MSD Single Cylinder Programmable Ignition
PN 4217

Parts Included:	1 - CD Rom 9609
1 - PN 4217	1 - Parts Bag
1 - PN 4217 Wire Harness	1 - Serial Cable

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

The Single Cylinder Programmable Ignition is designed for use on a variety of single cylinder motorcycle type 2 and 4-stroke engines. It delivers increased spark energy and voltage through the entire rpm range and provides the user with a variety of programmable functions including mapping two timing curves, setting a launch rpm limit, using TPS for timing control and more.

To program the PN 4217, MSD includes the Pro-Data+ software on a CD along with a 6-to-9 pin PC harness for easy programming on a PC. The ignition can also be programmed with MSD's optional Hand Held Monitor, PN 7550.

TIMING FUNCTIONS

The Programmable Ignition gives you control over the timing functions of your engine, making it imperative to understand ignition timing. Following are a couple basic explanations of ignition timing.

One timing setting is not ideal as engine rpm and loads change. By adjusting the ignition timing you can improve performance by matching the ideal timing with the engine's needs. To achieve the optimum performance, you'll need time for testing and tuning.

Total: Total timing references the Start timing along with the available advance. As an example, if you have 10° of Start timing and add another 22°, the total timing will be 32°.

Start Timing: The amount of timing advance that is in place when the engine is idling or during start up.

Available Advance: This determines what is the most timing advance available. This is determined by the Pickup Width, or the duration of the pickup signal. See "Pickup Width" in Programming Features.

PROGRAMMING FEATURES

TIMING CURVES
There are two timing curves that can be switched between through wire activation. Both Timing Maps allow up to 20 points to be plotted in 100 rpm and 1° increments from 0 – 16,000 rpm and 0-50°. The Brown/White wire is used to switch between Curve A and B. When it is connected to ground, Curve B is selected.

These curves can also be set up relative to TPS voltage input from closed throttle to Wide Open Throttle. See TPS Timing Curve on next page.

Timing Curve A: This is the default timing curve.

Timing Curve B: This is the optional curve and is active when the Brown/White wire is switched to ground.

TPS/TIMING CURVE

If a TPS sensor is being used on your application, the timing curves can be programmed relative to TPS input. This provides a three dimensional timing map (Figure 1). This feature allows the user to map timing curves for Closed Throttle and Wide Open Throttle. With the two timing maps, the PN 4217 will control the timing based on throttle position, within the timing map parameters. This flexible feature allows for timing to advance or retard as the throttle opens/closes.
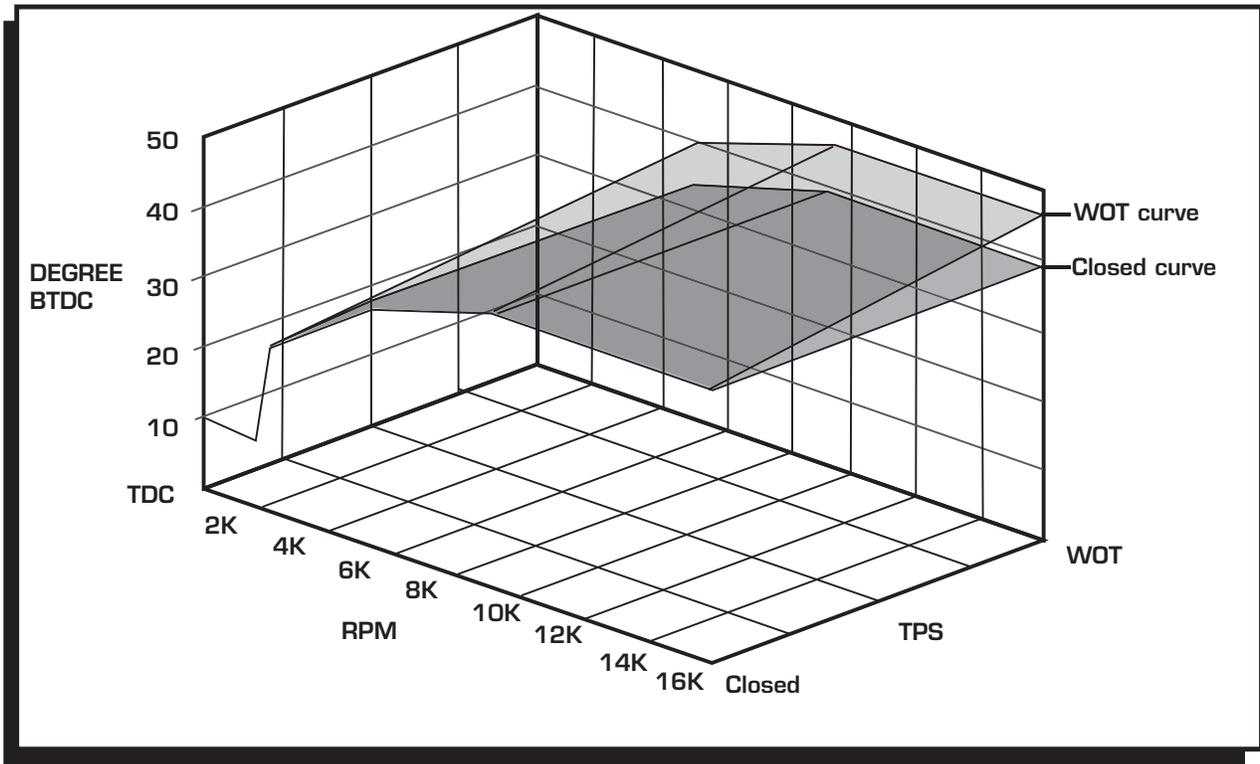
Figure 1 TPS/Timing Curve Example.

