

True-Fire Applications:

ARIEL ARROW / ARIEL LEADER & SIMILAR TWIN 2 STROKES CONVERTED TO 12 VOLT ELECTRICS, POSITIVE OR NEGATIVE GROUND

- 6 Volt system also available (part code: PTFA-6)

True-Fire System Contents:

- IGNITION MODULE 12 VOLT (BLACK CASE WITH LONG WIRES)
- TRIGGER ASSEMBLY (ROUND PRINTED CIRCUIT)
- STEEL ROTOR ASSEMBLY (PLATED) WITH FIXING SCREW & CIRCLIP
- BLACK COIL LINK WIRE
- RED GROUNDING WIRE
- TWO NGK 5K RESISTOR PLUG CAPS
- CRIMP CONNECTORS & INSULATORS
- LARGE & SMALL CABLE TIES
- CABLE TIE ADHESIVE MOUNTING BASE

This system requires two 6 volt ignition coils or one 12volt dual output type.

If converting from 6 to 12 volts and fitting this ignition system at the same time, the original ignition coils can be retained. If the machine has already been converted to 12 volts the ignition coils will need to be changed to two 6 volt or one 12 volt dual output.

See pages 9-11 for technical details.

WARNING: RISK OF ELECTRIC SHOCK
ALWAYS TURN OFF BEFORE WORKING ON THE SYSTEM

BEFORE FITTING, PLEASE READ THESE INSTRUCTIONS CAREFULLY, INCLUDING THE NOTICE ON PAGE 12.

True-Fire Installation Instructions:

5K resistor plug caps (as supplied) 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.

1. All connections must be of the highest quality, use crimped or soldered connections; twisted wires will not give a satisfactory operation.
2. Remove linings to dummy tank to gain access. For safety, disconnect the battery (preferably both terminals).
3. [Remove side shield on the Leader]. Remove the contact-breaker cover. Disconnect the two wires (usually black-white & black-yellow) from the contact-breakers. Undo the two fixing screws and remove the complete contact-breaker assembly. Keep the screws in a safe place for later. At the other end, these two wires must be disconnected from the ignition coils. These two wires are no longer required, but they can be used later to pull the new trigger wires through (step 17).
4. Remove the points cam from the end of the crankshaft. This is normally fixed to the crankshaft with a self-extracting screw. Undo the screw and it will go tight, where it pushes against the circlip inside the cam. Keep turning and the screw should extract the cam from the taper on the end of the crankshaft.
5. Disconnect the remaining wires from the ignition coils (normally coloured white or black-white). These come from the ignition switch supply.
6. Find a suitable place for the ignition module, preferably near to the ignition coils. Secure the ignition module to the frame using one or more large cable ties. An adhesive mounting base is provided; this can be affixed to the underside of the module and the cable tie passed through and around the module and frame. Alternatively, strong double-sided adhesive tape/Velcro can be used. Do not completely wrap the module in foam rubber. There is an access panel on the bottom of the dummy tank, the ignition coils can be mounted here between the bottom of this and the real petrol tank.
7. Using the black coil link wire, connect the negative (— or SW) terminal of one ignition coil to the positive (+ or CB) terminal of the other ignition coil. See figs. 1/2 on page 8.
8. Take the black wire from the ignition module, cut to length and fit an insulator and female spade connector to the end. Connect to the negative (— or SW) terminal on ignition coil #2. See figs. 1/2 on page 8.

