

# **MSD** **IGNITION** **INSTALLATION INSTRUCTIONS**

## **MSD Timing Twister** **GM LS1/LS6 - PN 8625, GM LS2/LS7 - PN 86251,** **Ford 4.6L '96-'04 - PN 86252**

### **Parts Included:**

1 - Timing Twister Control Unit	1 - Parts Bag (includes 1 - 1/4 Ring Terminal, 3 - All-weather Butt Splices and 1 - Tee Splice)
1 - Vehicle-specific Plug-N-Play Wire Harness	Mounting Hardware

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

## **FEATURES**

The MSD Timing Twister ignition controller plugs into the stock wiring harness and gives you complete control of ignition timing advance and retard. Advancing the timing can produce improved acceleration and better fuel economy. The timing advance function allows up to 9° of advance.

The timing retard feature allows the simple installation of a nitrous system as well as adding boost from a turbo or supercharger. Used alone, the Step Retard function can pull up to 30° of timing.

For boosted applications, the optional MSD 4-BAR MAP Sensor, PN 2314, is easily connected to the Timing Twister. This sensor will measure up to 45 psi of boost, to which the user can program up to 30° of retard. When used in conjunction with the Boost Retard function, the Step Retard is limited to 18°. Combined with the Step Retard, this means the Timing Twister can retard timing ignition up to a maximum of 48°.

The Timing Twister does not modify ignition timing at idle or low engine speeds. Above 1800 rpm the timing advance and retard functions become active and ramp to the full timing value over several revolutions of crankshaft rotation. The timing is also ramped back to stock over several revolutions when the engine rpm falls below 1500 rpm.

A MODE switch is included to allow the user to disable the unit and utilize stock timing. It can also be used to disable only the retard functions while leaving the advance timing function active.

**Note:** The MSD Timing Twister will allow the user to advance the factory ignition timing in order to make more power. However, the factory ECU also advances timing at part throttle under light load for emission reasons. It is not recommended to advance timing more than 2° when driving around town under part throttle conditions. At the race track when the vehicle is going to be under full throttle more timing can be applied. If at any point detonation is detected (knocking or pinging sound from the engine) this timing is too far advanced and needs to be retarded in order to prevent engine damage.

**Note:** It is crucial that premium fuel (91 octane or higher) be used whenever advancing ignition timing. Failure to do so may cause severe engine damage due to detonation.

## **INSTALLATION**

The Timing Twister connects directly to the stock wiring harness connectors at the crank and cam pickups, between the sensors and the ECU (Figure 3).

WIRING	
<b>RED</b>	On/Off wire. Connects to switched 12 volts (Powered while cranking and when key is On).
<b>BLACK</b>	Connects to Ground.
<b>BLUE</b>	Step retard (Active when 12 volts is applied).
<b>GRAY</b>	Tach output. 12 volt square wave, 30% duty. V8 only.

The Red and Black wires must be connected so they power ON concurrently with the ECU. The Cam In and Out and Crank In and Out connectors are plug and play. Simply disconnect the factory harness and insert the Timing Twister connectors in the appropriate locations. Refer to your vehicle's Service Manual for location of sensors. The optional MAP Sensor is connected with the 3-pin connector.

