

Pazon
IGNITIONS WITH THE 7½ YEAR WARRANTY

Smart-Fire™

HONDA

CB450 TWIN

**HIGH-PERFORMANCE
IGNITION SYSTEM**

12 VOLT



SYSTEM TYPE: PDH450

Smart-Fire Applications

- **HONDA 180 DEGREE TWIN (ROAD): CB450 (BLACK BOMBER) & SIMILAR MACHINES (E.G. CL450)**

Smart-Fire Features

- **HIGH-POWER DIGITAL IGNITION MODULE (FULLY ENCAPSULATED)**
- **LOW POWER CONSUMPTION**
- **FULLY PROGRAMMED IGNITION TIMING & COIL ENERGY CONTROL: IGNITION ADVANCE CURVE IS MAPPED TO SUIT THE HONDA TWIN ROAD ENGINE**
- **USER-PROGRAMMABLE REV-LIMITER BUTTON**
- **ELECTRONIC TACHOMETER OUTPUT**
- **PRECISION ENGINEERED STEEL TIMING DISC ASSEMBLY**
- **RELIABLE & RUGGED HALL-EFFECT SENSOR , INCLUDES ON-BOARD STATIC TIMING LIGHT, FOR EASY SETTING OF IGNITION TIMING**
- **LESS MAINTENANCE**
- **IMPROVED ENGINE PERFORMANCE, INCLUDING: BETTER STARTING, SMOOTHER RUNNING & ALLOWING YOUR ENGINE TO REACH ITS FULL POTENTIAL**
- **FOR SPECIAL RACING APPLICATIONS: CUSTOM ADVANCE CURVES & REV-LIMITERS AVAILABLE**
- **COVERED BY MANUFACTURER'S 7½ YEAR WARRANTY**
- **MODULE SIZE (mm):
90 LONG x 65 WIDE (95 INC. MOUNTING BRACKETS)
x 30 DEEP, WEIGHT: 400g (INC. WIRES)**

Smart-Fire Ignition System Comprises:

- **IGNITION MODULE (ALUMINIUM HOUSING WITH MOUNTING BRACKETS) & WIRING**
- **IGNITION TRIGGER PLATE**
- **STEEL TIMING DISC, SPACER & FIXING**
- **DIGITAL IGNITION COIL (DUAL OUTPUT)**
- **H.T. LEADS (COPPER-CORED)**
- **NGK PLUG CAPS (ANGLED, 5K RESISTOR TYPE)**
- **FIXING SCREWS, WASHERS & NUTS**
- **CRIMP TERMINAL CONNECTORS & INSULATORS**
- **TIE-STRAPS**

Smart-Fire Fitting Instructions

**WARNING: THIS SYSTEM PRODUCES VERY HIGH VOLTAGES,
ALWAYS SWITCH OFF BEFORE WORKING ON THE SYSTEM.**

IMPORTANT NOTES:

BEFORE FITTING, PLEASE READ THESE INSTRUCTIONS CAREFULLY, INCLUDING THE NOTICE ON PAGE 16.

This system is designed to work only with the special digital ignition coil provided with the system. 5K resistor plug caps as supplied with the system should be fitted to the h.t. leads. Alternatively, resistor spark plugs can be used. Attempting to run the system without resistor type caps or plugs will result in excessive radio frequency interference (r.f.i.), which may cause bad running, misfiring and loss of ignition. For reliability, copper or steel cored h.t. lead should be used, we do not recommend using carbon fibre leads. This ignition is a wasted spark system, therefore both plugs fire at the same time.

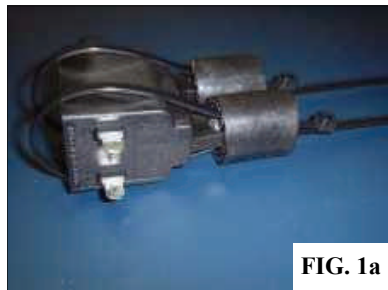
These instructions are a general guide for installing the system to various machines and therefore it may be necessary to modify the length or routing of some wires in order to complete the installation. All connections should be made using good quality crimped or soldered connections; twisted wires will not give satisfactory operation. Wiring should be trimmed to the correct length, excess wire should not be coiled up as this can affect the correct running of the ignition system. If electric welding is to be carried out, the ignition module should be disconnected and its connectors covered with insulation, to help prevent stray sparks from damaging the module. If in doubt, remove the unit from the machine.

