

The BK350 Saga

End of Article

Ever since I first saw a picture of a BK350 I wanted one to add to my collection of MZs and other quirky bikes. In the UK they are quite rare probably less than 10 on the road though they are coming over more frequently particularly from Poland.

I came by mine following an advert in the VMCC journal around the end of 2011. I was contacted by Mark Hales who lives in North Lincolnshire and there followed a lengthy dialogue via phone and email supported by pictures. My preference was for a complete and running bike as I already had enough major projects. Finally in June 2012 Mark contacted me to say that he had sourced a required spare part and it was now a runner and sounded healthy. The deal was done and a cheque sent in payment. I had considered driving up to view the bike but it was a 600 miles round trip which I could not face. I knew anyway that if I had driven that far I was going to buy the bike anyway so it was bought purely on the basis of photographs and telephone conversations. The price we agreed included delivery to my home on the basis of Mark fitting it into a trip to my part of the world; something he normally did quite regularly. Murphy's Law then came into operation as Mark had no need to visit the South West for some time so we agreed to use a courier service and the bike finally arrived together with two boxes of spares on 4th October 2012. Seen below supported by friend Keith whilst the delivery driver and I both took pictures.



Other than pushing it into the garage, no serious inspection was done at that time as I was already late for another appointment. My first impression was that it was not quite as pristine as the photos had suggested, mainly the chrome which was scabby in places and the handlebars were twisted round for some reason. But what the heck it was a BK350 and it was in my garage. Mark had bought the bike from a Polish guy who brought it to the UK in 2010. Apart from a dating letter provided by Worthington- Williams, there is absolutely no paperwork so I will have to sort out the UK registration in due course. Fortunately this bike is well provided for on the Internet so I have been able to download a workshop manual, user's guide and spares book as well as other useful documents. Helpfully many of the documents were in textual format so I was able to use Google to get a somewhat quaint English translation.

Thursday 4th October 2012

Some air in the tyres made it easier to push around and a few minutes with spanners got the handlebars to a more sensible position. One of my major concerns had been the wheel hubs as they are magnesium castings and can rot. Mine seem very sound though they will benefit from clean using soda blasting in due course. The wheels themselves have clearly been rebuilt with new spokes and powder coated rims. Opening the first box established that the engine covers not currently fitted were present and in good order and there was a speedo, scruffy but working showing around 41k. There were a lot of other bits but nothing that I think I need immediately and all well worn possibly useful as swaps. The second box contained a full brand new exhaust system which was much more exciting. The original seems very sound if a bit sad so will be left in place during the tinkering stage.

Cosmetically the bike has clearly been repainted in the fairly recent past and though there are a few scrapes and scratches is generally very satisfactory. Looking inside the tank there was no sign of rust which was reassuring. Gears selected and there were no unduly worrying noises from the bevel box. Mark was lead to believe that the engine had been overhauled so let's hope this proves correct. The engine kicked over freely and seems to have good compression which was encouraging.

The immediate problem was sorting out the wiring which was almost certainly the original cloth covered type. I do have a wiring diagram sourced from the internet which gave me an idea of the colour coding but there were an awful lot of wires with very similar colours hanging loose so it's not going to be easy. I gingerly connected a 6 volt battery (which fits neatly into a combined battery and tool box). Turning the ignition switch gave me a rear light in two positions and not much else. After a couple of hours of fiddling I finally got the lights working, the main problem turned out to be a missing earth wire. This also fixed the brake stop light. The neutral switch works but needs a special bulb as does the ignition warning light. These are called cup bulbs and can be bought on the internet but are quite expensive. The AWO425 uses the same system and on that I made up leds which was fine until I converted to 12v and promptly blew them. The ignition warning light is the only

important one for now as it provides the feed to initialise the dynamo so I have rigged up a temporary light connection. I did work out how to connect a live feed to the coils and proved that we have sparks which was also very encouraging but sorting out the proper ignition connection and the other wires which terminate on the dynamo will be a task for another day. I don't want to try starting the bike as this would involve putting fuel in the tank. This needs to be removed to trace some of the wiring. As the two sides are linked by a rubber tube it will be easier to do the task whilst the tank is dry.

Friday 5th October 2012

Not too much time available to tinker today, important things like going to the library, shopping and bathing the dog to priority. However, I did manage to get into the garage mid afternoon for a few hours. The wiring is now largely sorted, quite why so much of it around the dynamo area was disconnected is a mystery. I was unable to source any of the correct cup bulbs but I have managed to bodge the warning lights for now. I also rewired the horn so that it was only live when the ignition was turned on. I still need to fit fuses but otherwise the wiring is acceptable for now. We have sparks controlled by the ignition switch rather than wired direct to the battery as was the case when it arrived.

I had to remove the tank to trace the wiring and this gave me a chance to check the carbs. I found that one of the cables was too tight and would not allow the slide to drop fully. Cutting about 5mm from the outer cable gave me enough slack and I was then able to balance both cables. The slides themselves are unusual, being flat rather than round. No petrol in the garage so no temptation to try starting the engine today. I did have a quick look at the ignition timing but left it alone pending reading the manual as it has an automatic a/r device which probably means it needs setting on full advance.

I tried adjusting the rear brake as there was a lot of movement on the brake pedal. Not too successful as I found there was no more adjustment left and the rear lever was nearly at the limits of travel. The linings looked new when checked so I am hoping the shaft is splined so I can move the lever round a bit. It was reluctant to move so rather than force it and break something I left it alone for now. Last job before dinner was to check the oil levels in bevel box and gearbox. Both bone dry which does support the fact that the bike has been rebuilt and not fully commissioned. Need to consult the manual for grade and quantity.

Saturday 6th October 2012

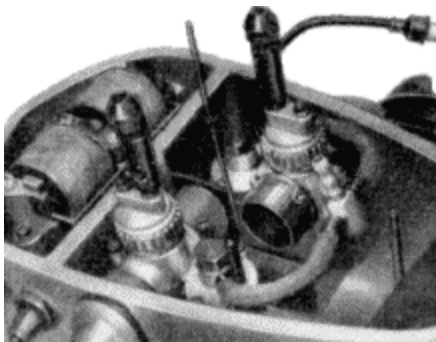
Spent most of the day at the Shepton Mallet autojumble, spent quite a lot of money but mostly on stock items like oils and a few odds/ends. I did remember to buy 5 litres of petrol which was mixed up with 200ml of oil to give the 25:1 ratio mentioned in the manual. I also topped up the bevel box with gear oil and the gearbox with engine oil as per the manual.

Half the petrol went into the tank and I gave both carbs a good tickle; there is no other choke mechanism. Sadly there was absolutely no response to a dozen or so kicks on the

starter. Took the plugs out and squirted some WD40 into each cylinder to get some lubrication behind the rings. This did the trick and the motor reluctantly coughed into life. Mechanically it sounds ok; immediate rattles or knocks but the exhaust noise was quite loud and odd so it was hard to tell. I am not sure it was running on both pots as it seemed unbalanced and reluctant to rev. Of course, one of the characteristics of these bikes is that they fire on both cylinders at the same time so it will sound a bit like a single anyway which does not help diagnosis. My wife came to call me for dinner and even she thought it sounded a bit unwell. The other thing I noticed was the ignition warning light which only just went out when revved quite hard so more investigation needed there as well. Switched off the engine and tried to start it again a couple of minutes later without success. However, when I tried again after dinner with a good tickle it did start but as it was quite late I decided to leave it for another day. Not quite the resounding success I was hoping for but not bad progress considering it has only been in the garage for 48hrs. Next task will be to check and reset if necessary the timing (3mm btdc on full advance) and strip the carbs to make sure they are correctly configured.

