Fitting Guide, Specifications & Technical Support Document
Applicable to: Electronic Ignition Stator Kits RMK-6, 7, 10, 11, 15 & 16



Thank you for purchasing a Rex's electronic ignition kit. Designed and assembled in our East Sussex workshop, this self-generating ignition system replaces failed original electronics to restore the original performance with modern, dependable ignition and significantly improved 12 volt lighting.



The ignition and charging systems remain completely independent, exactly as Yamaha intended. Battery voltage must never be applied to the HT coil or CDi unit. Roadster versions retain the direct lighting system, now operating at 12 volts to give much brighter lighting than is possible with 6V. The headlamp only operates while the engine is running, just as before.

Drawing on many years of experience, this well-proven, high-energy ignition system is designed to match the original system's magnetic and electrical characteristics, bringing dependable ignition and the engine's original lively character back to life.

The stator has timing adjustment, allowing the ignition to be set to the original specification or carefully fine-tuned to suit the engine. This offers the precision experienced tuners expect, while remaining straightforward for anyone with suitable mechanical skills to fit and adjust accurately.

IMPORTANT: Please read this guide fully before fitting, also check you have all the tools and parts you may require. Technical support is included in this help sheet.

Before you Begin: Warnings & Cautions

Working on motorcycles requires specialist tools, knowledge and training. Serious injury, damage or loss to property, may result if parts are incorrectly fitted, adjusted, modified or used for a purpose other than the manufacturer's intended purpose. Failure to follow this guide, the Yamaha workshop manual, accepted industry practices, or normal workshop safety procedures may result in unsafe conditions within the machine. If you do not possess the expertise required to replace ignition and charging parts, have this kit installed by a professional who has the knowledge, experience and tools to do so.

Always refer to our website for the latest version of this publication. Use only the latest available Yamaha documentation for torque settings, assembly procedures, specifications and safety information. Nothing in this guide overrides or replaces Yamaha's published instructions or warnings.

Modification, improper fitting or adjustment or use of non specified equipment invalidates the warranty. Do not cut wires or connectors, may cause an unsafe situation that causes damage or failure of the kit's electrical parts, polarity protection is lost where connectors are removed.

The person carrying out the work is solely responsible for inspecting components before assembly and for all final adjustments, settings, safety checks and verification that the machine is fit for service before use.

Warning: High Output Ignition System: When checking ignition timing, only use a strobe timing lamp with an inductive clamp that attaches around the HT lead. Timing lamps that interrupt the HT lead cause ignition system voltages to rise to dangerous levels, creating a risk of severe electric shock, damage to the ignition system, serious injury or death.

Pacemakers: Persons fitted with a pacemaker, implanted medical device, or those with a known heart condition should not work on, adjust, or test ignition systems, nor work on the machine while the engine is running, due to the risk of electric shock.

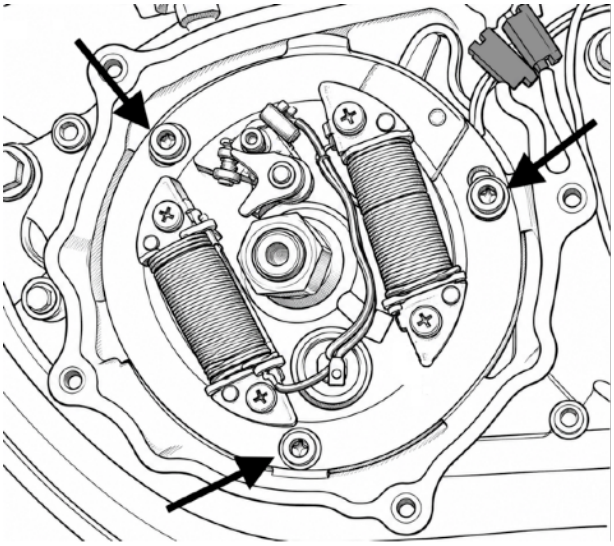
Single-cylinder two-stroke engines can be prone to kickback during starting. Always refer to the owners manual for specific starting advice. Ensure you are familiar with the starting procedure. Use a firm, positive kick through the full stroke and wear suitable motorcycle boots to reduce the risk of injury. Do not jab or partially operate the kickstarter, as this can increase the likelihood of kickback. Larger capacity engines (250cc and above) and all highly tuned engines pose a significant risk and require considerable respect when starting.

