

MSD INSTALLATION INSTRUCTIONS

Flying Magnet Crank Trigger Kit Chevrolet Big Block V8 Engines PN 8620 / 86203

ONLINE PRODUCT REGISTRATION: Register your MSD product online. Registering your product will help if there is ever a warranty issue with your product and helps the MSD R&D team create new products that you ask for! Go to www.msperformance.com/registration.

Important: Read the instructions before attempting the installation.

Parts Included:

1 - Trigger Wheel	3 - Bolts, 3/8"- 16 x 1 1/4"
1 - Pickup Holder Assembly	3 - 3/8" Washers
1 - Non Magnetic Pickup Assembly	2 - Bolts, 7/16"- 14 x 2" Hex
1 - Pickup Base	4 - Spacers
2 - Bolts, 5/16" - 24 x 1 1/4"	Tech Bulletin #104
2 - 5/16" Washers	

Note: On some vehicles the MSD Crank Trigger Kit may require slight modifications to accommodate special engine plates, pulley systems, etc.

INSTALLING THE PICKUP AND BRACKET

1. Mount the pickup holder onto the bracket using the two fine thread bolts (Figure 1). The pickup base will only install one way, do not try to force the bolts in, and hand tighten the bolts.
2. Install the bracket onto the engine. The bracket may be mounted on either side of the balancer. Be sure to use the correct length bolts and shims in the proper location.
3. Install the pickup and locknut into the holder. Do not tighten the locknut at this time.

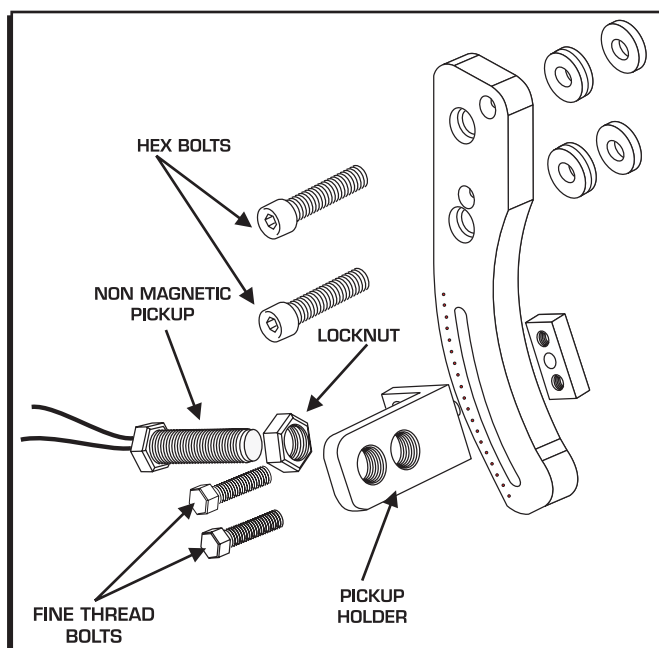


Figure 1 Pickup Bracket Assembly.

MSD INSTALLATION INSTRUCTIONS

INSTALLING THE TRIGGER WHEEL

1. Position the No. 1 cylinder under compression at the desired total timing.
2. Position the trigger wheel onto the harmonic balancer so one of the four magnets lines up with the center of the non magnetic pickup. Make sure the wheel is mounted so it rotates in the direction of the arrow on the wheel. If necessary, slide the pickup in its mount until it properly lines up with the trigger wheel magnet.
3. Check and make sure the wheel is positioned correctly with the pickup and torque the trigger wheel bolts to 25 - 30 lb-ft. The pickup should be centered to the edge of the trigger wheel (Figure 2). If not, it may be necessary to add or delete shims to the pickup bracket to achieve the proper position.

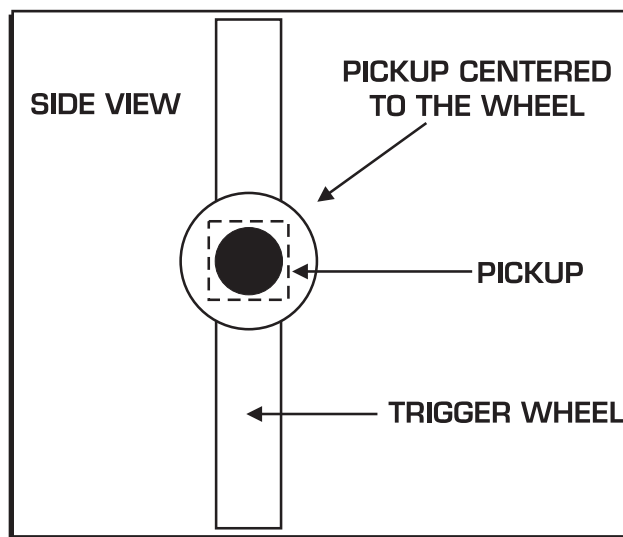


Figure 2 Pickup Centered on the Trigger Wheel.

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.msdpower.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.

Flying Magnet Crank Trigger Kit General Wiring

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These instructions cover the wiring and general installation tips of all the MSD Flying Magnet Crank Trigger Kits. For installation of the brackets and trigger wheel refer to the enclosed Installation Instructions for each specific kit.

SETTING THE AIR-GAP

The air-gap between the trigger wheel and the non-magnetic pickup is important to the operation of the crank trigger system, however its adjustment does not affect engine power or performance. The proper air-gap will result in a good trigger signal at cranking rpm through high rpm with no interference to the wheel. The optimum setting is generally between 0.050" – 0.080".

With the brackets and trigger wheel mounted (with the arrow on the wheel facing out) position the pickup within 0.050" – 0.080" from the wheel then tighten the locknut (Figure 1). Do not over tighten the locknut.

