Smart-Fire™

V-TWIN

HIGH-PERFORMANCE IGNITION SYSTEM

12 VOLT

SYSTEM TYPE: PDV1
### FEATURES

- **HIGH-POWER DIGITAL IGNITION MODULE** (FULLY ENCAPSULATED)
- **COMPATIBLE WITH 12 VOLT POSITIVE & NEGATIVE EARTH ELECTRICS**
- **FULLY PROGRAMMED IGNITION TIMING & COIL ENERGY CONTROL**: IGNITION ADVANCE CURVE IS MAPPED FOR THE VINCENT V-TWIN ENGINE
- **USER-PROGRAMMABLE REV.LIMITER BUTTON**
- **ELECTRONIC TACHOMETER OUTPUT**
- **PRECISION ENGINEERED STEEL TIMING DISC**
- **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
- **FOR RACING 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 COMPRISSES:

- **IGNITION MODULE** (ALUMINIUM HOUSING WITH MOUNTING BRACKETS) & WIRING
- **MAGNETO REPLACEMENT CAST HOUSING WITH** PRE-INSTALLED TRIGGER PLATE & TIMING DISC
- **DIGITAL IGNITION COIL** (DUAL OUTPUT)
- **H.T. LEADS** (COPPER-CORED)
- **PLUG CAPS** (5K RESISTOR TYPE)
- **FIXING SCREWS, WASHERS & NUTS**
- **CRIMP TERMINAL CONNECTORS & INSULATORS**
- **RED EARTHING WIRE, YELLOW-GREEN EARTHING WIRE**
- **TIE-STRAPS**
WARNING: THIS SYSTEM PRODUCES VERY HIGH VOLTAGES, ALWAYS SWITCH OFF BEFORE WORKING ON THE SYSTEM.

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.

1. Disconnect the battery.
2. Remove the timing cover and automatic timing device (if fitted).
3. Remove the magneto cowl and magneto. Fit the magneto replacement unit in place of the magneto (using the original fixings), noting that the body is offset towards the front to allow access to the rearmost bolt hole in the triangular mounting flange, where the long nut is.
4. Fit the ignition module in a convenient place, preferably under the battery platform, or behind the magneto cowl. 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, shakeproof 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.

5. Fit the ignition coil in a convenient place, away from the ignition module & magneto replacement unit. 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 h.t. lead goes to which plug. Push the plug caps firmly onto the plugs, they should click into place.
WIRING

(PLEASE SEE WIRING SCHEMATICS ON PAGES 8 & 9)

1. The ignition trigger wires (sleeved) are coloured: white—red, violet—red, white—black & yellow—green. Allowing some slack in the cable, route these wires down to the magneto replacement housing, remove the housing cap & feed through the grommet in the cap. Route the wires around to the ignition trigger 4-way connector block. Allowing some movement in the cable (for setting the ignition timing), 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:
   white-red, violet-red, white-black & yellow-green. 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 fig. 3, page 12.

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.

For positive earth electrics, please go to step 5.

4. For negative earth electrics: 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. Connect the spare terminal on the piggyback connector (on the positive side of the second ignition coil), to a switched positive supply (+12 volts), preferably via a fuse (8 amp recommended) and through the ammeter (if fitted). Go to step 7.

5. For positive earth electrics: connect the spare terminal on the piggyback connector (on the positive side of the ignition coil) to a
good earth point on the frame or directly to the battery positive (+), using the red earthing wire provided. Connect this wire to the coil end using a female spade connector and insulating cover. Connect the other end to earth using a ring terminal.

6. Connect the black wire from the ignition module, to a switched negative supply, preferably via a fuse (8 amp. Recommended) and through the ammeter (if fitted).

7. Suggestions for the choice of switch can be a spare position on the headlamp switch (if available), a second dip switch on the handlebars or a key switch located in the headlamp shell. It is important that the switch is in good condition; corroded or dirty contacts will cause misfiring/cutting out.

8. The **ORANGE** wire is an *ignition inhibit* input. This can be connected to a grounding kill switch or a hidden security switch, provided that the vehicle is negative earth. If not required, place insulating tape over the end of the wire to prevent shorting out.