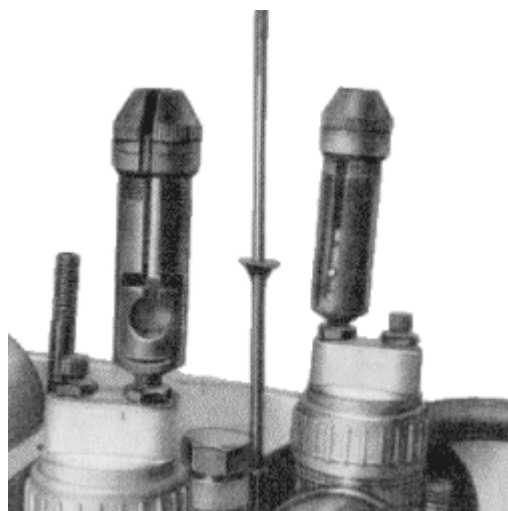
Monday 8th October 2012

Today the carbs were partially stripped and a few minor things sorted out. Both needles were in the lowest position which may be significant but for the moment I have set them per the manual at groove 3. The pilot airscrew on inside was nearly correct at 2 turns out



the other was about 4 turns out. Both are now set to 2 ½ turns out also per the manual. The throttle slide arrangement is quite unique and not just because of the flat slides. The slide is actually operated by a rod which terminates in a special housing which also locates the throttle cable. This complex arrangement is needed to allow the top cover to be removed and replaced easily. There are also buttons built into the top cover to

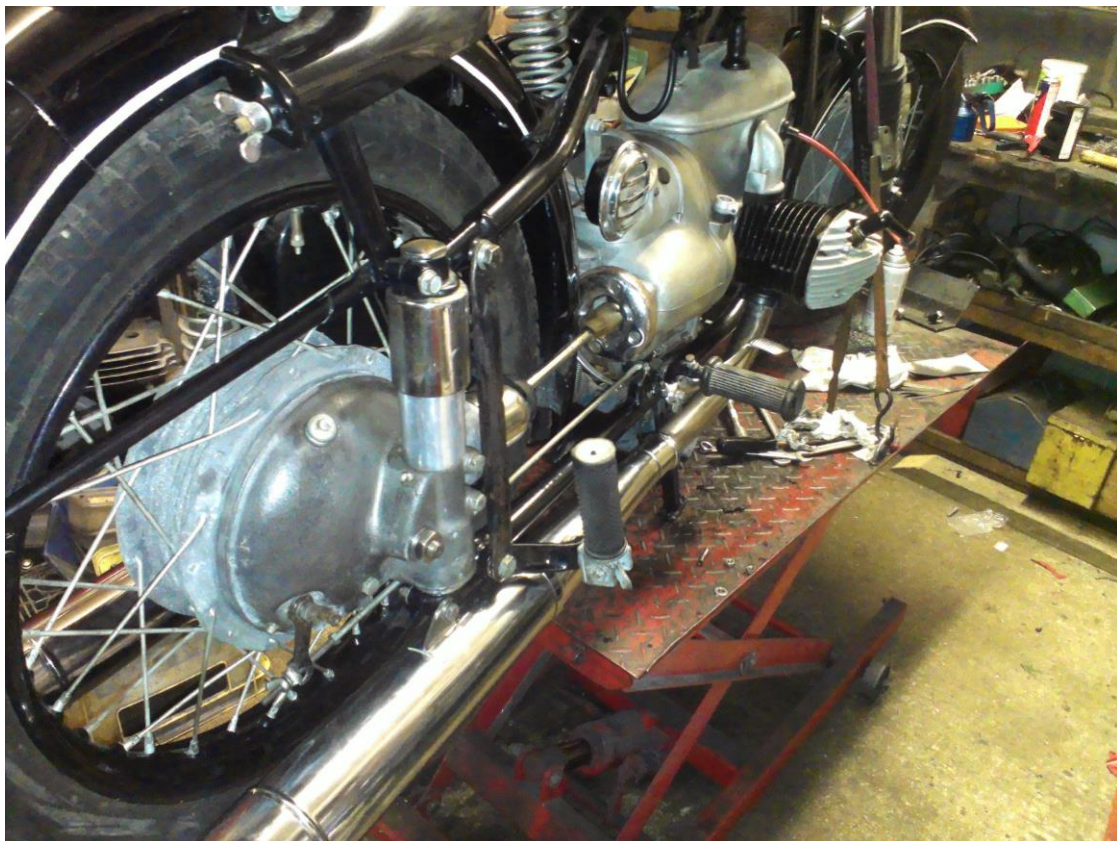
operate the ticklers. One of the housings did not have a lock nut so I found a suitable nut and it can now be locked down firmly instead of floating around loose. The tickover adjustment is also unusual though not unique as the AWO carb has a similar arrangement. A rod locates under the top of the slide and is attached to a threaded bolt. Screwing it out lifts the slide to set the tickover speed. It all looks very Heath Robinson but it seems to work. I noticed in the user guide a picture of a choke assembly, basically a rod which lifts a piece of plastic or metal sheet to cover the carb bell mouth.



My bike does not seem to have this assembly but perhaps it was discontinued in favour of the ticklers which seem to work well enough to get it started.

With the carbs sorted, turned my attention to the timing. I was delighted to discover that the special timing device provided for the ES250 motors with offset plugs worked just as well on the BK350 engine so getting an accurate 3mm btdc was quite easy. I could not rig up a timing bulb so had to use a very thin feeler gauge to detect points opening but after a few attempts I got it pretty well spot on; remembering to push the automatic a/r device to the full advance position of course. All the preparation work seems to have paid off as the bike now starts quite easily and will settle down to a reliable if somewhat lumpy tickover. The ignition warning light is still reluctant to go out so that's a task still needing attention but not a priority.

There was a lot of smoke coming from various places in the exhaust system and I doubt there were many baffles in the silencers as it was rather noisy. I decided it was time to fit my shiny new exhaust system but first I masked off the barrels and gave them a coat of black BBQ paint from a spray can. This hides the rust nicely for now. Later I will probably have the barrels sand blasted and powder coated black. Removing the old exhaust system was easy, most of the fittings were quite loose. My first attempt to fit a new pipe and silencer was very disappointing. On the off-side whichever combination of pipes and silencers I tried it



was simply impossible to get the system to align properly. I had more success with the near side and found a combination of pipe and silencer which aligned pretty well spot on. Out of interest, I tried the original off-side exhaust pipe with a new silencer and still no joy, the

pipe was too short and in any event it was pretty shoddy. More out of desperation than anything else, I tried the near side exhaust pipe and to my surprise it was a perfect fit with the new silencer. Moreover, this pipe was a stainless steel item which I was able to polish up quite well. At some time I will have to re-visit the off-side exhaust for now I have a pretty good looking system.