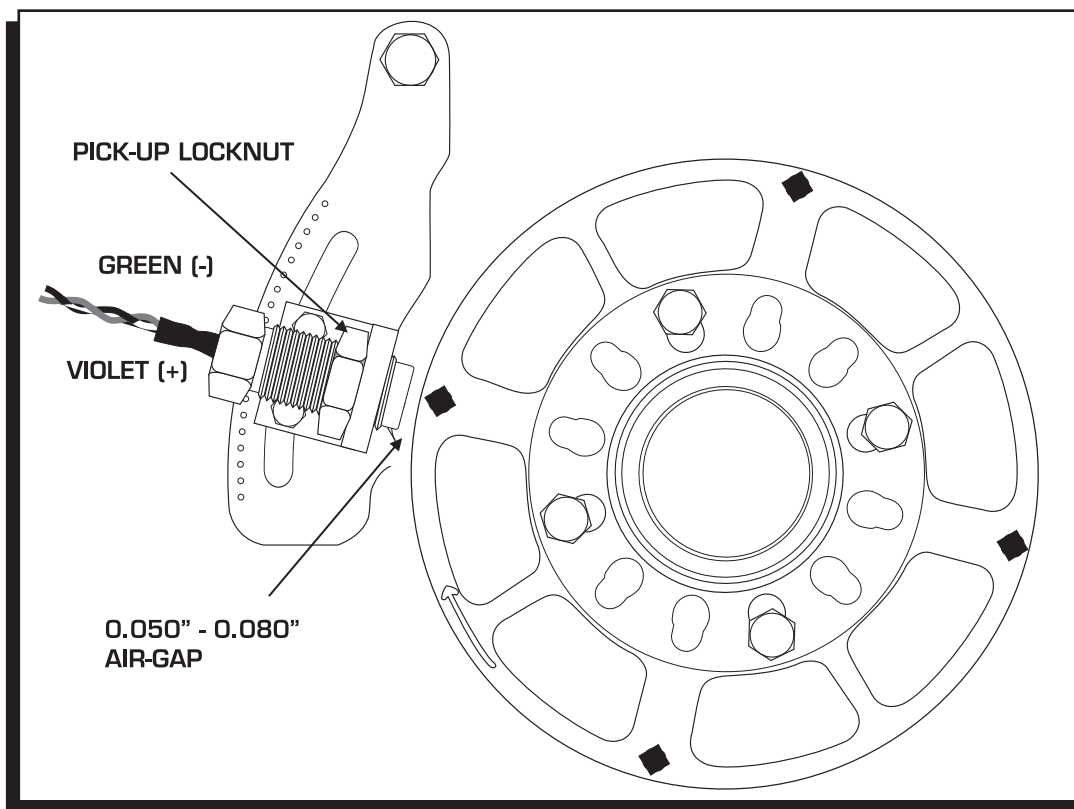


Figure 1 Setting the Air-Gap.

WIRING

The non-magnetic pickup acts much like a coil. The wires are wound around a small piece of iron so that when the magnet passes the pickup a voltage signal is created. This signal is what triggers the MSD Ignition Control. Before completing the wiring, review these tips to ensure the best performance from your crank trigger system.

- Like other pickups, the wiring is polarity sensitive. The Violet wire is Positive and the Green wire is Negative. The resistance of the pickup should be 65 - 85 ohms. MSD offers replacement Non-Magnetic Pickups as PN 8276 for Crank Triggers.
- Twist the wires of the pickup together several times before connecting it to the MSD wiring harness. Twisting these wires together helps reduce the chances of Electro Magnetic Interference (EMI).
- Route the pickup harness along the chassis or engine block. This provides a ground plane that protects against EMI.
- Do not run the trigger wires along the coil primary wiring or spark plug wires. There are high voltages running through these wires so they should not be close to the pickup wires.
- Never use solid core spark plug wires with an MSD Ignition system or crank trigger. A helically or spiral wound suppression wire such as MSD's Heli-Core or 8.5mm Super Conductor Wire must be used.
- If you are running a digital ignition control or aftermarket EFI system, it is highly recommended to use a shielded harness, PN 8862, to prevent the chance of EMI interfering with the trigger signals.

The following diagrams show how to wire the crank trigger to MSD Ignition systems.

SETTING UP THE DISTRIBUTOR

If your distributor is equipped with a centrifugal advance assembly, it must be locked out by welding or bolting the advance mechanism. The distributor has nothing to do with the engine ignition timing when using a crank trigger system. Its function is to distribute the high voltage spark to the spark plugs. To achieve maximum performance from the ignition, the rotor should be properly phased to the distributor cap as explained in the supplied Tech Bulletin on Rotor Phasing.

TIMING THE IGNITION SYSTEM

The timing can be adjusted by sliding the pickup holder assembly up or down in the bracket slot. To retard the timing, move the pickup holder assembly in the direction that the crank trigger wheel rotates. To advance the timing, move the pickup holder assembly in the opposite direction of the trigger wheel rotation (Figure 2). Check the air-gap whenever the timing is changed.

Note: Do not attempt to adjust the timing while the engine is running.

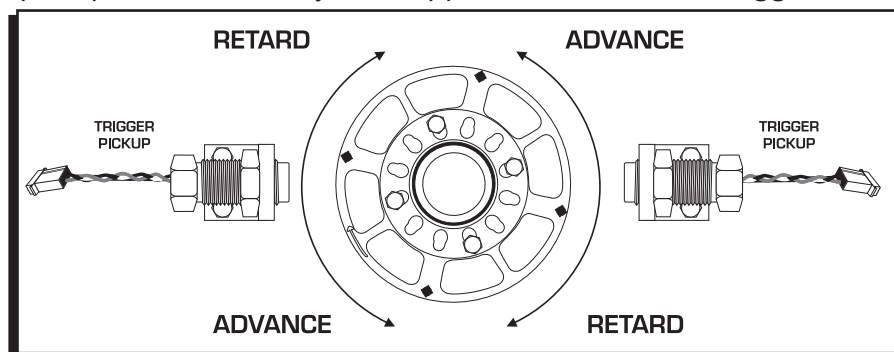


Figure 2 Adjusting the Timing.

