

# Pazon

IGNITIONS WITH THE 7½ YEAR WARRANTY

## Smart-Fire

### DUCATI

### TWIN

### HIGH-PERFORMANCE IGNITION SYSTEM

### 12 VOLT



SYSTEM TYPE: PDD90

## APPLICATIONS

- DUCATI 90 DEGREE V-TWINS WITH 12-VOLT ELECTRICS
- 1/2 ENGINE SPEED / CAMSHAFT TRIGGERED, ANTI-CLOCKWISE ROTATION

NOTE: REQUIRES ENGINEERING FACILITIES, SEE PAGE 3

## FEATURES

- HIGH-POWER DIGITAL IGNITION MODULE (FULLY ENCAPSULATED)
- FULLY PROGRAMMED IGNITION TIMING & COIL ENERGY CONTROL: IGNITION ADVANCE CURVE IS MAPPED FOR THE DUCATI V-TWIN ENGINE
- USER-PROGRAMMABLE REV.LIMITER BUTTON
- RELIABLE & RUGGED HALL-EFFECT SENSOR , INCLUDES ON-BOARD STATIC TIMING LIGHT, FOR EASY SETTING OF IGNITION TIMING
- MINIATURE HIGH-ENERGY DUAL IGNITION COIL
- WASTED SPARK SYSTEM FOR SIMPLICITY
- LESS MAINTENANCE
- IMPROVED ENGINE PERFORMANCE, INCLUDING BETTER STARTING & SMOOTHER RUNNING
- 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
- YELLOW-GREEN EARTHING WIRE
- LARGE & SMALL CABLE TIE-STRAPS

# 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 ring & rotor may vary between machines. 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. See page 13 for an example. You may also need to make a cover to protect the trigger & rotor.

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.

1. For safety, disconnect the battery (preferably both terminals).
2. Remove the seat and/or tank to gain access to the existing ignition system & wiring.
3. Disconnect wiring & remove ignition module(s), ignition coil(s), h.t. leads & caps. From the existing ignition wiring, all that is required for the new ignition system is a single +12 volt feed via the ignition/kill switch. Refer to the wiring diagram for your machine to find the +12 volt feed wire(s) or use a test lamp/multimeter to check for power when the ignition is switched on.
4. If the old ignition system is crankshaft triggered, these trigger(s) can be left in place (unused). However, if the ignition is camshaft triggered, you will need to remove the trigger(s) & rotor to allow fitment of the new parts.
5. Remove the cam belt cover (right-hand side). Mark the position of the pulleys. Undo the nut & remove the half-engine speed lay shaft pulley & belt.
6. If fitting the new rotor to the pulley you will need to cut a hole in the cam belt cover to allow the rotor to pass through.
7. Fit the new rotor onto the pulley, or other half-engine speed shaft & refit to engine. Refit cam belt.
8. Mark out & drill four trigger mounting holes (centres 24mm x 14mm); if preferred these can be tapped M3 to accept the mounting screws. Mark out & drill one (or more) pairs of 3mm holes (approx. 8mm apart) close to the trigger; these will be for securing the sleeved trigger cable to the mounting ring with small tie-straps. Fit the ignition trigger to the mounting ring using the screws, washers, spacers & nuts, as required. The trigger must be mounted with the hall-effect device facing towards the centre of the rotor, (the wires will be facing away). The air gap between the trigger face and outer rotor edge should be between 0.5-2.5mm (not critical), we recommend 1.5mm/0.060".
9. Fit the trigger & mounting ring to the machine (normally bolted to the cam belt cover).
10. Fit the new ignition module in a convenient place, this can be in the place of the old module(s). The unit can be orientated in any position, but this should be onto a flat surface, if possible. Secure the unit 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. The module casing acts as a shield for the internal electronics, therefore it is recommended that the case is connected to the frame earth. This can be achieved by direct contact between the mounting brackets & screws, but if the mounting surface is non-metallic, plastic-coated or not connected directly to the frame, then the yellow-green earthing wire provided should be used. A ring terminal at one end is placed under one of the module mounting screw heads or nuts (or case end plate screws) and a ring terminal at the other end connects to the frame earth.

11. Fit the ignition coil in a convenient place, away from the ignition module. This can be in place of the old coil(s). 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 by passing the tie-straps around the frame tube & 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. Since both h.t. leads fire together, it does not matter which each h.t. lead goes to which plug. Push the plug caps firmly onto the plugs, they should click into place.



