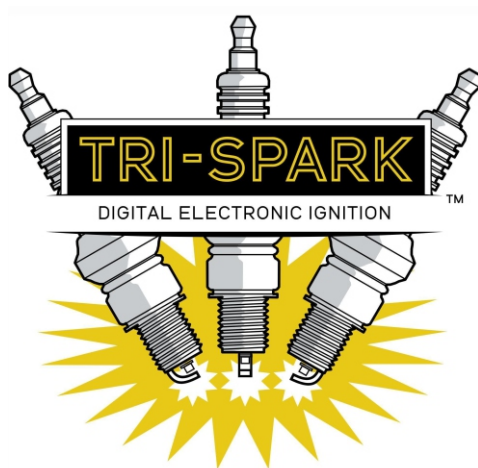


# Tri-Spark - Compass Ignition

BMW Twin Cylinder 1980 - 1996

Installation Instructions

CS-0065



Thank you for purchasing the Tri-Spark Compass 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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The Tri-Spark Compass system for BMW is a wasted spark system. It controls the spark advance and retard timing electronically eliminating the need for springs and weights to control the timing. If the existing ignition components are worn or faulty it can improve the performance of the engine dramatically.

### Step 1: Preparation

Read all the installation instructions before you begin. **Disconnect the battery.** Remove the front engine cover 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 ignition coil. The system is designed to work with the Tri-Spark IGC-2012 dual lead ignition coil.

**The original equipment Bosch coils are not compatible. The use of incompatible ignition coils will burn out the control box and void the warranty.**

## Step 2 - Remove the ignition can

Remove the front engine cover for access. Undo the two screws retaining the ignition can. Remove the can with its wiring from the engine. Follow the instructions on the next 2 pages to partly dismantle the can. Please note that some of the steps apply only to the points can or the electronic can and some apply for both.

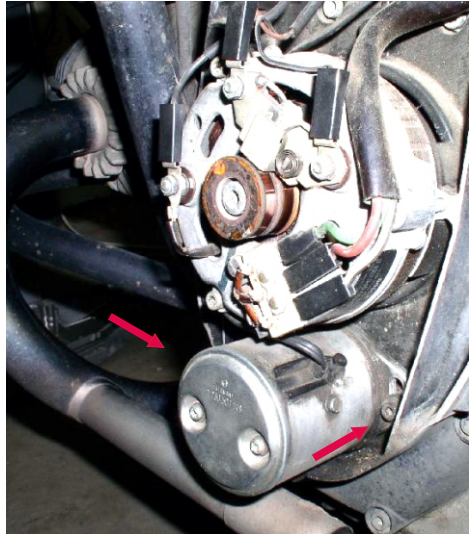


Figure 2A

## Step 3 - Rotate the engine to the fully advanced timing position

Remove the rubber plug covering the strobe timing port to enable viewing the timing marks on the flywheel.

With the engine in gear, rotate the engine forward using the rear wheel until the dot next to the letter 'F' is in the centre of the viewing port as shown in figure 3A.



This is the fully advanced timing position for your engine. Leave the crankshaft in this position while fitting the Tri-Spark trigger rotor and pickup in the next steps.

