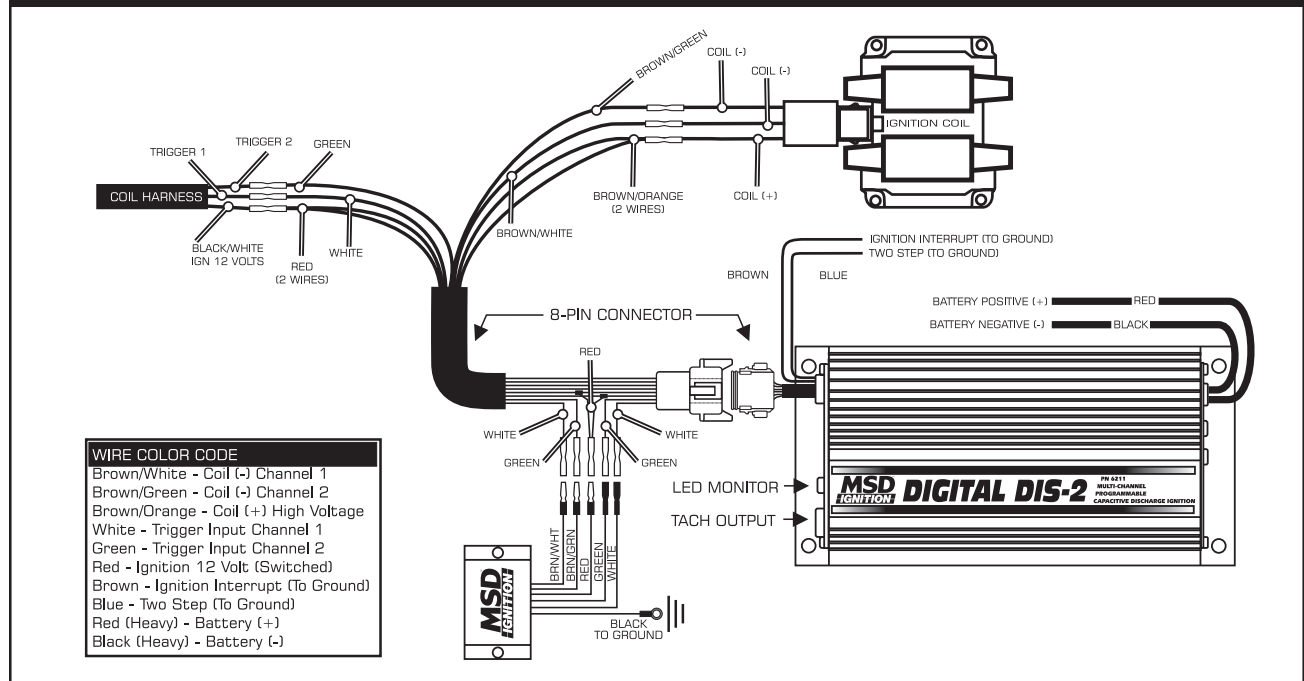
**INSTALLING THE PN 8912 TACH ADAPTERS.**

The number of adapters required is determined by the number of cylinders on the engine. Four cylinder engines will need the PN 8912 Adapter, 6-cylinder and V-8 engines will need two PN 8912's. Figure 16 shows a PN 8912 installed to a 4-cylinder engine. Note: If you bypass the MSD using the supplied bypass plug you must disconnect the adapters from the harness.

If you still experience problems after installing the adapters, call the MSD Customer Service Department for further instruction.

