Diary of the BMW/EMW R35 Project - Started September 2011

Click here to go to end of document

A picture of a 1938 R35 is below, sadly not mine as that is some way from complete at present. Theses bikes are single cylinder 350cc OHV models with rigid rear end, pressed steel frame, 4-speed hand change gearbox and shaft drive amongst their features. Introduced in 1937 as a development of the R4 they effectively ceased production in 1940 with about 15600 delivered; seemingly the Wehrmacht preferred the twins. The production facilities for these machines were transferred to Eisenach at some point and in 1945 this was in the DDR under Russian domination. The DDR restarted production initially assembling machines from stockpiled parts. By the late 1940s, they were back in production differing very little from the 1937-40 version,

which is commonly called the R35/0. Probably the most significant differences were the front forks which were undamped on the earlier models, the wheel rims which have a very unusual shape and the pressed steel rather than cast front brake plate. These early post war models are referred to as the r35/1 (those mainly built from stockpiled parts) or R35/2. Such models were fitted with the standard blue/white BMW badges. The name was changed to EMW (Eisenach Motoren Werke) after BMW won a court case to stop the DDR using the BMW name on 17 Nov 1950. Opinions differ as to exactly when the EMW badge appeared on the vehicles (former BMW cars were also made at Eisenach), some sources quote 1951 others 1952. Around the same time the R35/3 with plunger rear suspension was introduced and this model is by far the most numerous of all the R35 variants.

Mine, which is believed to be an R35/2 came from a friend who acquired it many years ago from a classic bike dealer. The bike had been used by the Polish Post Office for most of its working life, no other history is known and it is not clear exactly when it came into the country. Its frame number dates it as late 1950 probably September and it does have the damped forks with a rigid rear end. Some of the printing on the VIN plate has rubbed away making it hard to decipher though the stamped parts are clear enough. The manufacturer's name is Awtowelo, which was a company incorporated in Russia. According to the literature I have found this makes it a BMW/SAG (not found out yet what the SAG part means). I guess in the end it will depend on what the expert who issues

the dating certificate decides. I would prefer it to be a BMW but can live with EMW.

Sadly it was not a good deal for my friend and many things were found wrong so the bike was progressively dismantled for repairs over a long period and it was never registered or used on the road during his ownership. At that time sourcing spares and

information for older continental bikes was not easy – the internet has changed that. Though many parts including the engine and the bevel box were eventually refurbished, it remained a basket case. I first got to see the bike in 2009 but decided it was too daunting a task. However, having subsequently tackled a Simson AWO 425 project which is heavily based on BMW technology, I felt a bit more confident and the bike duly arrived in my garage in early September 2011.

I was under no elusions about the task ahead. Though much work had been done, it was very likely that other horrors would be revealed as the rebuild progressed. In fact the first problem came to light when the bike was delivered. Though the most of the engine components had been refurbished, it had never been assembled. When doing a test assembly, it was found that the crank was not running true so the bike came without any engine components. I will only be given the engine when that issue has been resolved – how honest is that. Still there were plenty of other bits to sort through and a missing engine was not an immediate problem.

7th Sepember
The first task was to fit the handlebars as it was unwieldy trying to move it around without. A brand new set of bars was found but alas, they were 1” diameter whereas the controls and clamps were clearly for 7/8” bars. A set of MZ bars from a TS model are fitted as a temporary measure. Included in the box of bits were new inverted brake and clutch levers which I had been looking forward to using but they are for the 1” bars. I have to establish if 1” bars are correct, if so I will then need to find 1” twistgrip and adv/ret levers.

Digging deeper I found the riders footrest and the rear brake lever, which were duly fitted. What I did not find was the centre stand. A call to my friend confirmed that the

elusive stand was still in the boot of his car so will be collected when the engine is ready. In the interim, some blocks of wood provide a makeshift support, I also found a set of rear brake shoes so the back wheel came out, the drum was de-rusted and everything reassembled with a smidgeon of grease on the pivots. While the wheel was out the rear mudguard and carrier were fitted, There is also a pillion seat, one of those very posh continental types which bolts to the carrier. However, it weighs a ton so I have left it off for now. The pillion footrests are very smart cast alloy plates – this was clearly a quality machine. Next on the task list was the wiring system. I had managed to download a wiring diagram from the web but a check soon established that the wire colours on the bike bore no resemblance to the diagram and the switch was also of a different type with only certain connection numbers the same as the diagram. Time to stand back and think about this.

Refreshed by coffee and a sandwich, I tackled the wring from first principles and traced everything through with a meter. Amazingly, nearly everything was in place so all I had to do was make up a new wiring diagram with my bike's colours and the layout of my ignition/lighting switch. This latter is presumably from a BMW as it uses the same style of key which is pushed down to turn on the ignition then rotated for lights. Curiously it has four lighting positions 0,1,2 & 3. So far I have only found a need for the first three positions to give me lights off (0), sidelights(1) and headlights(2). I had to add a new dipswitch as I could only find bits of the old one. The brake light switch is in place but needs wiring and I have yet to test the horn itself but otherwise I have a full electrical system. Whether we have a working dynamo is another unknown at present; I am told that it was serviced by Lucas and passed as working fine but that was many years ago. Getting it running will be vital as the bike uses coil ignition. Looking at the diagram, it seems that the regulator and cut-out are combined within the dynamo so this could be a major issue if it is faulty. Disappointingly www.powerdynamo.de do not list a replacement alternator for the R35, only an electronic ignition system that is very expensive (c £380) and seems to need a battery anyway.

One annoyance is a headlamp rim seems marginally too small to fit the headlight. Exactly the same problem as I found and have yet to solve with my Simson. Not an excess of paint this time so maybe some previous owner has tried grafting on a British rim which is a tad too small. Anyway, this has been left for another time. All in all a pretty good start to the project.

10th September
Not a great deal of time spent on the bike as I have been busy on other tasks for a few days. I have now wired in the stop light switch and have a 6v battery that I purchased at Netley Marsh yesterday. I have now fully sorted all the boxes of bits and found what I think is the proper 1" bore a/r lever and the remains of a dip switch which probably fastened to the a/r block. Looking at the spares book there should be a horn button that also fixes to the a/r block but there is no sign of that. I am still a bit confused as to what the twist grip should look like. There are three different versions shown in the spares books but they are such poor photocopies it is difficult to see the detail. I am avidly watching R35 spares on German ebay to see if I can spot anything helpful. A friend is going to a big bike jumble in Mannheim next month and has offered to look for bits but I need to be sure which bits to ask for first.