9. Take the red wire from the ignition module, cut to length and fit an insulator and female piggyback connector to the end. Connect to the positive (+ or CB) terminal on ignition coil #1. See figs. 1/2 on page 8.
10. For NEGATIVE GROUND electrics go to step 13.
11. **For POSITIVE GROUND electrics (standard):**
Take the white wire from the ignition module, cut to length and fit an insulator and male spade connector to the end. Connect to one of the negative ignition feed wires previously removed in step 5 (normally coloured white). The other wire(s) are spare and should be covered with insulation to prevent shorting to the frame etc.
12. Take the red grounding wire, fit an insulator and female spade connector on one end and connect to the spare spade terminal on the positive (+ or CB) terminal on ignition coil #1. Cut to length and fit a ring terminal on the other end and connect to a good grounding point on the frame, ideally the battery positive (+) terminal. See fig.1 **GOTO STEP 14.**
13. For NEGATIVE GROUND electrics:
Connect one of the positive ignition feed wires previously removed from the ignition coils in step 5 to the positive terminal of ignition coil #1. See fig. 2. Any other wires are spare and should be covered with insulation to prevent shorting to the frame etc.
Take the white wire from the ignition module, cut to length and fit a ring terminal connector to the end. Connect to a good earth point on the frame, ideally the battery negative (—) terminal. See fig. 2
14. If not already done, remove the two contact-breaker wires (and any sleeving), previously disconnected in step 3.
15. Take the ignition trigger assembly (round green printed circuit) and pass a small tie-strap through the set of holes in front of the 3-way connector block; leave unfastened at this stage.
16. Fit the ignition trigger assembly in the contact-breaker housing, with the terminal connector block at the top, positioned midway on its adjustment slots. Refit the original contact-breaker fixings, finger tighten only at this stage.
17. Allowing some slack in the cable (for ignition timing adjustment), route the three sleeved bi-coloured wires (white-red, violet-red & white-black) from the ignition module down to the contact-breaker housing; this would normally be following the same route as the original contact-breaker wires. To make it easier to pass these

wires through the small hole in the framework, feed a piece of stiff wire (or a large tie-strap) from underneath, tape the wires to it and use to pull the wires through. Feed the sleeved wires through the hole in the contact-breaker cover. Route the sleeved wires into the trigger connector block. Cut the wires & sleeving to length. Carefully strip back a small amount of insulation (4-5mm) from the ends of the three wires (the ends can be soldered, if preferred). Insert the wires into the connector terminal block (see fig.3) on the trigger in order (from top to bottom):

White—Red, Violet—Red, White—Black (**colours must match**)

Tighten the terminal screws. Secure the sleeved wires to the trigger plate by fastening the small tie-strap; cut off the excess from the tie-strap. **Ensure that the trigger wires are routed away from the centre hole area, where the rotor is to be fitted (see also: steps 20 & 25).**

18. Remove the spark plugs.
19. Set the engine to the standard timing mark in the normal manner, by inserting the factory tool (or a 9/64" rod) into the top contact-breaker cover fixing screw hole and rotating the engine until the rod engages into the hole; this locks the crank into the correct timing position. Either of the two timing holes can be used, since both plugs fire at the same time.
20. Fit the new steel rotor onto the end of the crankshaft (this has a built-in self-extracting screw). Note that the rotor only fits onto the crankshaft a short distance, if it fouls on the pin in the end of the shaft the pin should be removed. Position the rotor so that the leading edge of one of the slots is aligned with the centre of the sensor on the trigger assembly (the rotor spins anti-clockwise). See fig. 3. Tighten the rotor fixing screw.
21. Remove the timing tool inserted earlier.
22. Re-check all connections are good and tight; any loose crimps should be removed, slightly closed up and refitted, or preferably replaced.
23. **IGNITION TIMING:**

Warning: risk of electric shock, keep hands & body away from coil, ht leads, caps & plugs

Push the spark plugs into the plug caps and ground onto the

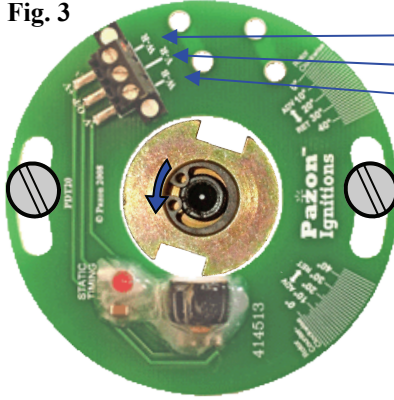
engine. The following operations will normally produce a spark from the plugs, therefore it is recommended that the black wire be temporarily removed from the negative terminal of ignition coil#2, place insulating tape over the end of the connector to prevent shorting to earth. This will prevent any undesired sparks whilst timing and **avoid the possible risk of electric shock**.

Check that the ignition switch is off. Reconnect the battery.