9. The **GREY** wire is a tacho output signal for driving an electronic tachometer, if fitted. This is a 12 volt pulsed output and provides 1 pulse per two engine revolutions (0.5 pulses/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, an inductive pickup tacho (e.g. Scitsu) 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.
WARNING: TURN OFF/DISCONNECT THE BATTERY BEFORE WORKING ON THE SYSTEM
HIGH VOLTAGES CAN KILL

POSITIVE EARTH

TO NEGATIVE FEED FROM IGNITION SWITCH

IGNITION COIL

TO FRONT & REAR PLUGS

HT OUTLETS

IGNITION MODULE

CASE TO FRAME EARTH

OPTION #1

OPTION #2

IGNITION TRIGGER

4-WAY CONNECTOR BLOCK

WHITE—RED
VIOLET—RED
WHITE—BLACK
YELLOW—GREEN

ORANGE
NOT USED (INSULATE WIRE END)

SIGNAL TO TACHO

GREY

VIOLET

BLACK

RED

WHITE—RED
VIOLET—RED
WHITE—BLACK
YELLOW—GREEN

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

FRAME EARTH / BATTERY NEGATIVE

TO +12V POSITIVE FEED FROM IGNITION SWITCH

HT OUTLETS

IGNITION COIL

TO FRONT & REAR PLUGS

IGNITION TRIGGER

SIGNAL TO TACHO

CASE TO FRAME EARTH

OPTION #1

OPTION #2

IGNITION MODULE

WHITE—RED
VIOLET—RED
WHITE—BLACK
YELLOW—GREEN

4-WAY CONNECTOR BLOCK

TO GROUNDING KILL/STOP SWITCH (IF REQUIRED)
1. Switch off ignition or disconnect the battery.
2. The automatic advance unit is no longer required and should be removed. However, if it is to remain in place it must be locked solid by whatever method is available. The ignition module includes electronic advance/retard suited to the Vincent engine. The preferred alternative is to replace the automatic advance unit with a solid drive pinion, please contact your dealer for the necessary parts, if required.
3. Remove spark plugs. Set the rear piston at t.d.c. (top dead centre) on the compression stroke.
4. Remove the cover from the magneto replacement unit.
5. Undo and remove the trigger plate hex pillar fixings & washers and place in a small container for safe keeping.
6. Lift out the trigger plate to expose the steel timing disc.
7. Slacken the centre screw using a 3/16" hex key.
8. Rotate the timing disc until it is as shown in fig. 2. With the two holes at 12 o’clock & 7 o’clock. Tighten the centre screw & re-check the position.
9. Refit the trigger plate, washers and hex pillar screws previously removed in step 5, turn them down using only your fingers, so that the plate can be rotated by hand.
10. 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 disconnected 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.
11. (Reconnect battery).
   - Position the trigger plate in the fully clockwise position. See fig. 4
   - Switch the ignition on, the small green light on the ignition module should flash once and then stay on continuously. The red timing light on the trigger plate should be on.
   - Turn the trigger plate slowly anti-clockwise until the red timing light turns OFF, stop turning. See fig. 5
   - Finally, turn the trigger plate very slowly clockwise until the red timing light turns ON, stop turning; this is the timing point for TDC
on the rear cylinder. See fig. 6

- Keeping the trigger in position, finger tighten the pillar fixings.
- If you make a mistake, switch the ignition off and restart from the beginning of step 11.
- Note the final position of the timing hole at approximately the 7 o’clock position, visible through the inspection window.

12. Tighten the hex pillar fixings using a 7mm hex driver or spanner. Do not over-tighten or the trigger plate may become distorted.
13. Switch off the ignition.
14. Replace the cover on the magneto replacement unit.
15. Refit the spark plugs & caps, if removed earlier. Reconnect the violet wire to the ignition coil, if disconnected in step 10.
16. 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).

*Installation is now complete.*
STATIC POSITION OF TIMING DISC
WITH REAR PISTON AT
T.D.C. ON COMPRESSION,
TIGHTEN CENTRE FIXING SCREW

TRIGGER ASSEMBLY FITTED,
WITH HEX. PILLAR FIXINGS
& WASHERS, PILLARS
LOOSELY FASTENED

PLEASE NOTE: MAGNETO REPLACEMENT HOUSING ORIENTATION
MAY BE DIFFERENT TO THAT SHOWN IN THESE PICTURES
STATIC IGNITION TIMING
ANTI-CLOCKWISE TIMING DISC ROTATION
(WIRING NOT SHOWN FOR CLARITY)

FIG. 4

START POSITION FULLY CLOCKWISE.
IGNITION ON
RED TIMING LIGHT ON

FIG. 5

TURN SLOWLY ANTI-CLOCKWISE
UNTIL THE RED TIMING LIGHT TURNS OFF, STOP TURNING

FIG. 6

TURN VERY SLOWLY CLOCKWISE
UNTIL THE RED TIMING LIGHT TURNS ON, STOP TURNING
TIGHTEN TRIGGER FIXINGS
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

VINCENT 50° V-TWIN

DEGREES OF ADVANCE *

ENGINE R.P.M.

* RELATIVE TO STATIC SETTING
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 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.