Fitting—stage 1

1. For safety, disconnect the battery.
2. Fit the ignition module in a convenient place. This could be under (or on the side of) the battery platform, or secured to the frame using a suitable mounting bracket. The unit can be orientated in any position, but this should be onto a flat surface, if possible.

The module can be secured by the mounting flanges using the two M5 bolts, washers & nuts. Alternatively, the mounting flanges can be removed by slackening the bracket securing screws and sliding the brackets out of the dovetail slots. The module can then be mounted using large tie-straps, with a small sheet of rubber between the case & the frame.

3. Fit the ignition coil in a convenient place. Suspend the coil by the two mounting lugs, using the M5 bolts, washers & nuts, provided. Alternatively, to avoid the need for drilling or a mounting bracket, the coil can be rubber mounted using two small pieces of rubber tubing (such as fuel pipe or heater hose) & two large tie-straps, see figs. 1 / 1a. The coil can then be secured to the frame tube by fully tightening the tie-straps. Fit the new h.t. leads by pushing the brass connectors fully into the h.t. outlets of the coil, along with the rubber boots. Small tie-straps can be placed around the rubber boots & tightened to give extra security, if desired. The h.t. leads should now be cut to length, if necessary & the plug caps screwed onto the ends of the h.t. leads. Push the plug caps onto the plugs (either way around), they should click into place.



4. Disconnect the two contact-breaker wires (coloured blue & yellow).
5. Remove the contact-breaker cover and gasket.
6. Undo the two screws & remove the complete contact-breaker assembly.
7. Undo the fixing bolt & remove the mechanical advancer unit.

8. The timing disc assembly is supplied in two parts. Taking the small part first, slide over the camshaft (female taper facing outwards); turn the part until it sits down onto the locating pin.
See figs. 2, 3 & 3a (page 10).

Wiring (SEE WIRING SCHEMATIC ON PAGE 7)

1. Connect the black wire from the ignition module directly to the battery negative terminal (—) or to a good grounding point on the frame, using a ring terminal.
2. Connect the violet wire from the ignition module to the negative (—) terminal of the ignition coil (left-hand spade connector), using a female crimp connector and insulating cover. The signal feed to an electronic tachometer can also be connected here.
3. Connect the red wire from the ignition module to the positive (+) terminal of the ignition coil (right-hand spade connector), using a female piggyback crimp connector and insulating cover.
4. Connect the spare terminal on the piggyback connector (on the positive side of the ignition coil), to the ignition switch positive supply (+12volts). An (optional) in-line fuse can be fitted here (8-10 amp. recommended).

**Re-check the connections to the ignition coil;
Reverse polarity may damage the coil.**

5. The ignition trigger wires (sleeved) are coloured:
Yellow-Green, White-Black, Violet-Red, White-Red.
Avoiding sharp edges & areas that become hot (e.g. exhaust), route these wires down to the contact-breaker housing, allowing a minimum of 50mm/2" of excess wire between the trigger and ignition module. Feed the sleeved wires through the original contact-breaker wire hole, using a grommet or sleeving to protect the wires. Route the wires to the ignition trigger 4-way connector block, cut the cable & sleeving to length. Carefully strip back 4-5mm of insulation from the ends of the four wires. Insert the four wires into the connector block (from left to right) as follows:
Yellow-Green, White-Black, Violet-Red, White-Red. Tighten the four screws with a small screwdriver. Secure the sleeved wires

