Pazon

IGNITIONS WITH THE 7½ YEAR WARRANTY

Smart-Fire™

CRANKSHAFT TRIGGERED
TWIN CYLINDER 4 STROKE
HIGH-PERFORMANCE
COMPETITION
IGNITION SYSTEM
12 VOLT

SYSTEM TYPE: PDCTT1

Smart-Fire Applications

- TWIN CYLINDER 4 STROKES, E.G. TRIUMPH/BSA/NORTON
- RACING OR ROAD USE
- 12 VOLT ELECTRICS, POSITIVE OR NEGATIVE GROUND
- 360° CRANKSHAFT FIRING (WASTED SPARK)

FEATURES

- HIGH-POWER DIGITAL IGNITION MODULE (FULLY ENCAPSULATED)
- FULLY MAPPED IGNITION TIMING & PROGRAMMED COIL ENERGY CONTROL, SUITABLE FOR COMPETITION OR ROAD USE
- USER-PROGRAMMABLE REV.LIMITER BUTTON
- ELECTRONIC TACHOMETER SIGNAL OUTPUT
- RELIABLE & RUGGED HALL-EFFECT SENSOR , INCLUDES ON-BOARD STATIC TIMING LIGHT, FOR EASY SETTING OF IGNITION TIMING
- MINIATURE HIGH-ENERGY IGNITION COIL
- LESS MAINTENANCE
- IMPROVED ENGINE PERFORMANCE
- FOR RACING OR HIGHLY TUNED APPLICATIONS: SPECIAL 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)

IGNITION SYSTEM COMPRISES:

- IGNITION MODULE (ALUMINIUM HOUSING WITH MOUNTING BRACKETS) & WIRING
- MINIATURE DIGITAL HALL-EFFECT TRIGGER UNIT & FIXINGS
- TRIGGER MOUNTING BRACKET NOT INCLUDED
- STEEL TIMING DISC + FIXING NOT INCLUDED
- DIGITAL IGNITION COIL (DUAL OUTPUT)
- H.T. LEADS (COPPER-CORED)
- PLUG CAPS (5K RESISTOR TYPE)
- COIL & MODULE FIXING SCREWS, WASHERS & NUTS
- CRIMP TERMINAL CONNECTORS & INSULATORS
- RED GROUNDING WIRE
- LARGE & SMALL CABLE 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 suits many applications, therefore the trigger mounting plate & rotor (timing disc) will be different for each system. This ignition system does not normally include these items, unless agreed & specified in advance with your ignition dealer. If your system has been supplied without these items, you will need to make them to fit your machine.

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. Resistor plugs & resistor caps can be used together, although it is not necessary to use both. 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. leads should be used, we do not recommend using carbon fibre leads.

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.

1. If not included with your system, you will need to make a suitable mild steel timing disc for your machine. This disc design should

consist of a continuous ring or solid disc of mild steel, with a raised step ('tooth'), radiused to give a consistent airgap. Attaching a piece of steel to an alloy or aluminum ring or pulley may give incorrect results, including misfiring/mistiming. See fig.2 page 6 and pages 12-13.
The recommended specification for the timing disc is below.

MATERIAL:	**MILD (LOW CARBON) STEEL**
THICKNESS:	**MINIMUM 6mm RECOMMENDED**
DIAMETER:	**RECOMMENDED 30-100mm**
TOOTH DEPTH:	**> 5mm**
TOOTH ARC LENGTH:	**RECOMMENDED 25°-30°**

2. Secure the disc to the crankshaft or engine speed shaft; this can be fixed to a drive pulley. It is important that no spinning magnets or large metal objects pass close to the hall-effect trigger. Only the timing disc should pass over the face of the trigger. It may be necessary to remove the alternator (if fitted) in order to fit the timing disc to the crankshaft.
3. If not included with your system, you will need to prepare a suitable baseplate or mounting ring, to hold the trigger assembly. Mark out & drill two trigger mounting holes (centres: 26mm). Mark out & drill two 3mm holes (approx. 8-10mm apart) close to the trigger; these will be for securing the sleeved trigger cable to the baseplate with a small tie-strap. Secure the ignition trigger onto the baseplate; various M4 fixing screws, nuts, spring & flat washers are provided. The trigger must be mounted with the black hall-effect device facing towards the timing disc/rotor. The trigger can be oriented in a variety of positions, e.g. at the 9 o'clock or 3 o'clock positions.