Figure 3A

Step 4 - Dismantle the Ignition Can

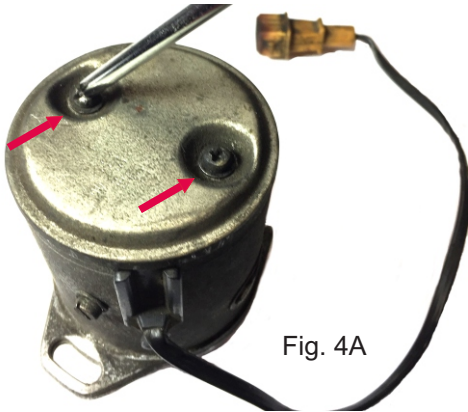


Fig. 4A

Undo the cover screws and remove cover

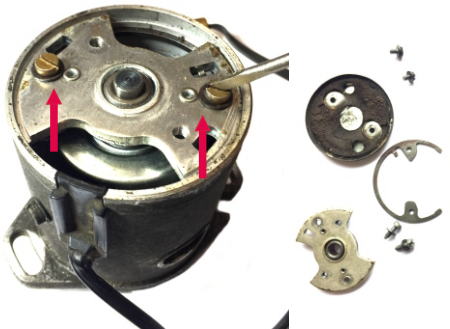


Fig. 4B

Undo the screws and remove bearing plate and large spring clip

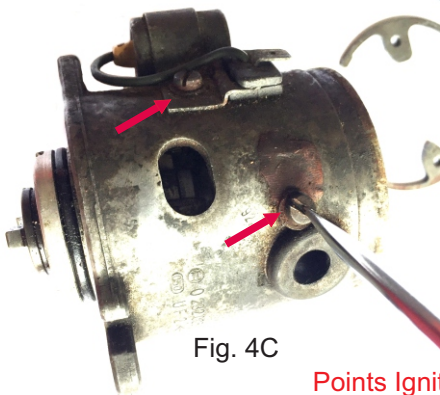


Fig. 4C

Points Ignition Can Only

Remove the condenser and points plate.