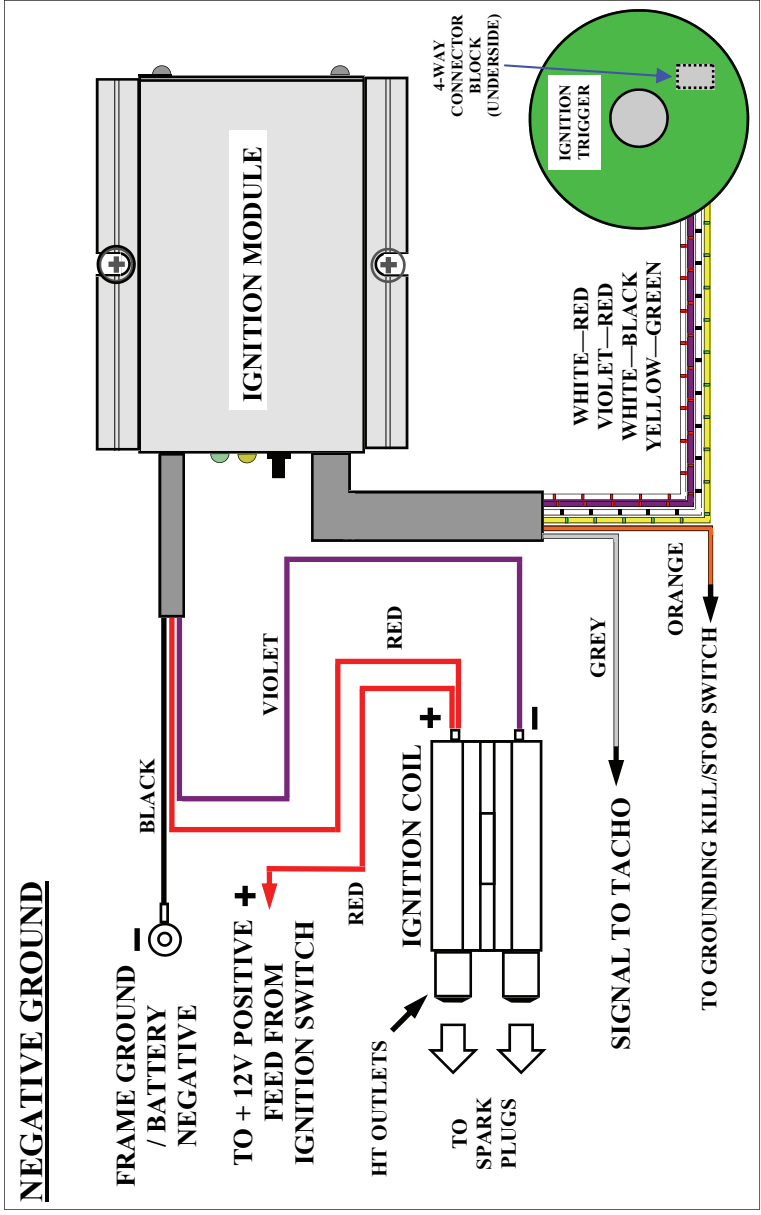
to the trigger plate with two small tie-straps, using the two sets of holes provided. See figs. 5-6 (page 11)

6. The **ORANGE** wire is an IGNITION INHIBIT input. This can be connected to a grounding kill switch or a hidden security switch. If not required, place insulating tape over the end of the wire to prevent accidental shorting out.
7. The **GREY** wire is a tacho output signal for driving an electronic tachometer, if fitted. This is a 12 volt output and provides 1 pulse per two engine revolutions (0.5 pulse/rev). If your tacho requires a different pulse rate, contact Pazon Ignitions. Connect to the tacho signal input terminal/wire. If you have a mechanical tacho (or no tacho) then leave unconnected; cut short the wire & and insulate the wire end.
8. Any remaining wires which may be present on the ignition module are for factory use and should remain unconnected and insulated, as supplied.

Fitting—stage 2

1. Turn over the ignition trigger and fit into the contact-breaker housing. The 4-way connector block will be on the underside at the bottom of the housing. Fit the two M6 button head screws & washers (supplied) & tighten with a 4mm Allen key. Alternatively, the original contact-breaker fixings may be used.
2. Slide the grommet into the cut-out in the contact-breaker housing. Taking the larger timing disc part, slide over the camshaft (male taper facing inwards). Fit the securing bolt & washer (supplied); **finger tighten only at this stage.** See fig. 7 (page 12)

**WARNING: TURN OFF/DISCONNECT THE BATTERY
BEFORE WORKING ON THE SYSTEM
HIGH VOLTAGES CAN KILL**



Ignition timing (See figs. 7-9, pages 12-13)

1. Remove the generator cover. Rotate the generator rotor counter-clockwise, until the **LF** mark (left hand cylinder static timing mark) aligns with the timing mark, with the left cylinder on the compression stroke.