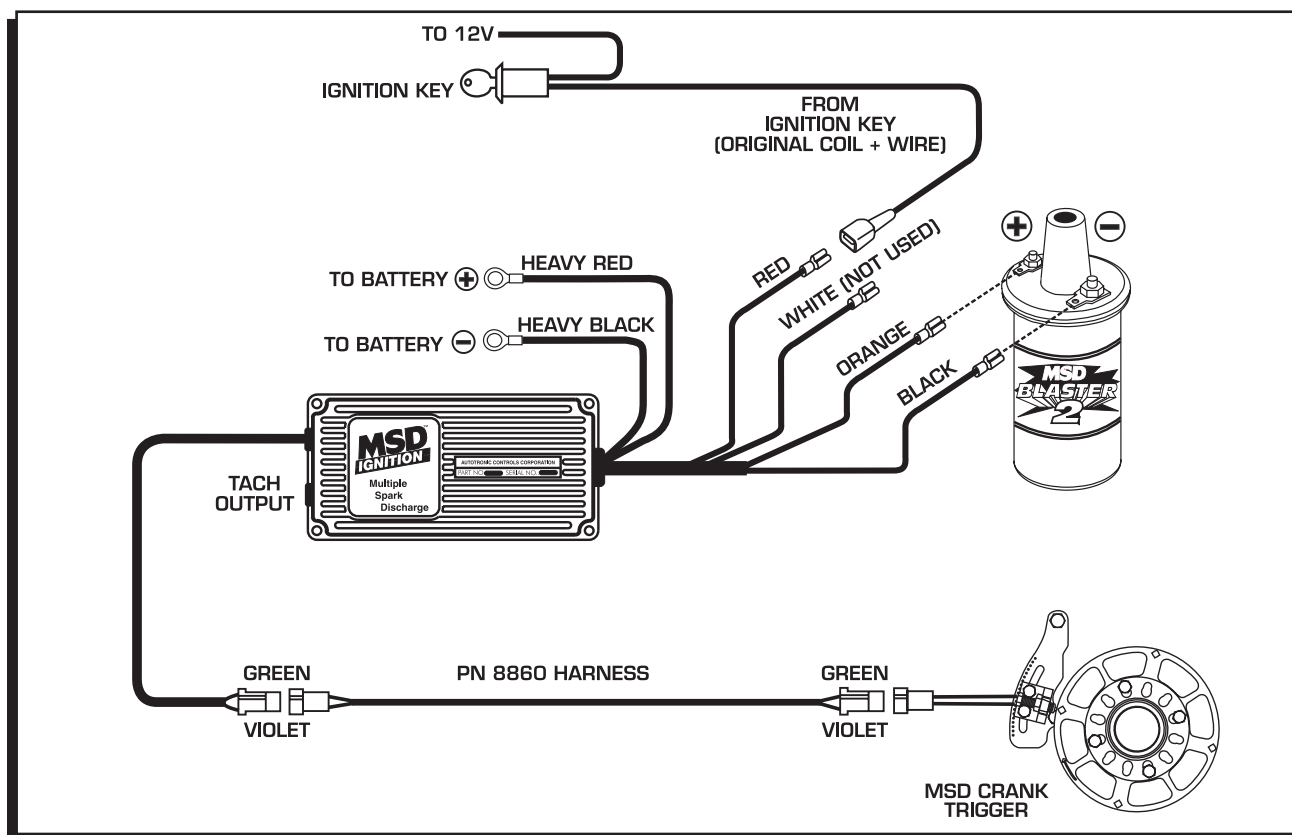


Figure 3 Wiring to an MSD 6AL Ignition Control.