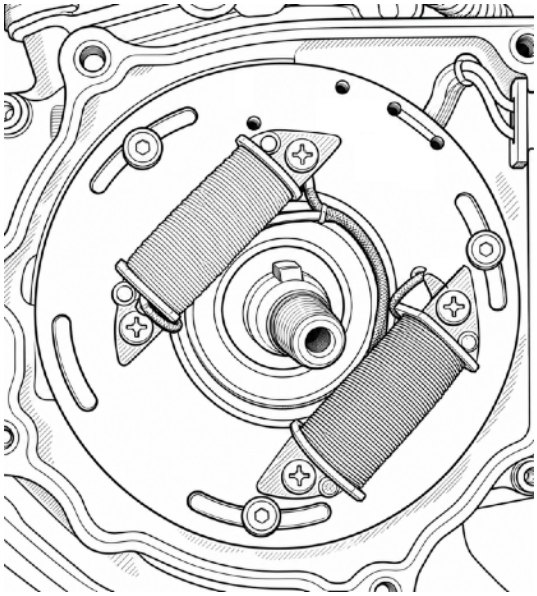
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1. Access and remove the flywheel. You will need a flywheel puller (p/n: FWP-1). A pneumatic or electric impact driver makes this job much easier. The flywheel can be virtually impossible to remove without the correct tools.

Damage to the engine and/or flywheel will be caused if you attempt to remove the flywheel with pry bars, 'three leg" pullers or other tools than the correct puller.

2. Undo the 3 stator retaining screws (arrowed) and remove the stator along with the wiring. Some models had CDi ignition, others contact breakers.





3. Fit the new stator with windings positioned at 11-4 O'clock, as shown left. Ensure the wires are pushed into the sealing grommet cut-outs. Follow the original lead routing. **Connect the larger block connector to the original from the bike's wiring loom**.

Check that no wires are trapped between the engine and new stator, and the wire is clear of the rotor.

4. Refer to the timing advice (Pg 5), align the slots to the original retaining screws holes. The stator will only align one way round. Use all 3 x M6 screws from the kit to retain the new stator. Secure the screws EXACTLY in the centre of the slots (base timing position).

5. Refit the flywheel, the torque values are given in the shop manual.

6. If your model had electronic ignition, remove the old unit and fit the new on the same perch.

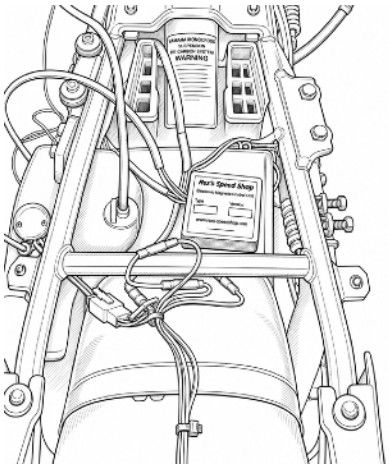
Where there was points ignition, find a suitable location for the CDi unit - around the battery carrier/air box. Connect the wires as follows:

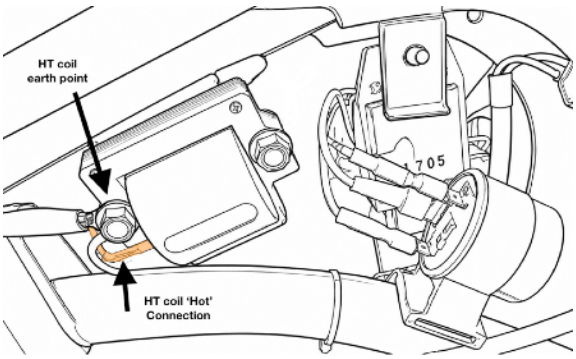
From CDi unit: ***Lead 1*** *~ White connector ⇉ corresponding connector from the new stator wire.*

Lead 2 ~ HT Coil, Black to mount bolt, Orange = coil 'hot'. Black/white connects to kill wire.

On some models, the CDi unit can be attached to the air filter with velcro.

Alternate locations could include under the battery tray using cable ties.





7. Replace the HT coil with the one from the kit. Connect the orange wire to the HT coil spade connector (or adaptor lead, as applicable). The black goes to the mount bolt.

If fitting a 12 volt conversion - the regulator loom also earths at this point.

8. Ensure that wires are secured well clear of the exhaust system.

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12V Conversion - Roadster Kits

Warnings & Cautions

To avoid injury, damaging electrical parts and electrical fires, ensure the battery is disconnected and removed from the machine while working on the electrical system.

Modification, improper fitting or adjustment or use of non specified equipment invalidates the warranty and may cause an unsafe situation that causes damage or failure of electrical parts.

Our 12 volt conversion equipment is designed for filament bulbs and lead acid technology (AGM and sealed) batteries.

Lithium batteries MUST NOT be used this equipment, serious damage to you motorcycle or injury may result.

Applying 12 volts to a 6 volt battery can cause the battery to explode or leak acid. Battery acid is highly corrosive and toxic. We recommend only AGM or sealed lead/acid batteries, to reduce the possibility acid leakage.

Connecting the regulator/rectifier incorrectly to the battery will damage it beyond use. Ensure you read and follow this guide before making these connections.