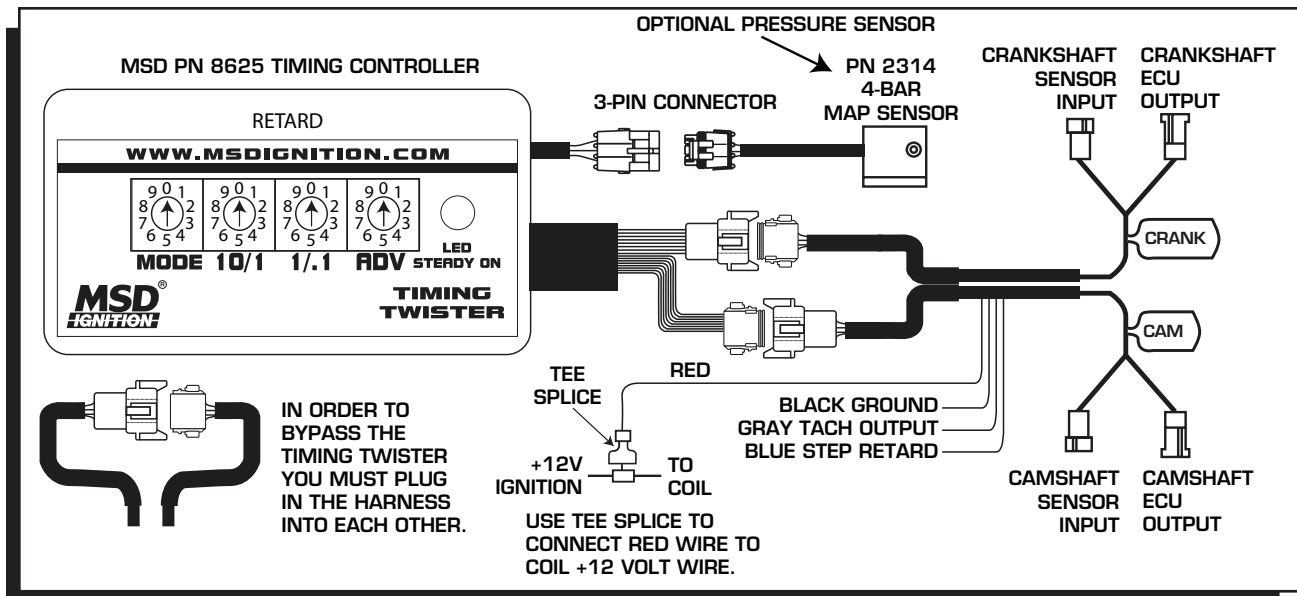


Figure 1 Wiring the Timing Twister.

## OPERATION AND PROGRAMMING

The Timing Twister has four 10-position rotary switches that allow the user to select ignition timing values (Figure 2).

### MODE SWITCH

The MODE switch allows the user to select which retard modes are active as well as the range of the retards. The Advance timing function allows from 0 to 9° of timing advance independent of the retards.

The retard switches have unique functions for each MODE switch position. The maximum possible timing retard using the maximum range would be 48° with a Step Retard of 18° and a Boost range of 30°. See the Switch Position Table in Figure 2 for the MODE and timing values and ranges.

Also the MODE switch allows the user to disable all timing and allow pass through timing for stock timing or to disable only the retard functions while enabling the advance timing function only.