Note: for correct operation the timing disc must pass over the face of the trigger in the directions shown on pages 12-13, figs 3-6 / 3a-6a.
For clockwise timing disc rotation, see page 12.
For counter-clockwise timing disc rotation, see page 13.
Note the position of the trigger at 9 o'clock or 3 o'clock.

The air gap between the trigger face and rotor face/edge should be between 0.5-2.5mm (not critical), we recommend 1.5mm/0.060". Secure the sleeved wire to the baseplate with one or more small tie-straps (pass through the two holes (drilled earlier) and over the

sleeved wires. It is important that these wires are secured to minimise vibration effects & also to prevent contact with spinning objects (e.g. the timing disc, pulley, etc.). Secure the trigger & baseplate to the crankcase; this can be onto slotted holes to adjust final timing.

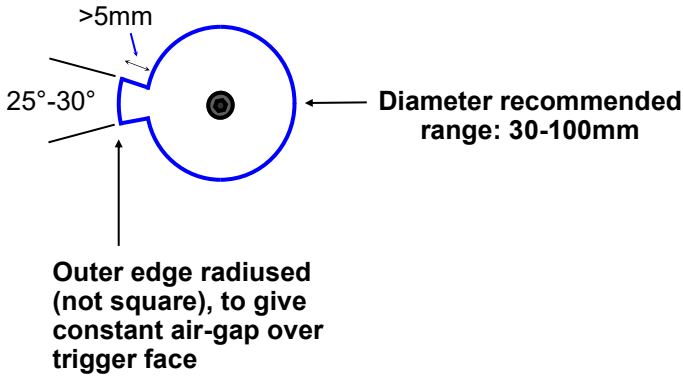
4. Remove the petrol tank (and seat, if necessary) to gain access to the existing ignition system & wiring.
5. For safety, disconnect the battery (preferably both terminals).
6. If fitted, remove the existing ignition system parts, including contact-breaker and mechanical advance unit.
7. If fitted, remove the coil, h.t. lead & any mounting bracket. If there is a separate condenser fitted, this is no longer required & can be removed.
8. Fit the ignition module in a convenient place. This could be under (or on the side of) the battery platform, inside the toolbox (if available) 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.
9. Fit the ignition coil in a convenient place. Suspend the coil by the two mounting lugs, using the M5 bolts, washers & nuts. 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 each rubber boot & 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 end of the h.t. leads. Push the plug caps firmly onto the plugs (either way around), they should click into place.

FIG. 1

FIG. 1a

EXAMPLE TOOTH TYPE TIMING DISC

Fig. 2



WIRING

(PLEASE SEE WIRING SCHEMATICS ON PAGES 9 & 10)

1. From the hall-effect trigger unit, feed the sleeved bi-coloured wires (white-black, white-red & violet-red) up to the ignition module. Where possible, avoid running the wires alongside other wires or ht lead.
2. On the trigger and the ignition module, cut the bi-coloured wires & sleeving to length. Carefully strip back 4-5mm of insulation from the ends of the trigger wires and the corresponding wires on the ignition module. Connect each wire as detailed below.

TRIGGER		IGNITION MODULE
White-Red	⇨	White-Red
White-Black	⇨	White-Black
Violet-Red	⇨	Violet-Red

Colours must match.

3. 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.
4. 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.

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

For positive ground electrics (standard), go to step 6.

5. For *negative ground* electrics (see page 10): connect the black wire from the ignition module to a good grounding point on the frame or directly to the battery negative (—), using a ring terminal. Connect the spare terminal on the piggyback connector (on the positive side of the ignition coil), to a switched positive supply (+12 volts) or directly to the battery positive (an inline 8-10 amp fuse can be fitted here). **Go to step 7.**
6. For *positive ground* electrics (see page 9): connect the spare terminal on the piggyback connector (on the positive side of the ignition coil), to a good grounding point on the frame or directly to the battery positive (+), using the red grounding wire provided.