These kits are intended to restore the original charging system function and characteristics giving brighter, more reliable lighting from the use of a 12 volt supply. The installer assumes all responsibility and liability in ensuring that the lighting system, lamps, bulbs reflectors and associated controls all comply with local vehicle regulations.

The kit follows the original Yamaha design, but is not a direct copy. The ignition and charging system remain two totally separate systems that must never be connected to each other. Applying DC power from the battery to the electronic ignition will damage it beyond repair.

Ensure all 6 volt parts have been replaced with 12 volt equivalents before applying 12 volts to the system.

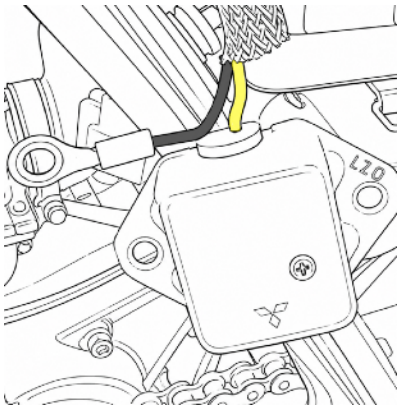
When troubleshooting take electrical measurements with only professional quality multimeters that would be standard equipment in a modern dealership. Basic, low cost or antique meters often give unreliable readings.

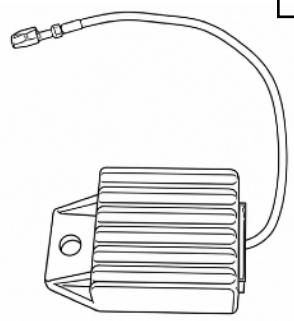
1. Start by replacing the 6 volt battery, bulbs, horn & indicator relay with 12 volts versions.

Do not connect the 12V battery at this stage

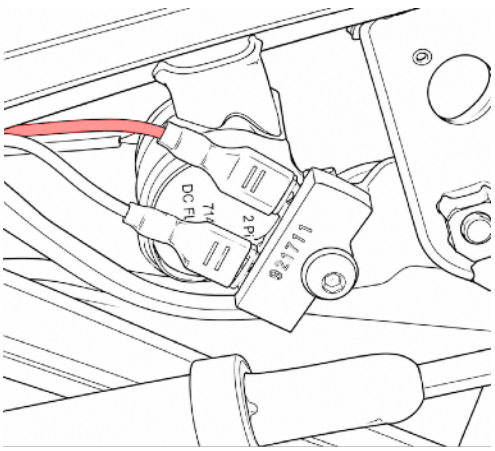
2. The same FUSE can be used, there is no need to replace it with a different value.

3. Locate the 6V regulator, near the HT coil or around the battery. The yellow from the new RR unit fits here and connects to the original yellow. The black with a ring terminal earths either on to the RR case, or the HT coil mount. Which ever is easiest.





An OEM style 6V regulator shown left and an aftermarket one right.



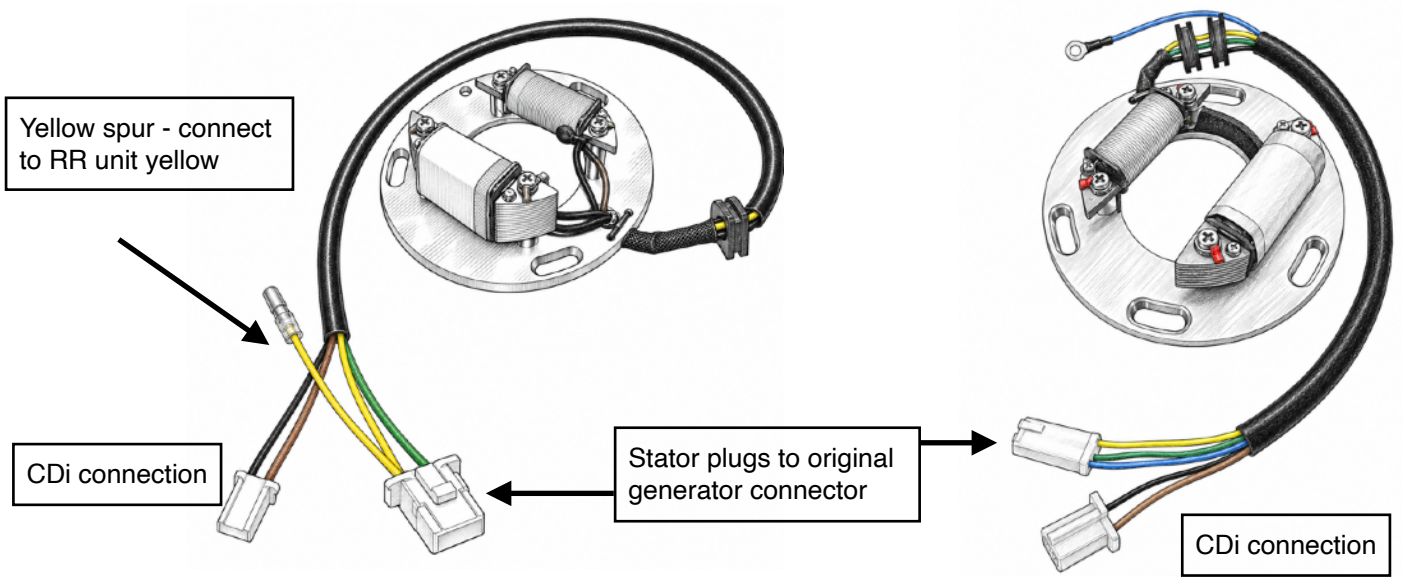
4. Identify and remove the old rectifier which is located by the HT coil.