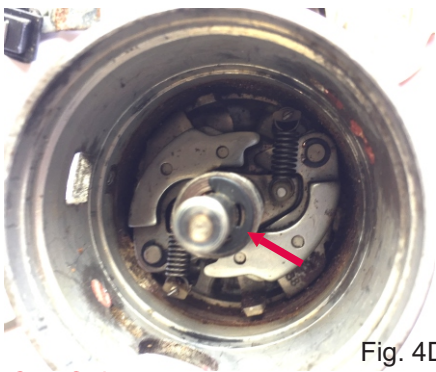


Fig. 4D

Remove clip, points cam and springs

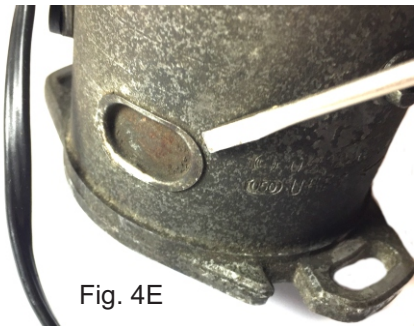


Fig. 4E

Pry off oval access cover

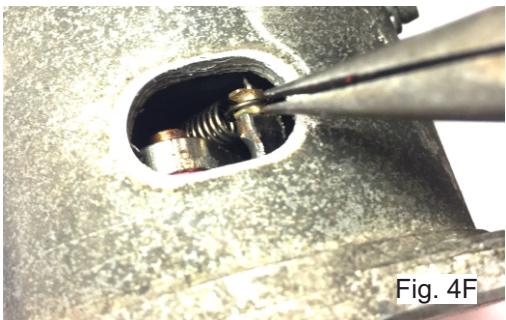


Fig. 4F

Electronic Ignition Can Only

Use small pliers to unclip the two springs from their support posts

Step 4 - Dismantle the Ignition Can continued

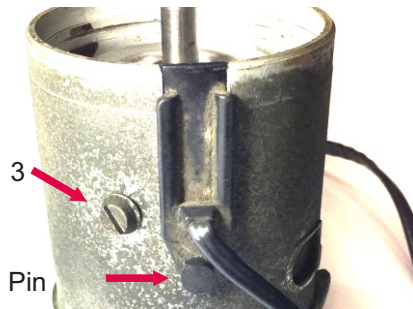


Fig. 4G      **Electronic Ignition Can Only**

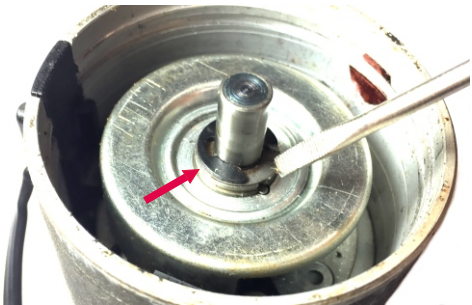


Fig. 4H

Undo 3 screws and pry out black plastic pin

Remove clip from central shaft

**Electronic Ignition Can Only**

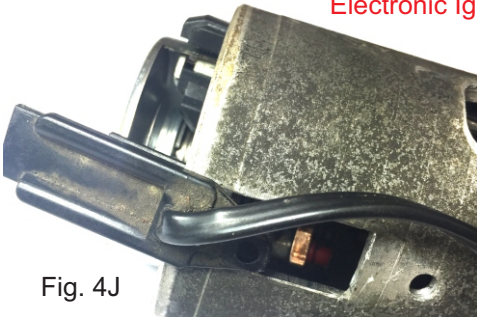


Fig. 4J

Slide plastic cable support out halfway

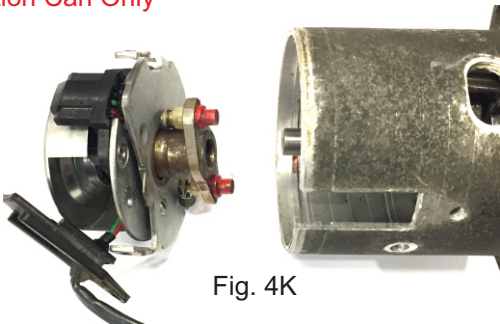


Fig. 4K

Remove trigger unit with the cable support

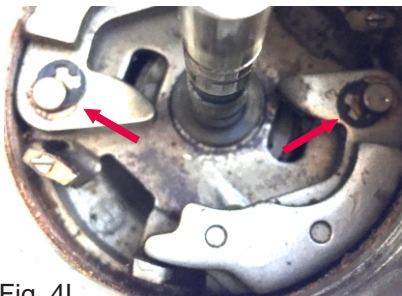


Fig. 4L

Remove 2 clips, bob weights and washers



**Points and electronic cans**

Fig. 4M

The empty can ready for Tri-Spark pickup and trigger rotor



## Step 5 - Install the Tri-Spark Trigger Rotor and Pickup

Install the Tri-Spark pickup assembly into the can as shown below. Feed the brown and blue wires through the rubber grommet and through the side of the can.

Please note The points can and the electronic can uses different mounting brackets.



Fig. 5A

Electronic Can - Square Brackets



Fig. 5B

Points can - Rounded Brackets

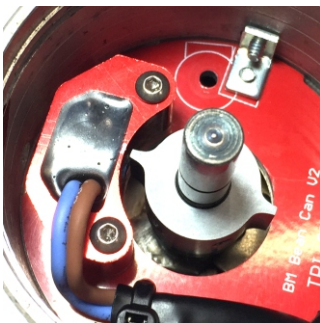
Note the relative position of the brackets to the cable exit from the can for alignment of the plate. Push the plate down to the ledge in the can and use the existing screw holes in the can.

Install the trigger rotor into the can with the top face in line with the second groove in the central shaft as shown in fig. 5D. The trigger rotor is held in place with 2 grub screws (do not over tighten). **Check for clearance between the rotor and pickup.**

Loosely install the ignition can into the engine and adjust the position of the trigger rotor as necessary to get the correct alignment as shown in fig.5C.

One of the points on the trigger rotor should align with the pickup as shown in Fig. 5C when the can is installed in the engine and the crankshaft is set with the 'F' dot in the strobe timing port.

There should be a small gap of approximately 0.5mm between the rotor tips and the pickup.



Reassemble the can with the large spring clip, bearing plate and top cover. Install the can back in the engine with the mounting screws in the middle of the adjustment slots.

Fig. 5C



Fig. 5D

## Step 6 - Install the Control box and connect the wiring

Remove and unplug the original ignition coil(s) and ignition control box.

Fit the Tri-Spark control box in the frame as shown in fig. 6A. Connect the brown and blue wires to the pickup wires as shown in fig. 6B and tuck them out of the way.

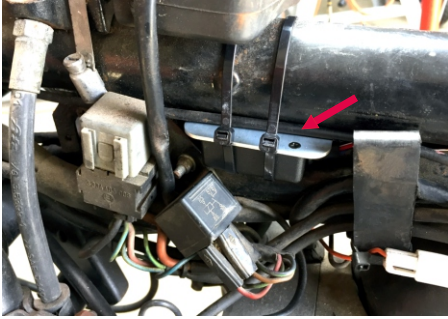


Fig. 6A

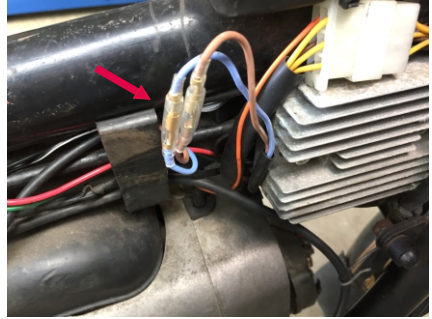


Fig. 6B

Connect the Black and yellow wire from the box to a suitable earthing point on the frame as shown in fig.6C.