I also spent an hour or so cleaning the paintwork and touching up the many chips and scratches. Most of the tinware is quite presentable after this work but the tank is disappointing. Superficially it looks good with neatly applied lining. Closer inspection reveals large areas which are blistering and under the paint is very rusty metal. Apparently the whole bike had been repainted professionally during my friends

ownership and there is no evidence of poor preparation anywhere else so the state of the tank is a bit of a mystery. I have touched it all up for now but the tank will need shot blasting, painting and re-lining before it can be used seriously. Fortunately the metal itself seems very solid so I do not think perforation will be a problem. I also noticed some play in the back wheel whilst cleaning. Not clear where it's coming from. There are no bearings in the wheel itself, one is in the bevel box the other in a housing in the frame so that the wheel spindle can be seen rotating; a very odd sight. The bearings are perfect so I hope its just a case of making a slightly wider spacer so that the wheel is clamped tightly on the spindle.

12th September

I removed the dynamo today and made up connectors so that it would be easier to remove next time. Under the cover the cut-out and dynamo look pristine with shiny commutator and new brushes so this looks promising. I did clean up and repaint the outside so that too now looks presentable. Closer investigation of the wobbly rear wheel established that it was no more than a missing washer. Without it the nut bottomed on a shoulder of the wheel spindle. Would be nice if all problems were so easily solved. I also decided to remove the front wheel to check the state of the brake components. The linings were obviously new and there was only a little rust on the drum so it was all carefully re-assembled.

Less satisfactory was the state of the fork legs under the clamps which hold the mudguard stays. The fork legs had been nickel or dull chrome plated at some stage (they ought to be painted black). Under the clamps, the nickel had lifted and the base metal was badly rusted. Since I have a phobia about rust there was no option but to remove the clamps and mudguard and carry out an aggressive de-rusting program. Several coats of aluminium paint later things looked a lot better. Eventually, I will probably dismantle the forks and have the legs and covers powder coated black. Re-assembly was a comedy of errors. The clamps were of stainless steal and I suspect home made so finding a matching pair for each side took a while. Then I found that the holes were so close together on one side that it was extremely difficult to tighten the nuts so I had to search for a pair of socket head screws to make the job easier. Then when finally tightened up the clamps were still loose on the legs. Thinking back I remembered that I had removed some packing from under the clamp which on closer inspection turned out to be leather, I suspect that this packing was the cause of the corrosion as it would have retained moisture and festered away unseen until too late. Anyway I found some s/s shim and this combined with insulating tape to hold it in place has ensured the clamps are tight for now. I am not totally happy with this situation and I have some thoughts on how to make a better job.

While the wheel was out I was able to check the front end for play more easily. I could feel some slight movement and thought initially it was the steering head bearings. Tried tightening them but really there was nothing to take up so the play must be in the fork legs themselves. Now we have a working front brake I will be able to test the fork action and see if there is any need for further investigation. To finish of

the day I decided to try the pillion seat to make sure there were no surprises. I did need to make up some insulating spacers from thick plastic sheet to protect the carrier paint but otherwise it fitted easily. I did notice that there were very few springs under the cover so will need to find a some spares. Both saddle covers are leather that is very dried out though quite sound. I treated them both to a dose of clear dubbin and will repeat this several more times until the leather looks more supple.

Not really much more I can do until the engine is ready for collection.

Tuesday 20th September
Happy day. I went to Exeter on Monday and collected the engine and a few other bits that had been overlooked. However, as the engine is still in bits, its not absolutely certain that I have everything. First task today was to fit the centre stand which went on easily. I will make up some better bushes in due course as the bolts I used were

not quite the right size but this is not a priority job. Amazing what a difference it makes having a stand for the bike.
I then sorted the engine bits and could find nothing obvious missing which was a relief. I spent some considerable time working out the shimming arrangements for the crankshaft. Excessive crank end float was the major reason the bike came of the road in the first place. The movement was such that the clutch could not be operated. Anyway after a dozen or so trial assemblies using various combinations if shimming I got a satisfactory result, A crank which spins easily but no detectable end float. Two rear main bearings were supplied, one was a standard 6207, the other was a double row ball bearing of the same size as a 6207. This allows a small amount of axial movement on the crank (much as was done with the Norton Commandos). Not sure the engine really needs it but I used it anyway. I then fitted the flywheel, a massive assembly. It will need a further tightening up on the taper but I will have to put the engine in the frame to achieve the necessary leverage.

The timing gear is very simple, small sprocket on the crank, larger sprocket on the camshaft (which was already in situ). Some time spent looking for the woodruff key to get the small sprocket in place. Not to be found so I made one, which took ages because it was so small and fiddly. Finally the sprocket was properly located and I was able to fit the timing chain. This was also obviously new and I had to resort to a cable tie to draw the end together before I could fit the link. I turned the engine over a few times to make sure it was still free and that the cam timing was roughly correct. Next task was another tedious one, making a gasket for the timing cover. Once done, I was able to oil the seals and put the timing cover in place. Then I hit the next snag, the v belt pulley for the dynamo would not fit, the shaft was not sticking out far enough. This shaft is an extension of the lock nut for the crank timing sprocket. Off with the cover, about twenty times in total before I found the correct combination of washers under the lock nut that allowed the pulley to fit without the nut fouling the inside of the timing cover. Finally we had a free engine and secure pulley. The outer engine cover serves two purposes, to protect the dynamo drive mechanism and to provide the mounting for the point plate. As the advance/retard is manual, the points box actual rotates. All seemed well and the points were already correctly gapped and did seem to open at about the right place. I will have to find out the correct timing, for now I left it alone.

A nice new piston (R60 BMW I understand) and a re-sleeved barrel came with the bike so these were fitted after I had improvised a ring compressor out of a piece of thin strip steel and a couple of cable ties. This piston has three compression rings and two oil control rings. Seems like a bit of overkill to me and if the engine feels stiff after running–in, I may remove one of more of these rings. Amazing to think that it took me a whole day to get this far on what is a very simple design. I guess it's always the same with an engine that someone else took apart and it will be a lot quicker and easier next time. Final check before packing up for the night and the engine still turns freely though a little more friction

now a piston is in place as you would expect. Tomorrow the cylinder head.

Wednesday 21st September
Overnight I had an epiphany and suspected I had made at least one if not two mistakes in the previous day's assembly. Sure enough, when I undid the flywheel nut and looked up the keyway, it was obvious that the woodruff key had displaced. I had to make an extractor to get the flywheel off but it was then only a moments work to re-position it. The nut then tightened up correctly. The second problem involved the position of the washer holding the sprocket locknut. They were not in fact holding the sprocket in place, just acting as spacers to get the dynamo pulley lined up. In the end I had to make a washer on the lathe to get the correct diameter and thickness. Having cleared up yesterdays mistakes, I felt confident enough to oil the timing gear, put some Wellseal on the joint faces and seal the timing cover up. Whilst at that end of the engine I also checked the ignition timing and found it to be spot on at 12mm btdc fully advanced. The cylinder head went on easily enough though the nuts are very fiddly to engage as they are between two fins. Almost forgot to put the pushrods in initially but finally we got to the acid test; would the valves hit the new piston. Thankfully the engine turned over freely with no nasty metallic clanks.