YR	VEHICLE	ADAPTER	QTY
All	Mitsubishi Eclipse, Galant, Mirage, Montero, Precis, Expo	8912	1
All	Eagle Talon, Summit	8912	1
All	Dodge Avenger, Neon, Stratus, Caravan	8912	1
All	Chrysler Sebring, Cirrus	8912	1
All	Plymouth Breeze, Voyager, Acclaim, Colt, Sundance, Laser	8912	1
'96-'98	Ford Mustang, T-Bird, with 4.6L Engine	8912	2

Figure 16 MSD DIS-2 IGNITION WITH PN 8912 ADAPTER



## TROUBLESHOOTING

Every MSD Digital DIS Ignition undergoes numerous quality control checks including a four hour burn-in test. If you experience a problem with your MSD, our research has shown that the majority of problems are due to improper installation or poor connections.

The Troubleshooting section has several checks and tests you can perform to ensure proper installation and operation of the MSD. If you have any questions concerning your MSD, call our Customer Service Department at (915) 855-7123, Monday - Friday, 8am to 5pm mountain time.

### MISSES AND INTERMITTENT PROBLEMS

Generally, a miss or hesitation at higher rpm is usually not caused by the ignition. Most probable causes include a coil or plug wire failure, arcing from the plug boot to ground. Several areas to inspect are:

- Always inspect the plug wires at the coil and at the plug for a tight connection and visually inspect for cuts, abrasions or burns.
- Inspect the positive (+) and negative (-) coil terminal/wire connections. Because the MSD is a Capacitive Discharge ignition and it receives a direct 12 volt source directly from the battery, there will **not** be voltage at the coil positive (+) terminal with the key turned On. During cranking or while the engine is running, very high voltage will be present at the coil. **Do not** connect any test equipment to the coil positive (+) or negative (-) terminals/wires.

**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 essential check.
- Is the engine running lean? Inspect the spark plugs and complete fuel system.
- Inspect all wiring connections for corrosion or damage. Remember to always use proper connections followed by soldering and seal the connections completely.

If everything checks out, use the following procedure to test the ignition for spark. MSD also offers an Ignition Tester, PN 8996, which can be used to check the entire ignition system, tachometers, rpm activated switches and shift lights without removing them from the vehicle.





# INSTALLATION INSTRUCTIONS

## **CHECKING FOR SPARK**

The following procedure will determine if the ignition is producing a spark.

1. Make sure the ignition switch is in the "Off" position.
2. Remove the spark plug wires and spark plugs from the engine. With the spark plugs inserted in the end of the plug wires, lay the spark plugs against ground.
3. Disconnect the MSD trigger wire (Green, White, Yellow or Violet) from the ignition amplifier harness.
4. Turn the ignition to the On position. Do not crank the engine.
5. Tap one of the trigger wires to ground several times. Each time you pull the wire from ground, a spark should jump across the spark plugs. If spark is present, the ignition is working properly. Repeat the test for each coil. If there is no spark proceed to step 6.
6. **If there is no spark:**
  - A. Inspect all of the wiring.
  - B. Substitute another coil and repeat the test. If there is now spark, the coil is at fault.
  - C. If there is still no spark, check to make sure there is 12 volts on the small Red wire from the MSD when the key is in the On position. If 12 volts is not present, find another switched 12 volt source and repeat the test.

**NOTE:** Some vehicles will require cranking the engine to provide +12V to the MSD Ignition Red wire.
  - D. After following the test procedures and inspecting all of the wiring there is still no spark, the MSD Ignition is in need of repair. See the Warranty and Service section for information.

## **RETURNING TO STOCK IGNITION**

To return the ignition system back to standard operation simply unplug the MSD Digital DIS control cable and insert the supplied jumper plug into the cable connector. If using aftermarket low resistance coils, they must be replaced with the original factory coils. Note: If any tach/fuel injector adapters were added to the vehicle harness the adapters must be disconnected before reverting back to the stock ignition.

## **LED MONITOR**

The MSD Digital DIS Ignition is equipped with an LED monitor. The LED will light every time there is a spark. At above idle speeds, it may appear to be on continuously. If the LED begins to flash erratically, it is indicating that there is a problem. The battery supply voltage may be getting to low for full power operation, or a coil positive wire may be grounded.

### **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.