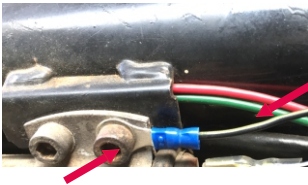


Fig. 6C

Install the Tri-Spark Ignition coil in a suitable location. Connect the Black / White wire from the control box to one of the ignition coil primary terminals as shown in fig. 6D.

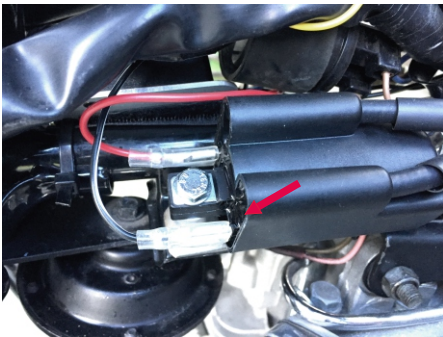
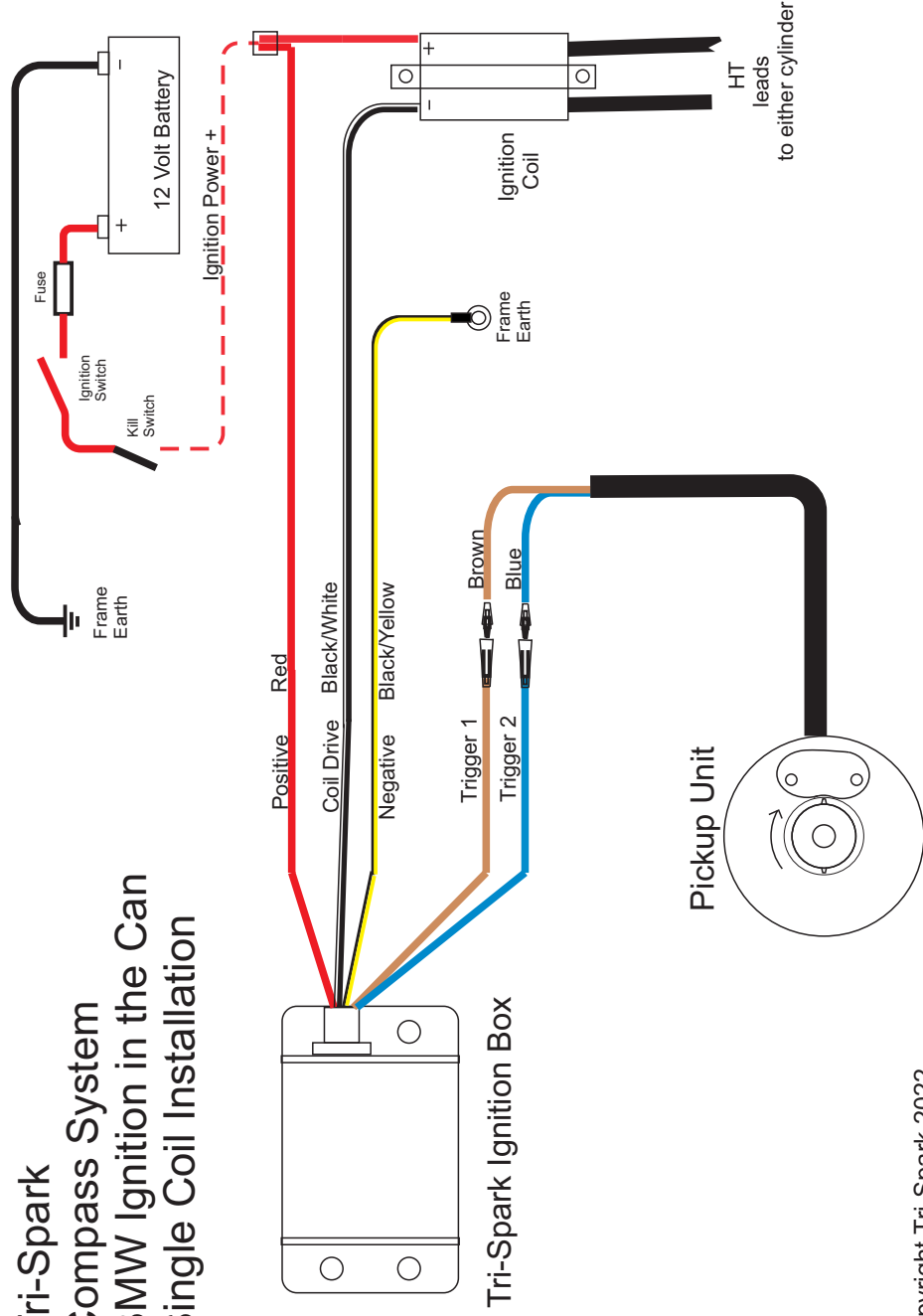


