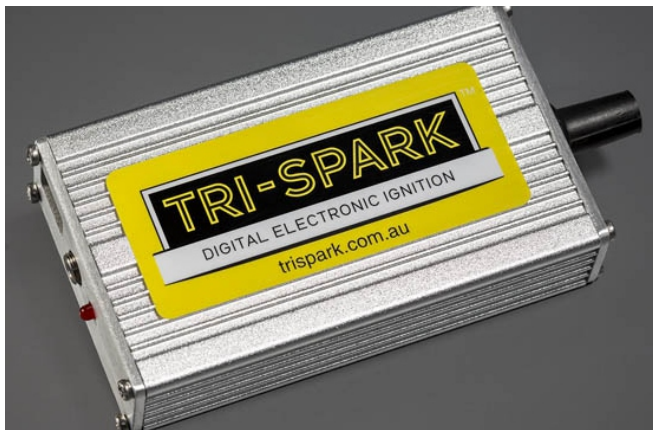
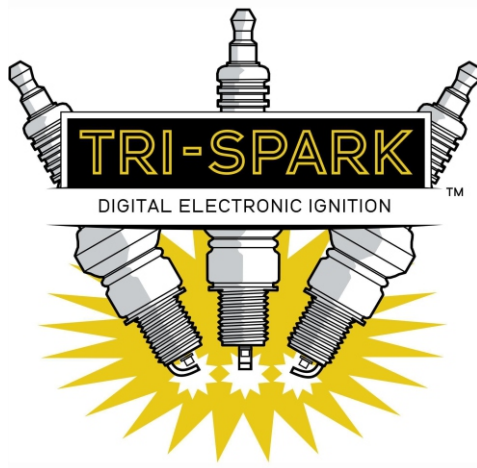


Tri-Spark - FireBox Pro

BSA Rocket 3 Triumph Trident

Installation Instructions



Thank you for purchasing the Tri-Spark FireBox Ignition system for your Classic bike. For your own safety and success with the installation we strongly recommend that you engage a qualified technician to install your new ignition system. The following information is provided to assist them in the installation and setup.

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Please note - The FireBox Ignition is available in several versions which are not interchangeable due to internal differences.

This triple cylinder version is a wasted spark system with the difference that the two coils are energised separately to maintain a high spark output up to 10,000 RPM. The spark output voltage is approximately 35 KV across the rev range.

Step 1: Preparation

Read all installation instructions before you begin. Disconnect the battery, remove fuse, seat, side covers, points cover, air filter and the fuel tank in preparation.

Caution: A general inspection and tidy up of all wiring including inside the headlight shell is highly recommended. Inspection and testing of the charging system prior to installing the system is also highly recommended.

Caution: use the recommended Tri-Spark coils or compatible ignition coils.

This Triple kit has been optimised to work with our Tri-Spark IGC-2006 coils only.

Step 2 - Remove the original points base plate and auto advance unit

Remove the 3 screws retaining the points base plate.

Remove the points plate and auto advancer.

Disconnect the points plate wiring from the connectors located along the frame near the right side cover.

Alternatively - remove any other electronic ignition rotors and pickups from inside the points cavity.

Step 4 - Install the Tri-Spark Trigger Rotor

Install the trigger rotor into the points cavity as shown here. The alignment is not critical - 22mm +/- 1mm is fine.



Step5 - Install the Tri-Spark Sensor Plate

Install the sensor plate into the points cavity so that the pillar bolts are in the middle of the adjustment slots. Feed the cable through the wire hole carefully. Run the cable along the frame rail and up between the oil pipes and then up the frame beside the oil tank. Pay attention to keep the cable well away from the exhaust pipes. Check for clearance between the rotor and sensors.

Step 6 - Install the Control box and connect the wiring

Fit the FireBox in the tool tray under the seat with velcro strips as shown.



Connect the 2 coil circuit wires (Black/Yellow and Black/White) from the FireBox to the coils as shown in the wiring diagram.