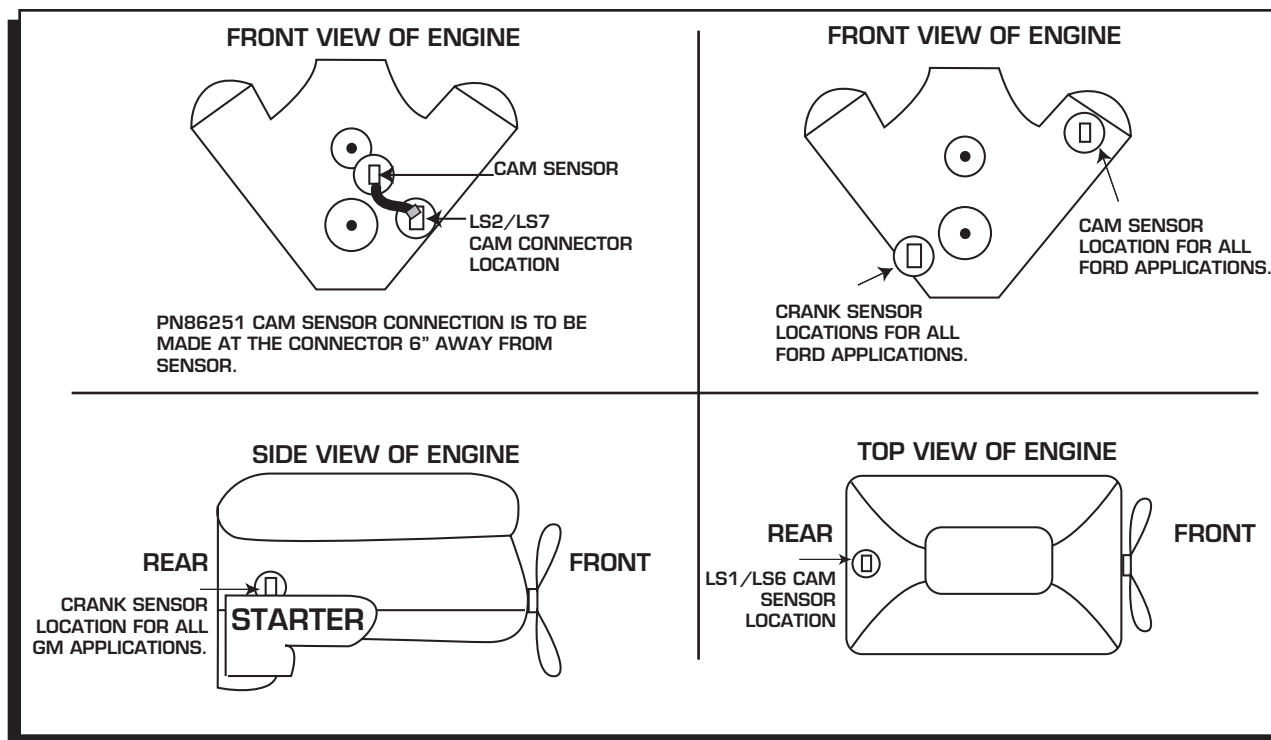
**LED**

A flashing LED on the controller indicates that the controller has not acquired the cam and crank tooth patterns. It will use pass-through timing from the sensors below 1800 rpm or above 1800 rpm anytime the LED is flashing. Once the Timing Twister has learned the tooth patterns the LED will remain illuminated with no flashing when the engine rpm is above 1800 rpm, indicating the timing is being controlled, not passed through.

**SWITCH POSITION TABLE**

MODE Switch Position	10° Retard Switch Position	1° Retard Switch Position	ADV Switch Position
0=Step Retard in 1° steps, 30° Max	0=0°      3 thru 9=30° 1=10° 2=20°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
1=Boost Retard 15° Max in Deg./PSI	0=0° 1 thru 9=1°	0=.0°   3=.3°   6=.6°   9=.9° 1=.1°   4=.4°   7=.7° 2=.2°   5=.5°   8=.8°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
2=Boost Retard 20° Max in Deg./PSI	0=0° 1 thru 9=1°	0=.0°   3=.3°   6=.6°   9=.9° 1=.1°   4=.4°   7=.7° 2=.2°   5=.5°   8=.8°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
3=Boost Retard 30° Max in Deg./PSI	0=0° 1 thru 9=1°	0=.0°   3=.3°   6=.6°   9=.9° 1=.1°   4=.4°   7=.7° 2=.2°   5=.5°   8=.8°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
4=Step and Boost Retard 15° Max Boost Retard and Step Retard in 2° steps 2-18° range	Step Retard 0=0°      5=10° 1=2°      6=12° 2=4°      7=14° 3=6°      8=16° 4=8°      9=18°	Boost Retard °/PSI 0=.2°   3=.6°   6=1.2°   9=1.8° 1=.3°   4=.8°   7=1.4° 2=.4°   5=1°   8=1.6°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
5=Step and Boost Retard 20° Max Boost Retard and Step Retard in 2° steps 2-18° range	Step Retard 0=0°      5=10° 1=2°      6=12° 2=4°      7=14° 3=6°      8=16° 4=8°      9=18°	Boost Retard °/PSI 0=.2°   3=.6°   6=1.2°   9=1.8° 1=.3°   4=.8°   7=1.4° 2=.4°   5=1°   8=1.6°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
6=Step and Boost Retard 30° Max Boost Retard and Step Retard in 2° steps 2-18° range	Step Retard 0=0°      5=10° 1=2°      6=12° 2=4°      7=14° 3=6°      8=16° 4=8°      9=18°	Boost Retard °/PSI 0=.2°   3=.6°   6=1.2°   9=1.8° 1=.3°   4=.8°   7=1.4° 2=.4°   5=1°   8=1.6°	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
7=Disable Step and Boost Retards	No Retard	No Retard	0=0°   3=3°   6=6°   9=9° 1=1°   4=4°   7=7° 2=2°   5=5°   8=8°
8 and 9=Stock Timing Only	No Retard	No Retard	No Retard or Advance

**Figure 2 Switch Position Table.**



**Figure 3 Cam and Crank 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 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.msdisignition.com/rma](http://www.msdisignition.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 Ignition at (915) 855-7123. MSD technicians are available from 7:00 a.m. to 6:00 p.m. Monday - Friday (mountain time).

### Limited Warranty

MSD IGNITION 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 Ignition. 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 Ignition. 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 Ignition 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 Ignition. Any modifications to this item or if it is used on an application other than what MSD Ignition 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 Ignition will accept no liability for custom applications.