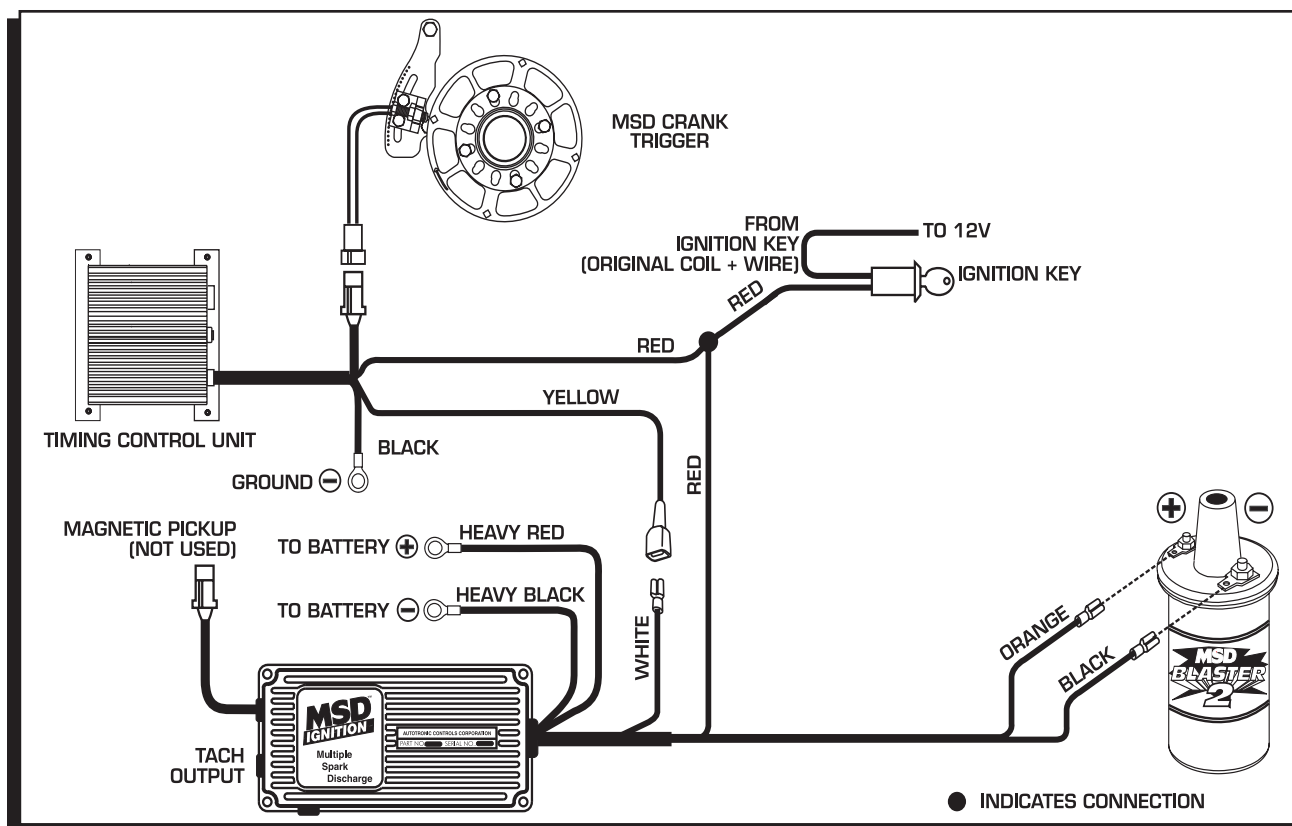


Figure 4 Wiring to an MSD 6AL Ignition and Timing Control.

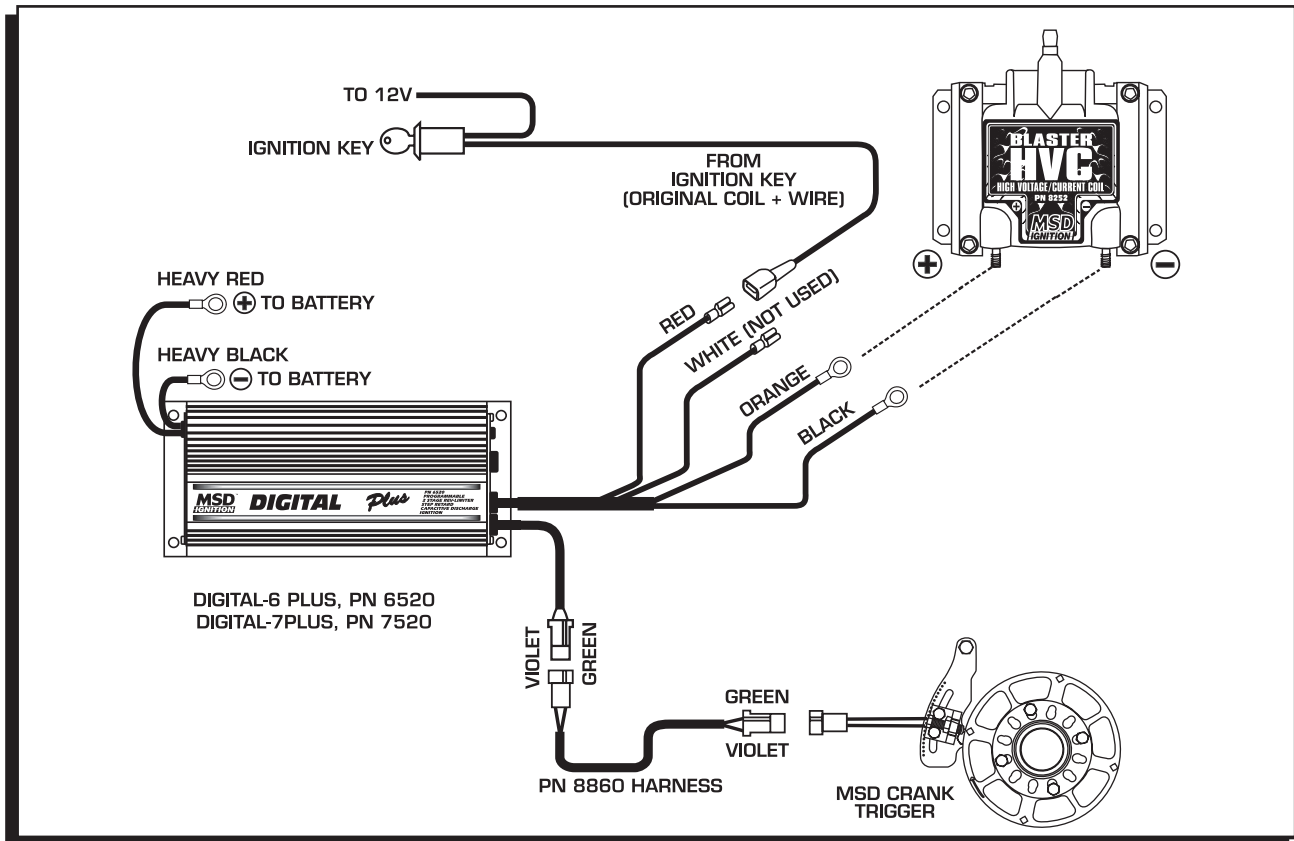


Figure 5 Wiring to an MSD Digital-6 Plus or Digital-7 Plus Ignition Control.