Notes:

- Always turn the generator rotor counter-clockwise
- the timing disc has two timing holes 90° apart, this equates to a crankshaft firing interval of 180°
- The advance graph on page 15 relates to static timing at 10° BTDC and full advance at 35° BTDC. Other settings can be used, in which case the graph will be shifted up or down accordingly

Warning: this system produces very high voltages, keep hands & body away from coil & ht leads

2. The following operations may produce a spark from the plugs, therefore it is recommended that the spark plugs be removed and grounded onto the cylinder head (with the plug caps & h.t. leads connected to them). Alternatively, the violet wire can be temporarily removed from the negative terminal of the ignition coil, place insulating tape over the end of the connector to prevent shorting to ground. This will prevent any undesired sparks whilst timing.
3. (Reconnect the battery).
 - a) Check ignition is switched off. Without turning the engine, turn the timing disc (by hand) until the two timing holes are positioned as shown in fig. 7 (page 12).
 - b) Switch the ignition on, the small green light on the ignition module should turn ON. This indicates that the digital ignition module has successfully powered up. Position yourself so that you can see the small red static timing light on the ignition trigger unit (at the 12 o'clock position). See fig. 4 (page 10). The red timing light should be OFF.
 - c) Turn the timing disc **counter-clockwise**, so that the timing hole passes over the hall-effect sensor; the red timing light turns **ON** See fig. 8 (page 13).
 - d) Continue turning the timing disc slowly **counter-clockwise**;

as soon as the red timing light turns **OFF**, STOP TURNING.
See fig. 9 (page 13).

- e) Keeping the timing disc in position, secure it by tightening the M6 centre bolt with a 10mm spanner or driver.
 - f) If you make a mistake, switch the ignition off and restart from the beginning of step 3.
4. Switch off the ignition.
 5. Refit spark plugs, if removed earlier. Reconnect the violet wire to the ignition coil, if disconnected in step 2 (above).
 6. If removed earlier, push the plug caps firmly onto the plugs, they should click into place.
 7. Refit the fuel tank and/or seat, as required.
 8. The engine should now start and after warming up should tick over well, provided everything else is correctly adjusted. The ignition will advance as per the pre-programmed curve (see advance graph on page 15).
 9. Ignition timing can be checked using a strobe timing light. If required, proceed as follows:
 - Warm engine for 4-5 mins.
 - Using a white light strobe (for correct results, power the strobe from a separate 12 volt battery), time the engine to the LF static timing mark (as used to set the static timing in ignition timing, step 1) with the engine running at idle
 - Alternatively, if you have a full advance timing mark, you can strobe time to this mark with the engine running above 3400rpm.
 - To advance the timing, rotate the trigger plate clockwise (or you can rotate the timing disc anti-clockwise)
 - To retard the timing, rotate the trigger plate anti-clockwise (or you can rotate the timing disc clockwise)
 - Make very small adjustments; 1° of trigger movement equals 2° of crankshaft movement
 - **For safety, switch ignition off between adjustments**
 10. Refit contact-breaker cover & gasket.

Installation is now complete.

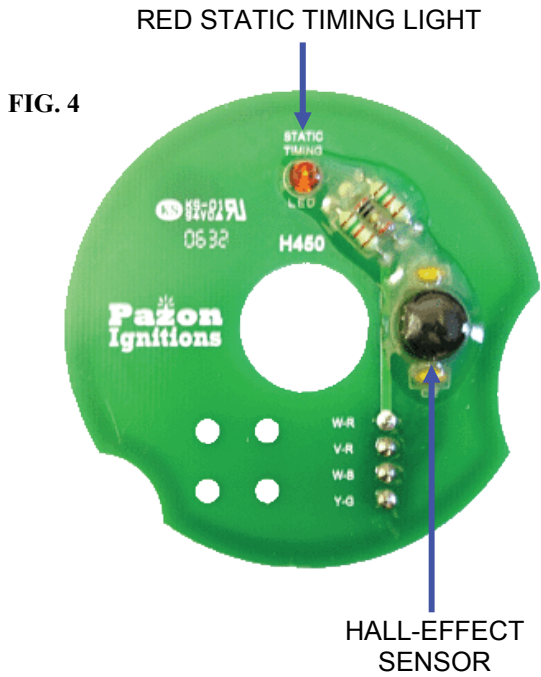
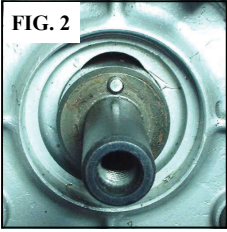


