Fitting MZ-B Magdyno to BMW R12

I recently bought an MZ-B ignition generator unit to fit onto my BMW R12, the problem with the original Bosch D2B unit being that while the magneto part of it worked perfectly, the generator part was beyond repair as well as being of too low an output to balance the lighting needs with a sidecar fitted.

First impression was that it was a nicely made unit and a good cosmetic replica for the original Bosch D2B. The shaft end thread was different to that on the Bosch but it was supplied with two "Nylok" nuts to suit this thread and a pair of very nicely made "long" nuts as well.

The major cosmetic difference between the units is that on the MZ-B the HT leads come from under the rear housing that, on the D2B, covers the dynamo control regulator, rather than from the sides of the main body and that there is a sleeved cable bundle coming from it as well as a single red wire, which is the generator output, each of about a metre in length.

In this bundle are 4 wires which go to a plug which then connects to the ignition control unit and a separate blue wire, this blue wire is the ignition cut out which you connect to ground when you wish to stop the motor.

Fig.1 :- BMW R12with Bosch D2B unit.

Fig.2 :- BMW R12 with MZ-B unit.

First thing to do was to read the instruction sheets, and then to do it again and I found nothing particularly difficult, worst thing was that there was not a positive indication of the ignition point other than the trailing edge of the rotor "wing" being 4 mm (about a third of the way) past the rear edge of the sensor coil core, and on playing with the unit I found that the magnets had a very strong pull, you will not spin this unit over with your fingers on the shaft like you can the D2B! I later made use of this feature.

On sizing the job up I decided to fit the ignition control unit, and a sealed type (12 Volt)battery, into a GRP replica battery case which I already had. The first problem was that the control unit was a little too wide over its mounting lugs to fit into this case. Solution was that I took a coarse file and reduced this width, I only needed to remove 2 to 3 mm from the lugs until it was a neat fit and I secured it in place inside the casing with the double sided adhesive pads used for mounting mirror tiles.

I also used some of these pads to secure Sorbo rubber blocks onto the battery to make it a neat fit into the remaining space in the casing.

Since on the R12 the battery is mounted behind the engine this meant that I had to run the cable bundle back to this point. As I wanted the blue lead to go forward to the main switch I pulled this lead back out of the bundle and paired it with the red wire.

In the instructions you are advised to have a switch between the generator red wire and the battery so that when the bike is left standing for a prolonged time the battery charge does not "leak away" through the diodes in the control gear.

Fortunately with a little adjustment of the connections you can manage this with the standard R12 main switch.

The standard arrangement is that the battery first connects to the dynamo and then both connect to the switch. The lights side of the switch is permanently live, so that you can park and remove the key leaving the lights on.

There is however a sub circuit, which powers the horn (and can also be used to supply power for a stop light circuit) which is only live when the key is in and pressed home and I decided that while I would connect the battery the the main switch as normal that I would connect the generator to the sub circuit, I also decided to fit a fuse into the battery lead while I was at it and I found a nice "period appearance" fuse carrier for the job, listed by Vehicle Wiring Products, to take the pointed end ceramic fuses as used on the later BMW bikes.

With an R12 you have 2 options for setting the ignition timing, you can either remove a cylinder head and time it 12mm before TDC, or you can remove the gearbox and use the timing marks on the flywheel and this is what I decided to do.

So out and get started with the job. After having removed the gearbox I then removed the old D2B unit, I did not separate the timing chain, just pulled the sprocket off the shaft leaving the chain fitted.

While I had the magneto drive apart I took the opportunity and converted from a felt ring seal to a proper garter type oil seal at this point, and I have also put a big felt ring between the magneto body and the motor here as well, outside of the cap spring, to soak up any oil leakage.

Fig.3:- With Bosch D2B fitted

fig 4 :- With MZ-B unit fitted

The new unit went straight into place without any problems, I just had to adjust the chain tension by removing one of the 2 shims I had already fitted below the D2B.

Now to set the timing.

I aligned the flywheel marks and tried to get the rotor of the new unit in the correct place and fit the sprocket in place at the same time and found that I not only needed 3 hands, but had difficulty in seeing the rotor position due to the frame members of the R12 while doing this.

Thinking things through I came up with a work round. As I have said earlier, this unit has very powerful magnets, these magnets will always pull the rotor back to the same rest position.

So I set the flywheel marks in alignment and allowed the rotor to find its rest position.

I then fitted the sprocket and tightened it enough to turn the shaft, but not so tight that I could not remove the sprocket with my fingers once the nut was removed again.

I next turned the motor until the rotor was in the correct position and marked the flywheel there, point(A), see fig.5

This mark is of course between TDC and the correct ignition point so I measured the distance round the flywheel between "A" and this correct point and then transferred this distance to the other side of that point, to point "B", see fig.6.

Fig.5 :- Flywheel marked at point "A"

fig 6 :-Flywheel marked at point "B"

I now turned the motor back to the correct ignition point and removed the sprocket, leaving the shaft free.

The next step was to turn the motor back to before point "B" and then turn it forward again to that point. I then fitted the sprocket onto the shaft of the MZ-B unit.

I then turned the motor forward till it was at the correct ignition point and checked the rotor position on the MZ-B unit, I did this visually and was also able to check this with a 4mm wide piece of plastic I cut to make a guide for this job.

All measured up correctly so I turned the motor over several times and then rechecked the settings again and found it still was as required so I then

fully tightened the magneto shaft nut and refitted the magneto chain top cover.

The next job was to do the wiring.

I took the main cable bundle up to the top right frame rail, and then bound the red and blue wires against it with non-adhesive harness tape for the length between the MZ-B unit itself and the top frame rail so that it appeared as a single bundle to this point.

I then led the red and blue wires forward and the main bundle back inside the frame rail, using adhesive backed cable ties to hold it in place, very non-original I admit but they cannot be seen and are a practical way to secure the wires in place.

The length of the main bundle was sufficient to lead back across the frame at the rear fuel tank support cross member and then to lead neatly back and down to the dummy battery.

As there was not enough length in the red and blue wires to reach the switch in the headlamp following the route of the main wiring loom I joined extra length onto them inside the frame, where the joints cannot be seen, and then took these wires up to the switch panel inside the headlamp shell, again using the non-adhesive tape to bind them against the main loom.

The blue wire was attached to terminal "2" on the switch and the red wire attached to terminal "54".

All that remained was to put everything back together and start the old lady up.

Ideally you would now check the ignition timing with a stroboscope, but there is not this provision on a standard R12, and while Vech does give details as to how to overcome this, to do so does mean removing the flywheel and probably the right hand side cylinder as well and I was not willing to go to this length at this time.

There is a fine adjustment for timing advance built into the MZ-B unit however, which does not require any dismantling of the motor to use, so I will easily be able to adjust the timing if it appears necessaryfollowing a prolonged road test.