

PME XT/TT500

ELECTRONIC IGNITION

'Field & Tarmac' RMK-2 & 'Full Power Competition' RMK-4 Fitting Guide

Thank you for purchasing our electronic ignition upgrade for the XT/TT500. The 'Field and Tarmac' (RMK-2) is a solid 'all-rounder' that brings good starting, sure footed performance and all the benefits of electronic ignition without the price tag of the competition equipment. The 'Full Power Competition' (RMK-4) version with its unique dual ignition windings is the most powerful self generating system available. This is intended as a performance up-grade for road bikes and for gruelling competition use where it has proven to give outstanding results under all conditions, even where the rev limit of the engine has been considerably raised. The RMK-4 also gives outstanding start up performance even on highly tuned engines.

Both systems do away with the points and mechanical advance unit replacing them with electronic timing. They are self generating hence they do not need power from the charging system or a battery. Fitting is very similar for all systems, if you are using an ignition only kit ignore the sections referring to 12 volt system changes just fit the stator, EMCU, HT coil and go to the ignition timing adjustment section.



Fig 1. RMK-2 single ignition source coil
Performance range 150 - 6,000rpm

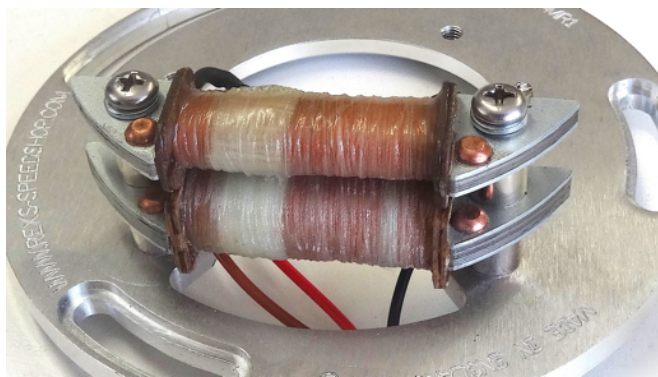


Fig 2. RMK-4 'Dual Power' ignition source coil
Performance range 125 - 10,000rpm

The RMK-2 and RMK-4 systems are available in 12 volt and 'ignition only' versions. The 12 volt charging option is a real upgrade over the standard 6 volt as it brings a bright headlamp and reliable indicators. 12 volt systems are supplied with a fully factory assembled charging coil so are 'plug & play' with standard XT500 electrical systems. 'Ignition only' systems come with no charging coils or associated wiring - stripped down to bare minimum for competition where there is no other wiring on the motorcycle. Again these are 'plug and play'.

If you wish to remain 6 volt

The 'ignition only' kits can also be used by owners who wish to keep the 6 volt charging. The standard XT500 6 volt lighting coil can be fitted to the stator - HOWEVER - this is considered an owner modification. We do publish a separate free to download information sheet, but we give it a 'three spanner - expert' rating, as the generator needs in-depth stripping to remove the good XT lighting coil from the old stator (we can supply a new one if yours is in poor condition) you will also need wiring kit p/n WK-XT6V.

12 volt kit contains:

- 12 volt / electronic ignition stator plate
- Regulator rectifier & adaptor loom
- Electronic Magneto Control Unit
- New HT coil & NGK HT cap
- Timing adjustment tool

Ignition only kit contains:

- Ignition only stator plate
- Electronic Magneto Control Unit
- New HT coil & NGK HT cap
- Timing adjustment tool

Tools not included but required: Flywheel puller (27 x 1.0mm left hand thread), an air or electric powered impact gun (buzz gun), strobe light with inductive clamp.

Warning: Only use strobe lamps with an inductive clamp that fits around the HT lead. The type of strobe that is connected between the spark plug and HT lead, interrupting the HT supply must NEVER be used as this type can lead to severe electric shocks that may be lethal or could cause injuries. People with heart conditions or those fitted with a pacemaker are most at risk.