Running the engine now directed all the smoke out of the end of the silencer, it seems smokier than I would like. This may be due to the 25:1 mixture or possibly an indicator of the carbs being set too rich – perhaps that is why the needles were in the top groove? Anyway, the relative quietness of the exhaust did finally enable me to hear other noises which were a little concerning. There is a definite rattle coming I think from the near side piston area which will have to be investigated further. Other problems noted were a very stiff throttle action and a reluctance to rev cleanly. The former I can sort with my cable oiler, the latter needs more thought.

Final job for the day was to move the rear brake arm on its spline so it no longer fouls the bevel box on full travel. This also identified that there is something not right about the rear brake action which goes tight and loose as the wheel is rotated. I suspect an oval drum so that's another task on the todo list which now includes:

Remove head/barrel on near side to investigate source of rattle

Check and fix charging system – a powerdynamo setup would be nice but hideously expensive for this model.

~~Have another look at the carb settings to reduce smoke and reluctance to rev~~

~~Investigate why gearbox oil is dripping out of the air cleaner box.~~

Remove rear wheel to investigate brake binding and noise from bevel box area.

~~Oil throttle cables~~

Fit new fork gaiters

Tuesday 9th October 2012

Only had an hour or so to spare this evening so I decided to do a couple of the easier jobs from the todo list. Oiling the throttle cables and dropping the needles to the weakest setting did not take too long. Not sure the throttle action is any lighter for my efforts and it was too late in the evening to run the engine so I won't know until tomorrow if my work has achieved anything. The worst of the fork gaiters has also been patched with insulation tape for now, hopefully sufficient to get it through the MoT if I don't get time to do the job properly. The MoT is a priority issue as I need this to get the bike registered and until its registered I cannot legally ride it which makes testing pretty difficult.

The oil leak from under the air cleaner housing was annoying me so that was also tackled. In principle a simple job, the housing was held in place by four cheese headed screws but the front two are very hard to reach and were well chewed. The gasket that sealed the joint showed clear evidence of only being clamped at the back end. Cap head bolts would be better as it is much easier to insert a ball end allen key than a screwdriver. The obstacle was that the bolts were waisted and the length was critical. Too short and they would not hold, too long and they fouled the air box. Took me well over an hour to find some suitable cap head bolts, get the length correct and waist them and even then I had to grind a taper on the heads to clear the air box. Eventually I got the job done and shining a torch from the other side confirmed there was no longer a gap. Whether it will keep the oil in is another matter. If not I will have to swallow my pride and use some silicon gasket cement, something I normally try to avoid.

I am also concerned about the bevel box, idly turning the back wheel tonight I fancy that something is rubbing or grinding over and above the dragging brake. I could not make up my mind if the noise was coming from the universal joint or the crown wheel & pinion. Something else to be added to the list anyway.

Wednesday 10th October 2012

Only a brief spell in the garage today, to be truthful my mind was on other things. It started very easily and ticked over quite reliably after the carb tinkering. Still reluctant to rev freely and there is definitely a rattle coming from the top end of the engine. It is still smoking more than I would expect and strangely it seems to be more on one side than the other. This is odd since they share a common crankcase so ought to have the same mixture. Later I found a pool of petrol under the bike caused by the tap being left on so clearly one or both of the carbs is flooding so this may be the cause of the smoking. Attention to this will wait until I strip the top end to find the source of the rattle.

The oil leak from the air cleaner area has stopped but there was still some gearbox oil under the bike though the source is not clear. It's not too bad so I will just watch and wait on this point. I did make up some MZ badges by printing the logo then laminating. Not brilliant but it does add a bit of colour to the tank and will do until I can get the proper large size Comet badges. I also took the bike outside to get some better pictures. Funnily enough I think it now looks better in the flesh than in the photos.



Nothing much will be happening to the bike for the next 10 days as I am away on holiday. When I get back I intend to take it for MoT and get on with the registration process.

Tuesday 23rd October 2012

Back from holiday and suitable refreshed, I took the BK350 to my local MoT centre on Monday afternoon and came home an hour later with a pass certificate. Today I assembled all the paperwork and drove to the DVLA Local Office in Bristol. Took a book with me expecting a long wait but I back in the car within 10 minutes and never opened the book. They were happy with all the paperwork I supplied but it apparently takes about 3 days to process everything. I will eventually get a letter either containing a tax disk and the new registration details or an invitation to take the bike to Bristol for inspection. I suspect it will be the latter.

I did a few small jobs on the bike today. I have replaced the dip switch as the one fitted was very gritty in operation; a standard MZ type fitted perfectly and when I do the rewiring, I can also have a headlight flasher, something the original switch did not include. I have fitted a bicycle speedo as a temporary measure until I can source the correct BK speedo cable. Last little job was to fit a threaded clamp to hold a rear view mirror for the RH side. Due to the straight pull twist grip with internal cables, you cannot use bar end mirrors. I could not find any spare mirrors (used to have loads of them) so I have borrowed one from the AWO for now. On the other side I can use a conventional bar end mirror which I bought today but did not get round to fitting. I also bought two B8HS plugs as spares for the tool box.

Tuesday 30th October 2012

DVLA have confirmed that the bike is to be inspected on Tuesday 6th November at 10:15 so another trip to Bristol but at least this time I should come away with a registration number and a tax disk. Pondering on the temporary warning lights that are currently fitted, I figured out a way to improve them. Two led bulbs were made up with tails long enough to connect into the wiring switch and bypassing the special cup bulb holder. The tail wires of the led



assembly were slim enough to pass through the cup holder and a couple of rubber grommets neatly sealed the hole. Not a wonderful job but much neater than my first attempt. The only snag was that in my haste to fit them, I forgot to seal the assembly with araldite to make it waterproof so I will have to partially dismantle them some time. It's not urgent as

there is little chance of the bike going out in the rain and for the trip to Bristol I can put a plastic bag over the headlight.

Whilst working on the headlight I also looked more closely at the actual rim and reflector which have never looked quite right to me. The rim itself has a lot of flaking chrome and the reflector seems marginally too big for the rim. There is also no tag to locate the spring that keeps the bulb holder secure. I found that the original rim from the AWO425 fitted the shell and was in much better condition. I assembled its glass and reflector and found a suitable spring so this is now in place of the old deadlight assembly. I will strip this down some time to see if it can be improved but meantime we have a rather better front end.

Decided also to fit the new plugs I had bought and though it's probably my imagination, the engine does seem to run more smoothly without the slight misfire on the nearside pot. There is still a rattle but even that does not seem so pronounced. Whilst the engine was running I put the meter on the battery and as expected, there is no evidence of any charge from the dynamo so that's another task to be tackled. As the warning light does go out (well almost) I suspect the regulator is at fault but it's an odd looking thing bolted to the top of the dynamo and hidden inside the engine casing. The rest of the dynamo looks very similar to the type fitted to later MZS so I am hoping that I can graft a solid state regulator into the system with luck it may even fit in the same space in the crankcase. In the meantime I will need to keep charging the battery and take a spare with me for any journeys.

I want to strip the front forks to replace the rubber bellows which spoil the look of the front end. I consulted the spares book and the manual and in theory it's pretty straightforward. However, I decided it might be prudent to wait until the DVLA inspection has been done before tackling the job. It would be embarrassing if I struck a snag and could not then load the bike on the trailer.