# WIRING

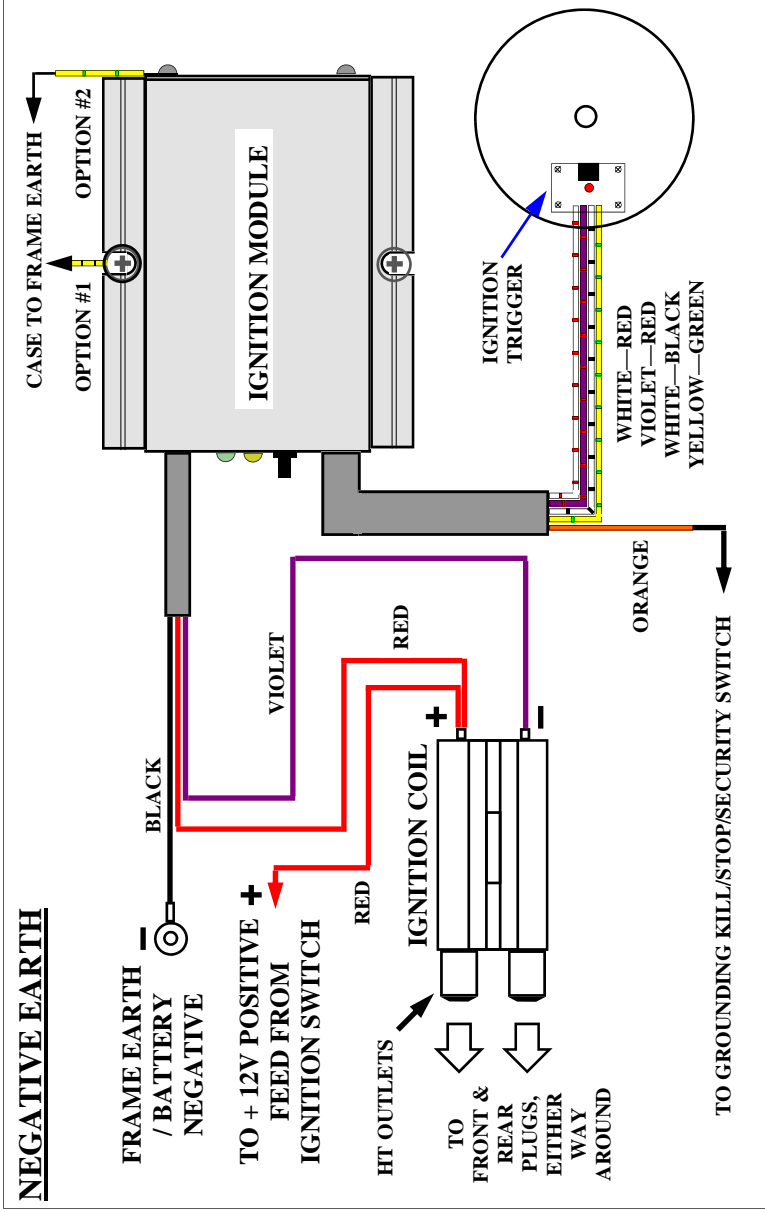
## (PLEASE SEE WIRING SCHEMATIC ON PAGES 7)

1. The ignition trigger wires (sleeved) are coloured white—red, violet—red, white—black & yellow-green. Secure the sleeved wires to the trigger mounting ring with small cable ties. Make sure that these wires cannot come into contact with rotating parts. Allowing some slack in the cable (for ignition timing adjustment), route these wires from the trigger up to the ignition module. If passing through holes in metalwork, use grommets or sleeving. Cut the trigger cable & sleeving to length; cut the ignition trigger cable & sleeving to length. Carefully strip back a small amount of insulation from the ends of the four wires. Connect the four wires from the trigger to the corresponding coloured wires from the ignition module, using individual crimps or multiway connectors.
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.
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.

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

4. Connect the black wire from the ignition module to a good earth point on the frame or directly to the battery negative (—), using a ring terminal.
5. Connect the spare terminal on the piggyback connector (on the positive side of the ignition coil), to a switched positive supply (+12 volts). An in-line fuse can be included (8 amp recommended). It is important that the switch is in good condition; corroded or dirty contacts will cause misfiring/cutting out.
6. The orange wire is an **ignition inhibit** input. This can be connected to a grounding kill switch or a hidden security switch (negative earth only). If not required, place insulating tape over the end of the wire to prevent shorting out.