You must use this guide in conjunction with the Yamaha shop manual for your bike. You will need the manual for torque figures, assembly procedures and safety precautions. This guide does not over-ride any safety warnings or torque settings.

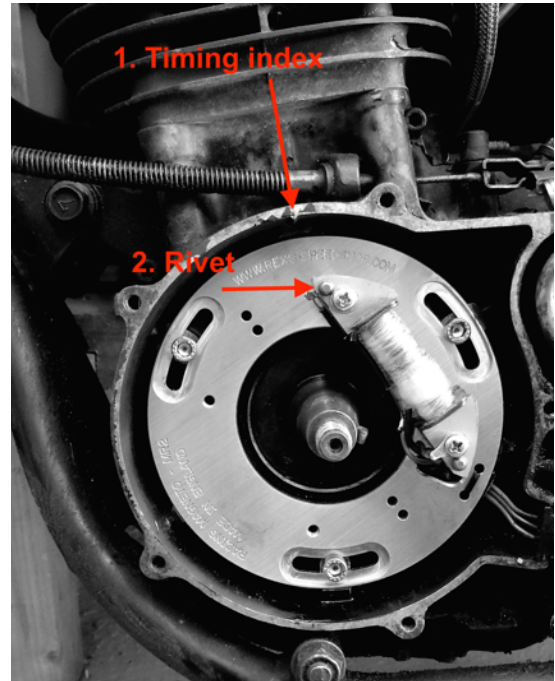
Fitting guide

1. Remove the points and mechanical advance unit, these are no longer used. The wire from the points can be removed or left in place if you want the bike to appear standard. If left it must be insulated from the electrical system.

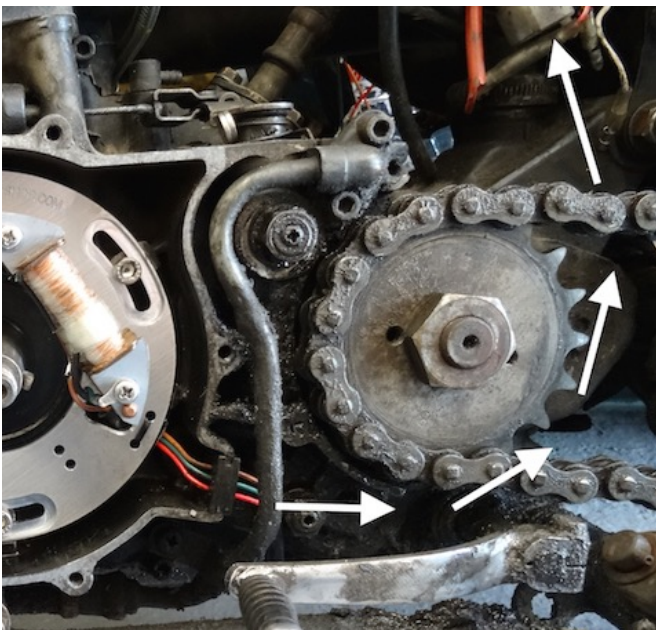


2. Remove the flywheel & stator from the bike. Replace the stator with the new one from the kit. Mount the stator with the CDI source coil in the 2 O'clock position, with the upper rivet in line with the timing index:

REMOVE ANY PROTECTIVE PACKING COVERING THE WINDINGS



3. Ensure that the wires are not pinched between the backplate and engine, route the loom as per the original and secure it away from the drive chain. Tighten the stator plate and refit the flywheel to the torque values as per the shop manual.