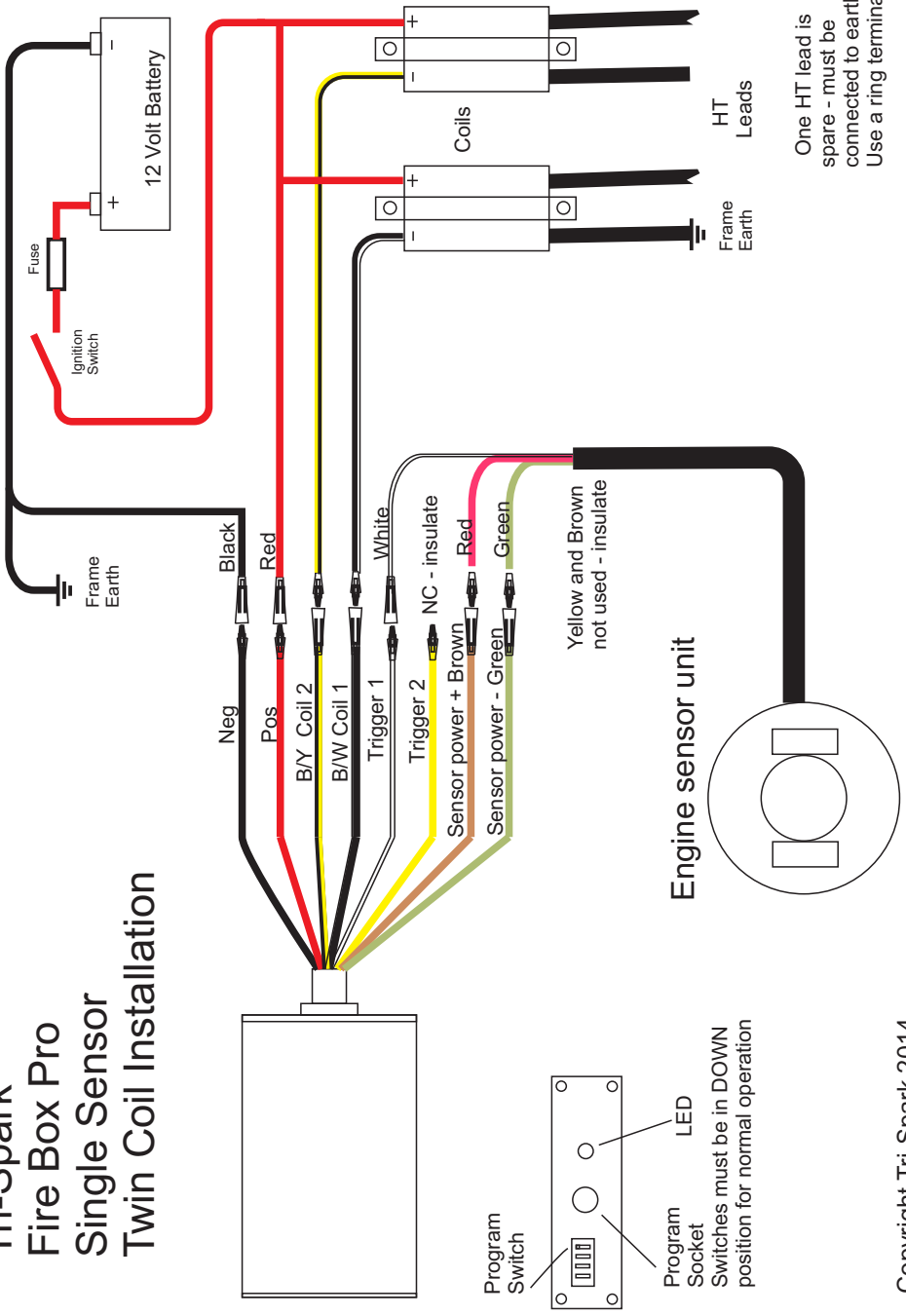
Connect the 3 wires from the sensor plate to the FireBox as shown in the wiring diagram. The cable may be cut shorter if required. Insulate the 2 unused wires (yellow and brown). Route the cable away from the HT leads.

Connect the Black wire (negative power) from the FireBox to a suitable negative battery connection point (not to the battery directly).

Connect the red (positive power) from the FireBox to the ignition circuit on the bike.

Route the wires along the frame backbone next to the wiring loom avoiding interfering with the throttle cables and carburettor linkages.

