Pazon

IGNITIONS WITH THE 7½ YEAR WARRANTY

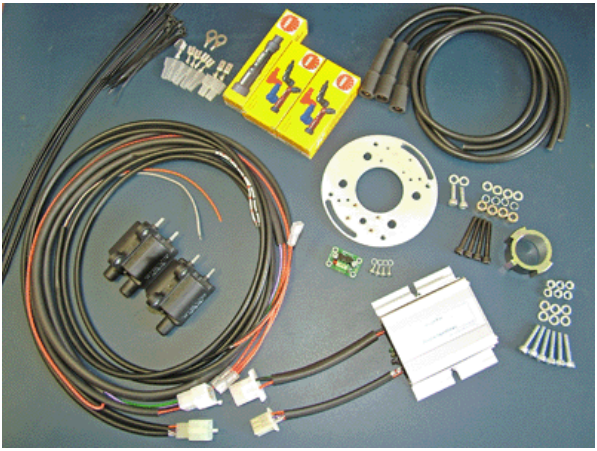
Smart-Fire™

LAVERDA

LAVERDA 180° 3 CYLINDER

HIGH-PERFORMANCE IGNITION SYSTEM

12 VOLT



SYSTEM TYPE: PDL1

Smart-Fire Applications

- **LAVERDA 180° 3 Cylinder motorcycles, including Jota and 3C.**
  Replaces factory or aftermarket ignition system.
  Retains the original charging coils.

Features

- **HIGH-POWER DIGITAL IGNITION MODULE (FULLY ENCAPSULATED)**
- **FULLY PROGRAMMED IGNITION TIMING & COIL ENERGY CONTROL: IGNITION ADVANCE CURVE IS MAPPED TO SUIT THE LAVERDA 180 TRIPLE**
- **TRIGGER INCLUDES STATIC TIMING LIGHT, FOR EASY SETTING OF IGNITION TIMING**
- **USER-PROGRAMMABLE REV.LIMITER BUTTON**
- **ELECTRONIC TACHOMETER SIGNAL OUTPUT**
- **SECURITY/KILL SWITCH CONTROL INPUT**
- **FOR RACING , HIGHLY TUNED OR MULTI-PLUG 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 & MULTI-WAY CONNECTORS)**
- **IGNITION WIRING HARNESS**
- **ONE MINIATURE DUAL OUTPUT DIGITAL IGNITION COIL**
- **ONE MINIATURE SINGLE OUTPUT DIGITAL IGNITION COIL**
- **HT LEADS WITH PRE-FITTED HT CLIPS & RUBBER COVERS**
- **THREE NGK PLUG CAPS (5K SUPPRESSOR TYPE)**
- **ALUMINIUM STATOR MOUNTING BASEPLATE**
- **OPTICAL IGNITION TIMING SENSOR + FIXINGS**
- **FOUR STEEL SPACERS**
- **FOUR M5 CAP HEAD SCREWS + WASHERS**
- **IGNITION TIMING ROTOR (PLATED)**
- **MODULE & COIL FIXING SCREWS, WASHERS & NUTS**
- **CRIMP TERMINAL CONNECTORS & INSULATORS**
- **LARGE & SMALL CABLE TIE-STRAPS**

Smart-Fire Fitting Instructions

Special tools required:

- Alternator flywheel extractor/puller tool 61818034
- 32mm spanner or large adjustable wrench
- Allen (hex) keys, including 4mm, 3mm & 2.5mm

Optional tools:

- Alternator locking tool 61808032
- Xenon strobe timing light + 12 volt battery

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 coils 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, 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. lead 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. Lift up (or preferably remove) seat. For safety, disconnect the negative terminal of the battery.
2. Remove fuel tank.
3. Undo the two securing screws and remove the a.c. alternator (generator) cover. Take care not to lose the small stone-guard mesh at the bottom of the housing (if fitted).
4. It is recommended at this point to remove the spark plugs and rotate the engine to the TDC mark on cylinders 1&3; this is normally marked on the outer edge of the alternator rotor, with a corresponding mark on the casing. With the plugs out the engine can be turned by grasping and turning the alternator rotor. If in doubt about the correct mark, you can find an approximate TDC position by inserting a rod down cylinder#3 and feeling for maximum height.
5. Flatten the lockwasher.
6. Lock the alternator rotor and slacken the nut using a 32mm spanner (or large adjustable wrench). **Note: this nut has a left-hand thread.** Use special tool 61808032, if available. If this tool is unavailable: unless it is exceptionally tight, the large nut can be undone without this, by turning against engine compression (with all spark plugs fitted).
7. Withdraw the nut and washer.
8. Tighten alternator puller tool 61818034 fully home onto the rotor hub.
9. Tighten the puller bolt until the rotor is extracted from the crankshaft taper.
10. Check that the woodruff key is in good condition and securely fitted into its slot in the crankshaft. Also, check that the two tapered surfaces of the rotor and crankshaft are in good condition.
11. Having fully removed the rotor (flywheel), you can now access the original ignition and charging systems. See fig. 3.
12. The stator plate holds the two charging coils and the two magnetic ignition pickups. There are two wires coming from each charging coil (normally coloured Yellow and Yellow-Black) and two wires coming from each ignition pickup (typically coloured White and Black-White and White-Red and Black-Red). Trace these wires up to the main wiring connector terminal block (located under the seat, behind the fuel tank). Make a note of the connections for the charging coils. Undo the six screws and pull out the wires coming

from the charging coils and the two ignition pickups.

13. Undo the two fixing screws to allow removal of the complete charging/ignition stator assembly. Retain the screws and washers for later.
14. Remove the grommet to the left of the stator assembly. Remove the complete stator assembly, carefully withdrawing the leads from the hole in the casing. If necessary, gradually push the sleeved wires through from the other end to assist removal.
15. Loosen the grub screw with an Allen key and withdraw the electronic trigger sleeve from the crankshaft. This part is no longer required.
16. Take the complete stator assembly to a workbench.
17. Undo the four screws and remove the two charging coils, carefully feeding the wires through the holes in the stator plate. The original stator plate (and ignition pickups) is no longer required. Whilst the charging coils are removed it is advisable to check them for serviceability. Check each coil for continuity across the yellow and yellow-black wires, using a multimeter/ohmmeter. Also, check that there are no shorts between the winding and the metal laminations. If there is no continuity or if there is a short to the laminations, then the faulty charging coil must be replaced. Examine the wiring for signs of broken insulation. If necessary, repair any splits by covering with heatshrink or silicone rubber sleeving, to prevent shorting out to the frame, etc.
18. Take each of the original charging coils and feed the wires through the holes in the new baseplate, fix to the plate with the supplied spacers, M5 cap head screws and washers.
19. If not already protected, place a small length of 6mm sleeving over each pair of wires from the charging coils.
20. Slide the new ignition timing rotor over the crankshaft, aligning the grub screw hole directly over the indent in the shaft. This will be a tight fit; if necessary rub the inside of the rotor with emery paper to remove a small amount from the inner surface, wipe clean and refit. Fit the grub screw and tighten with a 3mm Allen key. To prevent the grub screw from working loose it is recommended that medium strength Loctite threadlock (or similar) is placed in the thread before fitting, or the metal can be peened over the edge of the screw using a hammer and punch.
21. Fit the new Pazon ignition module in a convenient place.

The PAZON ignition module can be orientated in any position, but this should be onto a flat surface, if possible. We recommend removing the side panels and mounting the module onto the vertical section of the subframe directly behind the battery, with the wires exiting directly upwards. This allows gives a clear view of the leds and easy access to the rev-limiter pushbutton. 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 and a small sheet of rubber between the case & the frame (or Velcro/double-sided tape), or suspended by two rubber mountings, as described below.

22. Fit the new ignition coils in a convenient place, ideally underneath the fuel tank. 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, each 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 coils can then be secured by passing the tie-straps around the frame tube & fully tightening the tie-straps. An example of this is shown in figs. 2 / 2a, where the coils are mounted to the frame tube above the engine. 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 & 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. The straight plug cap is used for the centre plug.