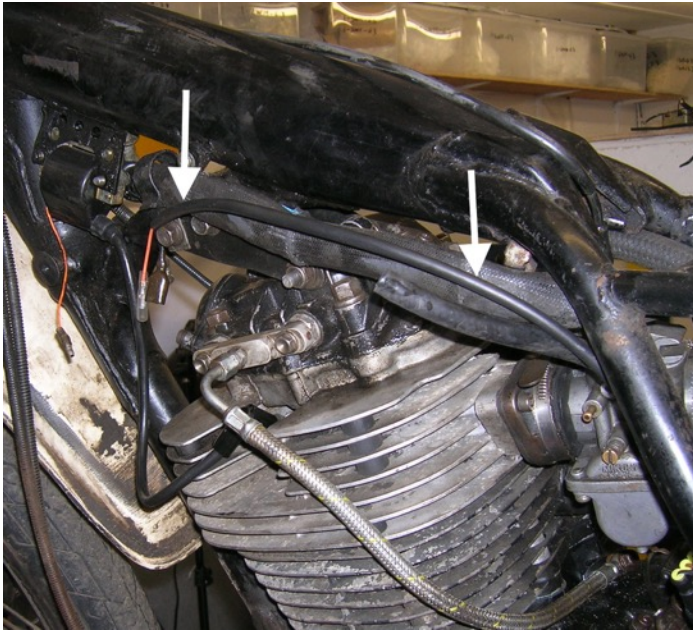
4. The EMCU ignition unit can be secured under to the battery carrier using the cable tie supplied. However leave the unit loose so you can access the timing adjustment.

Connect to the matching plug on the generator wiring.

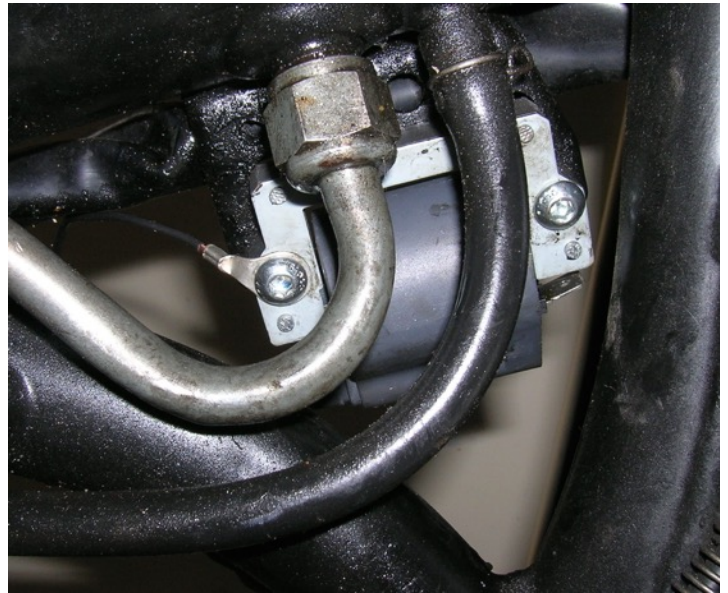


5. Route the long wire from the EMCU forward to the HT coil. Secure it using the wiring loom clips, that hold the standard wiring loom.

If these have been removed (eg competition bikes), refit them or secure the EMCU wiring away from engine and exhaust.



6. Fit the new HT coil. Put the earth terminal from the new wire under one of the mounting screws. Connect the orange (hot) wire to the spade connector on the HT coil.



7. Bikes with standard wiring looms; connect the black/white wire from the EMCU to the double connector on the black/white wire from the bike's wiring loom.

On ignition only systems; we assume no wiring on the bike other than our ignition. Fit the kill switch at a convenient position on the handle bars and connect the wire coming from it to the black/white from the EMCU.