Back to the lathe for the next task, make up a mandrel to centre the clutch plates. I used a piece from an old wooden broom handle for this, which worked very well. Clutch assembly is fairly easy once you get the hang of it. The springs and bolts are pushed through a hole in the flywheel crankcase, I found the best technique was to push the springs into compression using a large screwdriver held in place against my chest whilst doing up the nut from the other side. Then turn the flywheel 1/6 of a turn to do the next one. Finally they were all done up. I was really pleased when the gearbox slid into position with only a modicum of persuasion. I have removed it again for now as I am hoping that I can put the engine in the frame first then add the box afterwards. Trying to put both in together is quite daunting; this is no lightweight. Tomorrow, the engine in the frame?

Thursday 22nd September
I debated whether to phone a friend to help me put the engine in the frame. However, having given the matter some thought and carried out a trial lift of the various assemblies, I decided that I could probably manage. In truth I did not have the patience to wait until someone had the time to come over and help.

In fact it was not to difficult. I put the engine on the bench and the rolling chassis on the bike lift with some bricks and wood blocks inside the frame at about the height of the sump. Some rags protected the paint on the frame and it was relatively easy to drop the engine into place. It has to be tilted to the right as part of the crankcase fits between the arms of the pressed steel frame. It then has to be tilted forward for the front engine bolts to enter the cross member in the frame. Actually takes longer to describe than to do it. With the engine in it was time to fit the gearbox. It was at this point I discovered I had been mislead. There is no way the gearbox can be fitted unless you remove the back wheel and the rear mudguard. You also have to fit the bevel box and drive shaft before trying to refit the rear mudguard. Any other sequence is doomed to failure, don't ask me how I know.

Thanks to my dry run on the bench, the gearbox fitted easily and it was a straightforward but tedious job to do up all the bolts. A couple of the bottom ones are real pigs to get started. I was relieved to find that I did have clutch operation when everything was tightened up. Not as much as I would have liked; the lever travel is

limited by the bell housing, but certainly enough (or so I thought) for operational use. The exhaust system was next and gave me a few headaches. The pipe seems not to be quite the right bend and does not follow the shape of the frame. In part this is due to it fouling the engine mounting bolt so I need to think of a way to slim this down. The silencer is a Chinese pattern item and a very tight fit on the pipe. In fact I had to cut a slot on the inside to get it on at all. Eventually I managed to make up various brackets and gaskets to achieve a satisfactory fit for the exhaust system but it is something I will need to re-visit.

Connecting up the electrics, filling with oil and sundry other minor tasks did not take too long so I fitted the carb as well. At this point I could not resist rigging up a temporary tank and attempting to start the engine. To my utter surprise it coughed and almost ran on the very first kick. However, that was as far as we got, no amount of kicking or squirting petrol in every orifice would do produce more than the odd cough or splutter. I also noticed that there was no evidence of oil coming out of the rocker feed (I had left the rocker cover off for this very purpose) and the charge light went out and would not come back on. I decided to call it a day; a lot of progress but still a few problems to be investigated.

Friday 23rd September.

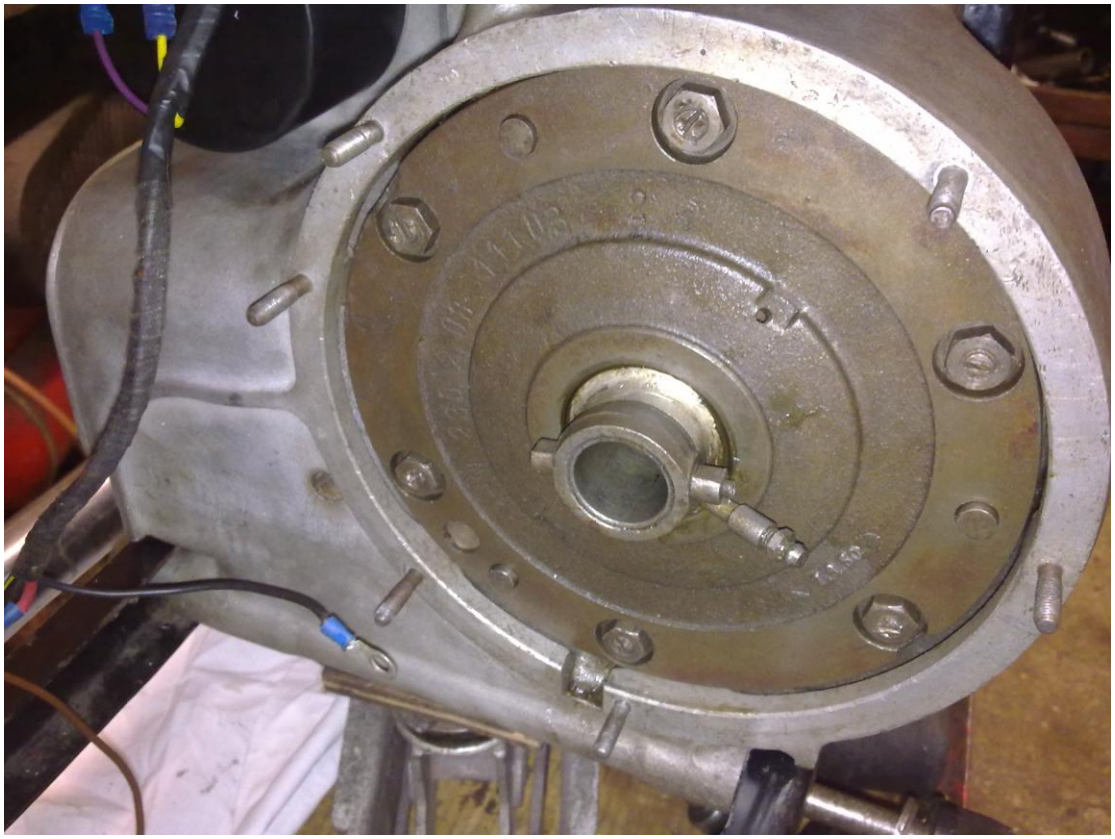
Thinking about the issues overnight, I was convinced the problem was electrical as the spark was not very bright. However, wisely it turned out. I decided to strip and clean the carb first as this had not yet been touched. This is a strange device in two respects, the throttle barrel fits horizontally rather than vertically and the slide has no needle. Not just missing, it is not designed to use one. Instead, there are three vertical jets which are progressively exposed as the throttle is opened. They are graded in size with the richest only being exposed at full throttle. Very odd but very simple and I found nothing obviously wrong with any of the carb components. However, the throttle cable did break on reassembly so a fair period of time was spent making a new one.