Connect the white and red wires from the new RR unit to the old rectifier wires: **red to red, white to white.**

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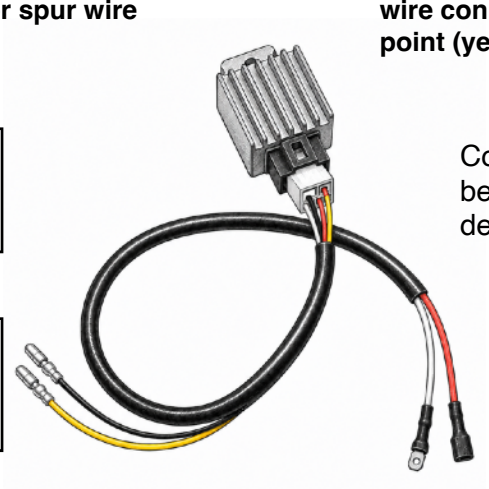
5. The new stator wire plugs in to the original wiring loom as before. The new stator lead may have a different number of wires or wires of slightly different colour, this is intentional. **Note that the basic wire colours should match across this connector.**

Occasionally with old motorcycles that have been through many hands you will find different connectors. This is no cause for concern and is usually easy to remedy by replacing the connector block.



Type 1 - With spur at stator connector. RR unit yellow wire connects to yellow stator spur wire

Type 2 - No spur at stator connector, yellow RR wire connects to original regulator connection point (yellow wire)



Black connect to black at old regulator, or if a ring terminal is present, secure at HT coil mount bolt,

Type 1: Yellow from RR - connect to yellow at stator spur: **Type 2:** yellow from RR connects to original regulator yellow wire.

Connectors and lead length may be different to the shown version, depending on RMK kit model.

White & Red, connect to the wires that were connected to the old 6V rectifier.

Final Actions Before Riding the Machine.

6. Check that none of the controls have been restricted or impeded by the new wiring looms or work carried out. Re-assemble the machine as per the shop manual and make it ready to ride.

7. Check all your connections.

8. Connect the 12V battery

9. Set up the ignition timing - see next section.

10. Check the charging by measuring the battery voltage. If the battery is new, fully charge it before testing, expect to see a changing reading while it transitions between new and service voltage if charing on thee bike. **Correct reading:** 14.5V +/- 0.75V at 2,500 - 5,000 RPM, with the headlamp **ON.**

Note: If using a battery eliminator in place of a battery, the voltage can be slightly higher and will fluctuate with load. This is unavoidable without a battery fitted.

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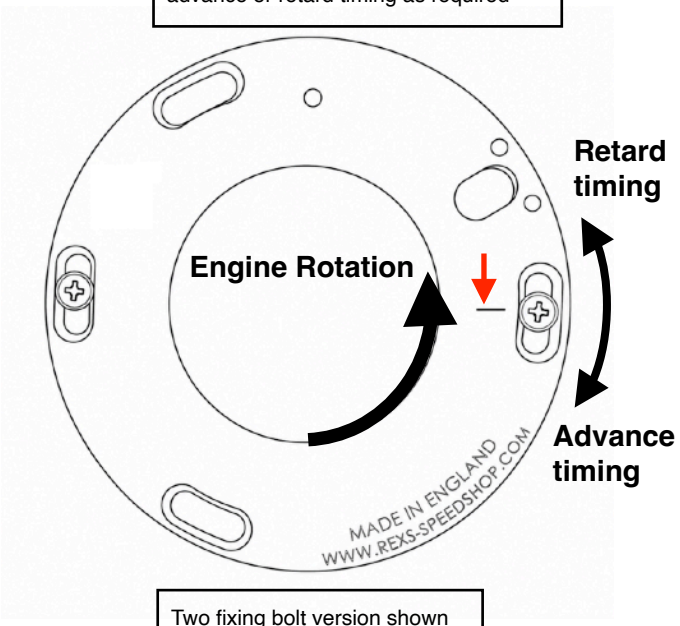
Adjustment of Ignition Timing - Please Read Carefully.
This is a basic procedure for an experienced mechanic, with Yamaha allowing approximately 0.4 hours for the work. If ignition timing adjustment is not something you are familiar with, we strongly recommend that this task is carried out by a suitably skilled and experienced person. The flywheel is removed to adjust stator position, as per the original Yamaha procedure.