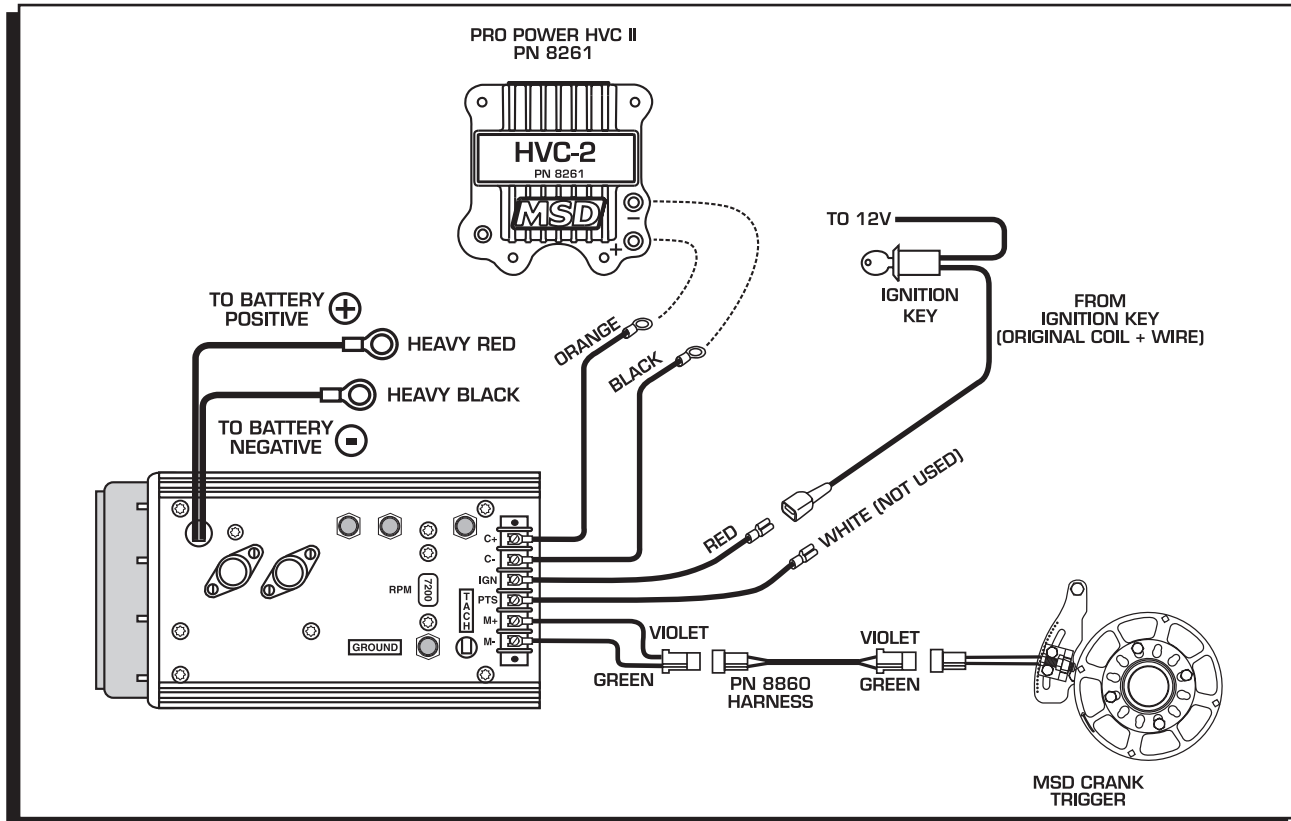


Figure 6 Wiring to an MSD 7AL-2 Ignition Control.

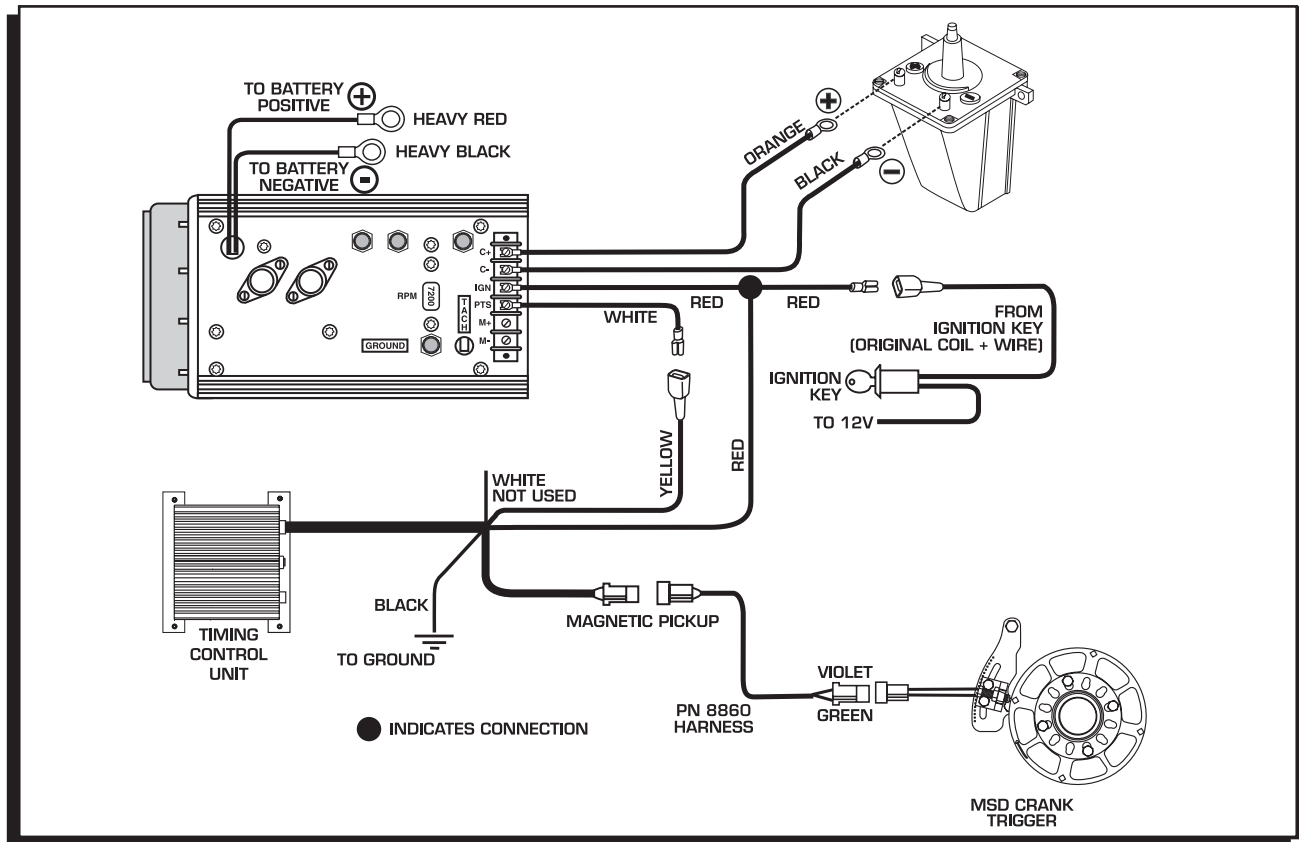


Figure 7 Wiring to an MSD 7AL-2 Ignition and Timing Control.