Friday 9th November 2012

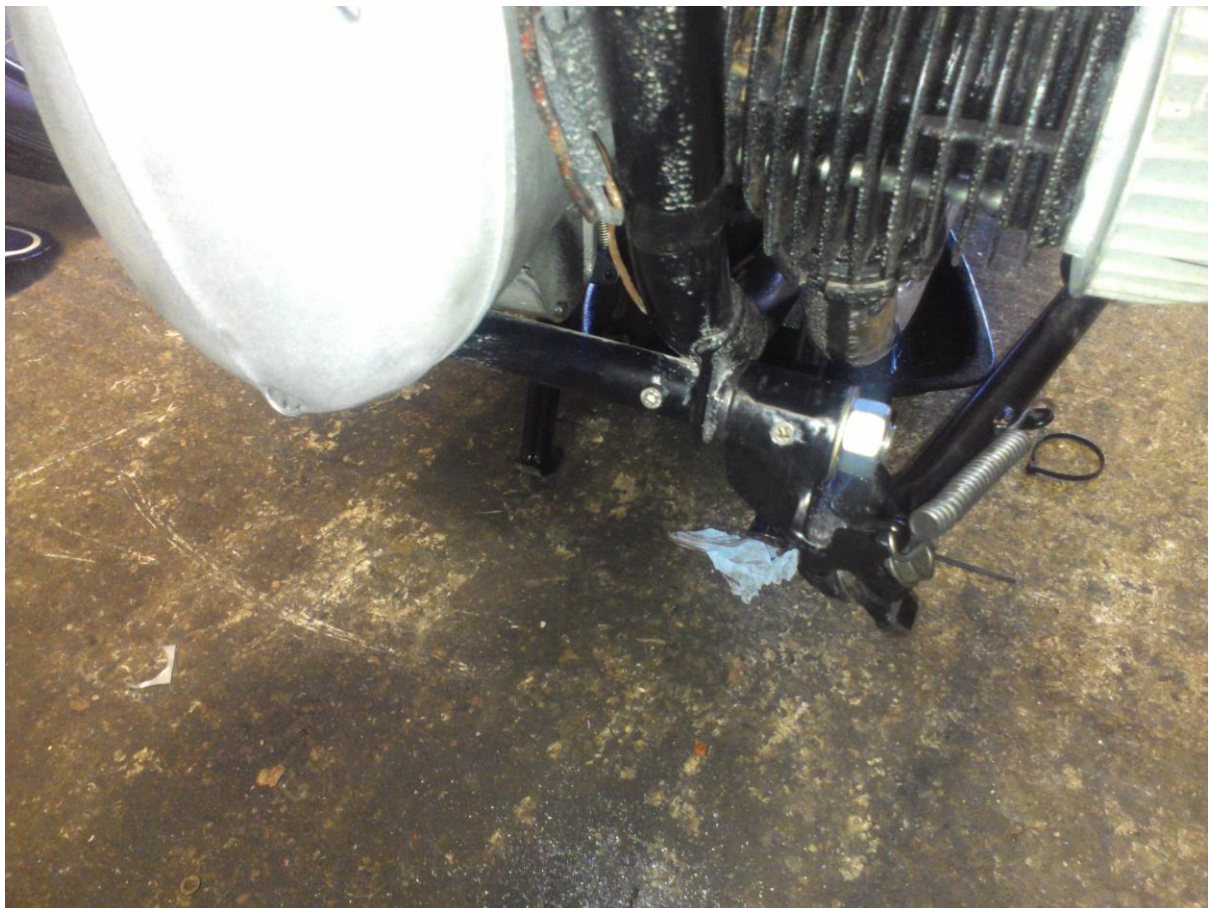
The trip to the DVLA Local office was uneventful; the inspection was carried out promptly at 10:15 and I was on my way home by 10:30. On the last trip to get the R35 and Simson registered, a wheel bearing on the trailer broke up and the journey home was character building. I was told all was in order and the paperwork would be processed later that day. Sure enough, on Thursday a tax disk and all my application documents arrived so the BK350 is now road legal with a regn number of 551 YUM. Quite a nice number and I have made up a temporary number plate pending ordering one of the pressed aluminium plates. Hopefully the weather will be kind and I can try a road test over the weekend

Saturday 10th November 2012

I took my first ride on the BK350 today with mixed results. It actually rode quite well though on my short test route I could only get it to 3rd gear as it seems quite high geared and is not overly flexible at lower revs. If you give it a wide throttle it smooths out immediately and

takes off like a rocket but on the overrun and lower throttle settings it is pretty lumpy. I suspect it is far too rich at the bottom end, possibly the flooding carb I noticed earlier is the culprit. Both brakes work quite well though the front fork action was not that smooth – more on this later. The biggest issue was the riding position. The rider's saddle is too low and too far forward in relation to the footrests and the gear lever. Not obvious how it can be modified either so this needs more thought

Back at the garage I decided to press on with a few other jobs. I wanted to fit a prop stand as the centre stand is a bit heavy to operate. Research on the internet showed an MZ style rear spindle fitting being used in conjunction with the front lower frame tube. As it happens I did have a spare MZ stand and some 16mm threaded bar. The result is shown in the picture below. To stop the stand turning I drilled a hole in the frame tube which was tapped for a high tensile 5mm set screw and a 5mm hole right through the stand and threaded bar for a high tensile 5mm bolt. Quite a neat result I felt.



Next task was to strip the front forks to replace the rubber bellows. Removing the wheel and the mudguard presented no problem, The brake drum was in good condition as were the linings so no horrors there. I hope to get the hub soda blasted by local specialist shortly as the magnesium castings are heavily coated in a powdery residue. Getting the nearside fork leg out was thought provoking but in practise fairly easy. Replacing the bellows was easy enough and the bushes and sliders were both in serviceable condition. However, I

found that the main spring was broken into two parts. I removed both and reversed them in the holders so that the flatter ends were abutting and made up a special washer which sat between the two parts of the spring to prevent them coiling inside each other. This works quite well but does mean that there is nothing to stop the fork topping out on rebound.

Doing the bellows on the offside fork leg was even easier as I now knew how to do it. However, the spring on that side was in no less than seven pieces totally beyond repair and the bottom bush also had some slack. This probably accounted for the slight judder I noticed on braking so I will replace this as well. The bike will now be off the road until I can source a pair of springs and the bushes.



Friday 16th November 2012

I have ordered a pair of front springs and a couple of other bits from a company called <http://www.oldtimer-teileschop.de> in Germany. They should be here around 26th November so further work suspended on the BK350 until then. I had also ordered a speedo cable previously which though not quite the correct fitting at the gearbox end does seem to be working ok.

Saturday 24th November 2012

It occurred to me that sorting out the charging system would be a lot easier done whilst the front wheel and mudguard were not fitted to the bike – the dynamo is at the front of the engine and not easily accessible normally. I ordered a new electronic regulator from Phil Speakman having checked that it was suitable for the BK350. The old regulator is screwed to the top of the dynamo which has to be removed to get at the screws. You also have to remove the points cam and a/r unit. Neither was particularly difficult but I did come across one snag. Normally on MZs there is a pip on the dynamo rotor which engages with a slot in the points cam to ensure the basic timing is correct; fine tuning is done by adjusting the points plate which is slotted.