Two-stroke engines are generally very responsive to small ignition timing changes. Adjustments should therefore be made in small increments, with the machine tested between each change. Under normal circumstances, the optimum setting will be found in the centre of the adjustment slots, without having to position the stator at either extreme end.

Basic method
A very quick method is to set the stator retaining fasteners precisely in the centre of the slots, so that the alignment mark is aligned with the centre of the retaining screw, as shown →

With all three stator retaining screws tightened, refit the flywheel and the engine cover. Start the engine.

Check the engine starts easily, is running forwards and picks up cleanly. Cautiously pull away and check for clean running at all engine RPMs.

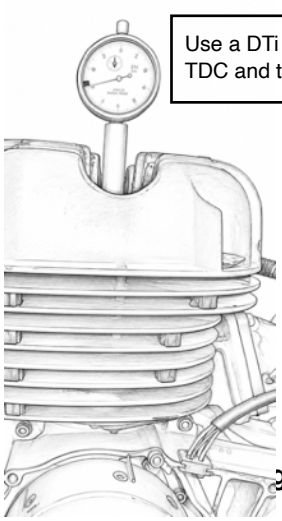


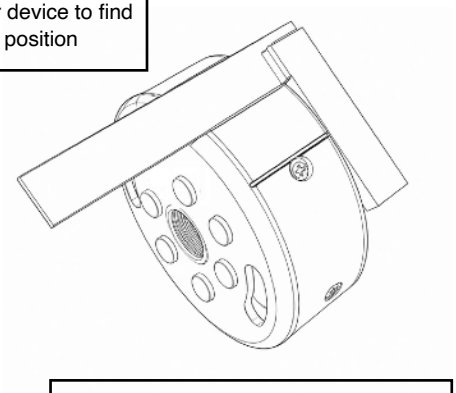
Two fixing bolt version shown

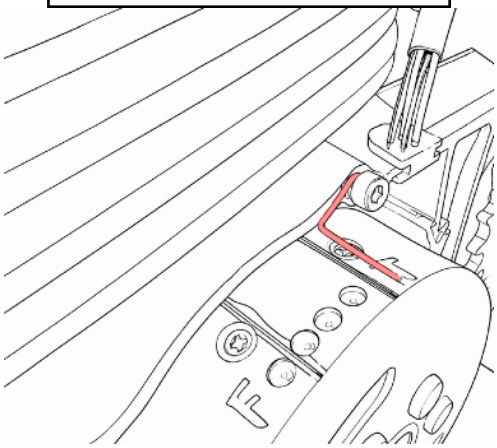
High accuracy set-up.
To set the timing with a higher degree of precision requires accurate timing marks to be made on the flywheel and a temporary pointer fitted to the engine. Use a set square to ensure your scribe lines are straight on the flywheel. A piece of wire bent to suit can be used as a pointer.

Use a DTi or similar device to determine TDC. Scribe an accurate line on the flywheel and align the pointer to show TDC. Turn the engine in the opposite direction to its normal rotation until the DTi shows the required amount of piston travel BTDC. Scribe a second line on the flywheel which accurately aligns with the pointer when the piston is in the correct position. This is the 'Fire', or 'timing' mark. Use the standard Yamaha timing specification given in the bike's shop manual.

Early shop manuals explain the use of a DTi to find the piston position in detail. Use these marks, a suitable pointer mounted to the crankcase and a strobe lamp, to set the timing at idle by adjusting the stator position.


Use a DTi or similar device to find TDC and the piston position


A set square will help produce straight, accurate scribe lines on the flywheel


Install a simple pointer (shown in red), set the engine to TDC and accurately align the pointer with the TDC mark on the flywheel.

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A popular and highly accurate technique for fine tuning, after having set the initial timing position and the motorcycle has been taken for a short test ride, is done by setting the stator so the pointer aligns with the **FIRE** mark while the engine is held at approximately **2,500 rpm** (stator is moved in the retard direction). Check each adjustment of the stator position with the strobe lamp.

Some customers have reported that adjusting the stator so the **FIRE** mark aligns at **3,000 rpm** produces excellent results. You could continue this pattern in 500 RPM increments noting the point when performance starts to suffer and returning to a prior setting. A point to note here is that riders may have different opinions on which running characteristics they wish to be more prominent.