An hour of playing with the carb setting and swapping plugs left me in a sweaty lather and not a lot of progress, It would fire and run for a couple of revolutions but simply not pick up. Finally inspiration struck and I took the top of the float chamber and injected fuel directly almost to the top. The engine immediately became more responsive and within moments I had it running reasonably well. Eventually getting it warmed up enough to set a nice even tickover. The problem I think is that the float is too far down the needle so the fuel level is far too low. I have moved it up a bit for now but will need to strip the carb again and examine the float needle and possibly file some extra notches. I was feeling pretty cocky by then so well overdue for my comeuppance. For no particular reason, I pulled in the clutch lever; there was a horrible graunching noise and the engine immediately stalled! Panic panic panic. Gently operating the kickstart gave no indication of problems so I turned the ignition back on, gave it a proper kick and the engine started. Ran smoothly, no indication of a problem so I looked at the clutch area, The lever has a large nick out of one side, has moved to the left somewhat and is also bent. Experimentation showed that when you pull the clutch lever in fully, it is fouling something on the flywheel, Bad but even worse is the fact that there is now virtually no arm movement left to actually operate the clutch. Obviously a major strip down is needed to discover what has gone wrong. I decided to pack up early, enjoy a leisurely dinner with a bottle of wine and leave the whole matter for another day.

Saturday 24th September

After an hours patient disassembly I finally managed to get the gearbox out of the bike to inspect the damage, I also removed the head and barrel so that I could check whether the crankshaft had moved. The damage seems to be limited to the bent and chewed clutch operating arm which can be seen in the picture above. Looking at the crankshaft through the top of the crankcase, the amount of clearance looked pretty much identical to what I had set originally. This did eliminate one fear that the multi row main bearing I had used was not suitable for the task. There was nothing else obviously wrong. After much head scratching the only thing I could conclude that the

problem was caused by the drive pins in the flywheel, which seemed to be sticking out much farther than was necessary. I did momentarily consider taking an angle grinder to them but common sense prevailed so I retrieved the extractor tool I made a couple of days ago and pulled the flywheel. The pins are a tight press fit in the flywheel and with the clutch assembled on the bench, it was obvious they only needed to protrude about 20mm. In fact two were about 26mm and the other was 25mm. Careful squeezing in the vice got them all down to 20mm without damaging



anything. This still leaves about 1.5mm for the pressure plate to move outwards which I think is plenty. You can see the result in the picture below:

The next problem was to get the correct bend on the clutch operating arm. This took longer as it was a trial and error with the gearbox having to be removed each time. Finally I got a shape that fitted and gave me the same amount of movement as in the original build. Turning the engine with the clutch open showed no fouling this time so hopefully I have resolved the problem without any major damage. After discussions with various people the conclusion we have reached is that someone had started to overhaul the motor and replaced the drive pins. I did notice that they looked perfect with no evidence of the wear you might expect on such a component. Whoever did the job either never finished the task or did not know how to set them correctly. I spoke to the previous owner but he had never had the engine running to encounter the problem. However, I did notice that the gearbox oil was leaking from the drain plug; this turned out to be only finger tight due to totally stripped threads. Full assembly now on hold whilst I get the drain plug thread repaired.

Tuesday 27th September

The gearbox remains a problem. I was able to borrow an 18mm by 1.5mm tap from a friend together with the correct size drill. I did a test on a piece of scarp alloy to start with and it was obvious that the tap did not want to start in the correct 16mm hole. Even opening it out a bit more would not do the trick. I think the problem is two-fold, I

do not have the proper tap wrench in a size suitable for the 18mm tap and I think the tap is well worn so needs a lot of pressure to get it started. Decided to leave this for now while I consult another friend and get on with a few other jobs.

I have replaced the barrel and head on the engine as all seems well in that department. I made up a thinner head gasket in alloy and tried this in place of the very thick brass head gasket. The valves still cleared the piston so I have left the alloy gasket in place. Kicking the engine over I was able to see that oil was coming out of the crankcase feed pipe to the rockers so the pump is clearly working which was a relief. I also had another attempt at fitting the exhaust system having found another bracket that lined up with a convenient hole in the frame. To get the pipe to fit better in the silencer, I cut several short slots at the very end to allow the pipe to shrink slightly in size. This has worked well and the pipe/silencer joint is now very sound. Overall I am now happy with the alignment and security of the exhaust system. You can see the new clamp in the picture below.

While the exhaust system was off, I had another look at the centre stand fixings and figured out a way to fit the stand spring in such a fashion that it will hold the stand up when not in use and keep it down positively when the bike is on the stand. The picture below shows the result. Not been able to test it yet as there is no wheel in the bike but I am hopeful. I will need a stronger spring; the one fitted is just to get confirmation of size and fit.

I then had ago at fitting the tank for the first time. The riders seat has to be removed first as the back of the tank will not quite slide under the front end of the seat. The front fixing bolt is very awkward to reach so I fitted a locked stud which the tank now drops on to and can be bolted up from the top. Fortunately, the back two fixings are easy to reach with ordinary bolts but rubber washers will be needed eventually. The

seat went back on but the clearance at the front engine is marginal so I will make up a thicker spacer to lift the seat about 5-6mm. This will be a good thing anyway as the bike is very low and I have long legs.

Once I get the gearbox drain plug sorted I think we can hope for a full assembly and possibly even a test ride.

Wednesday 5th October
Hard to believe that a week has gone by since I wrote up the project. However, it did include 4 days in Cornwall on our club's autumn run. For once we had absolutely superb weather and I was able to take advantage of the journey to visit a friend in Exeter who has both the tools and the skill to do a small machining job for me. During the previous week I had an inspiration and fitted the gearbox with washers on the studs to effectively move it a little further from the engine. The idea was to see if it increased the amount of available movement on the clutch arm. Eureka, it did just that so moving the clutch arm pivot point backwards would achieve the same result. This could be done by milling .9mm (the thickness of the washers) from the back of the clutch arm clamps, hence my visit to Exeter. Today I was able to fit the gearbox to the engine and thankfully the clutch arm now has a full range of movement. In fact I had to shorten the cable outer to give some free play. As far as I can see the clutch arm is now well clear of the drive pins even at full lift. During the preceding week another friend had helped me cut an 18mm thread in the base of the gearbox for a new drain plug so that problem is also fixed. After a tedious couple of hours re-assembling everything, I finally got back to the situation I was in on 24th September. The difference this time was a clutch that work should work properly and a gearbox that no longer drips oil.