On my bike there was indeed a slot in the cam plate, unfortunately, there was also a slot rather than a pip in the dynamo rotor so no obvious way to set the basic timing position. First thought was to change the dynamo rotor. This plan failed when I found that the BK350 dynamo rotor was considerably smaller than the later MZ rotors. Plan two was to make a peg for the points cam which engaged in the rotor slot. This failed when I found I could not get enough adjustment on the points plate to set the timing correctly. In the end I had to use trial and error to get the points cam into a position where I could then use the points plate adjuster to set the timing (3m btdc on full advance). Though I was fairly confident I had this set up correctly, the engine does not seem to run as well as it did before and I need to experiment a bit more. However, the primary objective was achieved in getting the engine to run so that I could test the dynamo and regulator.

Wiring in the reg was easy enough. The old reg was nicely stamped with the connection numbers/names. I was therefore a bit disappointed to find that there was still no charge from the dynamo. First thought was that the led warning lamp was not passing enough current for the initial energising. I therefore fitted the cup bulb which was one of the other things I had bought recently. This did not work either but it did reveal a different problem. Though the warning light went out initially, picking the revs up further caused it to light up really brightly. This made me suspect some of the bikes wiring so I put a bulb on the 51 terminal of the reg (which is the battery output) with the other end to earth and sure enough the bulb glowed brilliantly with the engine running. Taking a wire direct from the 51 terminal to the battery and putting the voltmeter in circuit showed a nice 7.2v charge when running which was to be expected as the battery was getting pretty flat by then. So the dynamo and reg were ok (and maybe the old mechanical reg was ok also but let's not go there). I traced the original wire connected to the 51 terminal into the switch. Testing for voltage and circuit there was no life from the terminal in any of the switch positions. Indeed I could not make out from the wiring diagram what the purpose of this terminal was and I could not see any number –it's a tad difficult to read upside down inside the headlamp. I reconnected the wire to the main battery feed to the ignition switch which was how it seemed to be in the wiring diagram and bingo we had a charge. All I need to do now is make up a protective jacket for the new reg which rather handily, fits above the dynamo where the old one sat. And of course I still have to tinker with the ignition timing.

Tuesday 27th November 2012

The second parcel of bits arrived on Monday. Sadly though the fork springs were present, the bottom fork bush I had also ordered was not. This is still being investigated. I decided I needed to get the BK350 back on its wheels anyway as it has been clogging up the garage for too long. On the face of it a simple enough job given that the forks were 90% dismantled anyway. However, getting the broken spring parts needed the assistance of the angle grinder and I had to spend time reshaping the ends of the new springs before they would wind onto the retainers. None of this helped by the fact that everything was coated with a

thick layer of black grease. Eventually the forks were rebuilt and thankfully the mudguard and wheel went back easily. Quite a noticeable difference when the bike was finally standing on its wheels. The front end sits a bit higher and there is no longer a heavy clonk when its put on the stand. Quite a satisfactory job only spoilt by the fact that at some time I have to strip the offside leg to fit the new bottom bush; definitely a back burner job.

I finished the day by making a rubber jacket for the new electronic regulator and ran the engine briefly to ensure it was still charging properly. Having got this unscheduled job out of the way, I can get back to sorting the engine out. The timing is still suspect and the mixture is far too rich. It smokes heavily, the plugs are very black and oily and the rattle from the nearside cylinder is still present. Did someone mention the Forth Bridge.

Monday 4th January 2013

Where does the time go. Do a makeover on my R75 BMW and some more work on the AWO 425s (see the separate sagas) meant that the BK350 has not been near the workshop for 2 months. I did treat myself to a Christmas present in the shape of the Powerdynamo kit for the BK350. This was something I had eventually planned to do but the purchase was brought forward when they offered a 12% discount for December followed no doubt by a price rise in January. Anyway the kit arrived and sat in my study until yesterday when there was finally space and time to work on the BK350.

The strip down was quite easy, I have previously swapped out the dynamo and regulator and the coils are only held by two screws. Perhaps the most difficult part is removing the tank which is essential for this job. In their infinite wisdom IFA/MZ only fitted one petrol tap. However, the tank has fairly deep cheeks and to allow the fuel on the offside cheek to reach the tap which is on the nearside they have fitted tubes connected by a piece of pipe which has to run under the frame tube. Draining the tank via the tap still leaves quite a lot of fuel down at the balance pipes, trying to pull off the pipe and get a container in position to catch the flood was a messy and smelly business. I am still trying to figure out a way to overcome the problem as I am sure there will be many reasons to remove the tank and I don't want to go through this palaver every time.

Although some parts of the kit are similar to the kits I have fitted to other MZs, this one is far more complex. Their instructions are always comprehensive and the translation from German is excellent. I did read the whole booklet twice before making a start on the job and the fitting of the stator and rotor was quite easy. First novelty was that the rotor had to be timed as no keyway was used to position it. They do make it easy as the timing is done with the piston at tdc. The kit also includes a plate which is sandwiched between the engine and the out cover to which is fitted a black box that does the advance/retard function. The coil is a double ended type which fits neatly where the old coils were located. Once assembled, there is nothing to indicate the modification to the engine. The regulator fits in the tool/battery box which is a bit of a shame as the space for tools was not huge anyway. I did

make one modification to their suggested wiring by moving the ignition cutout relay from the engine sandwich plate to the battery box. This meant totally stripping the lovely new loom they provided to move some of the wires and fit new colour coded ones. While I was at it I redid a lot of the existing wiring as well and I now have a much simpler and better engineered harness; plus a good understanding of the overall wiring system.

The reason for moving the relay was pragmatic. This shorts out the ignition coil when the ignition switch is turned off. If the battery is flat the engine will not start as there is no power to operate the relay. By having the relay easily accessible in the battery box, I can easily pull off the cutout wire, start the engine then replace the wire once the generator has put some juice into the battery. Getting at the cutout wire when its under the front engine cover would be far more difficult and one of the main reasons for fitting a Powerdynamo system is the fact that the ignition itself is self energising and does not depend on a battery.

Playing around with the wiring took

Most of the afternoon but finally it was all done and I was greatly relieved when it all worked. Putting some fuel in the carbs (I don't want to refit the tank until I have a solution to the balance pipe issue) I have the engine a couple of kicks and away it went. Not very well as I had forgotten to reconnect the throttle cables but at least it ticked over. With the cables re-connected it ran cleaner than it had done previously and the charge light went out so both aspects of the Powerdynamo system are working fine. Sadly the misfire cum rattling noise was still present.

Time to bite the bullet and strip the top end of the nearside cylinder which seemed to be the source of the problem. The cause was only too obvious when the barrel was removed. There is a huge amount of play in the big end bearing so a crank rebuild is now a matter of priority. The nearside piston was marked .5 which I assume means 1/2mm oversize. There is a slight wear ridge at the top of the barrel and a rusty patch about half way down the upper part of the bore. Not sure why this should be still there given that the engine has been run a fair amount. Anyway, I will need to investigate the offside of the engine to see what state it is in and what options I have over further oversize pistons. I cannot understand why anyone would do so much work to a bike and then reassemble the engine with a badly worn crank. Does make me concerned about what else I am going to find when I start the engine strip. Given that the riding season is not too far away, the BK350 may well have to go into storage until next winter now as I don't want it hogging the garage during the spring/summer period I need the time and space for bikes I can actually ride. I will also need to locate spares and someone who rebuild the crank so the BK350 is now a long way from being a rideable bike. Not a good day really.