- Rotate the trigger fully anti-clockwise to the end of the adjustment slots. See fig. 4
 - **Switch the ignition on**. The red static timing light on the trigger assembly will be OFF.
 - Rotate the trigger fully clockwise to the end of the adjustment slots. See fig. 5. The red static timing light turns ON.
 - Rotate the trigger fully anti-clockwise to the end of the adjustment slots. See fig. 6. The red static timing light turns OFF.
 - Finally, rotate the trigger slowly clockwise until the red static timing light turns ON. Stop turning. See fig. 7
 - Keeping the trigger in position, tighten the two fixing screws. Do not overtighten or the plate may become distorted.
 - If you make a mistake with the above, switch the ignition off and restart from the beginning of step 23.
24. After road testing, if you wish to fine-tune the ignition timing, make very small movements of the ignition trigger on its slotted holes. The trigger has calibration marks (in crankshaft degrees) marked on the outer edge to assist with the timing adjustment.
- **For safety, switch ignition off between adjustments**
 - To advance the timing, turn the trigger clockwise.
 - To retard the timing, turn the trigger anti-clockwise.
25. Refit contact-breaker cover, **ensuring that excess on the trigger wires is gently pulled back through the grommet in the cover, to avoid damage to the wires by fouling on the spinning rotor**.
26. 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, ignition coils, switch, battery, h.t. leads, plugs and plug caps are in good order.
27. The emergency start facility should not be used with this ignition system and should be disconnected.
28. The installation is now complete.

STATIC IGNITION TIMING (WIRING NOT SHOWN FOR CLARITY)

Fig. 3



WIRING:
WHITE-RED
VIOLET-RED
WHITE-BLACK

Fig. 4

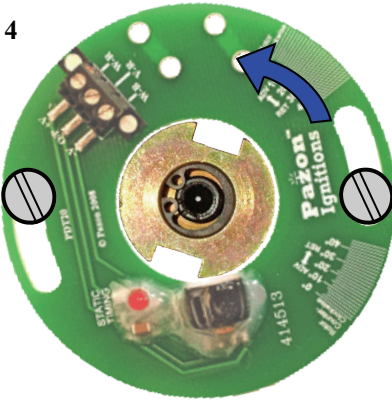
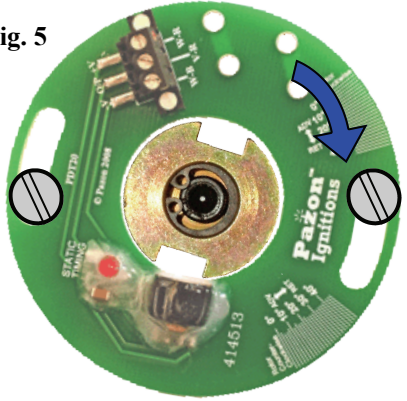