Fig. 6D

Connect the Red wire from the Tri-Spark control box to the positive wire in the loom designated for powering the ignition system. Connect this wire to the other ignition coil primary terminal also.

Route the wires along the frame backbone away from the HT leads. Avoid areas where the fuel tank could pinch the wires.

# Tri-Spark Compass System BMW Ignition in the Can Single Coil Installation





## Step 7 - Setting the timing statically

The ignition timing with the Tri-Spark system is set statically to the fully advanced crankshaft position. This is indicated with a dot next to the 'F' mark on the flywheel. The trigger rotor is then aligned as shown on page 6 fig. 5C. Matching these 2 settings (the 'F' mark and the trigger rotor) will set the ignition timing close enough to start and run the engine but it will need to be checked with a strobe light as detailed in step 8.

Note: The Tri-Spark system is not set with any reference to the 'S' mark on the flywheel which is different from the setting of the original contact breaker ignition.

It does not use the mechanical auto advance unit but instead calculates the timing according to the RPM using a mathematical process which is 100% reliable and does not vary from one system to another.

## Step 8 - Checking the timing using a strobe timing light

Reassemble the motorcycle fully with all the parts except the front engine 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 left side 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 'F' mark at 3500 RPM and higher as shown in fig. 8A.

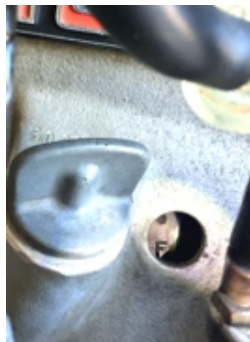


Fig. 8A

Adjustment can be made to the position of the ignition to fine tune the timing to 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. This will require opening the can and loosening the grub screws that retain the trigger rotor and then repositioning the rotor correctly as per Step 4.

Once the timing is correctly set you can fully assemble the machine.

# Engine pickup unit notes

The clearance between the trigger rotor tips and the pickup is very small. To avoid early failure of the pickup you must ensure that the trigger rotor has the correct clearance of approximately 0.5mm. A small amount of adjustment is possible by loosening the screws holding the pickup to the backing plate. **DO NOT OVER TIGHTEN** the screws.

The pickup has a strong magnet inside and will therefore pick up iron filings easily. Check for filings and debris on the pickup tip and remove if found.

The pickup can be tested for continuity and resistance with a multimeter. A reading of 10-12 ohms across the pickup wires is correct for a functional part.

The Rotor / Pickup position as shown below is the fully advanced timing position for the system. This is the position where the spark is triggered at 3500 RPM and higher.



Fig. 9A

# Specifications

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

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

Power consumption at idle: under 1 Amp

Power Consumption box only: 15mA

Coil primary resistance minimum: 3.5 Ohms

Dwell time: 8.0 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 voltage: 24 volts DC for 1 minute

Maximum load dump voltage spike: 400 Volts DC for 5mS

RPM range: 150 to 10000 RPM

Control Box Size: 70 x 50 x 20 mm

Safety - Coils are always off when engine stopped

Specifications subject to change without notice.

# Tri-Spark Compass Ignition 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 3.0 ohms)
- 2) the rotor contacting the pickup 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 \$50AUD 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.