ISDT MZ Project Diary – Started 27th February 2010 – Updated November 2014

Skip to End

Just as I got stuck seriously into the ES250 combo project, I was offered a 1972 ISDT MZ,. This was something I could just not turn down so it had to be bought, even though the price was my beloved BMW R80st and another MZ. This sad looking beast is what I got for my money:

As always, pictures flatter and its a lot rougher than at first sight, but it is complete, almost totally original, and has been owned by the same person since 1975. The log book states that it was first registered in 1972 but no indication of how many previous owners. Speedo shows 14600kms, which is just over 9k miles.

My intention is not to totally restore it in the first instance. Instead I want to make it safe electrically and mechanically and do only the most essential cosmetic work to arrest rust. Once it's proven, then I may do the makeover. On my initial survey, I listed the following things: new rear tyre, both wheels need rebuilding, new front gaiters, chain rubbers, headlamp reflector plus an awful lot of grime and corrosion. Anyway, I finally started work on Saturday 27th February 2010 and that is Day 1 of the project.

Day 1 – Mostly Electrics and stitching

First step was to remove the tank, which actually held on by the leather straps of the tank top bag. First surprise was how good the condition of the bag and straps was. A good clean in soapy water, some minor stitching of a couple of seams and a good soak in dubbin worked wonders. All I need is some new Perspex for the map window and it will be good as new. The seat is also basically very sound, a couple of loose seams and one small tear. As it has the rare MZ logo embossed at the back, I want to retain this so it has been put by for some tlc later. Not so the cloth cover round the carb etc, this was a home made job and a new one will be needed, probably something I can make if a pattern can be found.

With cover, seat and tank out of the way, I could see the battery tray so I optimistically installed a brand new 6v battery. This model still uses the MZ 6v dynamo with battery powered ignition and lights. Later models used things called Mag-Dyno (which I think was a grand name for flywheel magetos from Simson mopeds), and later still full electronic ignition which I believe also came from

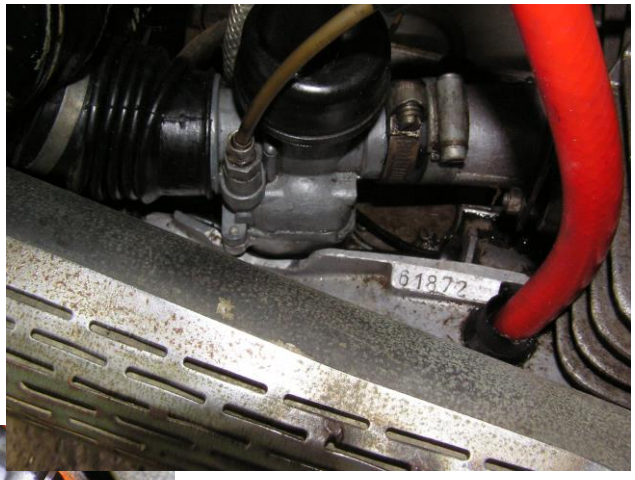
Simson. Both dispensed with the need for a battery. For the moment, I intend to retain the standard 6v electrics as I have plenty of spares parts for such system and its probably perfectly adequate. In the long run I would like to fit one of the Powerdynamo systems from MZ-B in Germany but they are very expensive and other things are higher on the priority list.

Anyway, predictably enough, fitting the battery produced no visible result in the way of lights or sparks. There followed a tedious but effective process of chasing the power though fuse boxes, connectors and the main switch and slowly things got better. Most of the bulbs were blown and replacing these got me, sidelights, dip beam (my spare 6v Biluz bulb had only one working filament) rear lights and finally a stop light. Once I had remembered the double pole switch in the ignition circuit, we even had a spark. The ISDT bikes were fitted with twin coils, one to the centre spark plug and the other to the side spark plug. The double pole switch direct power to one coil or the other, not both at the same time. With the switch cleaned we got a spark, albeit a bit weak, from each coil in turn.

In sorting the wiring, I had to remove the headlamp surround so this gave me a chance to look at the rim and the reflector. Though still far from pretty, the rim will suffice for now after its clean & polish; likewise the reflector. With a bit of silver paint to disguise the rust patch, the MoT man will never notice. Apparently, the whole headlight assembly is from a Simson (again) KR50 scooter, but they are pretty much as rare as ISDT MZs so not sure if I will be able to replace these items with new, but at least its no longer a priority. The rear light surround also cleaned up adequately as well. So all in all a good day with some potential problems solved and no new problems.