**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 EARTH**

## **TIMING (PLEASE SEE PAGE 11, FIGS. 2-5)**

1. Switch off ignition or disconnect the battery.
2. Set the rear (vertical) piston at the recommended full advance timing position on the compression stroke. This will be easier if the spark plugs are removed first. The advance graph on page 15 is shown for a setting of 40° BTDC. If using a figure other than 40° the graph line will be shifted up or down accordingly.
3. Loosen the trigger mounting ring fixings so that it can be rotated by hand. Position the trigger plate in the fully anti-clockwise position. See fig. 2
4. 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 earth. This will prevent any undesired sparks whilst timing.
5. (Reconnect the battery).
  - switch the ignition on, the small green light on the ignition module should flash twice.  
the red static timing light on the trigger should turn “on”.
  - Turn the trigger plate clockwise; as soon as the red timing light turns “off”, stop turning the trigger. See fig. 3
  - Turn the trigger plate anti-clockwise; the red timing light should turn “on” then “off”, turn the trigger a small amount (anti-clockwise). The trigger is approximately back at the start position. The hall-effect trigger is now calibrated. See fig. 4
  - Finally, turn the trigger plate very slowly clockwise until the red timing light turns “on”; this is the timing point for full advance. See fig. 5  
Keeping the trigger in position, finger tighten the trigger mounting ring fixings.
6. Fully tighten the trigger mounting ring fixings.
7. Switch off the ignition.
8. Refit spark plugs & caps, if removed earlier. Reconnect the violet wire to the ignition coil, if disconnected in step 4.
9. The engine should now start and after warming up should tick over well, provided everything else is correctly adjusted. Strobe timing



is not necessary. The ignition will advance as per the pre-programmed curve (see advance graph)

10. Strobe timing is not essential, but if desired, proceed as follows:
  - Warm engine for 4-5 mins.
  - Using a white light strobe, time the engine to the full advance mark (as used to set the static timing in step 2).
  - To advance the timing, rotate the trigger clockwise
  - To retard the timing, rotate the trigger anti-clockwise
  - Make very small adjustments; 1° of trigger movement equals 2° of crankshaft movement
  - **For safety, switch ignition off between adjustments**
11. Fit new cover over rotor & trigger assembly.

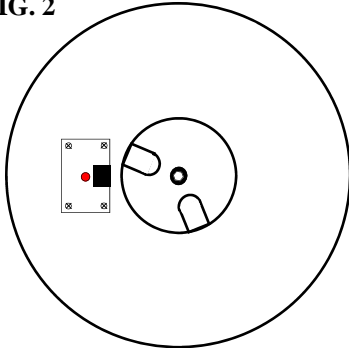
**Installation is now complete.**



# IGNITION TIMING

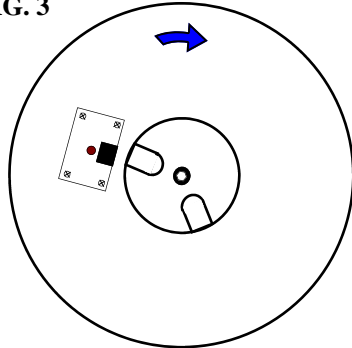
## ANTI-CLOCKWISE ROTATION

FIG. 2



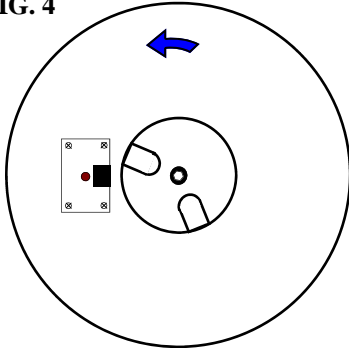
**START POSITION**  
**(ANTI-CLOCKWISE),**  
**SWITCH IGNITION ON,**  
**RED TIMING LIGHT "ON"**

FIG. 3



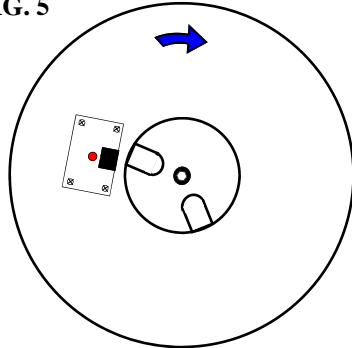
**TURN CLOCKWISE,**  
**RED TIMING LIGHT "OFF",**  
**STOP TURNING**