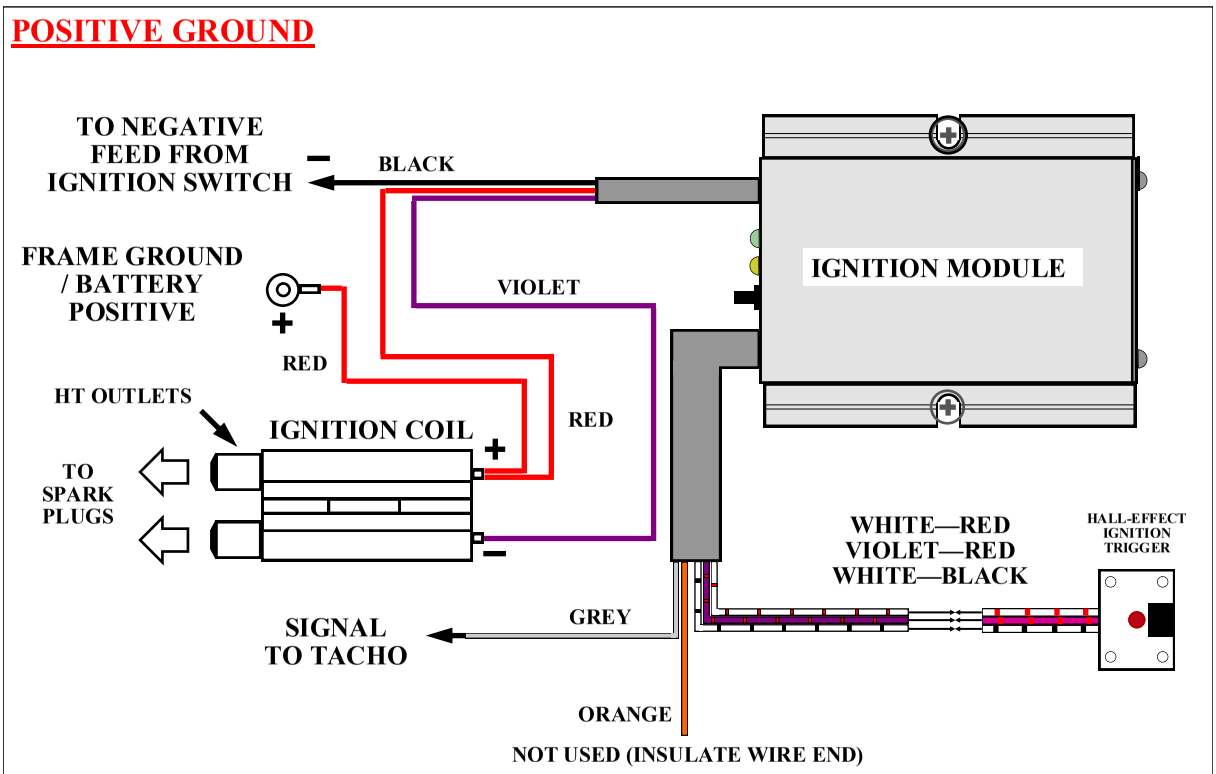
Connect this wire to the coil end using a female spade connector and insulating cover. Connect the other end to ground using a ring terminal. Connect the black wire from the ignition module, to a switched negative supply or directly to the battery negative (an in-line 8-10 amp. fuse can be fitted here).

7. It is important that any switch and/or fuse that is fitted is in good condition; corroded or dirty contacts will cause misfiring/cutting out.
8. The **ORANGE** wire is an IGNITION INHIBIT input, and only functions with NEGATIVE GROUND electrics.
   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.
9. 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 engine revolution (1 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.
10. Any remaining wires which may be present on the ignition module are for factory use and should remain unconnected and insulated, as supplied.
11. Remove any redundant wires or insulate bare ends. Re-check all connections are good and tight; any loose crimps should be removed, slightly closed up and refitted, or preferably replaced.