<u>Day 2 – The Beast Runs</u>

The objective for day 2 was to clean the carb and try to get the bike running. There was an amazing amount of oily dirt and rubbished around the carb and the top of the engine. These items are normally out of sight behind the leathercloth cover and obviously no one had looked or cleaned for a very long time.. The carb is mounted between 2 rubber tubes, one links it to the manifold, the other to the air cleaner. Getting it out was bit tricky as I did not want to damage either rubber mounting and the rubbers were a bit old and stiff. Some heat and lubrication finally had it released. The manifold rubber is only just serviceable but is a simple 32mm id tube. A bit of top hose from the breakers yard will sort that. The air cleaner rubber is a convoluted hose and unobtainable, fortunately it was in excellent condition. The carb once cleaned was also serviceable though it is not of either type mentioned in the spares book. It looks to be from an ETS Trophy sport and is 28mm against an expected 30mm carb. However, it will suffice for now. The only slight point of concern were marks on the float bowl indicating that it had rubbed against something. On reassembly I could see that a slot had been cut in the sidewall of the LH crankcase. Not sure if this is standard feature of ISDT bikes or if it was done to accommodate this particular carb, Regardless, at some time I will need to file the slot a little to give better clearance.



Petrol in the carb, ignition on and she started 3rd kick. Well not exactly, it was probably nearer the 300th kick before reasonably reliable starting was achieved. I think the problems were 3-fold. The PO had put a lot of oil down the plug hole and this was oiling up plugs. Secondly the plugs themselves were the originals an well past their prime. Thirdly, the spark

remained weak from both coils despite cleaning and re-gapping the points. Either the condenser is on its way out or the coils (which do look suspect) need replacing. However, I did eventually get the bike running long enough to note that there were no expensive sounding noises, and the ignition warning light went out indicating that the dynamo and regulator were working. In the picture you can see the automatic advance/retard mechanism. Was not expecting this and it makes me think my bike is earlier than 1972.

Having achieved this milestone, I turned my attention to the front end. The front forks needed to be stripped to replace the gaiters, but I also wanted to inspect the stanchions to see how far the rust extended. Getting the wheel out was easy enough, as was removing the front mudguard. Both of these items need significant cosmetic attention. Getting the fork legs out was less easy and I did some damage to the top taper of the RH leg which is going to need attention. I do not think it was entirely my doing as the top nut was quite hard to undo and there were already Stilson marks on the lower parts of the stanchions.

The good news is that the lower part of both stanchions where they run in the bushes is fine. The top part is rust pitted but I should be able to disguise this with a suitable piece of chrome or stainless tubing and the gaiters will disguise any marks on the lower section. The chrome lower legs also cleaned up quite well, certainly no need for re-chroming at this time. MZ designed these forks with external springs, much like older British bikes, The PO had fitted Ceriana internal springs. They seem to work ok so I intend to retain these for now. Two problems however remain, getting the new gaiters, and repairing the damaged fork leg. I consoled myself by spending the last hour or so cleaning up the handlebars and front end generally so it is beginning to look more presentable. Tomorrow the wheel and the mudguard get attention.

Day 3

Day 3 was largely a question of identifying a solution to the damaged forks and ordering bits. Fred Rogers is supplying fork gaiters and s/s spokes for the back wheel. He is ordering a set of spokes for the front wheel but they will be about three weeks. I also ordered a 28mm tap from Tracy Tools in Torquay in the hope that I can recut the damaged threads at the top of the fork. Spent some time cleaning up the fork legs to remove the rust and pitting and in the end both legs would slide firmly but easily into the yokes. I also made up some better spacers for the Ceriana springs, the PO had just used pieces of tubing which were not easy to assemble. Removed the mudguard and its bracket to clean and derust. Reassembled with s/s bolts and some touching up; the mudguard will be on the list of things to be powder coated in due course. Agonising over doing them black to be purist or silver which I think looks better. Final activity of the day was to replace One of the coils was a Lucas part and much bigger in diameter, the other had a hole worn where it had been rubbing the frame. The spark definitely looked brighter after this job, hope it improves the starting.