FIG. 5

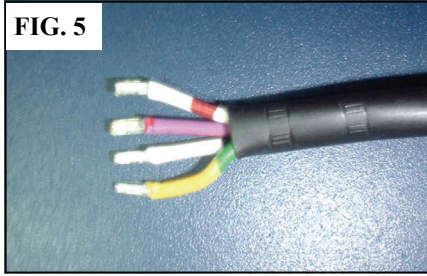
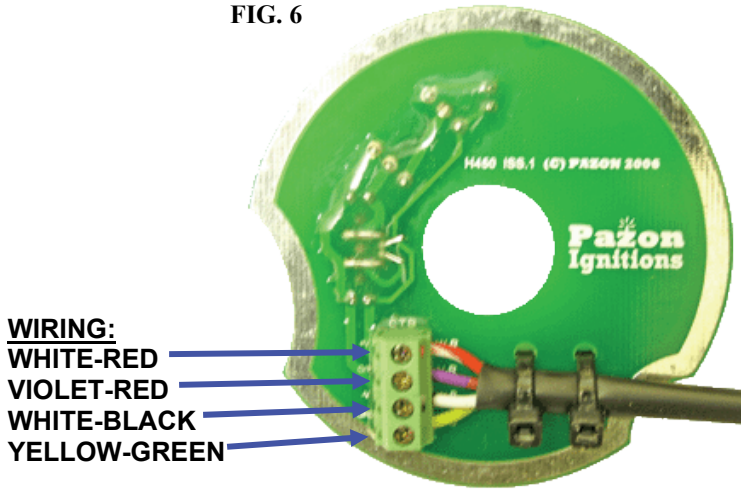


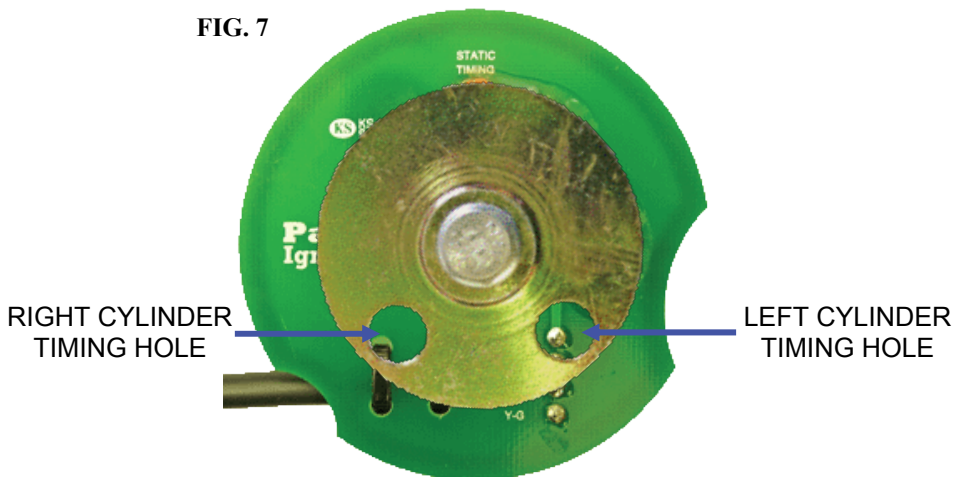
FIG. 6



WIRING:
WHITE-RED
VIOLET-RED
WHITE-BLACK
YELLOW-GREEN

IGNITION TIMING

FIG. 7



START POSITION

LEFT CYLINDER AT LF TIMING MARK
ON COMPRESSION

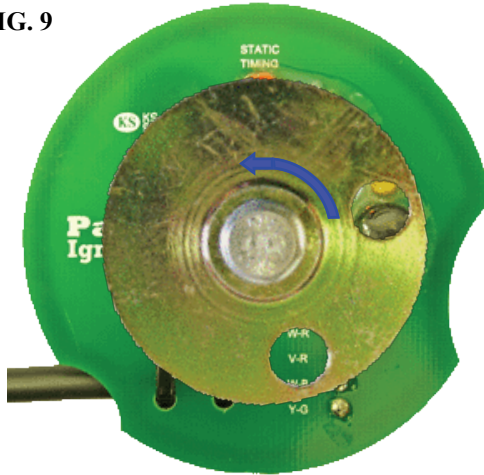
SWITCH IGNITION ON,
RED STATIC TIMING LIGHT IS OFF