Pazon
IGNITIONS WITH THE 7½ YEAR WARRANTY

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

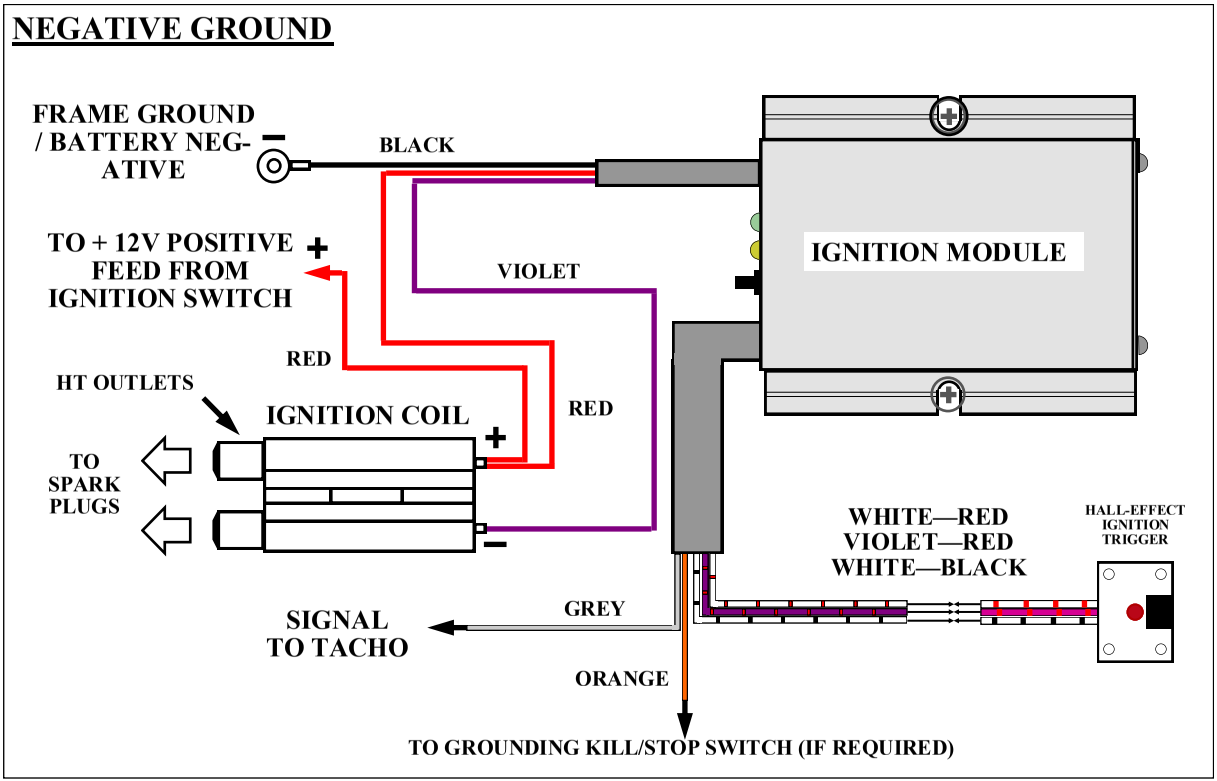
POSITIVE GROUND



WARNING: THE IGNITION WILL BE DAMAGED IF RUNNING WITHOUT A GOOD ENGINE/FRAME GROUND

Pazon
IGNITIONS WITH THE 7½ YEAR WARRANTY

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



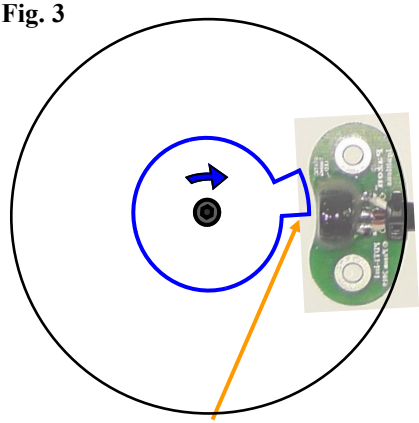
WARNING: THE IGNITION WILL BE DAMAGED IF RUNNING WITHOUT A GOOD ENGINE/FRAME GROUND

TIMING

1. Remove the spark plugs.
2. Rotate the engine to the correct full advance timing position for your machine (on compression or exhaust stroke), using one of these methods:
   - If available, use existing marks provided for strobe timing. Unless these marks are known to be accurate it is recommended that they are checked for correct alignment. These marks should line up at the full advance position, check using one of the methods below and, if necessary, re-mark.
   - Use a timing plug
   - Use a degree disc on the crankshaft
   - Use a dial guage down the spark plug hole
3. Align the leading edge of the tooth in the timing disc with the centre of the hall-effect trigger. This can be best done by angular adjustment of the trigger mounting plate. Alternatively, the timing disc can be repositioned, if it is not keyed. The red timing light turns off at the start of the tooth and on at the end. See pages 12-13.
4. Refit spark plugs and plug caps.
5. Refit tank, fuel lines, battery & seat, as required.
6. The engine should now start and after warming up should tick over well, provided everything else is correctly adjusted.
7. **FOR SAFETY, SWITCH IGNITION OFF BETWEEN ADJUSTMENTS.** If desired, the ignition timing may be checked/ fine tuned with the aid of a white light strobe (preferably powered by a separate battery). Time the engine (at 4000+ rpm) to the full advance mark. Adjust the timing by making very small movements of either the ignition trigger baseplate (or the timing disc).
   To advance the timing, turn the trigger against the direction of the rotor (or turn the rotor in its normal direction).
   To retard the timing, turn the trigger baseplate in the same direction as the rotor. If no timing mark is available, road test and adjust (if necessary) for optimum performance.
8. Tidy up wiring and refit covers, as necessary. The timing is now set and requires no further adjustment. However, please note that for satisfactory operation of this ignition system it is important that the wiring, connections, switches, battery, h.t. leads, plugs and plug caps are maintained in good order.