PICKUP WIDTH

This is the duration of the trigger signal. This is a self learning feature that is measured with the engine running between 800 and 1400 rpm. This duration determines the amount of advance you can program the ignition for. This value should be used as the reference pickup tab width for the program value PickupRef degrees. Figure 2 shows an example.

CAM OR CRANK TRIGGER

This option lets you select the trigger location of the engine, whether crankshaft (default) or camshaft.

Figure 2 Pickup Width.

TACH IN

This allows for the different type input signals such as Hall-effect or magnetic pickup such as an MSD type trigger.

Tach Input: RawHall or MSDHall: The white wire connects to an MSD Hall-effect pickup.

TachIn Mag: The Green and Violet 2-pin harness is used.

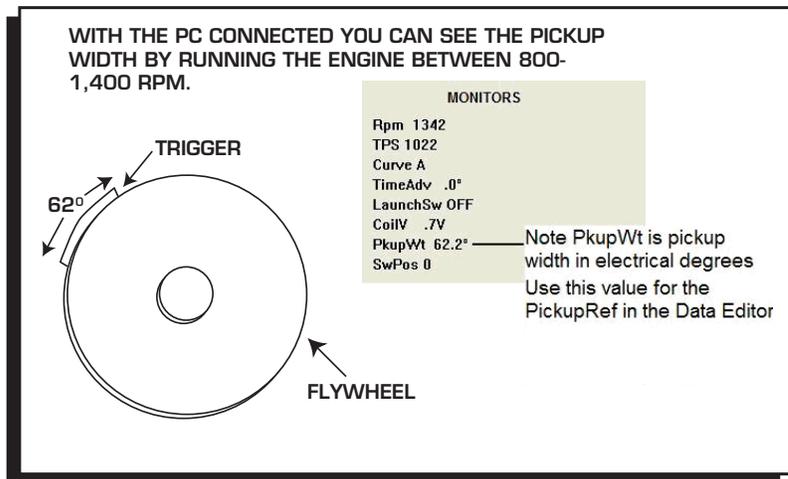**Two Tabs:** For use on engines such as the CRF450R with a dual tab flywheel and trigger design.

REV LIMITS

There are two rev limits to program with the PN 4217. One for overrev protection and another limit to use for the launch. Both are adjustable from 1,000 – 16,000 rpm.

Launch RPM: This provides you with second rpm limit that is activated when the Blue wire is connected to ground. Once removed from ground, the Max limit is active.

Max RPM: This is the overrev rpm limit. It will keep the engine from overreving due to a missed gear or driveline failure.