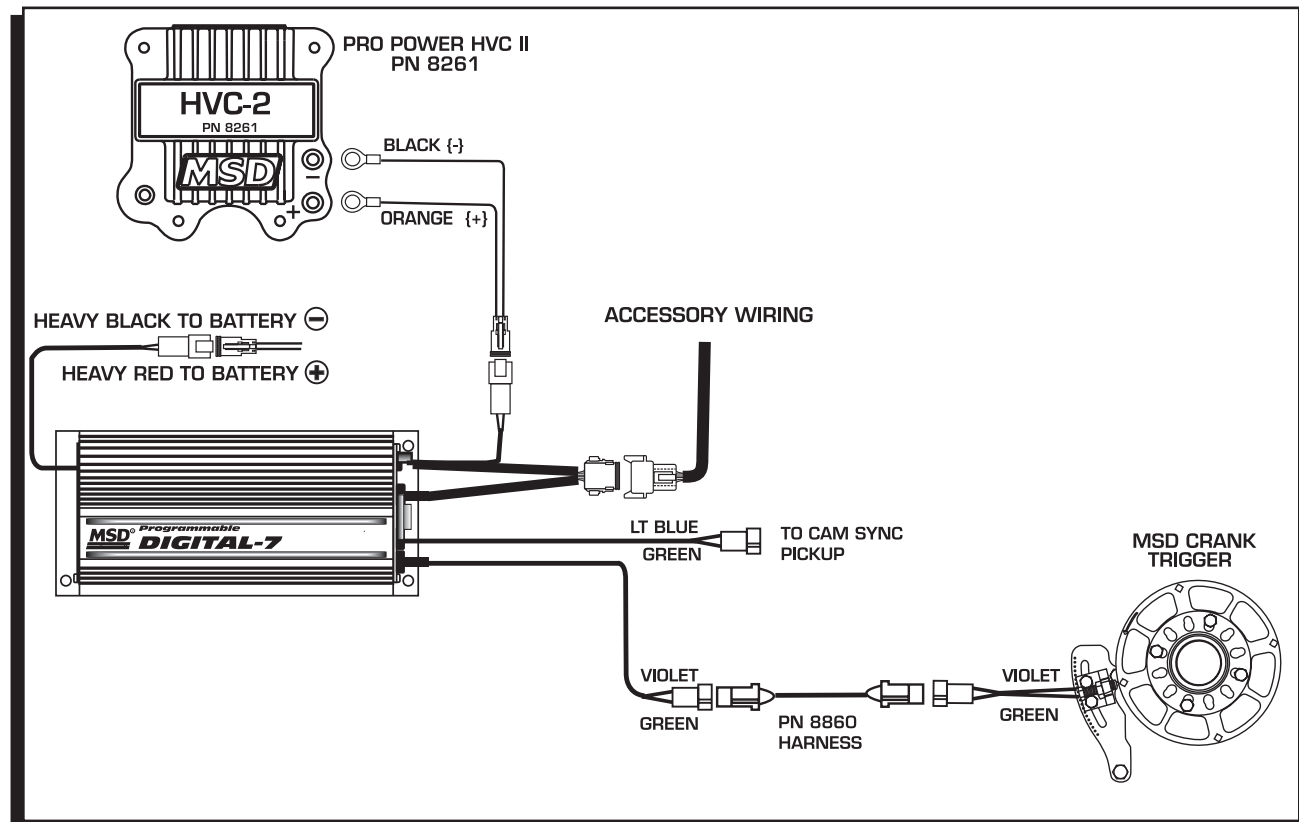


Figure 8 Wiring to an MSD Programmable Digital-7 Series Ignition Control.