Thursday 6th October
After a final test of all systems I started up the engine, which sounds fine in spite of my new, thinner head gasket. I gingerly pulled in the clutch and there was only a faint tinkling noise as it reached the bar. Once I had adjusted the cable properly and fitted the handlebar grip, the noise went away; what a relief. It was now worth fitting the tank properly which also entailed making up the spacers to lift the riders seat so that the nose did not scrape the top of the tank. Some rubber rings provided a suitable soft mounting for the tank. Until now I had been putting fuel directly into the top of the float chamber but with a tank in place I was able to connect tap to carb with a view to a proper fuel feed. What a palaver, the fuel system simply refused to oblige. Testing the tap, the pipe and the carb individually everything worked fine. Connect them together and no fuel reached the carb. Eventually, after about the 5th strip and rebuild it all started to work. The worrying thing is I am not sure what the problem was so it could recur. Anyway we finally had enough fuel to be able run the engine for a reasonable period so I could check out the dynamo. Initially this did not work and the charge light was very erratic. However, I found that giving the dynamo its own dedicated earth wire back to the battery cured the problem and with a temporary ammeter in circuit the dynamo registered a charge even with the headlights on. That was another relief. I finally plucked up courage to try riding the bike. It was something of a comedy to start with as some of the gears were reluctant to engage and I was unclear which was which anyway. Pulling away seemed very sluggish. I finally thought to look closely at the gate and sure enough it was clearly stamped with the gear positions. Putting it in first gear made all the difference; I had been trying previously to pull away in third. The ride was very limited about 10yards to the end of the drive and back but it was very satisfying. Then I noticed it was leaking oil all over my left boot, which brought me back to earth again. The immediate source was not obvious, it seemed to originate from the top of the crankcase and there are a number of suspects including the pushrod drain tubes, the rocker feed pipe and the breather.

As I was running short of time, I cleaned it up as best I could and left it for another day.

Saturday 8th October
Autojumbling has taken up most of the last couple of days so not a lot has been done. I did get some s/s jubilee clips which I have fitted to the drain tube rubbers to seal any possible leak there. I also tightened up the nuts on the rocker feed and screwed the pressure gauge in more firmly. When I ran the engine for a short period there was no sign of any heavy discharge of oil. However, it needs more testing to be sure. With an old engine like this there is always going to be some leakage. The wiring around the battery was also annoying me as it looked so untidy. I spent a little while re-laying the cabling then made up a black plastic cover that pushes down into the battery box. It actually looks quite neat now. A couple of times I trapped my fingers between the bars and the tank and I noticed that the brake lever clamp is fouling the tank on full lock. The bars fitted are wholly incorrect in shape but all I had available at the time. Though the long term aim is to fit the 1" bars, I will have to I will have to hunt out a better pair for the time being. Wish I had noticed this before I went to the autojumble. Tomorrow I am going to clean up the bike and take some pictures as I reckon its is now pretty much ready for an MoT.

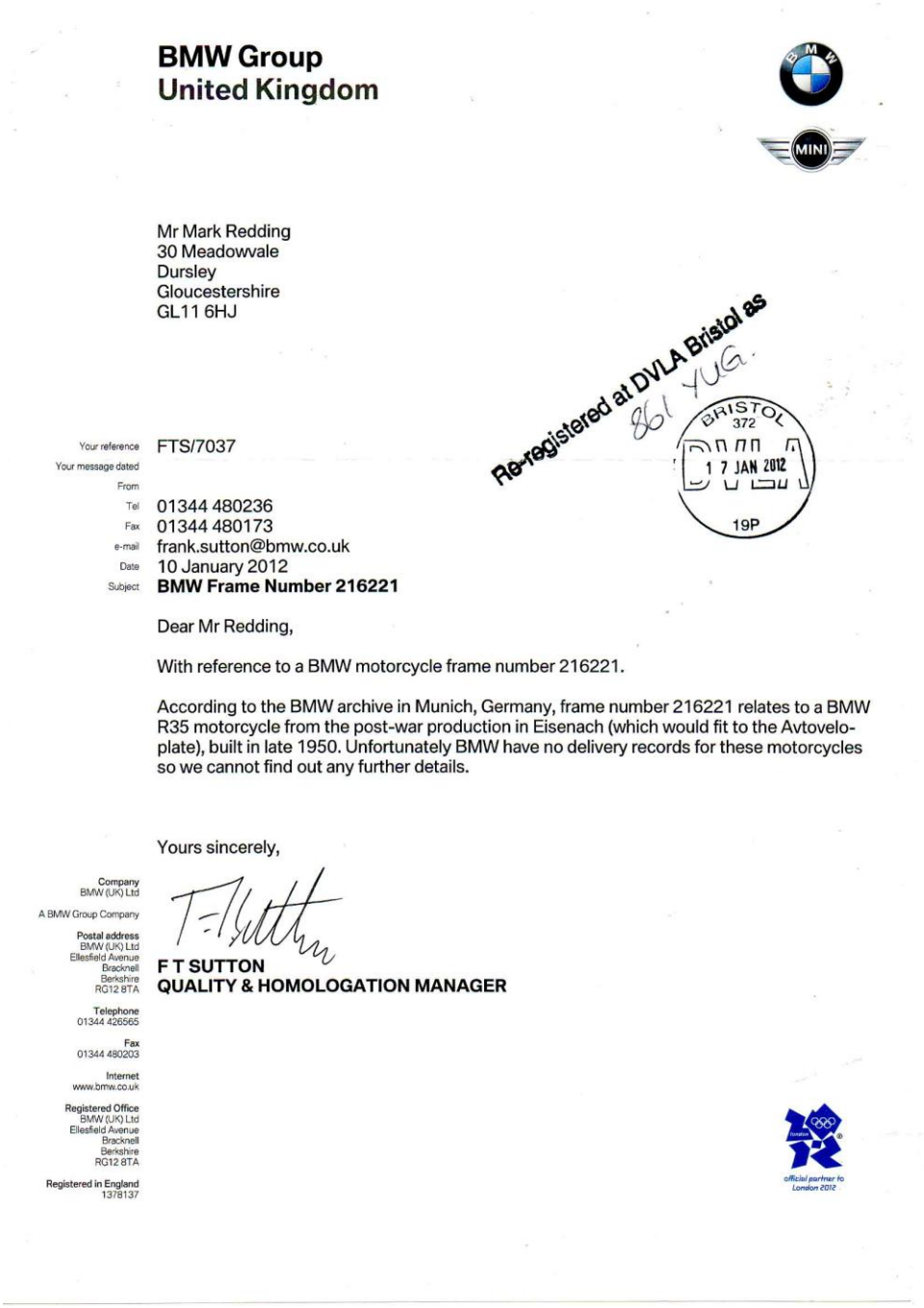
Wednesday 12th October
The bike was presented for MoT today and came home with a ticket and no advisories. Almost a sense of anti-climax and it really means the start of the next phase; getting the registration process completed and getting the gremlins sorted. I guess that will be Part Two of the saga.