Day 4 - The Front End

The bits all arrived so with tongue in cheek I attempted to recover the threads in the stanchion using my new 28mm tap. Initially it did not want to happen but with patience, I eventually managed to pick up the original thread line and was able to restore as new. Huge relief when the top nut screwed in by hand. Cleaned up the other fork leg as well just to be sure. Celebrated with a cup of coffee. Fitting the gaiters turned out to be tricky. They were a different shape to the originals and it was not clear how they could work satisfactorily. A chat with Fred R did not help but when I got back to the garage I had a brainwave and turned them the other way up. With some lubricant, I managed to get all the bits together. Not totally happy as the rubber seems stiff and they do not convolute in action properly in my view. At least they now keep the dirt out. At £40 the pair they were not cheap either. I may look out for a pair from a modern Motocross or trials bike, I think they would work better. Finally I was able to reassemble the front forks. I had also painted some 36mm id plastic water pipe silver and this served to cover the top part of the stanchions between the yokes; disguising the rust pits etc. A mucky hour was spent cleaning the front wheel as best I could. Not too much effort at this stage as it's much easier to finish the job whilst respoking. Also cleaned the brake drum and the brake back plate. Not wonderful but much, much better. Finally the wheel was back in, brake

adjusted and forks centred. Now I can at least move the bike around the garage again and from the front it looks quite presentable. Even put some scruffy gold lining on the mudguard. At the end of Day 4 this is what the bike is looking like:

You can se the new gaiters, the wheel is pretty good now apart from the new spokes. The brake plate is sand cast so will never be really shiny. Headlamp rim is clean but needs replacing or re-chroming. Speedo has been moved to the other side as the thread in the fork crown was a bit better. Not sure how to pretty up the speedo, its too big really and a smaller Simson type would look better. May try a TS type rubber surround. Tank was polished with Mer and I think will do, as I want to keep the patina of a used enduro bike. Tank bag is looking good after its re-stitching and dose of dubbin plus new map cover. I used laminating plastic, this was strong and flexible, just hope it lasts. Not much to show for 4 days work but getting there.

Days 5-6 – The Back End

Not much time working on the bike yesterday or today. Friend Graham brought a TS250 4 speed engine to be stripped and hopefully rebuilt. Normally this is a pretty straight forward job but today it was pig, The thread was distorted on the clutch so the puller would not engage, After an hour or so of filing, we managed to restore the thread enough to get the puller wound on, then it would not budge, Eventually the puller broke and I had to try again with my spare puller, This time it finally came free with a huge 'crack'. Then we could not get the circlips out. In the middle of the rebuild some other friends arrived to look at a couple of my bikes and Graham then discovered a broken stud in the clutch back plate. What with the hiccups and some missing bits which we eventually replaced from my spares box it was 4pm before Graham departed.

One good thing was that Graham helped me put the ISDT bike on axle stands high enough to allow the back wheel to be removed. Also took of the back brake pedal and the side stand plus the tyre. Too tired to do much more today but at least I have a bare wheel ready for respoking.

Day 7

Only an evening's work on the bike today as despite being retired. I do have a very part time job and today was one of the days. Nevertheless, the back wheel is now rebuilt with s/s spokes and has been given a preliminary polish. Looking good, just need to buy a new 4.0 x 18 tyre and that job is complete. You could see the competition heritage, there are spikes at regular intervals round the inside of the rim, which obviously stop the tyre drifting round the rim when the pressures are low. Also spent some time removing and replacing various nuts holding the rear mudguard and the cloth cover. All of these were very rusty and have now been replaced by s/s items. Think I have worked out how the mudguard is secured, but decided not the try and remove it yet, mainly because the wiring would have to be disturbed, There are no quick release connectors on the loom, something I may look at in due course. So, not a lot but very satisfying nonetheless.