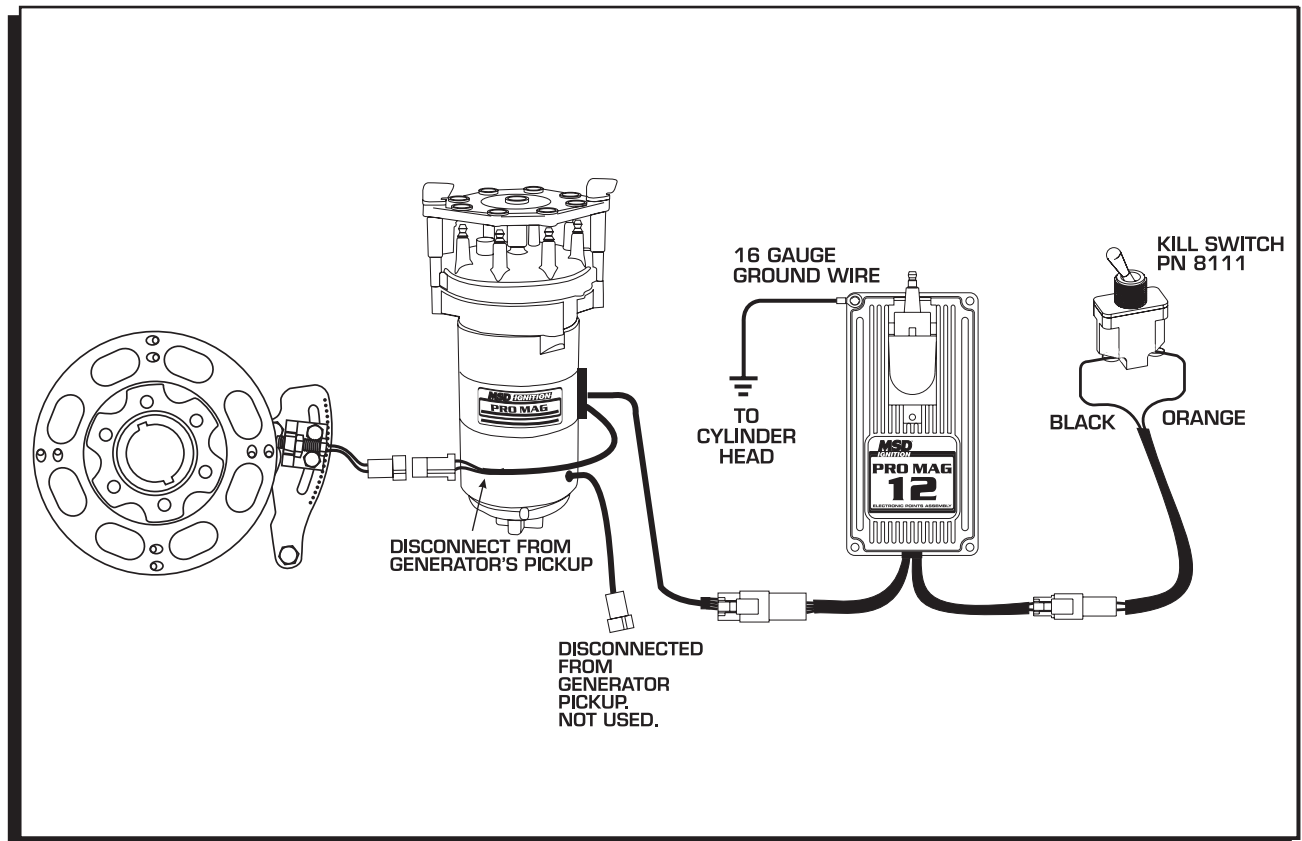


Figure 11 Wiring to an MSD Pro Mag 12.

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Tech Bulletin

Rotor Phasing

MSD's Tech Bulletins are designed to give you a more in-depth understanding of the ignition system and its components. If you have any other questions about the subject or MSD products you can contact our Customer Support Department at (915) 855-7123 or email your questions to msdtech@msdperformance.com.

ROTOR PHASING

Rotor Phasing is defined as the alignment between the rotor tip and the distributor cap terminal when the spark occurs. This position can be very important to your engine's performance. If the alignment is incorrect, the spark will jump to the next closest terminal or another ground resulting in a misfire and loss of Power.

On engines with extreme cylinder pressures, such as nitrous and supercharged applications, correct rotor phasing increases in importance. More voltage is required to ionize the plug gap and if the phasing is off, the spark is more apt to find an easier path to ground rather than the correct cap terminal. This may result in severe engine damage.

Go to <https://www.youtube.com/watch?v=aWMINwGWotM>
to see Rotor Phasing Video

Checking Rotor Phasing

To check rotor phasing, you'll have to modify a distributor cap so you can observe the rotor tip with a timing light when the engine is running. Drill a large hole into a cap near a terminal that will allow you an easy view of the terminal (Figure 1).

To help see the rotor tip you may want to mark it with white correction fluid. With your modified cap installed, connect the timing light's inductive lead to the corresponding plug wire. Start the engine and run at a steady speed. Shine the timing light in the modified cap and note the relation of the rotor tip and the terminal when the spark jumps (Figure 2).

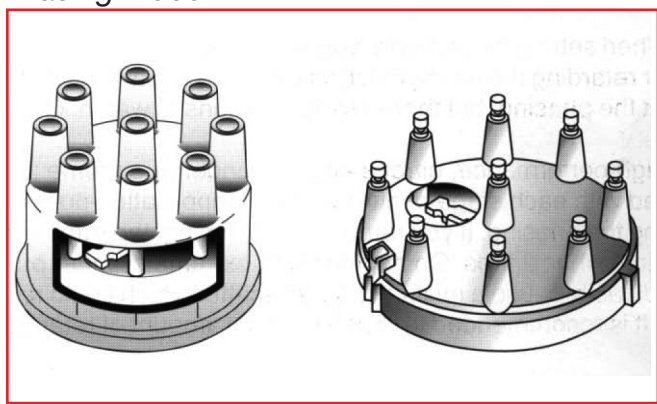


Figure 1 - Examples of modified distributor caps.

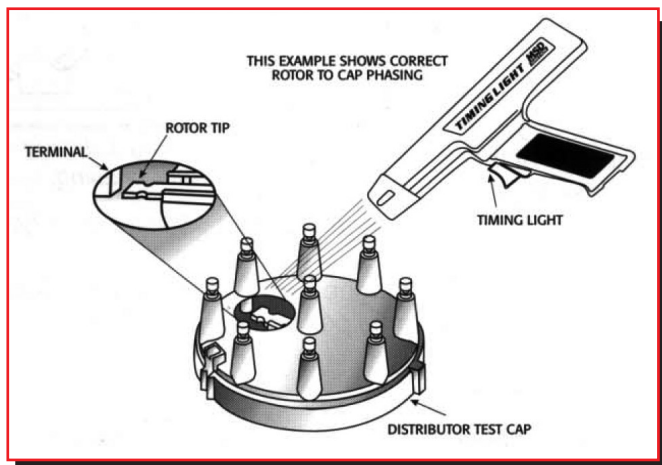


Figure 2 - Drill a hole in a cap to view the location of the rotor tip with one of the cap terminals.