Thursday 3rd November
The R35 has been sidelined for a few weeks due to other commitments and because I am still waiting for a visit from the dating officer. I have however collected a couple of better shaped handlebars from friends and I bought a pair of Kawasaki handlebar clamps from Ebay. The latter should have enough meat on them to allow boring to 1" diameter in due course, In the short term, the clamp arrangement makes it easier to swap handlebars as I try out different shapes. Today I decided to have ago at swapping the bars. Fitting the new clamps was easy enough but time consuming as I had to make up various spacers and washers to get the right amount of preload on the rubber mounts. Too much and there was no insulation at all, too little and the wobbled like jellys. Tried the set of Triumph bars first but the simply did not look right. I think the other bars are BSA or possibly Ariel, anyway the looked a lot better and at least my fingers no longer get trapped against the tank. I had to make up a longer clutch cable as the original was too short for the new higher rise bars. Anyway the result is shown below: You can see the neat clamp I found in a spares box for mounting a mirror. Pity I could not find a second to give me a nearside mirror as well. The clamps will need painting black but once that is done I doubt anyone will notice the change. Eventually of course I will be doing this all over again to fit the 1" bars and the inverted levers.

Thursday 5th January 2012
This has been a very frustrating period. Despite the elapse of nearly three months the MZ club has still not been able to produce a dating letter for the bike. To add to the frustration, I have held back from registering the AWO425 as well since I wanted to avoid a succession of 80 mile round trips to the DVLA office in Bristol. Finally today I decided I could wait no longer so off to Bristol I went with the AWO paperwork and took with me the BMW paperwork. To my utter surprise, they were prepared to accept the 2004 letter from John Lawes as the dating certificate even though John himself had told me they would not. This does mean it will be recorded as an EMW but I can live with that for now. It is not I believe wholly correct as VEB EMW was not created until July 1951 and bikes with the Red EMW badges were not produced until March 1952 according to my German friends. However, EMW seems to be accepted as a generic name for R35s produced at Eisenach regardless of the manufacturers name shown on the VIN plate (Awtowelo in the case of my bike). The registration will not be completed until 17th January when both bikes have to go to Bristol for inspection by DVLA. Very galling to think that I could have completed the registration process back in October 2011 if I had not listened to other peoples advice.

Tuesday 17th January 2012
Something of a breakthrough. Only two days ago I heard from Mark Redding the MZRC Classics Officer who had been working on the dating certificate for the R35. He had contacted the BMW club for confirmation of date of production, something that surprised me at the time as, though the identity of the bike was clearly in doubt, I thought the date of manufacture was pretty well documented. The BMW club referred the query to BMW in Munich who came back with the letter below confirming 1950 as year of manufacturer and calling it a BMW made at Eisenach not an EMW. A result at least and exactly what I had always thought to be the case. I presume that this change in attitude by BMW, who took the Eisenach factory to court in 1951 to prevent the use of the BMW name on post war R35s, is due to re-unification. This was real

11th hour stuff, I had to collect the letter in person from Mark as there was no time for it to be posted. However it was worth the trip, DVLA inspector was happy to accept the BMW letter and the bike is now officially registered and has an historic tax disk. I phone the insurers when I got back so the bike is now fully road legal.



BMW Group
United Kingdom

Mr Mark Redding
30 Meadowvale
Dursley
Gloucestershire
GL11 6HJ

Re-registered at DVLA Bristol as 861 YUG.

BRISTOL 372 17 JAN 2012 DVLA 19P

Your reference FTS/7037
Your message dated
From
Tel 01344 480236
Fax 01344 480173
e-mail frank.sutton@bmw.co.uk
Date 10 January 2012
Subject **BMW Frame Number 216221**

Dear Mr Redding,

With reference to a BMW motorcycle frame number 216221.

According to the BMW archive in Munich, Germany, frame number 216221 relates to a BMW R35 motorcycle from the post-war production in Eisenach (which would fit to the Avtovelo-plate), built in late 1950. Unfortunately BMW have no delivery records for these motorcycles so we cannot find out any further details.

Yours sincerely,

F T SUTTON
QUALITY & HOMOLOGATION MANAGER

Company
BMW (UK) Ltd
A BMW Group Company
Postal address
BMW (UK) Ltd
Ellesfield Avenue
Bracknell
Berkshire
RG12 8TA
Telephone
01344 426565
Fax
01344 480203
Internet
www.bmw.co.uk
Registered Office
BMW (UK) Ltd
Ellesfield Avenue
Bracknell
Berkshire
RG12 8TA
Registered in England
1378137

official partner to London 2012

Wednesday 18th January 2012
Down to earth a bit; firstly its raining and forecast to stay that way for a couple of days. No way am I taking it out for its first ride in the wet so it's tinkering time. I had originally taken the bike to DVLA on 5th January along with the Simson but they would not carry out an inspection at that time, hence my return on 17th. Just before Christmas I had slipped on black ice (walking the dog, not riding a bike) and broken a couple of ribs amongst other bruises and grazes. Getting the bikes on the trailer had been difficult and painful so I decided to leave both bikes on the trailer and sheeted

them down to protect them from the worst of the weather as the trailer was too wide to push into the garage. This was possibly a mistake, When un-sheeted both bikes had suffered cosmetically. There must have been some slate on the road on 5th as any exposed metalwork not painted or otherwise protected was showing signs of corrosion, the R35 more so that the Simson which had largely been newly painted and plated. So today I will work through the bike, put on the number plate and tax disk and clean/paint where I can. I will also try to replace the rusty nuts with s/s items if I can get the right ones. A lot are in metric fine pitch which is not something I normally keep in stock.

I also need to work on the trailer, too add to the excitement a wheel bearing broke up on the way home. Nothing I could do but keep driving very slowly with one eye firmly glued in the wing mirror to watching the wheel. We made it without the wheel falling off but it is not something I ever want to do again. I also found that the R35 is very low and bottoms out when wheeling it up/down the ramp. As this bike is likely to be trailered a lot, I need to attend to this as well as the bearings. It really needs re-painting as well so this could be a major diversion of time and energy but needs to be done ready for start of the serious riding season in April.