FIG. 1

FIG. 1a

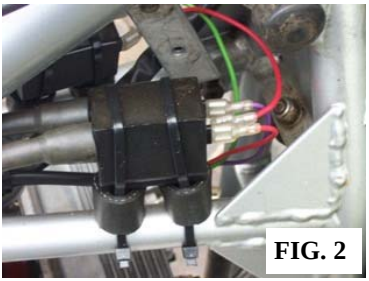


FIG. 2

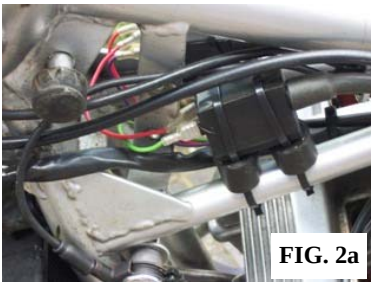


FIG. 2a

FIG. 3

WIRING

(PLEASE SEE WIRING SCHEMATIC ON PAGE 11)

1. Take the supplied wiring harness and push the two plug connectors into the matching connectors on the ignition module until they latch; the plugs will only fit one way. If they need to be released from the module at any time, depress the latch whilst pulling on the plug.
2. From the 6-way plug, route the sleeved bi-coloured wires along and down the frame (avoiding sharp edges), then feed through the exit hole in the generator housing.
3. Taking the baseplate, fit sleeving as required over the charging coil wires.
4. Route the upper charging coil wires route around the crankcase casting above the crankshaft; route the lower charging coil wires below. Feed the charging coil wires through the exit hole in the crankcase. Route the wires up to the connector terminal block and reconnect to the original rectifier/regulator connections, which should be as follows: yellow to yellow and yellow/black to yellow/ black, from each charging coil.
5. The ignition timing sensor wires (sleeved) are coloured: white—red, violet—red & white—black. Feed these wires (from the back of the baseplate) through the hole between the four hex spacers Cut the cable & sleeving to length. Carefully strip back approx. 4-5mm of insulation from the ends of the three wires. Connect the three wires from the sensor to the corresponding colour wires from the ignition module, as follows:

WIRE COLOUR		SENSOR TERMINAL	
White-Red	⇨	LEFT	(RED DOT)
Violet-Red	⇨	MIDDLE	
White-Black	⇨	RIGHT	(BLACK DOT)

Colours must match.

6. Take the new ignition timing sensor and position on top of the four hex pillars on the baseplate, with the 3-way terminal connector block facing towards the outer edge. Secure the sensor to the pillars with the four M3 hex screws and lockwashers. Tighten the screws with a 2.5mm Allen key. Gently pull the excess wire back through the rear of the baseplate.

Important: ensure that the sensor wires are kept well within the outer edge of the baseplate, to avoid possible contact with the flywheel. These wires should form a small loop, coming from under the sensor and into the connector block.
Feed any excess wire from the sensor back through the exit in the crankcase.

7. Carefully slide the newly assembled baseplate over the rotor and fit into the crankcase, making sure that the wiring on the reverse of the baseplate is not trapped between the plate and the crank casing. Fit the two fixing screws/washers, finger tighten only at this stage.
8. From the 4-way plug, route the sleeved violet, green & red wires along the frame tubing and around to the ignition coil spade terminals, avoiding sharp edges, etc. Cut the wires and sleeving to the correct length. Strip approx. 5mm of insulation from the ends of the wires, slide over insulators and crimp female spade terminals to the ends of the violet and green wires.
9. Take the short red coil link wire and push the piggyback connector onto the positive (+) terminal of ignition coil#1. Push the other end of the link wire onto the positive (+) terminal of ignition coil#2.
10. Connect the VIOLET wire from the ignition module to the negative (—) terminal of ignition coil#1, using a female crimp connector and insulating cover. Coil#1 is the dual output coil that fires cylinders 1&3.
11. Connect the GREEN wire from the ignition module to the negative (—) terminal of ignition coil#2, using a female crimp connector and insulating cover. Coil#2 is the single output coil that fires cylinder 2.
12. Connect the red wire from the ignition module to the +12 volts feed from ignition/kill switch.
13. Connect the other end of the red wire from the ignition coils to the +12 volts feed from ignition/kill switch. Alternatively, this wire can be connected to the battery positive (an inline 8-10A fuse can be fitted here). This second method can aid cold starting, by reducing possible volt drops in the wiring and switches.
14. Route the black wire from the ignition module directly to the battery negative (—), using a ring terminal.