Day 8 – A trip to the show

Saturday 6th March was the VMCC Autojumble at Shepton Mallett which I always like to attend. This year I was also helping out by manning the gate for an hour or so. Took a list of required bits for various bikes with me. Needless to say I came back much poorer with only half the wish list and a few other things bought on a whim. For the ISDT bike I managed to get a clip for the ign cable where it pushes into the coil and a couple of bilux headlight bulbs. One of which is a very expensive Quartz Halogen type from Paul Goff, the other an ordinary Tungsten filament for £1.20. I also looked for alternative fork gaiters but saw nothing suitable and examined various tyres, partly for the ISDT bike and also for my BSA A65. I looked at the Mitas tyres and their offering. They gave a choice of tyres for the ISDT bike, traditional trials patterns and a more road friendly enduro pattern. However, the price was I thought quite high. Their offering for the BSA was good on price, but the rear pattern was too much like the horrid Avon SM mk 2 already fitted to the A65. On another stand I looked at a variety of tyre makes and types. All the ISDT pattern stuff was very expensive and mostly trials pattern rather then enduro. For the BSA, I liked the pattern and wrap round style of the Avon Road Runner, but these appear to have been discontinued and could not be had in the sizes I wanted. Likewise with a Dunlop offering., so I came away empty handed and it looks like I will be ordering on the Internet.

Back at the garage, I fitted the ign clip and the QH headlight bulb, both performing admirably. While the headlight rim was off, I traced the orange wire from the horn button to see what it was supposed to be doing; the answer was absolutely nothing. Though it enters the loom at the handlebar, it never emerges at the other end so has clearly been cut off somewhere. So I am still none the wiser as to its original purpose. However, I was able to figure out how to wire in an electric horn, which will be concealed behind the cloth cover. If only I had remembered to buy the horn I could have knocked off another job.

Day 10

Quite a lot of progress today mostly in a somewhat destructive sense. I have decided after discussions with a number of friends to have the mudguards powder coated black for now. Its not an ideal finish for sheet metal items as it does tend to show all the imperfections unless you can retrieve the object between shot blasting and powder coating and use a special high temperature filler. However, as far as I can see the mudguards are basically very sound with only minor surface rust so I am going to take a chance. Worst case is that the mudguards are at least weatherproof and they can still be rubbed down, filled and sprayed at a later date. I plan to have them done in black for the moment; jury is still out on whether to go for the later silver finish.

Anyway a great deal of dismantling was done today some of it using the angle grinder to remove reluctant bolts. In the end I removed the swinging arm, the rear brake lever, the front down tube and sundry other parts which are shown in the picture. I always photograph the parts taken to the powder coater and give him a copy so there is no argument later about how many bits etc. I also made a useful discovery when removing the silencer clamps. The rear part of the silencer can be removed to expose the baffles. This of course will make removal of the complete system a bit easier and of course by reducing the weight and length of the system. However, I am still leaving this job until everything else is done and the bike has been tried on the road.

I also managed to buy a small 6v horn whilst out shopping and this was fitted at the back of the air cleaner box. I also bought some red leathercloth during the same shopping trip and the horn will be hidden by this once fitted. My previous investigation paid off and wiring the horn in was tedious but straightforward. Final act in the garage was the messy job of cleaning those areas exposed by removal of sump guard and s/a. An incredible amount of oily sticky muck came out. No serious corrosion (I guess the oil helped) so I was able to touch up any rusty patches with Hammerite smooth. Perhaps eventually I will do a full strip and have the compete frame powder coated, but its basically so sound that I do not want to go there just yet. I also touched up the rear part of the frame loop. The photo shows the bike in its stripped state, Hopefully from this point forward its reassembly.

Final actions of the day were conducted in the warmth of the house. I ordered a set of new tyres from Busters. I also dug out the family heirloom Singer sewing machine and using the old cloth cover as a pattern, made a smart new cover in Red leather cloth. Seems to fit ok, just need to cut the location holes and reinforce that area.

Day 11

Tuesday is our day for having the grand daughter so work on the bike was a bit spasmodic due to entertaining a 3 year old. However, some meaningful progress; the pile of bits was delivered to the Powder Coater and should be ready next week some time at a cost of £50. Reassembly can then start in earnest. I cleaned and painted the rear brake rod, just needs a coat of clear coat lacquer to finish. The back brake plate was dismantled, everything cleaned and the face of the plate polished. Reassembled with some copaslip on all the bushes it now works well and looks a treat. The rear shocks were also dismantled and checked. One just needed a good clean and the spring reversing so that the shiny part originally protected by the top cover is now exposed. After reassembly it looked very good. In a perfect world I would have the top cover re-chromed but it's perfectly acceptable for now. The other needed a lot more work for some reason. I suspect that this one may have been under the exhaust system and never cleaned properly when the bike was in regular use. Anyway, after a fair amount of elbow grease and the attentions of the polisher, it came up well enough to be sprayed silver and then lacquered. Today it should be dry enough to reassemble. The spring also needs to be reversed and we will then have two presentable shocks; a satisfying day. Lots of little jobs to do but the major tasks now seem to be down to: de-rusting and sealing the tank (hate that job), fitting the tyre to the rear wheel (when it arrives) and deciding what to do about the

exhaust system. Do not want to spend too much time or money on this now as any coating I put on will have to be removed when it eventually goes to the platers. It's a great pity that pipe and silencer are welded together as I think I could do a perfectly good job with the silencer, it's the pipe which needs the most urgent specialist attention.