Friday 20th January 2012
Well I still have not ridden the bike for a variety of reasons. The main one being a pre-occupation with one of our dogs, who has been very ill. In truth the weather has been wet until today and it is now cold and windy so I doubt I would have ridden it anyway. However, in between times I have tidied up the bike somewhat, I found some nice fine pitch s/s nuts on the internet and they make a surprising difference. Some BBQ paint on the barrel and touching up a few other spots has also helped. I also made up a strap to hold the centre stand in the down position. The centre stand does not go over centre quite enough and as the bike is nose heavy, in can all too easily rolled forward off the stand. The strap is only an interim measure as it will be a nuisance but better that than the bike falling over and being damaged. I had asset back this afternoon as well, the return spring on the k/s broke. I thought this would be a fairly easy thing to source but an exhaustive search on German ebay and various other specialist sites failed to locate one. I have devised a temporary fix using a bungee cord whilst the search goes on. The number plate and registration disk are now fitted, perhaps the weather will be suitable tomorrow.

The trailer wheel bearings have also been replaced and I modified the ramp to make it suitable for the R35 in future. So quite a productive couple of days overall.

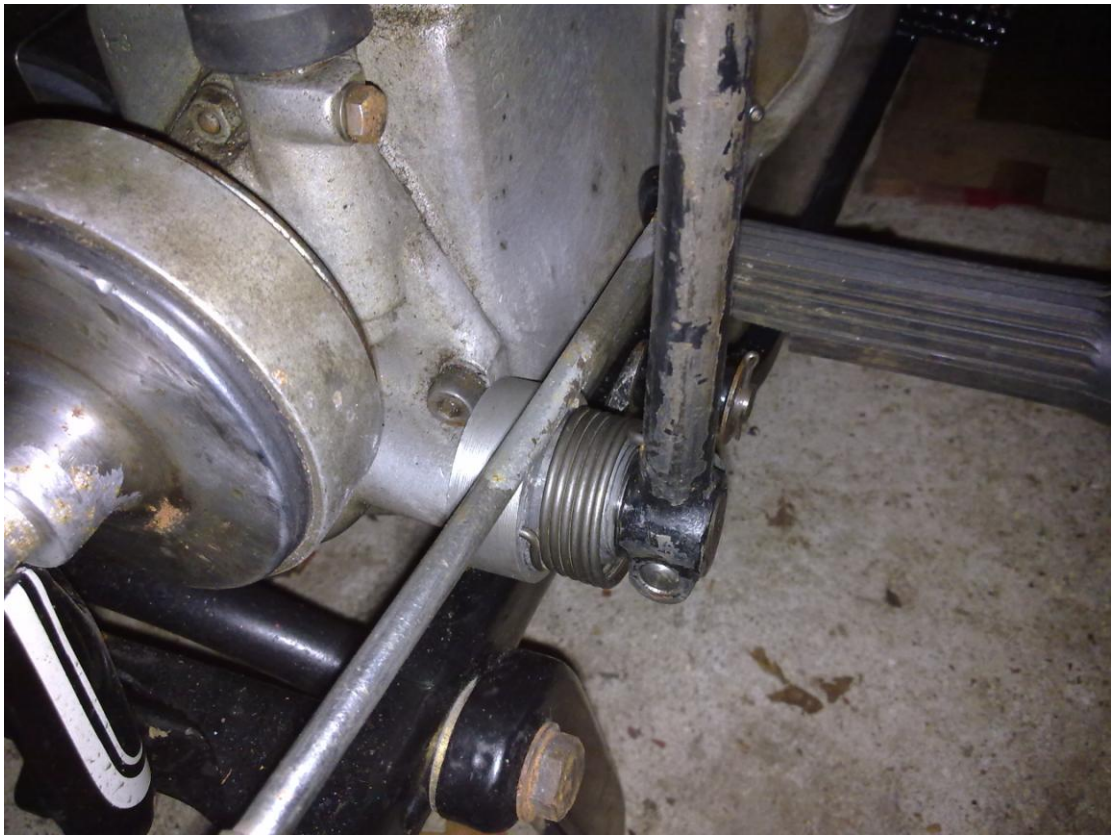
Thursday 26th January 2012

Yesterday I finally plucked up courage and took the R35 out for its very first trip on ht public highway. Only about a mile or so up and down the road outside the house as I did not want to stray too far in case of problems. In fact there was nothing serious to report. The biggest problem is the lack of the k/s spring which means I have to secure it before riding away. The first couple of times the engine stalled of course but eventually we got going. All four gears select quite easily with hardly any crunching. On the stand getting 3rd/4th was difficult, but on the move they select ok. I had expected it to be a very hard ride with the rigid rear end but in fact the spring saddle made it quite comfortable. The front suspension worked well taking the shock out of traffic calming speed humps. Bit of a relief as apart from testing the front end for obvious play in bearings and sliders, it has not been touched. Hardly used the brakes as I was travelling quite slowly, probably not more than 30mph tops (which means the speedo works too) so these will need to be tested more vigorously next time. Some smoke around the top end of the engine; no obvious leaks so it may just be the

assembly oil and BBQ paint burning off. All in all a very satisfying first ride. Only job needing immediate attention a leak from the rocker feed pipe unions. I tackled this today but it has been raining again so no real incentive to take another test ride for now.

Wednesday 21st March 2012

Nearly two months since I last wrote anything about the R35. Not lack of interest or enthusiasm, just lack of time and incentive due to another parallel project. The kickstart spring was resolved by a stroke of luck. Whilst wandering round the stalls at the Shepton Mallett autojumble in the middle of March I spotted a stall which had a display card with a large variety of k/s springs. Amongst these was one for a Villiers 3 speed gearbox which was very similar in design to the broken R35 spring. As it was only £4 I took a chance and bought one. Back home it proved to be a good fit except in once respect, it was too short but I was able to make up a spacer which bridged the gap and voila, a fully functioning k/s lever again.



I also removed and had powder coated the footrests and rear brake lever as these were rusty and spoiled the look of the bike. These bits came back a couple of days ago and have now been fitted. Spurred on by this success I finally plucked up courage to take the bike out for a ride today. Apart from a binding back brake caused by forgetting to adjust it after fitting the footrest and brake lever, the bike ran well and we did about 15 steady miles mostly at 30-35 with an occasional burst up to 40.

The engine seems fine not much if any oil leakage, which was a pleasant surprise. The gearchange worked well, Getting into top gear requires a knack which needs practise but all 4 seem to work fine. Hardly used the brakes so they still need a more vigorous testing. There are a few of points which need investigation:

The position of the rear brake lever is unsatisfactory, sits too high and you have to lift your foot to operate it. I wish in some ways that it was on the other side as with the rh gearchange my left foot wants to operate the brake. Something to investigate,

The rear drive unit seems to whine or rather moan more than I would expect and it got very warm by the end of the run. I double checked that it contained oil. It may just need a few more running in miles to loosen up, but I am concerned that it may have been rebuilt with too much preload.