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

15. 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 shorting out.
16. 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 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, an inductive pickup tacho (e.g. Scitsu) or no tacho, then leave unconnected; cut short the wire & and insulate the wire end.
17. Any remaining wires which may be present on the ignition module are for factory use and should remain unconnected and insulated, as supplied.
18. Refit fuel tank.

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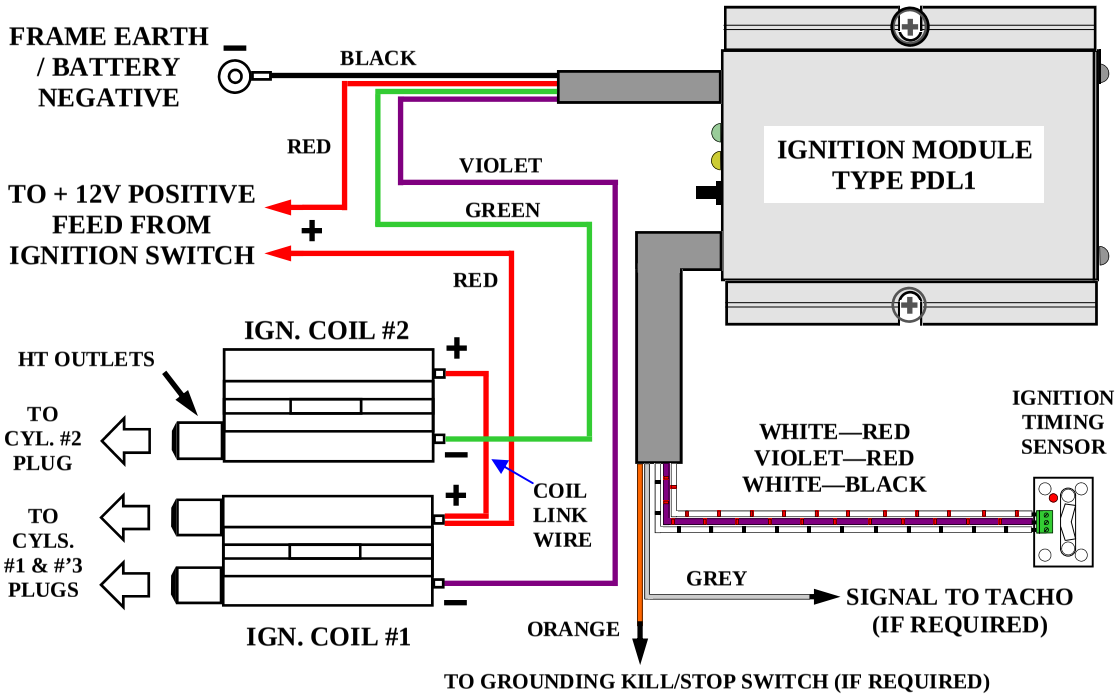
IGNITIONS WITH THE 7½ YEAR WARRANTY

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

NEGATIVE EARTH LAVERDA 180 WIRING



TIMING

WARNING: RISK OF ELECTRIC SHOCK.