Day 12

The big job today was cleaning out the petrol tank, did I mention that's a job I hate?. It was just as bad as I had feared. The inside was heavily rusted and the smell of 30 year old fuel clings to everything. I wore some very old clothes and spent ages swilling the tank with a couple of handfuls of nuts/bolts inside. Every so often I drained out the liquid and filtered it before trying again. Every 3rd filter I used a pint of fresh petroil. The amount of rubbish that came out was amazing. Eventually, the liquid came out clear so I concluded I had done as much as possible. The tank is now drying out thoroughly preparatory to being petsealed. I checked the tank regularly and fortunately there was no evidence of pinhole leaks but the base rust is still there and needs to be sealed otherwise I will be forever cleaning out the tap and carb filters. Need a warm day for the petsealing, not much chance of that currently. Suspect I will have to wait until Mrs F is out for the day and do the job indoors.

That occupied most of the day. I stripped and cleaned the petrol tap which just needed a new rubber washer. The brake rod was lacquered, the second shock was reassembled and I wirebrushed and Hammerited the sump guard. Final workshop job for the day was to make up a couple of large knurled knobs to hold the cloth cover. The originals were very rusty 6mm wing nuts, my alli knobs will look much better. I decided it was time I rode a bike so tok the afternoon off to give my BSA A65 an airing. Whilst out, I called at my local nuts&bolts supplier and bought some s/s items needed for the rebuild stage. Not much more I can do now until the tyres arrive and the bits are back from the powder coater.

Day 14

Tank is now Petsealed and is curing in our spare bedroom. The weather was sunny but far too cold to try to do the job in the workshop so I braved the wroth, covered the ironing board with lots of newspaper and got stuck in. Boy did it get warm for a while but seems to have cooled down and hardened off ok. Just needs to be left for 48 hours but that is no great issue as the bike is still some way from requiring a petrol tank. The swinging arm spindle was given a good clean and polished in the lathe. Couple of rough patches but I think it will do. I need to double-check the state of the bushes in the arm when it comes back from powder coating. There was no detectable play when I dismantled the back end and I did give the bushes a quick check at which time they looked ok. The photo below does show that I have turned the corner. The tank and seat are only loosely fitted with the toolbox resting on top but it does give some idea what it will look like when finished. The tank has not been painted at all, just well cleaned, polished and new gold lining applied. Other than that, it's a question of waiting for parts to turn up.

Day 18

Still waiting for parts, perhaps just as well since the arrival of spring has created a whole raft of things that needed doing around the house and the garden, even managed to cut the grass yesterday. However, pottering around in the garage in the evenings has resulted in a few more tasks completed. The battery tray has been rubbed down and sprayed satin black, just to contain the rust really. The petrol tap and pipe have been fitted and a few litres of petroil put into the tank. I also threaded the leather straps to secure the tank, don't want it falling off the bike. No obvious leaks in the tank or plumbing. Cannot run the engine until the front down tube is re-fitted.

The tiny headlight was now beginning to look very sad compared to the rest of the bike. I am very reluctant to dismantle the headlamp to do the job properly just yet. There is very little room inside the shell and redoing the switch connections and wiring looks to be a mite tricky, best left until essential. So I rubbed it down in situ, masked everything, then gave it a couple of coats of primer and 3 coats of satin black. Not a wonderful job but it will suffice for now,

Whilst in town today doing my domestic chores, I found a can of BBQ paint which has been recommended as a good coating for the exhaust. Long term I want to get it satin chromed l but I do need to do something short term, the paint was cheap enough and will both keep the rust at bay and hopefully improve the appearance. So tomorrow we tackle the exhaust and the back wheel as Busters have confirmed my tyres are finally on their way.