No Vacuum Advance: The rotor tip should line up with the cap terminal or be on the leading edge of the terminal when the spark occurs (Figure 3). This ensures that the spark is jumping to the correct cylinder at the proper time.

Note: MSD recommends using a non-dial back timing light for best timing results.

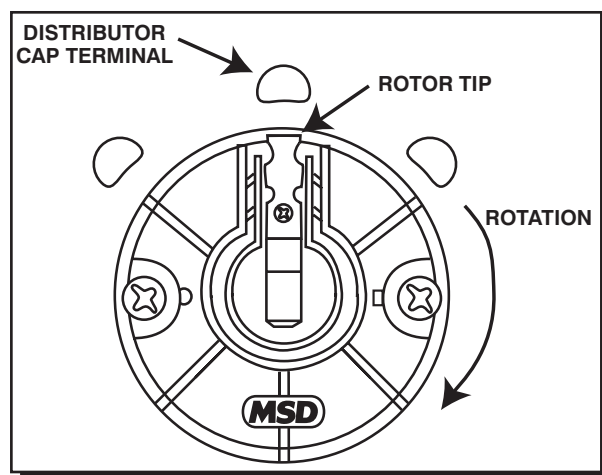


Figure 3 - The rotor tip should align with the cap terminal when the spark occurs.

Vacuum Advance: Vacuum advance affects rotor phasing so it should be checked with the vacuum disconnected and connected. On a distributor that turns clockwise, the rotor tip should be at the right or just after the terminal when the spark occurs with the vacuum disconnected and plugged. With the advance connected and the engine at a steady speed off idle, the rotor tip should be just to the left or before the terminal (Figure 4).

Note: On distributors that turn counterclockwise, these positions will be opposite.

Adjusting Rotor Phasing

Points and Magnetic Pickup Distributors

If the rotor phasing is off on your distributor, there are several options to adjust the phasing. The points plate or pickup needs to be moved or the cap can be repositioned. In most cases these are major modifications which is why MSD checks the phasing of every one of our Pro-Billet Distributors during the assembly process.

Crank Trigger Applications

In crank trigger applications, the distributor does not control the ignition timing so adjusting rotor phasing is easy. Simply rotate the distributor housing until the rotor tip is in the correct position.

Phasing and Electronic Timing Controls

When setting the phasing, you also need to take into consideration any timing controls or retard controls. If you are advancing or retarding the timing electronically, you are affecting rotor phasing. In most cases, the timing change will not be enough to affect the phasing, but there are applications to watch. One such application is with multiple stage nitrous systems and retard steps.

High performance, nitrous engines undergo extreme increases in cylinder pressures which is why timing is generally removed with each stage of nitrous. If your applications pulls out a total of 16° it is important to take this into consideration when setting the phasing. If you remove 16° of timing, the rotor tip is going to be past the cap terminal when it fires. On engines with extreme cylinder pressures and high rpm, this could easily cause a misfire or spark scatter which could result in severe engine damage. It is recommended to divide the total amount of retard by 2 and set the phasing at that half point.

For example, on an engine that pulls out 16° of timing, you should set the rotor phasing when the timing is 8° retarded (Figure 5). This way, with no retards activated the phasing will be 8° advanced, or just in front of the distributor cap terminal and when the full amount of retard is activated, the phasing will be just after the terminal (Clockwise distributors). Whenever checking the rotor phasing with an electronic timing control, it is important to check it with the retard activated and not activated.

Cap-A-Dapts

If you have enough room to run a larger cap, you should take advantage of the real estate. A larger cap spaces the terminals farther apart so there is less chance of crossfire or spark scatter occurring. MSD offers a Cap-A-Dapt Kit, PN 8445, that replaces the points/socket style cap on most of our Pro-Billet Distributors.

If you want to adjust the rotor phasing and use an MSD Pro-Billet Distributor with a magnetic pickup, we offer a Cap-A-Dapt with an adjustable rotor PN 8420 (fits PN 8433 and PN 8431). This rotor is two pieces and is made so the rotor tip position can be altered. A smaller adjustable rotor is now available as PN 84211 for use in place of the race rotor PN 8467.

Preventative Maintenance

Taking a little time between races to inspect your ignition system will help prevent minor problems. Periodically check the following:

- Visually inspect the cap and rotor for wear of the cap terminals and the rotor tip.
- Look for traces of carbon tracks where spark scatter occurs.
- Visually inspect the plug wires for burns or tears. Also, it is a good idea to periodically check the resistance of the wires.
- MSD's Spark Guard, PN 8804, is a dielectric grease that helps isolate the spark at the plug wire terminal and cap connection.

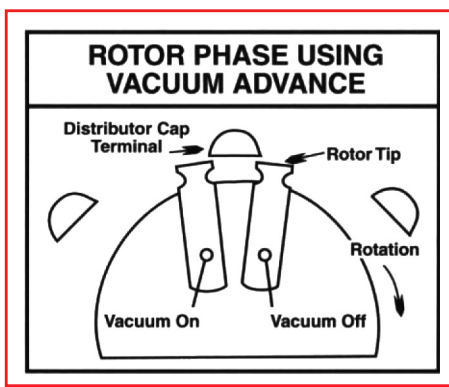


Figure 4 - Distributors with vacuum advance need to be checked with the vacuum connected and disconnected.

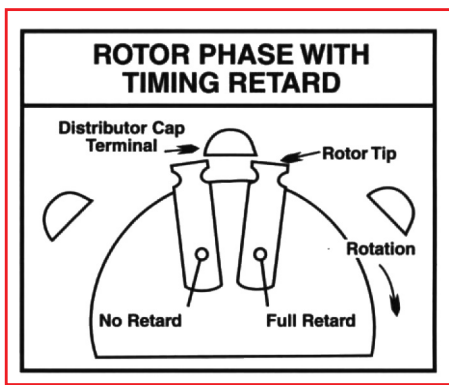


Figure 5 - When using a timing retard, compensate the rotor phasing.