WIRING	
Group A connectors:	
ORANGE	Connects to Coil positive (+)
BROWN/ORANGE	Connects to Coil negative (-)
VIOLET	On/Off, connect to switched +12 volts
BLACK	Ground, connect to battery negative or crankcase ground
RED	Connect to battery positive, 12 volts
Group B connectors:	
BLUE	Launch RPM Limit, the launch rpm is active when connected to ground
TRIGGER PICKUPS	
GREEN	Magnetic pickup negative
VIOLET	Magnetic pickup positive
See Figure 3 on page 4 for information about pickup polarity.	
Note: The mag pickup wires are never connected when the White wire is used. And vice-versa.	
WHITE	Hall Effect trigger input or kill switch to ground
BROWN/WHITE	Timing Curve B Select. When connected to ground, Timing Curve B is active
THROTTLE POSITION WIRING	
YELLOW	TPS input signal
BLACK	TPS ground
RED	TPS +5 volt signal output
LED	An LED indicator will be On when there is valid trigger input and can be used as a static ignition timing indicator with the Hall Effect pickup input

MOST ADVANCED (- SIGNAL)

62⁰

FLYWHEEL

MOST RETARDED
(NEAR TDC) (+ SIGNAL)

CLOCKWISE
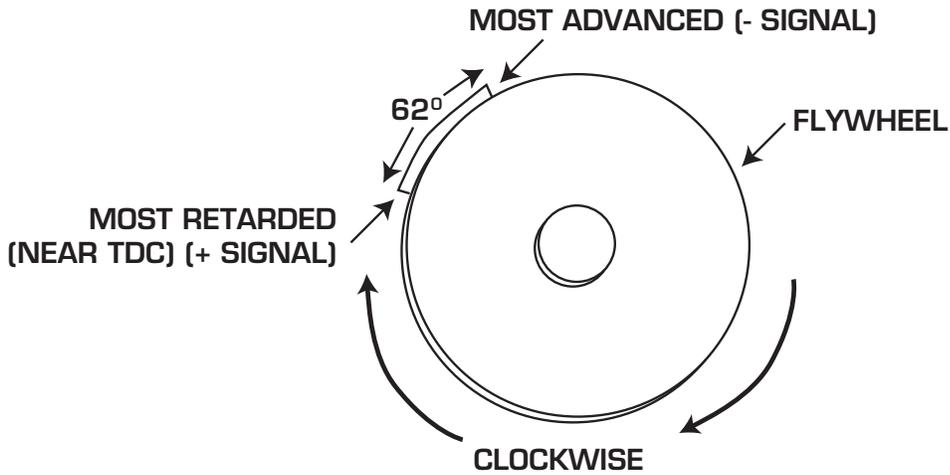
MAGNETIC PICKUP POLARITY IS IMPORTANT. THE
ENGINE MAY NOT RUN PROPERLY IF CONNECTED
REVERSE. THE ENGINE NEEDS TO SEE A NEGATIVE
SIGNAL ON THE VIOLET WIRE AT THE ADVANCED
EDGE OF THE TIMING TAB AND POSITIVE AT THE
TRAILING EDGE (THE MOST RETARDED AMOUNT).

NOTE: IF THE PC SHOWS PICKUP WIDTH AT A
LARGE VALUE >90⁰, THE POLARITY AT
          THE PICKUP IS REVERSED.

RETARDED
EDGE (+)

+
0
−

ADVANCED EDGE
CORRECT SIGNAL (-)
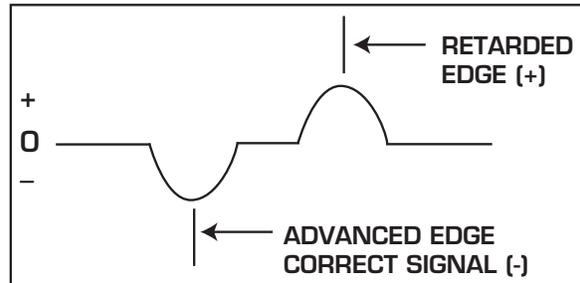
Figure 3 Pickup Polarity.

DARK BLUE

LAUNCH
RPM
SWITCH

HOLESHOT
WIRE

PN 4217

WHITE HALL EFFECT WIRE

BROWN/WHITE

YELLOW

BLACK

RED

VIOLET

SWITCH
12 VOLT

VIOLET   FACTORY+

OR

GREEN   FACTORY -

HALL-EFFECT
OR
KILL WIRE

MAG TRIGGERS

TIMING
CONTROL
SELECT
SWITCH

RED   BLACK

ORANGE

BROWN/ORANGE

TPS WIRES

BATTERY

C+ C-

GROUND

● - INDICATES CONNECTION
▼ - MALE BULLET CONNECTOR
▼ - FEMALE BULLET CONNECTOR

MSD
IGNITION
PN 8232

Figure 4 Wiring the PN 4217 Single Cylinder Ignition.