Tri-Spark Fire Box Pro Single Sensor Twin Coil Installation



One HT lead is spare - must be connected to earth Use a ring terminal

Step 7 - Setting the timing statically using the LED

Once the wiring from Step 6 has been double checked, reconnect the battery and main fuse.

Rotate the engine to the fully advanced timing position for any cylinder. In most cases this will be the 'B' mark except in certain early model engines that use the 'A' mark.

Loosen the screws retaining the sensor plate then rotate the sensor plate clockwise as far as it will go. Switch on the ignition and monitor the LED on the end of the FireBox which should be off. Rotate the sensor plate counter clockwise to the position where the LED just turns on and tighten it up there. Now switch off the ignition.

If the LED is always on or does not switch on within the range of the adjustment slots, an adjustment to the position of the Trigger Rotor may be required.

Step 8 - Checking the timing using a strobe timing light

Reassemble the motorcycle fully with all the parts (except the points cover) that were removed during the installation. Start and warm up the engine ready for timing with a strobe timing light. Clip the pickup from the strobe light onto the right hand cylinder spark plug wire and aim the light into the strobe timing port.

As the revs are increased the timing should appear to smoothly shift and line up with the 'B' line and pointer at 3500 RPM and above.

Adjustment can be made to the position of the sensor plate to fine tune the timing if it does not line up exactly at 3500 RPM. Always adjust for full advance timing not the idle.

If the correct adjustment cannot be achieved within the range of the adjustment slots, adjust the position of the trigger rotor slightly.



Engine sensor unit notes

The clearance between the trigger rotor and the position sensors is very small - approx. 0.1 mm. To avoid early failure of the sensors you must ensure that the trigger rotor is not contacting the sensors.

It is recommended to use a dial gauge to check that the trigger rotor is running true.

Also check that the top edge of the trigger rotor cup is at least 2mm below the ledge in the points cavity and not more than 3.5mm.

The sensors have strong magnets inside and will therefore pick up iron filings easily. Check for filings and debris in the sensor slot and remove if found.

Specifications

Nominal operating voltage: 12 volts min 8V max 16V

Power consumption including coils: 3A Max (typically 2A)

Power consumption at idle: under 1 Amp

Power Consumption box only: 75mA

Coil primary resistance range: 1.6 Ohms (1.5 absolute minimum)

Dwell time: 2.5 mS nominal

Advance range: 24 degrees at crank

Fully Advanced: at 3500 RPM

Idle stabilisation range: 500 to 1400 RPM

Advancing timing range: 1400 to 3500 RPM

Operating temperature range (box): -20 to 60 degrees Celsius

Absolute maximum: 24 volts DC for 1 minute

Maximum load dump voltage spike: 180 Volts DC for 50mS

RPM range: 150 to 10000 RPM

Control Box Size: 89 x 52 x 20 mm

Safety - Coils are always off when engine stopped

Specifications subject to change without notice.

- **General troubleshooting tips, installation notes, and cautions.**
- Take care! Do not probe around the wiring with the power on. Disconnect the fuse before attempting any adjustments or disassembly.
- Do not attempt to test for spark by 'hot wiring' or 'sparking' the coils as this can damage the Tri-Spark ignition.
- Do not run the bike without all spark plugs connected as this can damage the Tri-Spark system. If you wish to run the engine without all plugs firing, such as for tuning the carburettors, connect and earth a spare plug outside of the engine.
- It is recommended that resistor type spark plugs or spark plug suppressor caps be used with this system. Use 5k Ohm plug caps such as NGK.

If the engine fails to start, you should check the following:

- Spark plug leads (high tension leads) connected and tight
- Earth connections to the engine and frame are sound
- Check that fuel is getting through to carburettors
- Ensure that the battery is fully charged and in good condition
- Ensure that there is compression, there should be resistance felt on the kick start lever – pay particular attention to the valve clearances.

If there seems to be an ignition problem from first installation, reinstall the trigger rotor from the beginning of the installation procedure. Getting the rotor out of sync is a common installation error.

- The red LED on the FireBox should go on and off as you turn over the engine. The LED should come on as the piston rises on the compression stroke.
- Check that the clearance between the rotor and sensors is 0.5 mm.
- The LED should switch on as the rotor magnet passes each sensor.