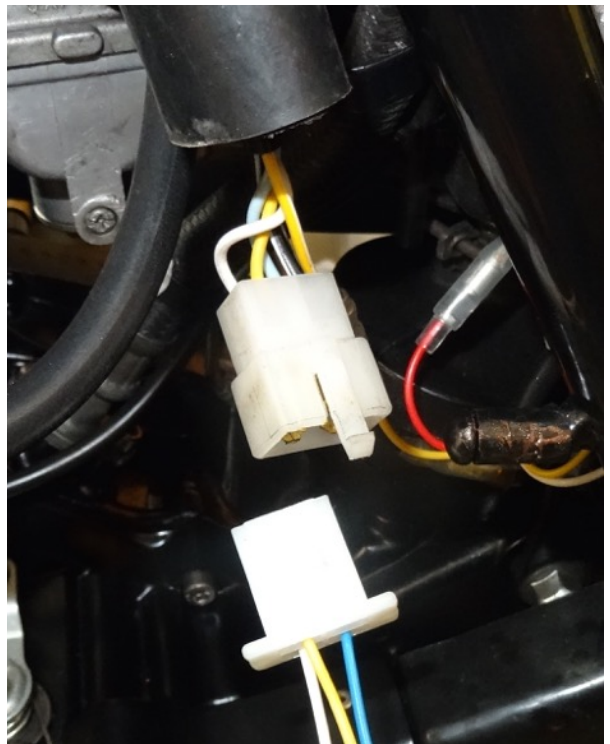
Fitting an 'Ignition only kit'? Now go to 'setting the timing' ➤



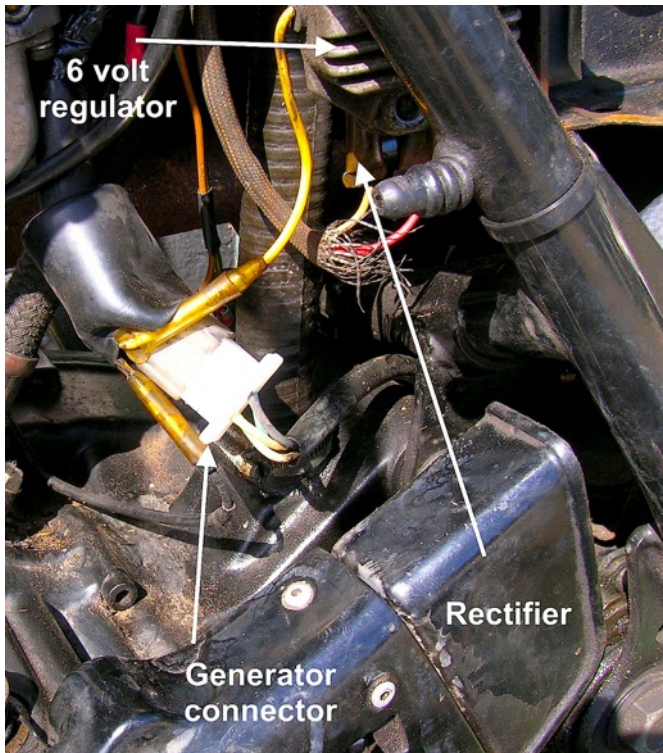
Note; also shows orange wire connection to HT coil.

8. **12 volt kits only:** On 12 volt systems plug in the larger white block connector to the bikes wiring loom.

The new connector has only 3 wires - this is intentional and not a missing wire



9. Next identify the old 6 volt rectifier and regulator. Remove these from the bike
The 6 volt regulator has a single yellow, the rectifier has a white and a red wire.



10. Fit the new 12 volt regulator as shown to the regulator mounting point placing the black wire with the ring terminal under the bolt. The wiring loom earth should be here as well. Connect the yellow to the old regulator wire. The new red and white wires connect to the rectifier wires



11. Remove the 6 volt battery, horn, indicator relay and bulbs. Refer the bike's manual if you need information on how to do this. Replace with 12 volt versions. Ensure the 6 volt parts have all been replaced before starting the engine.

Warning:

Do not use a 6 volt battery on a charging system that has been converted to 12 volts.

Supplying 12 volts to a 6 volt battery is dangerous and may result in damage to the bike, fire or serious injury. Acid may spill from the battery or it may burst if the wrong voltage is applied to it.

In Europe batteries must not be placed household waste and will need to be disposed of in accordance with local legislation. Seek advice from your local authority.

Testing 12 volt charging

Do the ignition set up before checking the charging. Once the ignition timing has been set, start the engine and using a professional quality multimeter check the system at the battery (or at the battery eliminator connections) that is producing 13.8-14.9 volts DC @ 2,500 RPM. The battery must be fully charged and a lead/acid or AGM type.