PROGRAMMING

Installing the MSD Pro-Data+ Software
1. Insert the CD.
2. In Windows, click Start then select Run.
3. In the box type: A:\Setup then press enter.
4. Follow the on screen instructions.
5. Two MSD icons should appear on the desktop.
6. Select the GraphView icon.
7. In the upper left corner of the screen select File, then PN 4217.
8. Select the file that says 4217vXX.ign (XX means the latest version such as 02).
9. Click on Open.

SAVES AND TRANSFERS

Whenever a change is made to a program it either must be saved to your PC or transferred to the ignition file you are programming. The software gives you the choice of automatically transferring the change to the MSD or the PC.
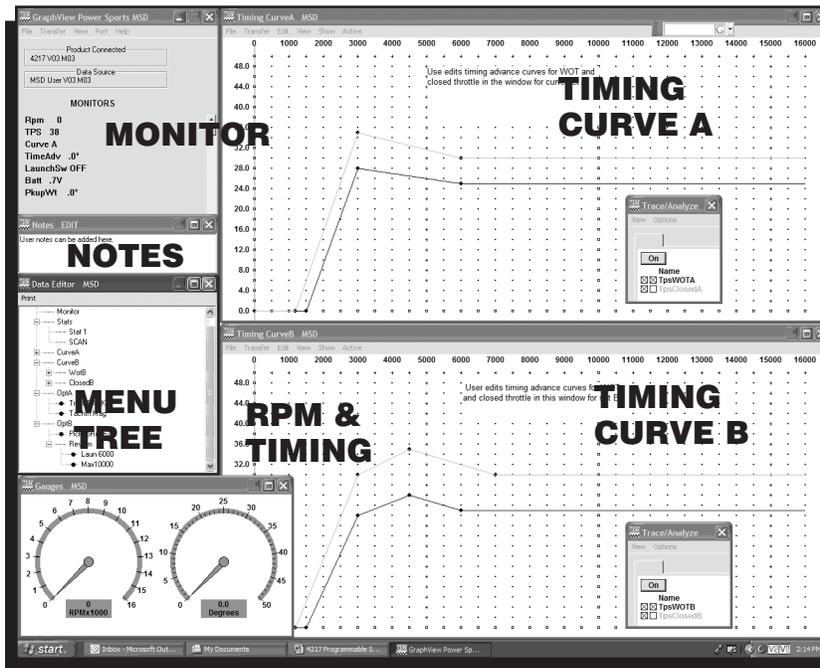
Figure 5 Pro Data+ Software for PN 4217.
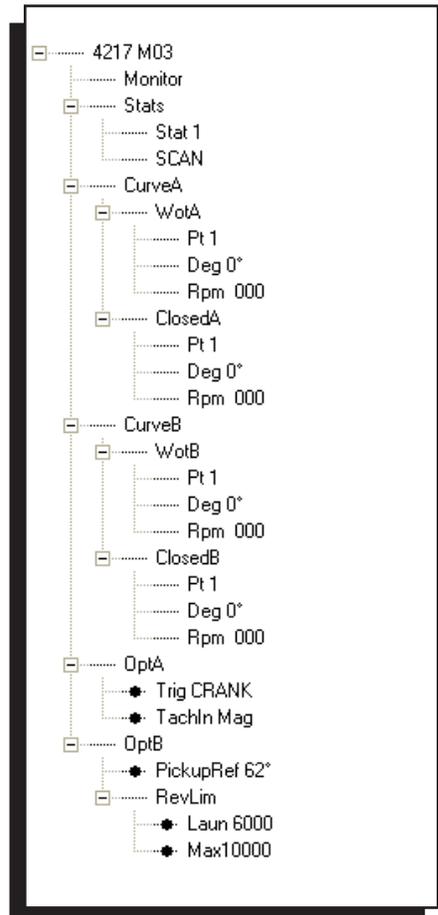
Figur 6 Menu Tree Options.

TIMING

When using the PN 4217 it is important to understand a few terms related to timing.

Pickup Trigger - This is the trigger used to tell the ignition when to fire. The PN 4217 can be used with either a magnetic pickup or a Hall-Effect pickup.

Timing Tab - This is the tab on the flywheel. A timing tab is primarily used on steel flywheel in combination with a magnetic pickup (Figure 7).