Saturday 9th February 2013

The good news is that research on the internet and a few emails has established that refurbished crankshafts are available for the BK350 from a couple of suppliers. The bad news is that they cost circa 400 Euros plus the return of the old crankshaft. A 250 Euro deposit has to be paid which is retained if your old crankshaft is not suitable for '*regeneriert*'. I have already contacted one supplier and sent some pictures of a couple of old cranks that came with the bike. As I expected both have been classified as scrap but they have offered a deal to purchase a crank outright for 599 Euros including postage which I am pondering on. I didn't really want to strip the engine until I had all the new parts to hand so it's something of a lottery whether the crank in the bike would be salvageable either in the UK or to get my deposit refunded from a German supplier. Steve at PistonBroke in Bristol tells me that he rebuilt a BK350 crank a while ago but cannot remember where the parts to do the repair came from; possibly they were obtained by the customer. So far I have not found a source of repair kits for the BK crank, just complete refurbed units.

One other option I am contemplating is to ask if my spare AWO425s crank would be acceptable as a trade-in. This seems to be to be in quite good condition and but for the fact that Stephan provided me with a fully refurbished crank it would have been used in the AWO engine rebuild. Now it is surplus to requirements and I was going to sell it along with some other useable spares. Anyway, we are off on holiday tomorrow so I shall think over things while I am away.

Friday 1st March 2013

In the end I agonised over the replacement crank for 3 weeks. I finally decided today that waiting was not going to achieve anything useful. I ordered the refurbished crank and a gasket set and sent payment by PayPal this morning. Hopefully it will be here in a couple of weeks or so. In the interim I need to read the manual to find out how to get the engine out of the frame and to carry out the strip/rebuild.

Tuesday 12th March 2013

A big box arrived today and it contained the new crankshaft for the BK350 together with a gasket set and a full set of fork bushes for the front forks. This latter was a pleasant surprise, I had expected only one lower fork bush which they forgot to include with my previous order in November; a generous gesture. No excuses now but to get on with the engine strip – however, its bitter weather at present and just started snowing so I will



wait till things warm up a little. In the meantime I can study the manual to find out how to get the engine out of the frame.

Monday 4th November 2013

Hard to believe that 7 months has passed by since I last worked on the BK350 but with the arrival of spring and the riding season, there was no time or inclination to work on the bike. Finally today I decide it was the right moment to dig the BK350 out of the shed and get it on the ramp. Some while ago I had found and downloaded a workshop manual and laboriously translated it from German to English using Google and I had intended to read this before starting work. However, in typical fashion I set to anyway and within an hour or so the tank, carbs exhaust barrels, pistons and electrics were all removed and I just had the crank case and gearbox in the frame. To this stage it was all straightforward and no problems were encountered. No obvious problems with any of the bits I had removed but things like barrels and pistons will get looked at in more detail later.



To my surprise the engine gearbox assembly was relatively easy to remove from the frame as a unit by myself though getting it back in with damaging the paintwork is definitely a two person job. Getting the gearbox off was just a question of undoing four nuts and it pulled clear. At some stage it will need some serious investigation as most of the oil I put in when I

first commissioned the bike has now drained out. However, that's a job for another day. The clutch came apart easily as well, just a question of undoing the 6 bolts steadily a bit at a time and everything so far was looking in good condition. The flywheel had three 8mm threaded holes and putting some bolts on these popped the flywheel off with no problems. Subsequently I found a drawing of a puller in the workshop manual which would have been a better way but fortunately I did not need it this time.

The crankcase is split vertically and held by 6 long studs around the periphery and 4 screws round the throat where the barrel fits. Gentle tapping with a hide mallet and applying some heat from the hot air gun around the bearings eventually got the crankcase halves to move (they had been glued together with some horrible orange gasket cement). The crank stayed in the rear part of the crankcase but soon came free with a few taps from the hide mallet and suddenly my engine was in pieces ready for inspection.

The crank was definitely toast since there was wear on the main shafts which would have caused oil seal problems as well as the worn big ends. Not an issue as I had already bought a refurbished crank. The rear main bearing was a 6305 and looked as though it had been replaced relatively recently but I will fit a new one at rebuild just to be sure. The front main bearing was a badly worn 6205. When I checked the spares book, this was found to be incorrect as it should have been a type NJ2205 which is a roller bearing. This also explained the 3mm spacer behind the 6205 bearing make the width 18mm to match the 2205. External and internal dimensions of the 2205 & 6205 are identical so I guess this was a bodge by a previous owner. This is something I have come to expect from bikes brought in from Eastern Europe. Further study of the spares book and the workshop manual indicated that the rear main bearing should be shimmed to control crankshaft end float but there was no evidence that this had been done on my engine. Indeed there was some evidence of wear on the 3mm spacer at the front suggesting that this had been taking end thrust. I was getting cold and stiff so decided to quit for the day having got a lot farther than I had anticipated.

Tuesday 5th November 2013

Today was largely a question of reading the literature, talking to knowledgeable friends and looking up things on the internet. As a result of my discussions with Terry, I now know how to work out the size and placement of the main bearing shims and we concluded that the front bearing should be re-stated as a roller to allow for crankcase expansion when hot. This was a bit of a nuisance as I had a new 6205 bearing on the shelf. Anyway I have ordered a set of correct bearings and seals from Simply Bearings which will be here in a couple of days.

Apart from cleaning things, there is not much more I can do with the engine till the bearings arrive so I turned my attention to other things which had been troubling me. First off was the covers for the drive shaft, the rear one is purely cosmetic to hide the universal joint, the front one holds the rubber spider which is the front universal joint. Both were originally

chromed but now rather scabby so I have taken them to Steve the powder coater to be tarted up. I also took the rear wheel to seek his advice on how to improve the appearance of the hub. This is made of magnesium and is corroding badly. Steve main line of business is restoring magnesium wheels from exotic sports cars so he has a lot of knowledge about this metal. The optimal solution is to dismantle the wheel to bare hub, and let Steve give it the works but I don't really want to do that just yet for a variety of reasons. The compromise is to take the wheel to a local guy who does soda blasting and let him clean up the hub without being too aggressive. Steve will then soak the wheel in his chromate bath to stabilise the magnesium then I will spray it either with clear lacquer or silver wheel paint.

The other thing that needed attention was initially just a cosmetic touch as well. The rear plunger unit on the near side only had a cover over the top part of the spring and annoyed me. In the box of bits which came with the bike were several chrome covers which looked as though they might fit. As it happened, I had to dismantle the plunger suspension anyway to get the rear wheel out, not sure why it was such a tight fit and I am not looking forward to re-fitting it. Actually the plungers are a very simple and easy design so stripping and reassembling with a pair of reasonable chrome covers did not take long. A test assembly indicated a problem with the wheel spindle which was very tight in a spacer within the drive unit. Eventually after cleaning up some burrs and polishing the spindle in the lathe I found it would slide through either suspension unit quite freely but not both together. When I looked more closely, I realised that the two plungers did not line up, the nearside one was a good 10-15mm higher at the spindle hole height than the other side. By observation you could also see that the rebound spring was sitting much higher. In the end I attacked the rebound spring with the angle grinder gradually removing material until the spindle holes were level. I did wonder if I should also put a spacer on the top side but decided to leave alone for now. At least spindle now slides in easily through both units. I suspect that someone has done a repair on the suspension at some time possibly using springs or other parts from a different machine. Memories of the front fork springs which were in many pieces came to mind and I doubt it will be the last horror which I find on this bike. Anyway I decided that was enough for today and it was time to write up progress.