FIG. 4



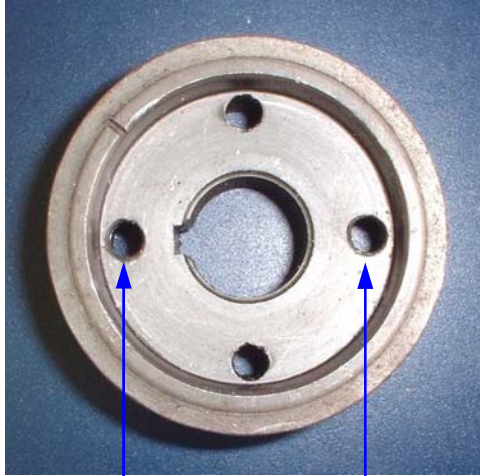
**TURN ANTI-CLOCKWISE,**  
**RED TIMING LIGHT "ON",**  
**KEEP TURNING,**  
**RED TIMING LIGHT "OFF",**  
**TURN SLIGHTLY FURTHER.**  
**TRIGGER IS NOW CALIBRATED**

FIG. 5



**TURN SLOWLY CLOCKWISE**  
**UNTIL**  
**RED TIMING LIGHT**  
**TURNS "ON",**  
**TIGHTEN TRIGGER FIXINGS**

**LAY SHAFT PULLEY  
(TOP VIEW)**



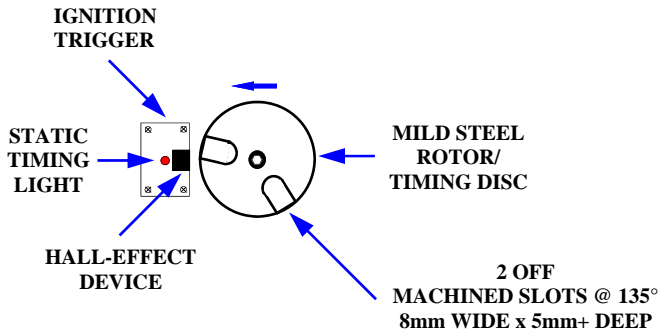
**DRILL & TAP M6  
FOR ROTOR FIXING SCREWS**