Caution:

Before the machine is ridden the ignition timing must be set and the 'ignition off' or engine 'kill' function must be tested for correct operation. Both the ignition switch and kill switch (if fitted) should turn the engine off.

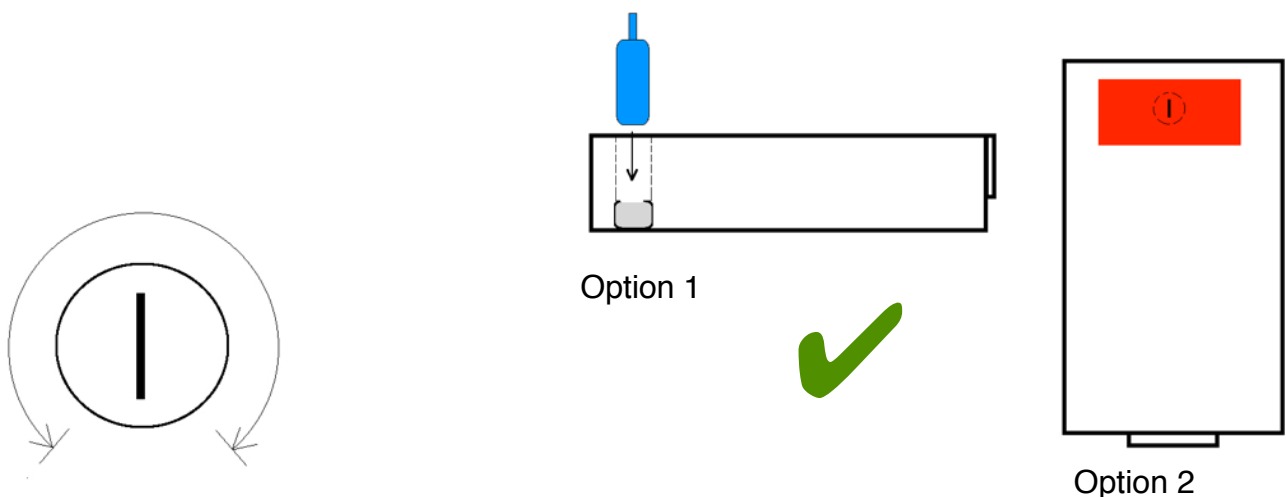
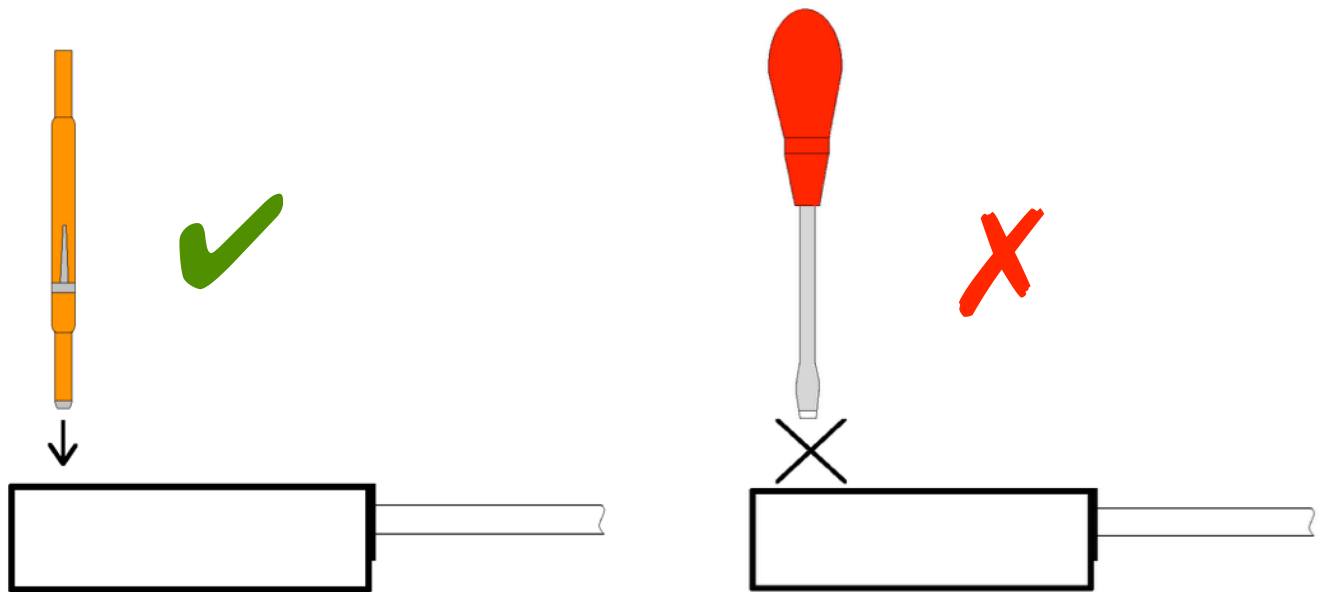
➤ Setting the ignition timing - Use of the EMCU adjuster