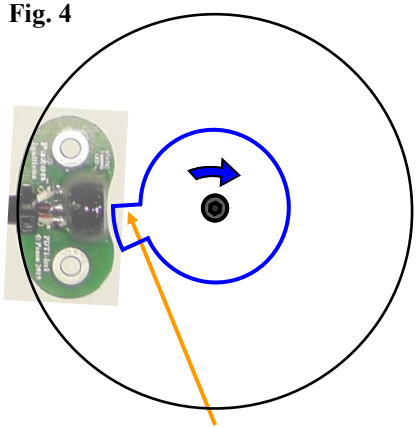
IGNITION STATIC TIMING AT FULL ADVANCE
CLOCKWISE TIMING DISC ROTATION

Fig. 3



TOOTH LEADING EDGE
RED LIGHT "OFF"

Fig. 4



TOOTH LEADING EDGE
RED LIGHT "OFF"

Fig. 3a SIDE VIEW

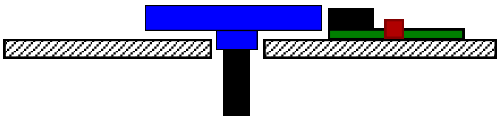
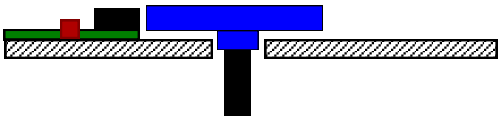
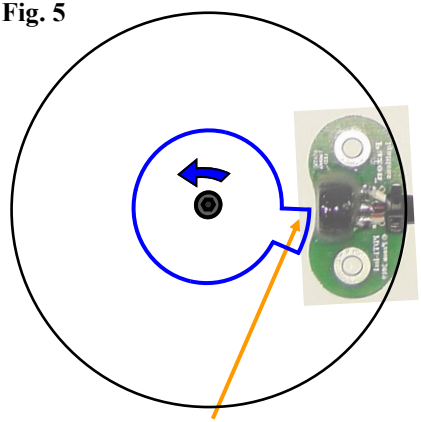


Fig. 4a SIDE VIEW



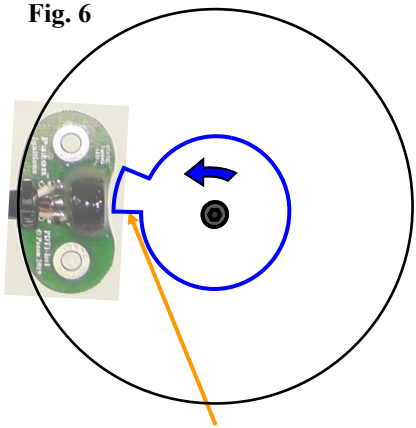
IGNITION STATIC TIMING AT FULL ADVANCE
COUNTER-CLOCKWISE TIMING DISC ROTATION

Fig. 5



TOOTH LEADING EDGE
RED LIGHT "OFF"

Fig. 6



TOOTH LEADING EDGE
RED LIGHT "OFF"

Fig. 5a SIDE VIEW

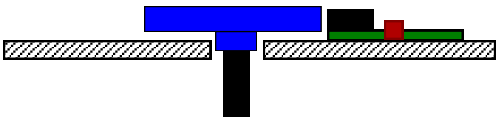
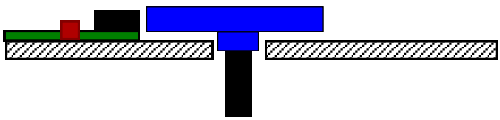


Fig. 6a SIDE VIEW



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 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).