Caution – Risk of injury or engine damage: Advancing the ignition beyond the recommended basic setting may appear to improve performance initially. However, excessive advance increases combustion temperatures and may result in severe engine damage or seizure. Always ensure that the ignition timing is set to avoid engine damage.

Our electronic ignition advance curve has been developed and refined for well over a decade to be compatible electrically and magnetically with the original system. It has been found by owners to improve starting and restore clean running. However we are not able to account for engine condition, fuel quality, carburettor settings, exhaust system or other modifications. The recommendations given have been developed through extensive testing and thousands of real road miles, we have no other timing advice to give therefore.

If you are unable to find the optimum setting with the normal method, retard the stator by **5°** from the initial setting (Use a protractor and marker pen if required), then advance it in **1.0°** increments, test riding the motorcycle after each adjustment until you are satisfied with the result. We would like to point out, that if you are having to do this, the bike is often found to have other issues preventing the engine running as it should.

Once the final adjustment is made, make a permanent scribe mark on the stator and engine casing. This allows the timing to be returned quickly and accurately should the stator need to be removed in the future.

If you feel the pointer has moved during adjustments, set the piston to TDC, check that the pointer is aligned with the TDC line on the flywheel, adjust it if required. This ensures the timing mark is also correct.

Providing you work carefully, making your own timing marks will often prove more accurate than relying solely on factory stamped timing marks.

We are always pleased to hear from owners who have fine tuned their own machines and are happy to receive feedback on the settings that have worked well for them.

Manufacturer's stated purpose of kit	Road bike kits are designed to restore ignition and charging functions to specified classic motorcycles while retaining the engine's original operating characteristics. Roadster versions retain the original lighting and charging arrangement, converted to 12 volts. Each kit is intended for the models listed and must be used with the specified flywheel. This statement does not apply to kits intended for competition use.	
Applicable Flywheels	RMK6/7-FOTO1971. RMK10/11-F1T350. RMK15/16-F3T357	
Spark plug	Standard plug as per shop manual	Iridium grade, or rider preference
Spark plug gap	0.7 - 0.8 mm (0.028-0.032")	
Plug cap	A 5K resistor required for optimum performance. EG; NGK LB05F or LB05EMH	
Timing	DT250 (Twin shock): 3.2mm BTDC	
HT Coil	P/N: HTC8. Primary 1.0 - 1.5 Ohms. Sec 5 to 8 K Ohms.	
Source coil	**Single Source** Kits: P/N: SC-6	**Dual Power** Kits: P/N: SC-7
Source coil resistance	Black~Brown = 175Ω @20ºC	Black~Brown=92Ω, Brown~Red=35Ω @20ºC