Of most concern is the jerking which happens at times normally when the speed is above 30mph and if the engine is pulling. It feels more like transmission than an engine or electrical problem and may be connected to the issues with the rear drive.

A trivial matter, but a lot of rust has appeared on nuts & bolts and on some of the paintwork through being stored in a damp garage for the winter. I weed to either replace with stainless, if I can match the thread size/pitch or zinc plate what cannot be replaced.

Other than that it was a pleasant ride and I think this is going to be a good bike.

Monday 26th March 2012

I took some time out to consult with others about the problems concerning the back axle and spent today following up on the advice given. The rear brake lever position was fairly easily solved though the actual problem was more complex than it first appeared. I have done part of the fix and know what else needs to be done which I will document at some future time. It is now apparent that the back axle needs some expert attention so the rear brake assembly has now been removed along with the bevel box, back wheel, mudguard and the rear electrics. As the wheel is supported on one side by the bevel box, which is now removed, the bike is effectively immobile and stuck on the bike lift until a repair is completed.

General diagnosis over the phone by the guy who rebuilt the bevel box for the previous owner, supported by some tests conducted by a knowledgeable friend, is that the meshing is too tight between the crown wheel and the pinion which is what caused the heat and that continuing to run it like this will cause serious damage. So the bevel box is going back to Devon as soon as I can arrange it for investigation and hopefully adjustment.

I also looked into the lurching or jumping problem encountered on the initial run. My fear was that the drive dogs were worn and that they were effectively sliding out of mesh under load. I am not so sure that this is actually happening now. There is no evidence of play when the assembly is tested statically and the amount they would have to move to create the lurch does not seem possible when everything is tightened up. I suspect that the lurch is somehow connected with the bevel box issue and will put this problem on the back burner for now. If it is still present when the bevel box has been sorted then I will investigate further.

Wednesday 4th April

No progress with the bevel box, After further discussion, a friend who is an experienced engineer and I are going to strip the box and try to fix the problem ourselves. It will be good experience and very satisfying if we succeed. If we don't, it

can still be sent to Devon in bits. Due to other commitments on both parts, the work on the bevel box has been deferred until after Easter. However, I did use the opportunity to redo some of the wiring which was untidy and annoying me. I am also part way through adapting a better rear light unit which will have LED bulbs to reduce the load on the dynamo.

Friday 13th April 2012

Hopefully this is not a day of ill omen. My friend Terry kindly donated his workshop and time to strip the bevel box of the R35 . What we found was worrying but with luck not fatal. The pinion was meshing far too tightly into the crown wheel and was blued showing excessive heat. Though the parts were new the pinion at least is now worn how badly only time will tell. The crown wheel seems not so badly worn. There were a number of problems revealed and it is unclear which was the cause and which was a consequence. Firstly the nut locking the bearings and shims for the pinion was loose and the thread was stripped. Tis meant the pinion could move up the crwon wheel making the engagement ever tighter. Secondly the crown wheel was not shimmed correctly and the assembly may well have been able to move in its housing, especially as the wheel spindle was locked up. We suspect that it was this that caused the pinion to be dragged into the crown wheel initially. The oild we drained out was very dark and sparkled slightly in the sunlight indicating the presence of very fine metal particles. Anyway after a number of trial assemblies and measuring back lash etc, we final achieved a satisfactory and were able to bolt everything up. It now feels like a smooth transfer assembly instead of the glitchy clunky thing we started with. Our hope is that the 20 mile test run with incorrect assembly has not worn completely through the case hardening of the pinion, only time will tell. Reassembly and a test run will have to wait until next Tuesday as I am committed to other things for a couple of days..

Thursday 26th April 2012

Well the weather and the arrival of the riding season conspired to delay my test ride on the R35 until today. First attempt was just ½ mile or so to he end of my road and back again. No problems noted with the bevel box and it was still quite cool. The centre stand was clattering on the silencer so I took 5 minutes out to fix this, then made a longer ride. Only about 4 miles and all on urban roads near to the house so that it was not far to walk/push if there was a problem. Back home and the central part of the bevel box was still cool. The outer part was warm but this was just heat transfer from the brake linings so things are looking good. Just want some decent weather to allow a longer ride. We have gone from a drought in March to a monsoon in April and hardly a day without some rain. Two things need further investigation. The lurching I noted previously is still present. I am pretty sure its carburetion rather than mechanical. It does not seem to happen on acceleration or on the overrun, just when trying to cruise on a light throttle. Not serious enough to stop me riding it anyway and I will solve it eventually.

The other problem is a safety issue. I feel very vulnerable because it’s difficult to give hand signals when turning right. The right hand is just too busy juggling with throttle, brake and gear changing. It may just be a question of practise and confidence but for now at least I intend to fit a set of indicators. Not period obviously, but it will make me feel a lot safer. So tomorrow I will delve into the spares to see what I can find.

Saturday 28th April

Well as always, it took longer than I expected, but I now have a set of ex MZ indicators working on the R35. A couple of pictures are included to show the end result.

The bicycle rear light is just a precaution with the original rear light as I did not entirely trust it. The rear light now fitted is more robust and has leds for both rear and brake lights. Not original, but then neither was the one I removed which is believed to be something made in Poland. I was going to buy one of the original type from Germany, but frankly the quality of the one I got for the AWO425 was so poor I will not bother. I doubt there are many people in the UK who know what type of rear light is correct anyway.

I now believe the bike to be roadworthy though doubtless a few more snags will arise, which if serious or of general interest, I will add to the diary. Otherwise I think this project is at an end. Now to hunt down a BK350 to complete my set of quirky East German bikes.

Postscript – August 2012

For a while it has become clear that I did not have the time, space or money to cope with my collection of 12 bikes, especially as there are some bikes which I am still anxious to try before I get too old to ride. A fundamental review was carried out to identify those which I could bear to part with. In the end the axe fell on two BMWs, a 1981 R80, which is duplicated by the 1970 R75 and the R35. Though I greatly enjoyed the challenge of getting it running and road legal, I did not enjoy riding it so much. Even with the indicators fitted, I was still not comfortable with the hand gear change. In terms of its role in my riding activities, it did not fit well either. As a 1950 model it fell into the post war VMCC. The mid 30s design of the R35 would have been fine if it had been made pre -1945 when it would have been competing against other post vintage machines. As it was my BSA Star Twin and Matchless G3 were both more suitable for my riding activities in this era. I decided therefore to offer it back to my friend John as I knew he had invested a lot more money in this bike than the amount I had paid for it. In the end a compromise was reached and the R35 passed into the hands of another mutual friend who will continue the re-commissioning and not being an active VMCC rider is not concerned about its age profile.

I guess this really does end the Saga, and yes I have found a BK350 which will be the subject of another saga in due course.

Click Here for Start of Document