Caution:

The EMCU timing adjuster is a precision electronic component which must be handled carefully to avoid damaging it:

1. Only use the adjuster tool in the kit to alter the timing control on the EMCU. Replacement tool p/n AJT-1
2. A use only a light 'finger and thumb' pressure when making adjustments.
3. The adjuster moves only 3/4 of a turn, do not apply force when it stops.
4. Do not push down hard on the adjuster.
5. Replace the sealing bung after adjustments are made to prevent water/oil/mud ingress.
6. Never direct water from a hose pipe or jet wash at the EMCU during cleaning.
7. Never apply adhesives to the adjuster, you will permanently damage it if you do.

ECMUs returned with adjusters that have been forced, adjusted with tools other than the supplied tool or show signs of mud, oil or water ingress or those that have been abused will not be replaced under warranty.



Adjuster rotates 3/4 of a turn only.

First turn it fully one way, then the other to feel where the end stops are - then set it to the mid point before timing the engine.

Protect EMCU from mud and water ingress. Refit the sealing bung after adjusting (option 1). Never spray the EMCU with water when cleaning the bike.

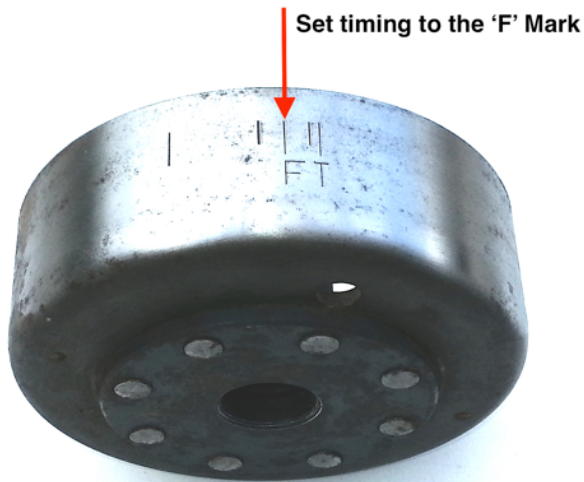
Tip! If the sealing bung is lost, obtain a new one (p/n G-6), use electrical insulation tape over the adjuster opening (option 2) as a temporary measure.

Setting the ignition timing

A strobe lamp with an inductive clamp must be used to set up the ignition timing, failure to do so may result in engine damage. If there is an arrow on the strobe HT clamp, it should point towards the spark plug. If the lamp has an advance calculating feature, switch it to 'off' or '0 degrees'.