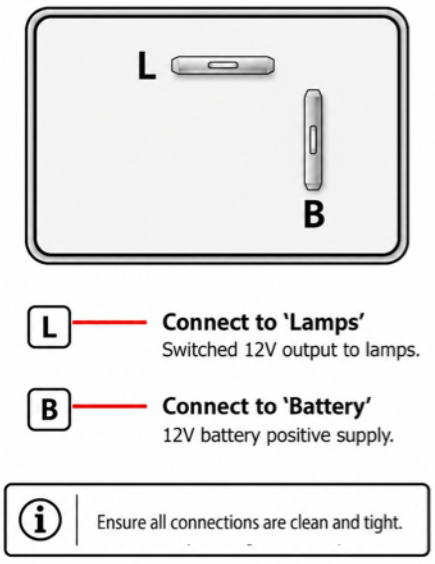
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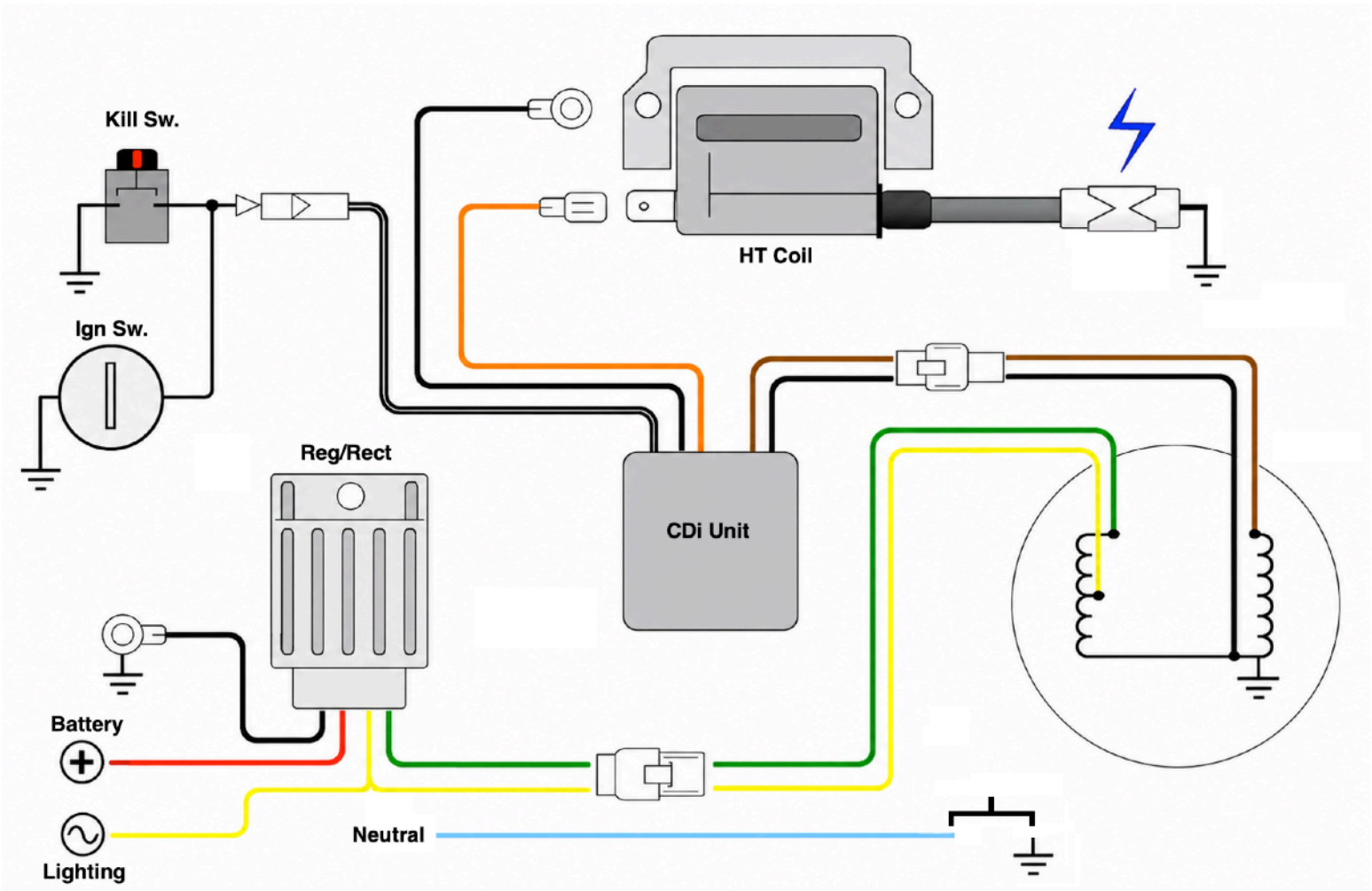
Wiring Information

Battery 6N4B-2B	12V - Use DT12V-Batt
Battery 6N6-3B	12V - Use Motobatt MB3U
Battery Eliminator (Optional)	BE1
Headlamp - Filament Bulbs Only	12V, 35 or 45 Watt
Stop/Tail	12V, 21/5 Watt
Indicator	12V,18 to 21 Watt
Instrument Lamps	12V, 4 watt
Fuse Rating	10 ~ 15 amps
Replacement Regulator	RR12V-1
Replacement Lighting Coil	LC-3
Replacement Indicator Relay	IR-E12V

Indicator Relay Connection

Note our two wire relay is designed to replace most 3 wire relays. The earth wire is not used in this case.





Wiring Diagram - Roadster & Ignition Only kits

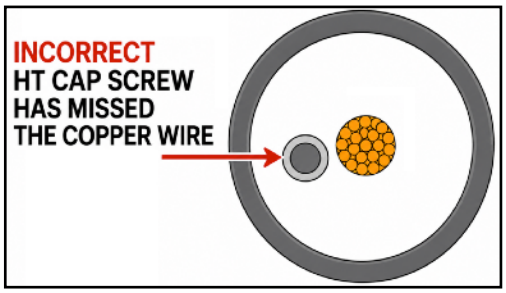
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Technical Support - Ignition
DT/IT/MX/YZ Owners: Our RMK electronic ignition kits are matched to a specific flywheel. The flywheel part number is more important than the motorcycle model. It is not uncommon to find an incorrect generator fitted, often as the original failed and early ones were known to have issues.

If the engine produces a spark but the ignition timing cannot be adjusted into range, check the number stamped on the flywheel. Compare this with the flywheel specified for your RMK kit on our website. If the numbers do not match, the ignition cannot be timed correctly. The solution is to source the correct flywheel for the kit.

XT500 Owners
Our XT500 RMK kit is designed for points ignition flywheels only. It is not compatible with the later factory CDI flywheel. The solution is to fit a points model flywheel, which is a direct replacement.

No Spark
The most common cause of a no spark condition is a faulty spark plug or an incorrectly fitted HT cap. Ensure the screw-in HT cap has penetrated the copper conductor of the HT lead. It is possible for the cap to screw into the insulation without making electrical contact.