Friday 9th November 2013

Quite a productive few days though some frustration as well. The bearings and seals arrived on Wednesday but as I was busy for a couple of days I did not make a start on rebuilding the engine until Friday. In the end it was a relatively simple task. The rear main ball bearing has to be shimmed to remove any play between the circlip and the out cap. I measured everything up and found some old shims which were the correct thickness and could be cut to size. The crank was then fitted and drawn into position using the flywheel securing nut and a spacer. Next I fitted the front end of the of the crankcase and measured the gap to see how much shimming the front roller bearing would need. I was advised to allow about .5mm slack to allow for expansion of the crank when hot and to avoid any end thrust on the

roller. One of the shims I removed when I stripped the engine turned out to be perfect for the job though it did not come from that position originally. The inner track was heated and pressed onto the crank, then the front crankcase was heated to allow the outer part of the bearing to be inserted, Some Welseal on the crankcase mating faces and bingo the two halves were back together. Putting on the end caps with new oil seals took only minutes.

It was at this point that things started to go wrong. I decided to put the generator and ignition onto the engine whilst it was still on the bench as it's much less fiddly. All the bits went back I set the timing as per the instructions. However, when I spun the engine over there was zero sparks. I double checked all my wiring and found one error but even when corrected there were no sparks. I took it off and checked everything visually. No obvious problems so I put it back on and still no sparks. In the end I simply removed all the electrics planning to send it back to Powerdynamo for checking in the belief that I had damaged something. I decided to call it a day.

Saturday 10th November 2013

Turning back to the engine I fitted the flywheel and clutch assembly; digressing briefly to make up a clutch centering tool and a replacement for the special washer that sits between the end of the flywheel and the inner track of the rear main bearing. It is there to prevent the crankshaft moving forwards when the clutch is operated. The difficulty is working out the thickness as too thin and it won't work; too thick and the flywheel will not engage sufficiently on the taper. I suspect the correct washer is collapsible type similar to that used in the MZ 250 clutches. There was no washer present when I stripped the engine and it is impossible to measure the gap so it was a case of trial and error before I found something close to the correct thickness (circa 2.8mm). I then made a suitable washer from some special plastic sheet. It was exactly the right thickness and is very strong, certainly strong enough to resist crankshaft movement under clutch operation but being flexible would compress a little when the flywheel was tightened onto its taper. That really completed the bottom end rebuild. The other bits I will add once it's back in the frame.

Time to look at the gearbox and figure out why it is leaking. A visual inspection showed no obvious problems so I poured in a 50-50 mixture of diesel/petrol. Nothing came gushing out but there was some dampness which I traced to the gear selector shaft which is situated at the very bottom of the box. Looking at the spares book there is no O ring on this shaft, just an external rubber ring with a shaped cover. There appears to be something similar inside the box but I was not prepared at this stage to strip it as everything else looked pretty good. There was horizontal movement in the selector shaft so the sealing arrangement had very little chance of working. The good news was that the lever is fitted on a spline so I was able to remove it, clean everything up, fitted an extra O ring and reassemble with the slack removed. This was a delicate compromise between keeping pressure on the seal and still allowing smooth operation of the gear change. Time will tell if I got it right. If not I may

have to resort to liquid grease instead of oil. With this job done I was able to fit the gearbox onto the crankcase.

I wanted to fit the engine/gearbox assembly back into the frame but could not fully connect it to the drive shaft as some of the bits are being powder coated. In any event reassembling that way is really a two man job. The easiest way round this was to remove the bevel box and plunger unit from the frame. With a couple of pieces of wood to support the engine loosely in the frame it was actually quite easy to get it lined up and the fixing bolts in place. I was on a roll now so the barrels were given a clean and sprayed with BBQ paint to smarten them up and left to dry while I had lunch. I then fitted the pistons barrels heads exhaust pipes and carbs and it is now looking like a bike again. Flushed with enthusiasm I decided to have one more go with the electrics and very carefully put it all back in place. To my amazement and relief, when I operated the kickstarter (by hand) both plugs were sparking well. I think I may have been spinning the engine the opposite way when testing it on the bench so I may have worried myself over nothing. Anyway I reckoned that was enough for today.



Monday 11th November 2013

Now that the ignition system is working again I turned my attention to the charging system wiring. In the original Powerdynamo configuration the wiring is in my view too complex with great wads of it being taken inside the engine casing. I patiently removed all the plastic

sheathing and revised the wiring to separate out the alternator, earth and ignition cut-out wire in one sheath which could now be taken directly to the outside. The remaining wires are purely related to the ignition system and which is wholly inside the casing. I then made the connections to the main loom though at a later date when I am sure this all works ok I can re-visit these connections and reduce the length of wire which is excessive.

The main benefit of this change is that the engine-loom connections are now all outside and easy to disconnect without having to dismantle the front engine cover. While I was working in that area I revised the way the Powerdynamo plate holding the ignition a/r black box is mounted. As delivered this plate floats free so you have to try and locate it together with the outer cover and of course it just flops down when the outer cover is removed. I made up a 20mm



piece of rod internally threaded 6mm. This now screws down to a 6mm dowel in the crankcase and holds the plate firmly in position. I shortened the out fixing screw which now goes into the 20mm threaded rod. The picture probably makes more sense than the description.

Whilst waiting for the powder coating I decided to mount the exhaust system as this had been somewhat vexing the last time I tried and I had finished up with a mixture of old and



new parts. I was determined this time to use the complete new system but each time I offered it up the result was disappointing. The silencers are identical but the pipes do have a slightly differing bend but whichever side I put them on they did not look right. Eventually I got it all to line up with the mounting holes in the frame but when I looked from the rear the offside silencer was sitting

about 4 inches higher than the nearside. The problem seems to be with the pipes which are not quite the right bend but though the system is new I don't know from where it was purchased so I cannot take issue with the supplier. In the end I decided the safest thing to do was make up an extension plate for the offside silencer mounting which drops the silencer to the same level as the nearside. That way, to anyone following behind they will look level though if you look closely you can see that they slope towards the pipes at differing angles. Raising the nearside (which I would have preferred) was not an option as the silencer is already very close to the frame on this side. I even tried making up a thick gasket for the exhaust manifold to push the pipe down lower but this did not work and really left too little thread to make a secure fixing. I guess German after-market stuff is just as bad as the stuff we often get for British bikes.



Tuesday 12th November 2013

A call from Steve notified that the powder coating was ready so I ran over to his workshop on the ETZ250 which is running really well after its makeover. Back at my workshop I reassemble the front universal joint using some new s/s screws to make it look a bit prettier.



Getting the bevel box back in place was a struggle on my own as the springs were reluctant to compress. Eventually it clicked in just as I was about ring a friend for some help. The silver powder coating looks a lot neater than the scabby chrome it replaced. The back end of the bike now just awaits the wheel to complete reassembly. I have left messages with the soda blasting guy but so far he has not responded. Will give

it a couple more days as I don't really want to put the wheel back in until I have cleaned it up somewhat.