Set the timing to the 'F' mark at 1,100 RPM viewed with the strobe. To begin:

- Align the index timing mark on the crank case with the centre of the upper rivet on the source winding (step 2 above).
- On the EMCU, use the adjusting tool to rotate the timing trim fully left then right, set it mid way between the two end stops.
- Start the engine and allow it to idle, adjust the trim adjuster to bring the timing to the 'F' mark
- Once set, replace the adjuster seal and secure the EMCU to the bike using the supplied cable tie



Strobe with inductive clamp attached to HT lead. 'F' mark highlighted in white on flywheel for clarity.

Hints and tips:

The EMCU adjuster mainly affects the low speed timing. If the engine won't start, make adjustments on the EMCU of 1/8th of a turn at a time. If the adjuster is rotated to the very end of its range but still does not correct the timing, reset the adjuster to the mid position and try the same procedure but going in the opposite direction. If this still does not bring the timing in range, the stator position must be altered. Reset the EMCU adjuster to its mid position and adjust the stator.

To adjust the timing via the stator, remove the flywheel and loosen the stator retaining bolts and rotate it in its slots. Move it 5 mm at a time. Avoid making simultaneous adjustments on both stator and EMCU as this will cause you confusion. It is better to leave the EMCU in its mid position and 'hunt' the timing point on the stator adjustment alone. Once found, fine tuning is again possible on the EMCU.

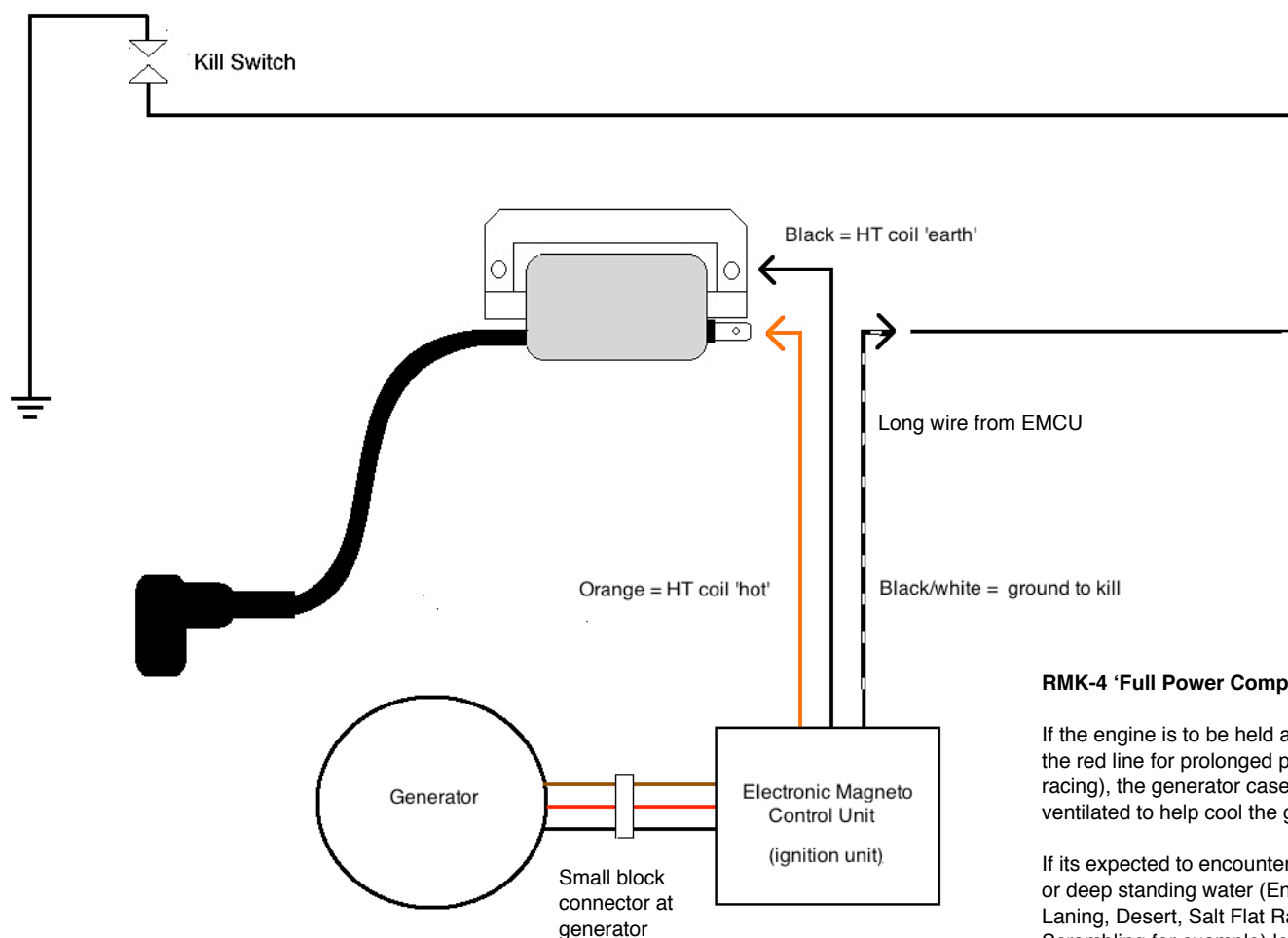
Rotating the stator anti-clockwise RETARDS the timing, clockwise ADVANCES the timing.