Fig. 5



START POSITION
SWITCH IGNITION ON

Fig. 6

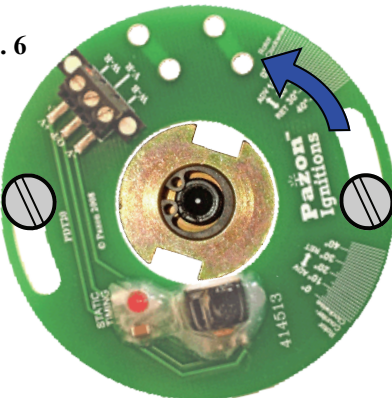
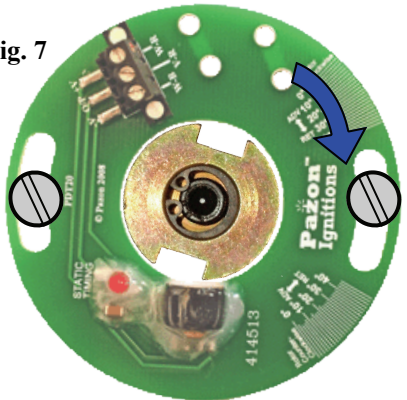
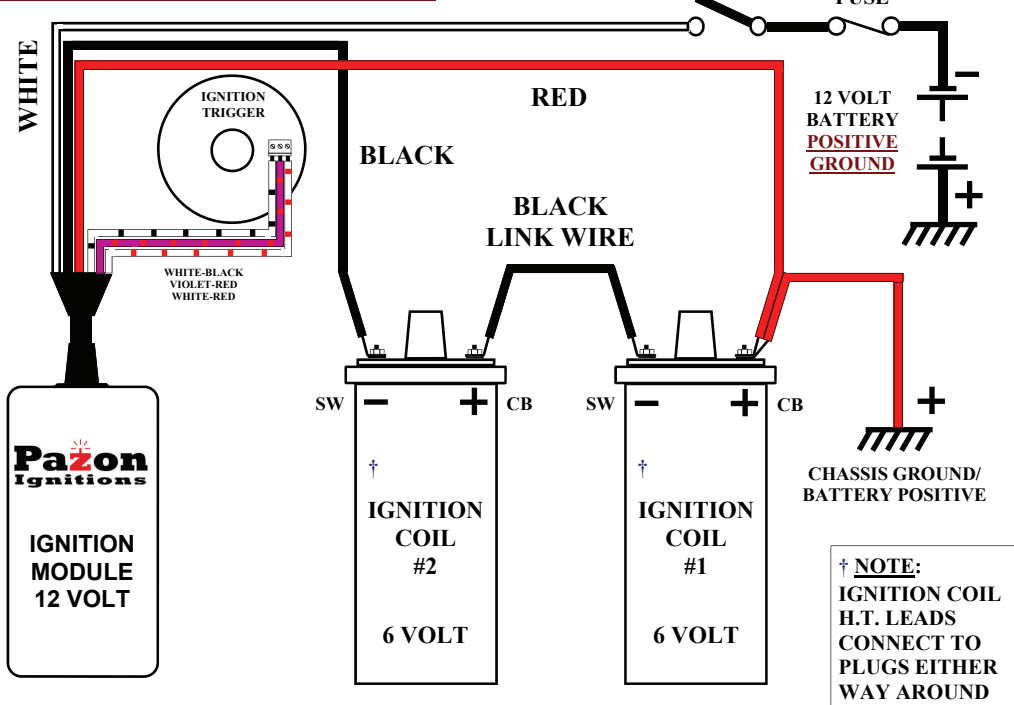


Fig. 7



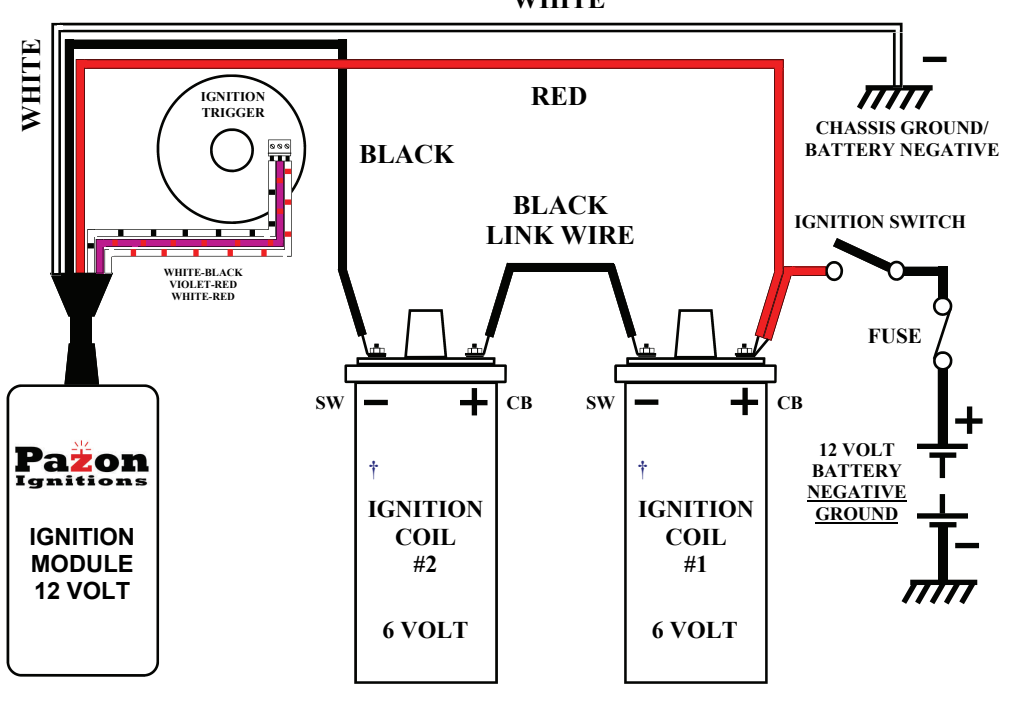
POSITIVE GROUND (standard)

IGNITION SWITCH FUSE Fig. 1



NEGATIVE GROUND

Fig. 2



Ignition Coils

When using the standard arrangement of two ignition coils, they must be connected in series, as shown in the wiring diagrams on page 7.