Saturday 16th November 2013

A very frustrating few days. On Wednesday I decided it was time to put some fuel in the carbs and try to fire up the engine. To start with no fuel would come through the petrol tap

so the tank had to come off so that I could fit it on one side to allow the tap to be removed. To be honest I did not find much wrong with the tap which is of typical east German design using a rubber membrane as a seal. I noted that there was no gauze filter on the inlet pipe so made one up and put the whole thing back together and everything worked fine on both main and reserve. One job done anyway. With fuel in the carbs I tried to kick it over and immediately the clutch started slipping. Nothing for it but to reverse everything and pull the engine out of the frame. Not quite so easy as the first time as I did not really want to remove the barrels, head pistons or electrics but it came out after a bit of wriggling.

It did not take long to get the gearbox off and I could see nothing obviously wrong with the clutch as it was steadily dismantled. However, when I came to the flywheel the problem was obvious as it came off the taper without the need for a puller. Obviously I had not tightened it up enough the first time and probably the spacer washer I had so carefully made up was possibly too thick. In the end I decided to remove this washer as being potentially more trouble than it was worth. After degreasing the crank taper and the internal taper of the flywheel it was bolted back up. I double checked the manual but could not find any torque settings, just the phrase – ‘do it up very firmly’ which was not too helpful. On the advice of a friend I did it up as tightly as felt safe and then checked it with the torque wrench. I reckon it was about 75 ft lbs. This compares with the 80-90 ft lbs recommended for the MZ clutch which is also held on a taper so should be been ok.

The engine was then reassembled and put back into the frame. Much more of a struggle but I simply did not wait until help arrived so managed it by myself though I did chip some paint. Putting everything else back on was tedious but not too difficult as I have now done it more times than I would wish. Fuel on and a good tickle and I was hoping for a first time start. The good news was that the clutch (or rather flywheel) did not slip so a healthy kick was possible but hardly any signs of life. I then noticed that fuel was leaking from one of the carbs and the other did not seem to be getting enough judging by the lack of feel on the tickler. Strange really as they had been set up and were working perfectly well before I decided to strip the motor and had not to my best belief been touched since. Anyway I decided to remove them both and check them right through. The fuel leak was not flooding as I had thought but a failed fibre washer on the input fixing otherwise the LH carb was fine. The RH carb was an enigma, when I removed the float chamber top the float was in upside down and jammed into the feed port so no fuel could get in. Worse still the needle end was bent over. I really don't remember stripping these carbs previously and find it hard to believe that I would have assembled them so badly but I suppose I must have done. Anyway I tried my best to straighten the float needle and clean up the sharpened end which acts as the fuel cut off.

I was now hoping that it would start but no such luck. I tried all my tricks, petrol down the plug hole, ether Easy Start spray, new plugs – the whole works. I also rechecked the timing and it was exactly where I had set it. With the easy start it would cough and fire very briefly

but nothing more. I spent the best part of Thursday and Friday messing about trying to get it running and eventually started to think about the problem. I reckoned it had to be ignition timing as I was dubious about the way the timing was set and could not really understand how the system worked. Eventually I went back to the Powerdynamo instruction pack and re-read the whole thing. Finally the penny dropped, what I had interpreted as the timing setup instruction was in fact an illustration of how the electronic advance system works using an external protrusion. The time it takes to pass this protrusion is used to calculate engine speed and thereby the amount of advance to apply. I had set the timing using the protrusion as they showed in the manual, but over the page it shows that the flywheel then has to be moved round to line up a dot mark. This explained why I could not figure out how the advance system worked. The protrusion actually passes the pickup about 45 degrees before tdc allowing time for the calculations and to fire the coils at the appropriate time.

Anyway I went into the garage this morning very hopeful that I would finally get the motor running. Pulling the alternator flywheel and resetting it to the correct mark took only a few minutes and a kick over with the plugs out confirmed we had sparks on both plugs. So fuel on and after a few hefty kicks still nothing. So I gave the carbs a good tickle and finally signs of life, it tried to kick back unless you were very positive with the starter so I think I may have it too far advanced. Nevertheless it finally emitted burst into life and sounded quite healthy. Tickover speed was a bit high but I soon managed to get that under control and it settled down to a reliable rumble. Though it is a twin it has a common crankcase and both pots fire together so it sounds more like a single and not that smooth exhaust you get with a Villiers 2T for example. Success at last; the engine revved up easily and slowly settled back to tickover which I fancy is due to the relatively heavy flywheel for the size of engine. Certainly when you turn the ignition off, the engine spins over several more times. There was still some rattling from the LH cylinder area but this is undoubtedly down to piston slap from the worn piston. There is a similar but much lesser noise from the RH cylinder but neither is bad enough to worry about for now. The loudest noise was the induction roar from the carbs so I quickly replaced the air cleaner and the top cover which cut this down considerably.

I switched the engine off and restarted it several times and provided you gave a firm kick it would start immediately. Gentle prods caused it to kick back so I will have to double check the ignition timing but that is not a priority. Then just as I thought I had cracked it the clutch slip returned. You can kick the engine over with the plugs removed but all you get with them in is a creaking noise which I suspect is the flywheel turning on the crankshaft. B*****r, the engine will have to come out once again and I am going to have to investigate why the flywheel will not stay on the crankshaft. Frankly I am so annoyed with the whole thing that I decided to leave it well alone for a day or two as otherwise I might be tempted to do something silly.

Tuesday 19th November 2013

I arranged with my friend Terry to come over for the morning to help me get the engine out of the frame and back in again after I had attended to the flywheel. He arrived about 1030 and prior to that I had removed all the ancillary bits and pieces so getting the engine out took only minutes and was very easy with two people to support it. Removing the air cleaner assembly and gearbox took only a few minutes more and we could see straight away that the flywheel was indeed loose on the crank. Examining the crank and internal taper on the flywheel under a magnifying glass it was easy to see that there was quite bad wear on the back section of the flywheel. The crank itself seemed unmarked so it is likely that the damage to the flywheel was historical but not good news.

Our conclusion was that the flywheel was not really safe to use but for the moment there was little option but to put the engine back together pending finding a new one (unlikely) or at least another one which could be repaired. To make the best possible job of the reassembly, the flywheel was heated to 100 degrees C in the oven and some bearing fit was dribbled in before tightening the securing bolt. We also made up a new much stronger lock washer and used threadlock to help hold it all in place. This time I torqued it up to 80ft lbs then we left it to cool down before completing the reassembly. Once the engine was back in the frame, also an easy job with two of us, we adjourned for lunch after which Terry departed. That evening I put the rest of the bike back together and started it up successfully without any trace of clutch slip. I felt it was still kicking back too much so I had another shot at the timing. So far as I could tell it was spot on but I have now retarded it a little and this does seem to help.

Anyway for the moment the bike is strictly for display as I am not going to risk running the engine for fear of damaging the crank should the flywheel let go again. Pity really because it is now looking quite respectable. My energies now will be directed towards obtaining a spare flywheel and getting it repaired as necessary. Terry is a Scott owner and knows someone who can probably do the repair as Scott's apparently have a similar layout which also gives problems. So I think this ends the current chapter of the BK350 saga.

[Beginning of Article](#)