Troubleshooting Continued.....

- To find a misfire issue, the spark plugs can be tested individually
- It is possible to check for spark from the plugs by having the plugs resting on the head, or similarly earthed position.
- Kick over the engine, the plugs should spark, along with the LED pulsing.
- If the LED lights as it should but the plug does not spark, first ensure the plug body is earthed correctly. If there is still no spark, try installing a new plug, then try swapping the high tension leads.
- If the either of these swaps corrects the problem, replace the offending part.
- If only one or 2 spark plugs are firing there may be a fault with an ignition coil.

Troubleshooting FAQ

Q: My engine's running badly - what should I do?

A: Try a new set of spark plugs (really new - out of the box) before anything else. If the problem clears even temporarily it was probably due to fouled plugs.

Q: The engine runs but doesn't idle smoothly - is this the ignition?

A: A variable idle and stalling out are often indications of worn out carburettors.

Q: What causes some of the most commonly reported faults?

A: Wiring faults are common with old bikes. Battery trouble too. Common places to look for a fault are, the main fuse (melted, bent or dirty contacts), inside the headlight shell (particularly the nylon connector blocks), ignition switch, kill switch, wire chaffing (look under the fuel tank, inside the rear mudguard, behind side covers), wires melted on the exhaust system, ignition coil connections and earth connections (frame and engine).

Q: How do I test for signals within the sensors?

A: Apart from the power connections, all other signals are electronic pulses and should not be tested for with simple lamp testers and meters.

Please note: the information in this document relates to the Tri-Spark system (p/n FB-0010) only and should not be applied to any other product.

Tri-Spark FireBox Warranty Policy

The Manufacturer Tri-Spark extends a Warranty to the original purchaser of this kit covering the control box and rotor components of the system (not sundry items) under normal use for a period of **three years from the date of purchase**. Only those parts which are deemed by Us to be defective due to faulty materials or workmanship in manufacturing shall be repaired or replaced under this Warranty. Conditions apply.

Limitation of liability

It is the sole responsibility of the purchaser to determine the suitability of the product for a particular installation or purpose. Under no circumstances shall the Manufacturer Tri-Spark be liable for any consequential, special, incidental, direct or indirect damages arising from the use or lack of ability to use this product. The Manufacturer's liability under this Warranty is limited to the replacement of the product or its parts and no other obligations, expressed or implied are assumed by the manufacturer Tri-Spark. A refund option is not offered as part of this Warranty.

Conditions

This Warranty will be void if the product or parts have been in any way misused, abused, altered or installed incorrectly as deemed by Us.

This Warranty will be void if faults are caused by but not limited to:

- 1) operation with incorrect coil primary resistance (under 1.5 ohms)
- 2) the rotor contacting the sensors as evidenced by scratches
- 3) bending, cutting or any other physical damage to the parts
- 4) the ingress of oil, water or other liquid into the parts
- 5) exposure of the parts to solvents or chemicals
- 6) damaged or broken wires connecting to the parts
- 7) any modification to the parts not authorised by the Manufacturer
- 8) any electrical damage to the parts caused by voltage spiking from the battery, charging system, jump starting or any other devices connected to the electrical system.

The manufacturer reserves the right to charge a testing fee of \$45AUD and a return freight fee of \$30AUD in cases where parts returned to Us are found to be functional.

The purchaser is responsible for the cost of freight, customs duties, taxes and tariffs to and from the point of purchase where the part or parts shall be assessed for possible replacement. Recorded delivery is recommended to protect against loss.

To make a claim under this Warranty the purchaser is requested to contact the point of purchase for instructions. The purchaser may be asked to perform certain tests to determine the nature of the problem. The suspected faulty part(s) must be returned with proof of purchase and a detailed account of the problem experienced to the point of purchase or the Manufacturer for testing and possible replacement. Returned parts must be sent with freight prepaid.

Statutory rights

Your statutory rights are unaffected. Additionally, if any statement herein is deemed to be invalid because it contravenes the purchasers statutory rights or any other reason then only that statement shall be deemed invalid. The Laws of South Australia shall apply to purchases made directly from the Manufacturer.