**CAM BELT COVER  
WITH HOLE CUT FOR ROTOR**



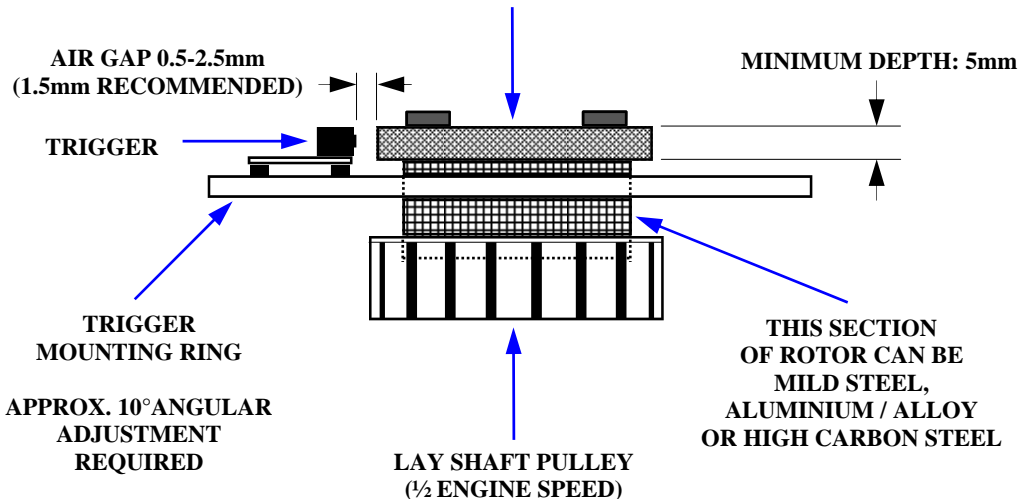
# IGNITION ROTOR/TIMING DISC DATA

## ANTI-CLOCKWISE ROTATION



## IGNITION ROTOR (MILD STEEL)

CAN BE ONE OR TWO PIECE CONSTRUCTION  
RECOMMENDED DIAMETER RANGE: 40-46mm



## 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

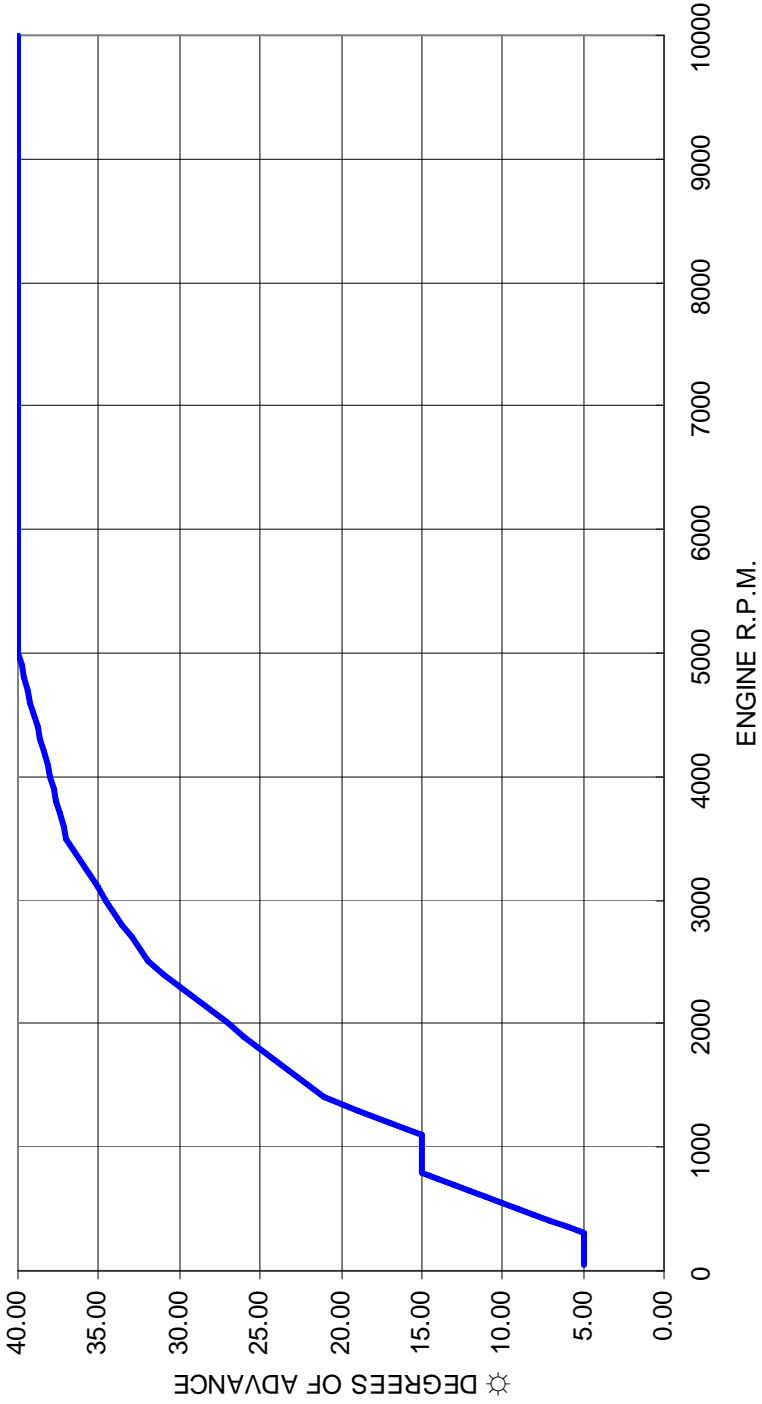
To accurately set the rev-limiter you will need a rev. Counter/tachometer to monitor the engine rpm. Rev the engine to one-half the desired rev-limit rpm, press & hold the function button for a minimum of 3 seconds. The ignition module will take a snapshot of the engine rpm at the instant the button 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.



\* RELATIVE TO STATIC SETTING

MIN. CRANKING SPEED: 100 RPM

MAP006

## Terms & Conditions and Warranty

- Use of this product indicates your acceptance of this notice.
- The product design, firmware & literature is Copyright © PAZON IGNITIONS LTD. 2005-2007, 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 of 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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