Check the HT coil's primary and secondary resistance readings give sensible readings compared with the specification table. No reading or an unsteady one shows a failure.

Check the Kill Circuit
Most RMK kits have a separate **black/white** kill wire found near to the HT coil connections. Disconnect this wire and kick the engine over.

- **Spark returns:** The fault is in the kill switch or wiring.
- **Still no spark:** Continue with the checks below.

On kits where the black/white wire cannot be disconnected separately, unplug the CDI connector and perform a continuity test - on the bike's wiring loom - between the black/white wire in that connector and the HT coil mounting bolt (earth). Expected results:

Ignition switch - (Kill switch - if fitted set to 'Run')
- OFF = Continuity
- ON = No continuity

Kill switch (Ignition switch set to 'On')
- RUN = No continuity
- STOP = Continuity

The kill circuit must operate correctly. Do not ride the motorcycle with a faulty kill function.

Inspect the Wiring
Carefully inspect all wiring between the stator and the ignition components. Remove the stator and check that no wires have become trapped or pinched, as this can short the ignition source coil and prevent the system from operating.

Check the Source Coil
Measure the resistance of the source coil and compare it with the specification in the specifications table, above for your RMK kit.

Resistance varies with temperature, the correct resistance is shown at 20°C only. A look-up chart is needed for other temperatures. If the corrected value is outside specification, there is no reading, or the resistance is unstable, the source coil is likely to be faulty.

CDI Unit
The CDI unit is not user serviceable or user testable. Never apply battery voltage or any DC power to the CDI unit or the HT coil connected to it. Doing so will permanently damage the ignition system.

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Technical Support - Charging and Lighting

Earthing
All RMK kits incorporate their own dedicated earth circuit, connected directly to both the stator and the motorcycle's main earth wiring. This ensures the ignition and lighting systems have a reliable return path.

As the new kit operates at full output, it can expose faults in ageing wiring looms, switchgear, connectors and, in particular, the earth circuit. The main earth wire carries the return current for the entire electrical system, including all lighting, the battery and the stator. Because of the current it carries, it is often the first part of the wiring loom to suffer from corrosion and high resistance.

Before investigating the new charging system, carry out thorough checks on the old, existing wiring loom, connectors and switches. The vast majority of charging and lighting faults are found in original (often 40-50 year old) wiring and/or components.

Batteries
IMPORTANT: Use only lead/acid type batteries, this includes AGM. Lithium batteries have a much higher open circuit voltage and must NEVER be used with this equipment.

The quoted voltages assume a fully charged lead-acid battery. New batteries are normally supplied partially charged for storage and should be fully charged with a motorcycle-specific battery charger before carrying out any charging system checks or fault finding.

Blown Bulbs or Charging Voltage Too High
If bulbs are repeatedly blowing, or the battery charging voltage is over the specified range, the most likely cause is a poor earth connection. High resistance in the earth wiring causes the type of regulator used to increase its output.

Provided the wiring loom is in good condition and the stator has been installed correctly, there is no need to remove paint or create additional earth paths at engine mounts or other parts of the frame. The motorcycle frame is a poor electrical conductor compared with a copper wire, therefore it is important to always ensure the original earth wiring is free of corrosion, all connectors are ‘as new’ and are intended for motorcycle use, secure and in good condition.

NOTE: If you have a battery eliminator in place of a battery, the voltage can rise to around 15V. This is normal, a capacitor does not have a fixed voltage like a battery so will charge up to the level of brief transient spikes that are present in this type of charging system.

Charging Voltage Does Not Rise Above Battery Voltage
This fault is most commonly caused by excessive electrical load. Typical causes include a headlamp bulb of incorrect wattage, a brake lamp switch stuck on, or accessories such as heated grips, phone chargers or USB charging modules.

Roadster kits are designed to improve the original lighting performance by operating at a higher system voltage. They are not intended to power additional electrical accessories.

Charging Voltage Falls Below Battery Voltage (Typically 7.5–9 V) With Engine Running
If the charging voltage falls below the battery voltage only after the engine is started, first check that the original 6 V regulator has been disconnected and removed.

If the charging voltage is correct with the lights switched off, but falls below the battery voltage when the lights are switched on, a ballast resistor or regulator has most likely been left connected in the lighting circuit, wired after the light switch.

Locate and disconnect the unit before further use. These components are often found in unusual locations, having been fitted under service bulletins or by previous owners in an attempt to cure bulb failures. Thoroughly inspect the wiring from the headlamp to the tail lamp.

If the above does not lead you to the issue, refer to the detailed charging system document for 12 volt conversions for ‘Roadster’ RMK kits. This explores the system more deeply, it is available to download on the technical support page of our website.

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