FIG. 8



TURN TIMING DISC COUNTER-CLOCKWISE,
RED STATIC TIMING LIGHT TURNS ON

FIG. 9



CONTINUE TURNING TIMING DISC
SLOWLY COUNTER-CLOCKWISE,
UNTIL RED STATIC TIMING LIGHT TURNS OFF,
STOP TURNING

TIGHTEN CENTRE FIXING BOLT

REV-LIMITER

USE OF THIS FUNCTION IS AT YOUR OWN RISK, SINCE IT IS POSSIBLE TO SET THE REV-LIMITER TO BEYOND THE DESIGNED UPPER RPM LIMIT FOR YOUR ENGINE.

The **Smart-Fire** ignition module features a function button that enables the user to set/reset the ignition rev-limiter. Unless specified when purchasing the system, the rev-limiter is not preset, allowing your engine to rev to its maximum (unrestricted).

To set the rev-limiter

To accurately set the rev-limiter you will need a rev. Counter/tachometer to monitor the engine rpm. Rev the engine to one-half the desired rev-limit rpm, press & hold the function button for a minimum of 3 seconds. The ignition module will take a snapshot of the engine rpm at the instant the button is pressed, therefore it is not essential to maintain a precise rpm whilst the button is pressed. The yellow indicator led on the module will flash 5 times Release the button. The rev-limiter is now set. When your engine reaches the preset rpm the ignition will turn off the ignition coil, cutting all sparks. Thus, the engine rpm will fall and, once below the rev-limit setting, ignition will resume.

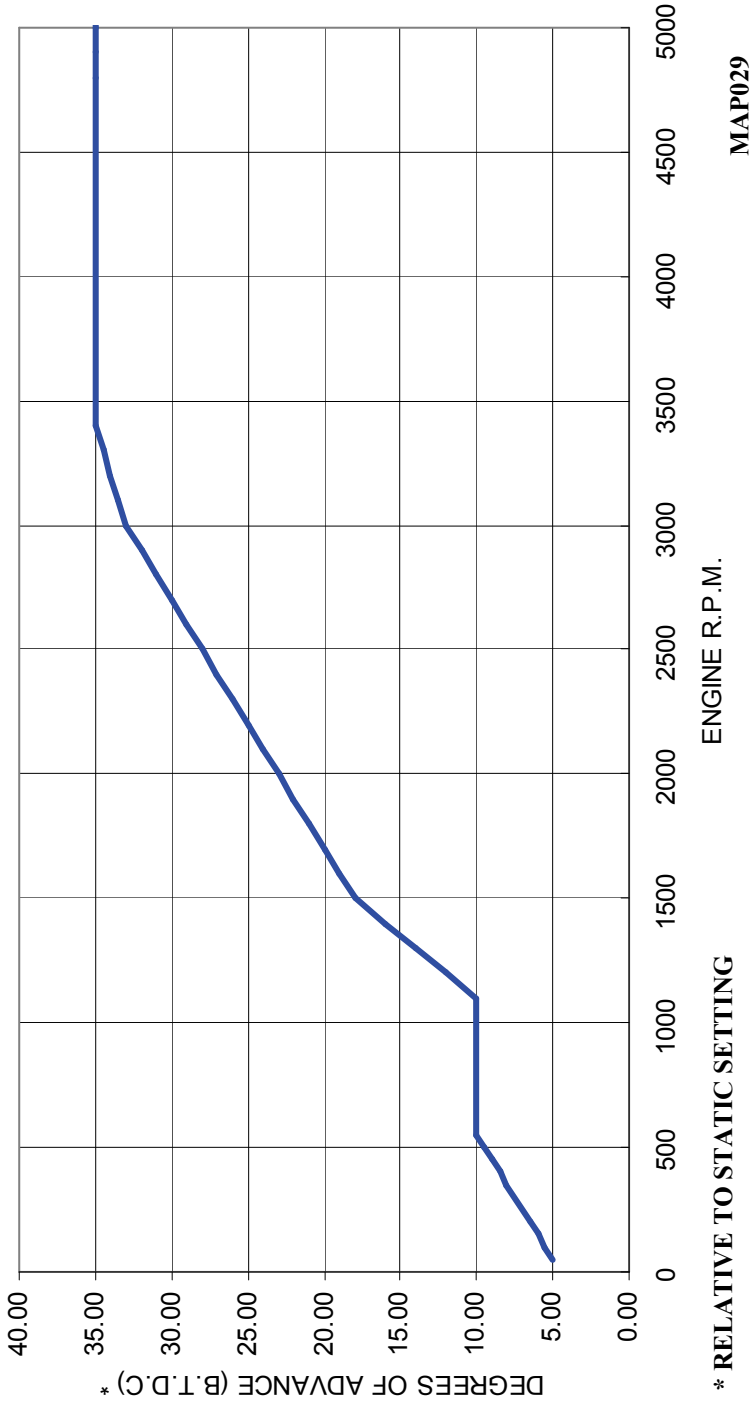
The minimum rev-limiter setting is 3000 rpm (i.e. set with the engine running at 1500 rpm).