Tab Width - This is the amount in crankshaft degrees, that the tab is long. This will control the amount of total advance curve you can achieve. For example, if you have a timing tab that is 30 degrees in length you can program up to a 30 degree curve into the PN 4217 (Figure 7).

Magnets - Magnets are typically used in an aluminum flywheel and trigger a Hall-Effect pickup. You might use several magnets in a row to be able to achieve a certain amount of timing curve capability (Figure 8).

Leading and Trailing edge - Leading edge refers to the first edge of the timing tab or magnet to pass the pickup. Trailing edge refers to the last edge of the timing tab or magnet that passes the pickup.

Total timing - This is the maximum amount of timing you can achieve with a particular combination. This will also be where the leading edge of the timing tab is located.

Initial timing - This is the idle timing of the engine. This will also be where the trailing edge of the timing tab is located.

Total timing advance - This is the amount of timing advance you can achieve with a particular combination. The total advance is the number of degrees between the leading and trailing edge on the flywheel.

IN THIS EXAMPLE, USING A STEEL FLYWHEEL AND A MAGNETIC PICKUP YOU WILL HAVE 10^0 OF INITIAL OR IDLE TIMING AND UP TO 40^0 OF TOTAL TIMING (WITH 30^0 OF ADVANCE BASED ON ENGINE RPM).

TRAILING EDGE
TDC
0^0
30^0
10^0
ROTATION
40^0
LEADING EDGE
STEEL FLYWHEEL WITH MAGNETIC PICKUP
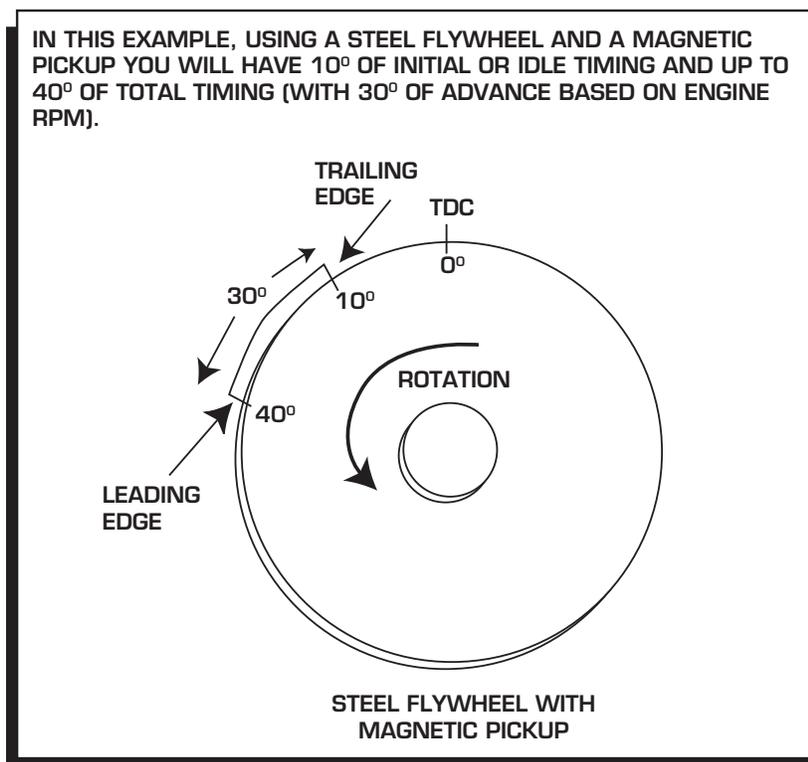
Figure 7 Magnetic Pickup.

IN THIS EXAMPLE USING AN ALUMINUM FLYWHEEL WITH MAGNETS INSERTED YOU WILL HAVE 10^0 INITIAL OR IDLE TIMING AND UP TO 40^0 OF TOTAL TIMING (WITH 30^0 OF ADVANCE BASED ON ENGINE RPM).

NOTE: WHEN USING MAGNETS TO TRIGGER A HALL-EFFECT PICKUP THE AMOUNT ADVANCE CURVE YOU CAN ACHIEVE WILL BE BASED ON THE FLYWHEEL DIAMETER AND NUMBER OF MAGNETS INSTALLED.

Figure 8 Hall-Effect Pickup.

TECH NOTES

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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 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.msdperformance.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.