1. The following operations may produce a spark from the plugs, therefore it is recommend that the spark plugs be removed & grounded onto the cylinder head (with the plug caps & h.t. leads connected). Alternatively, the violet and green wires can be temporarily disconnected from the negative terminal of the ignition coils, place insulation tape over the end to prevent shorting out, etc.
2. If not already done, the engine should be positioned at the TDC mark on cylinders 1&3.
3. Turn the baseplate until the trailing edge of the large lobe on the ignition timing rotor is approximately aligned with the middle of the ignition timing sensor. See fig. 4.
4. Switch the ignition on. The green led on the Pazon ignition module should turn ON to indicate power is on.
5. Check the red timing light on the sensor; if it is ON, goto step 7.
6. Rotate the baseplate clockwise until the red timing light turns ON.
7. Rotate the baseplate anti-clockwise until the red timing light turns OFF, stop turning. Tighten the two baseplate fixing screws with a 4mm Allen key. The final position will be as shown in fig. 4.
8. Refit flywheel, washer & large nut.
9. If you wish to verify and/or fine-tune the ignition timing with a strobe timing light, proceed as follows:
   - For accurate results when using a strobe light, we recommend using a separate battery for powering the strobe
   - Warm the engine and, using a white light strobe, check that the engine is at the required timing mark (10° BTDC at idle, or the standard full advance mark of 33.5° @ 5800 rpm)
     If so, there is no need to adjust the timing.
   - To adjust the timing, stop the engine and rotate the baseplate a small amount on its adjustment slots
   - To advance the timing, turn the baseplate against the rotation of the crankshaft shaft, i.e. turn the baseplate anti-clockwise
   - To retard the timing, turn the baseplate in the same direction as the crankshaft, i.e. turn the baseplate clockwise
9. Due to improved combustion with this ignition, you may need to

adjust carburation settings for optimum tickover and performance.

10. Refit alternator cover, side panels, etc., as required.
11. Installation is now complete.

MODULE FUNCTIONS

The Pazon ignition module has two leds (light emitting diodes) on the front, where the wires exit.

The green led functions as follows:

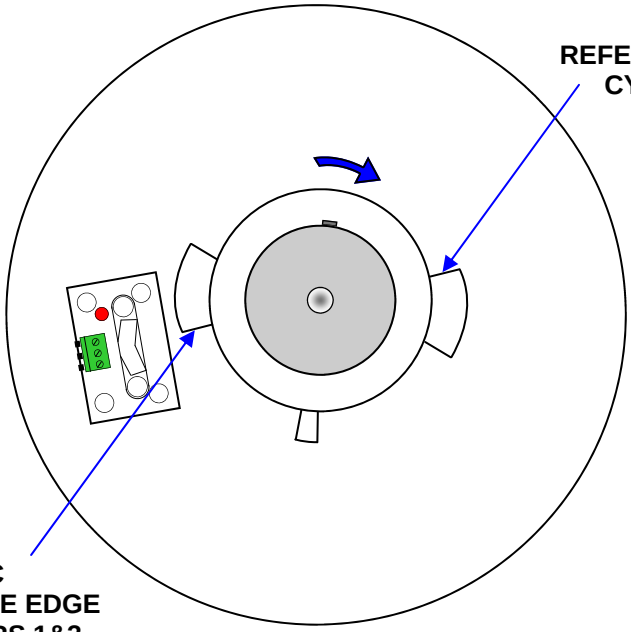
- Turns on to show a successful power-up condition of the module
- When the engine stops turning (with the ignition switched on) the green led will turn off & on within two seconds after the engine has stopped turning, indicating that the module has successfully reset

The yellow led functions as follows:

- Function button pressed indicator. Flashes during setting/resetting of user programmable rev-limiter, see page 14.

STATIC TIMING POSITION @ TDC CYLINDERS 1&3

FIG. 4



REV-LIMITER

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

Note: as standard, this system has a built-in rev-limiter in the form of a sharp ignition retard commencing at 8500rpm and reaching fully retarded (5°) at 8900rpm. To set a rev-limiter at a lower rpm, proceed as follows.

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

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.