Do not connect the coils in parallel.

For best results use two 6 volt coils connected in series or one 12 volt dual output coil with a primary resistance of 3 to 4.5 ohms.

CDI type and some electronic ignition coils are incompatible with this system; for suitability check the primary resistance is 3 ohms or more (measure across the + and — terminals with a multimeter).

Ignition coils can develop a short circuit to earth through the case, especially if the clamps are too tight. This can cause overheating of the affected coil and can also produce misfiring/bad running on one or both cylinders. Slacken the clamps and examine the coil casing for heavy crease marks. If in doubt replace the coils.

Recommended ignition coils (available from PAZON) for this system are:

2 x IC06 6 VOLT PVL SINGLE OUTPUT COIL (LUCAS 17P6 TYPE)

or

1 x IC05 12 VOLT DUAL OUTPUT COIL (4.2 OHM PRIMARY)
1 x HSK HEATSINK KIT FOR IC03/IC05

General Data/Troubleshooting

This system can be adapted to work on many types of engine, provided that the required firing interval is every 180°.

This ignition is of the wasted spark type, i.e. both plugs spark at the same time, every half turn of the engine. One plug will fire on the compression stroke and the other will fire on the combustion stroke (the wasted spark). Since both plugs spark at the same time, bad running/running on one cylinder can only be due to a faulty plug, cap, ht lead, ignition coil or mechanical problem, not the ignition module or ignition trigger.

Wiring should be cut to the correct length. Excess wire should not be coiled up; this can affect the correct running of the ignition system. Where possible the wires from the ignition trigger should be run separately from the rest of the wiring loom, especially the alternator stator wiring.

The frame/chassis must act as an electrical return (ground/earth), whether positive or negative ground. If the engine is rubber mounted a good ground/earth strap must be provided.

This system can be run without a battery, using a rectifier, zener diode and capacitor (or electronic rectifier/regulator), but note that kick-starting may be more difficult.

The system can also be run total-loss from a battery only (e.g. for racing applications).

The **True-Fire** ignition module features a simple self-test facility for producing sparks without turning the engine.

- Switch the ignition on.
- Loosen the middle screw of the connector block on the ignition trigger and disconnect the Violet-Red wire.
- Take the Violet-Red wire and touch the end of the wire onto the White-Black terminal block screw and remove it, approximately once per second. Both plugs should spark at the same time.
- If only one plug produces sparks, check the coil, lead, cap and plug.
- If there are no sparks, check battery, switch, grounding, wiring, connections & ignition module.
- Continuous sparks without turning the engine indicates a poor supply to the ignition; check battery (bad cell), switch, grounding, & electrical connections.

TRUE-FIRE TECHNICAL DATA

Ignition Module (Part# PTFMA)

Minimum Supply Voltage:

8 Volts DC

Maximum Supply Voltage:

16 Volts DC

(Reverse Polarity Protected)

Maximum Ignition Coil Peak Primary Voltage:

400 Volts (Regulated)

Maximum Ignition Coil Secondary Voltage:

Ignition Coil Dependent

Current Draw (Static):

0.05 Amps Max. (Ignition Coils Off)

Current Draw (Dynamic):

Typically 2 Amps (Coil Dependent)

Maximum Ignition Coil Current Draw:

5 Amps

Ignition Coil Turn Off (Engine Static):

< 5 Seconds (Typical)

Minimum Cranking Speed:

10rpm (Typical)

Ignition Trigger (Part# PDTA)

Trigger Type:

Dual element differential hall-effect

3-Way Connector Block Wire Size:

0.75mm² max.

Ignition Timing Rotor (Part# TRAA)

Material:

Mild steel, zinc/gold passivated

Terms & Conditions and Warranty

- Use of this product indicates your acceptance of this notice.
- The product design & literature is Copyright © PAZON IGNITIONS LTD. 2005-2010, and is protected under international copyright, trademark & treaty provisions.
- To provide the best ignition systems possible, PAZON IGNITIONS reserves the right to alter and 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 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 Ignitions 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 & 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