To reset the rev-limiter

To reset (disable) the ignition rev-limiter, press & hold the function button for a minimum of 3 seconds, with the engine below 1500 rpm (or stationary). The yellow indicator led on the module will flash 5 times. Release the button. The rev-limiter is now reset.

The rev-limiter setting is retained in the ignition module memory & will be recalled when the ignition is turned on.

Smart-Fire Ignition Timing
HONDA CB250/350/450 180° TWIN
ROAD MACHINES



* RELATIVE TO STATIC SETTING

MIN. CRANKING SPEED: ~150 RPM

Terms & Conditions and Warranty

- Use of this product indicates your acceptance of this notice.
- The product design, firmware & literature is Copyright © PAZON IGNITIONS LTD. 2005-2009, and is protected under international copyright, trademark & treaty provisions.
- To provide the best ignition systems possible, Pazon Ignitions Ltd. reserves the right to alter and improve the specifications of its products without prior notice.

Ignition Systems

- Pazon Ignitions warrants to the original purchaser that the Pazon Ignition System be free from defects in workmanship & parts under normal use for a period of 7½ years from date of purchase.

Ignition Spares

- Spares are defined as item(s) not purchased as part of a complete ignition system. Pazon Ignitions warrants to the original purchaser that these item(s) be free from defects in workmanship & parts under normal use for a period of one year from date of purchase.
- Ignition coils will only be covered by the warranty if it can be proved that the fault is due to a manufacturing fault within the coil.

Limitation of Liability

- In no event shall Pazon Ignitions' liability related to the product exceed the purchase price actually paid for the product.
- Neither PAZON nor its suppliers shall in any event be liable for any damages whatsoever arising out of or related to the use or inability to use the product, including but not limited to the direct, indirect, special, incidental or consequential damages, or other pecuniary loss.
- This warranty will be void if the product or parts have been altered, damaged, abused or installed incorrectly.
- This warranty will be void if parts supplied by Pazon Ignitions are used with other makes of ignition. Your statutory rights are not affected.

Warranty Claims

- To make a claim under warranty, the product must be returned to Pazon Ignitions or its authorized representative, with a copy of your receipt (or evidence of date and place of purchase), within the warranty period.
- Include a detailed description of the problem and why you believe there is a fault within the ignition system.
- The system must be returned postage paid. Proof of posting is not proof or receipt, therefore we recommend using a recorded mail service.
- Upon receipt we will thoroughly test the returned items and repair or replace any items found to be faulty and covered by the warranty.
- Please allow seven working days from receipt of the returned parts before contacting us, to allow sufficient time for a thorough test and evaluation.
- PLEASE CONTACT PAZON IGNITIONS FOR RETURN INSTRUCTIONS.

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