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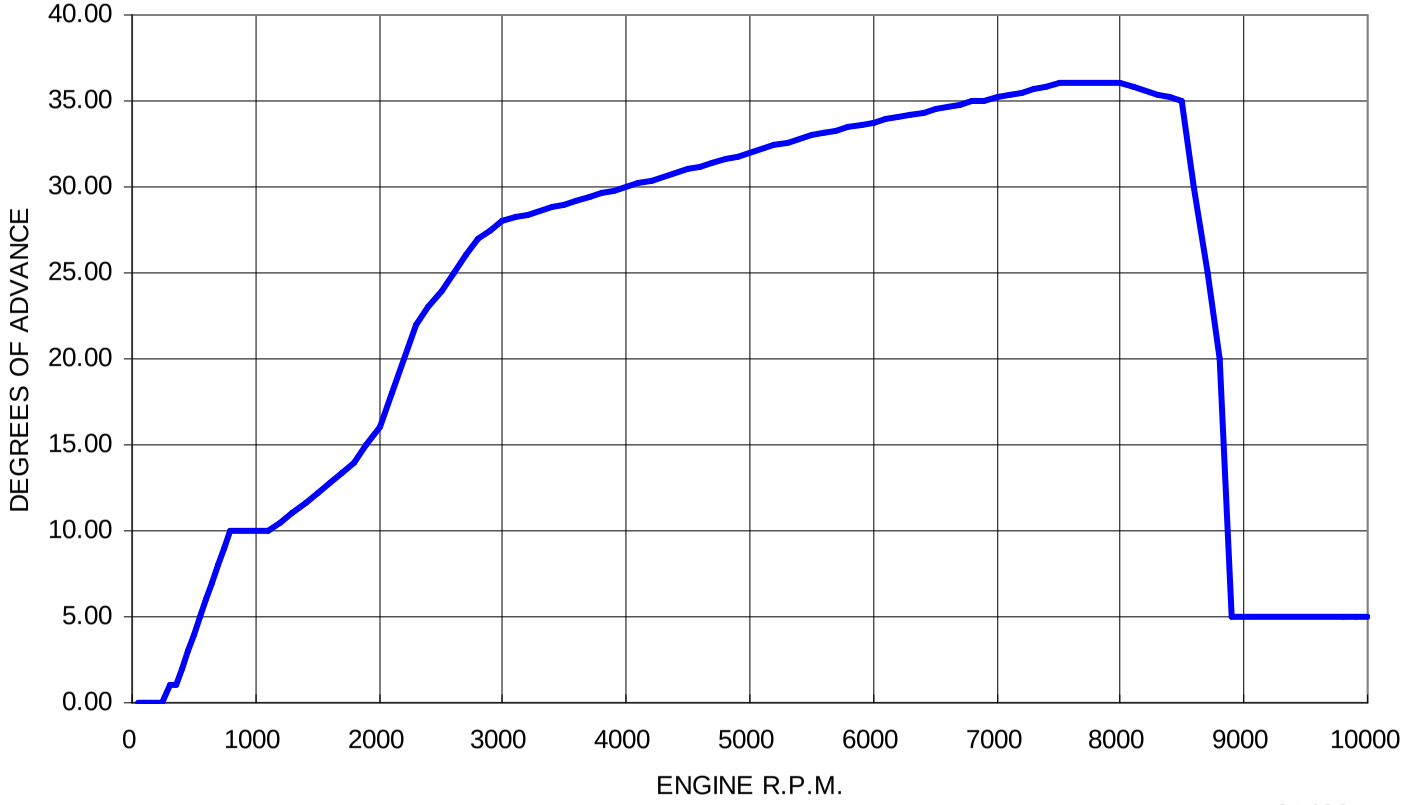
Smart-Fire Ignition Timing
LAVERDA 180° TRIPLE



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Terms & Conditions and Warranty

- Use of this product indicates your acceptance of this notice.
- The product design, firmware & literature is Copyright © PAZON 2005-2006, & is protected under international copyright, trademark & treaty provisions.
- To provide the best ignition systems possible, PAZON IGNITIONS reserves the right to alter & improve the specifications of its products without prior notice.

Ignition Systems

- Pazon 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 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's 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 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 or its authorized representative, with a copy of your receipt (or evidence of date & 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, 30 DOUBLEDAY DRIVE, BAPCHILD, SITTINGBOURNE, KENT ME9 9PJ U.K.**

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