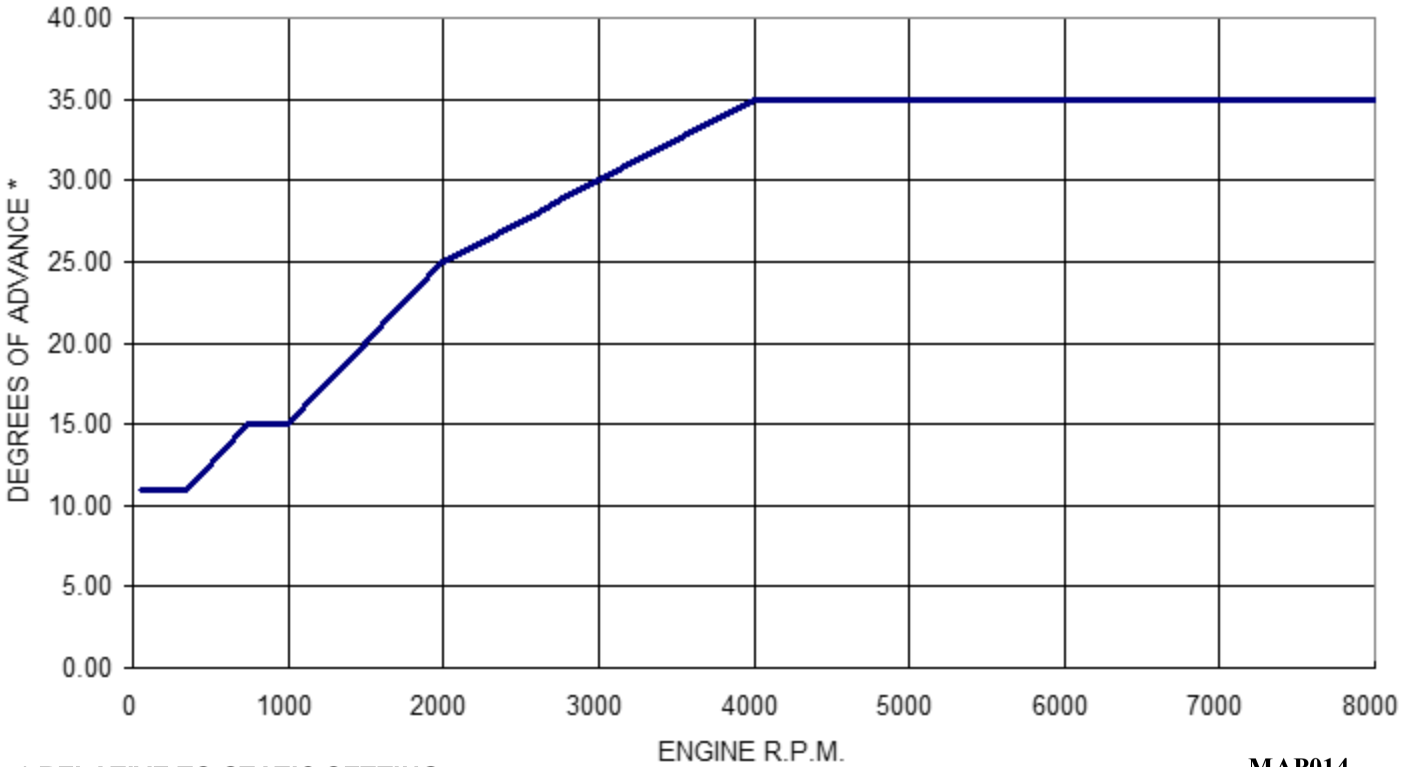
To reset the rev-limiter

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.

Pazon
IGNITIONS WITH THE 7½ YEAR WARRANTY

Smart-Fire Ignition Timing
CRANKSHAFT TRIGGERED
SINGLE/TWIN CYLINDER 4 STROKE



*** RELATIVE TO STATIC SETTING**

MAP014

Terms & Conditions and Warranty

- Use of this product indicates your acceptance of this notice.
- The product design, firmware & literature is Copyright © PAZON IGNITIONS LTD. 2005-2025, 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.

✉ **Pazon Ignitions Ltd, 274 Hot Springs Road, RD 2, Katikati 3178, Bay of Plenty, New Zealand**
☎ **TELEPHONE: +64 (0) 7549 5878** 🖷 **FAX: +64 (0) 7549 5879**
EMAIL: ignition@pazon.com WEB: www.pazon.com