Adjustments made on the stator affect timing through the entire RPM range.

Note the EMCU is very sensitive to frequency (engine speed) and reacts even to tiny changes, calculating the advance accurately for that exact speed. The engine naturally slows down as the piston comes up to compression, then speeds up on the power stroke. This system uses a wasted spark so the strobe will flash on the exhaust stroke as well as the compression stroke. The EMCU's electronics react to these changes in rotational speed and on a big single cylinder engine these may be pronounced when the engine is idling.

Some strobe lamps do not rect well with motorcycle ignitions, if your lamp will not flash or will not remain steady, first reverse the HT clamp. If this does not improve things try using a separate battery from the one on the bike, if this is still no better try a different lamp. It is often very expensive multifunction strobe lamps that have problems, very basic lamps without diagnostic or tachometer features prove to work better on these systems.

Wiring guide for competition use only.



RMK-4 'Full Power Competition' systems:

If the engine is to be held at high RPMs over the red line for prolonged periods (track racing), the generator case should be ventilated to help cool the generator.

If its expected to encounter mud, sand, salt or deep standing water (Enduro, Green Laning, Desert, Salt Flat Racing or Scrambling for example) leave the case sealed.

Timing	7 Degrees BTDC @ 1100 RPM (+/-3)
Full advance	44 degrees (+/- 1.0) @ 4,500RPM
HT Cap	NGK with suppressor LB, XB or SB series
Recommended spark plug	NGK BPR7EIX
Spark plug gap	0.7 - 0.8 mm (0.028-0.032")
RMK-2 HT Coil	PME p/n HTC8 or HTC13. Stock XT500 coil can also be used.
RMK-4 HT Coil	PME HTC13 or Genuine Yamaha TZ250 HT coil 3YL-82320-01
HT Lead	7 mm, silicone or PVC automotive, copper core.
RMK-2 Performance range:	150 to 5,500 RPM continuously, > 6,000 transitionally.
RMK-4 Performance range:	125 to 10,000 RPM continuously. Output remains at maximum
RMK-2 Source coil resistance	Brown to black 90 Ohms - <u>Cold engine @ 20 degrees C</u>
RMK-4 Source coil resistance	Brown to black 90 Ohms. Red to Black 130 Ohms - <u>Cold engine @ 20 degrees C</u>
Recommended 12V Battery	Motobatt MB3U
Charging - measured at the battery, lights off	13.8 - 14.9V @2,500RPM with a battery. 13.8-15.5V@2,500 RPM with eliminator
Fuse	10/15A or as per manual. There is no need to change this for 12 volts.
Battery eliminator (12 volt systems only)	BE1 (Not to be used on systems where a separate regulator & rectifier are used)