Day 19

Hooray, the tyres arrived today so I was able to fit the smart new enduro tyre to the back wheel. The front tyre will not be fitted until after the wheel has been rebuilt with its stainless spokes, for now it will have to retain its old tyre. I also gave the exhaust pipe and the back part of the silencer (which is an exhaust can from a Ford Escort neatly welded on) a spray with the BBQ paint. Interesting to see what it looks like when it's dried. Hopefully the powder coating will be back today or tomorrow.

Day 21

Phone call this morning from the powder coater. The good news; most of the bits were finished, the bad news was that the brake pedal was leaking grease everywhere and had dripped on someone else's wheel in the oven. Fortunately, he was fairly relaxed about it when I collected the parts, I half expected a substantial bill. Anyway I took 10 shiny black bits home and one grease soaked brake pedal. Powder coating the mudguards was a gamble but it seems to have paid off, not quite as good as a professional spray job, but certainly good enough for what is supposed to be an off road work horse.

First task was to apply the gold lining stripes to the mudguards, that improved them immediately. Reassembly was fairly straightforward. I started with the swinging arm, cleaned and oiled the bushes to make sure there was no grit remaining, then put it back in the frame and pushed the pin through. A bit fiddly to get the rubber seals and the retaining cups all fitted but we got there eventually. Shocks connected easily and I was able to put the rear sprocket carrier back into the fork as well; even managed to find a nice stainless steel 14mm nut to tighten it up. I do like shiny things. Next task was the rear mudguard, also very fiddly as two of the fixing screws have very little clearance . Once this was done I refitted the rear light unit. A moment of panic when I thought that the new retaining screws were too short (I had to angle grind the originals off). However, once I had pushed everything into the correct position they were just right. Cables fitted and a quick test established we had a rear light and a brake light functioning.

Rear wheel and brake plate fitted straight in and so did the spindle with its welded on lever, no spanners needed here. The torque arm proved a bit reluctant due to the thickness of powder coating but a bit of grease finally did the trick. Suddenly we have a two wheeled vehicle again. Before taking it off the axle stands, I decided it would be a good idea to fit the side stand. This was also a bit reluctant due to the paint but eventually I managed to spring everything into position and tighten up the bolt. I did a test assembly of the rear brake lever assembly which confirmed that I did

not have the arm in the back plate at the correct angle. I never seem to get that right first time even though I had sketched the layout before stripping. Taking the arm of the plate is easy enough, getting it back onto the splines in the new position not so easy. You cannot just tap it back, the shaft slides back into the brake drum. Ingenuity is required and eventually I did managed to get it tightened up correctly. Of course what I should have done was remove the wheel and do the job on the bench but guess who had by then removed the axle stands and ISDT bikes have no centre stand! Anyway, that was about as far as I could get with the back end rebuild until I get the brake pedal sorted.

Next task was one I was not looking forward to, re-fitting the front frame member and my apprehension was justified. No idea if it's a common problem with these bikes, but on mine, the fixing holes do not quite line up. Initially I thought I could solve the problem by putting a jack under the engine but all that did was lift the whole bike even when I slackened the rear engine bolts. Eventually, I fitted the top bolt and made up a tapered drift for the bottom mount. Tapping this in gently eventually lined everything up so that I get the fixing bolt in from the other side. Tapping the bolt pushed the tapered drift out and the job was done. Five minutes to describe, about 2 hours of messing around to reach a solution, but at least I will know the answer next time. Fitting the front mudguard was breeze in comparison.

That left just the exhaust system mounting brackets which also were fairly straightforward. The end can that I painted a couple of days ago slid on and everything bolted up nicely. Final act of the day was to remove the footrests and give them a good clean up in the rotary wire brush. The brake pedal was also soaked in the cleaning bath to get rid of the remaining grease and wire brushed. ISDT bikes have grease nipple to lubricate the brake shaft. I had masked the nipple and the outlet holes, but the oven heat forced out what was in the pipe. Even after 3 cycles in the oven, grease was still coming out. As my street cred is a bit low in that area at present as is the bank balance the footrests were sprayed in Silver smoothrite and the brake pedal in black smoothrite, Tomorrow the bike should be rideable for the first time since I got it.

Day 22

Footrests and brake pedal re-installed today and the bike is now complete and rideable, though there is still work to do – see list below. This is how it looks after 3 weeks of tlc, though bear in mind the pictures still flatter a bit.

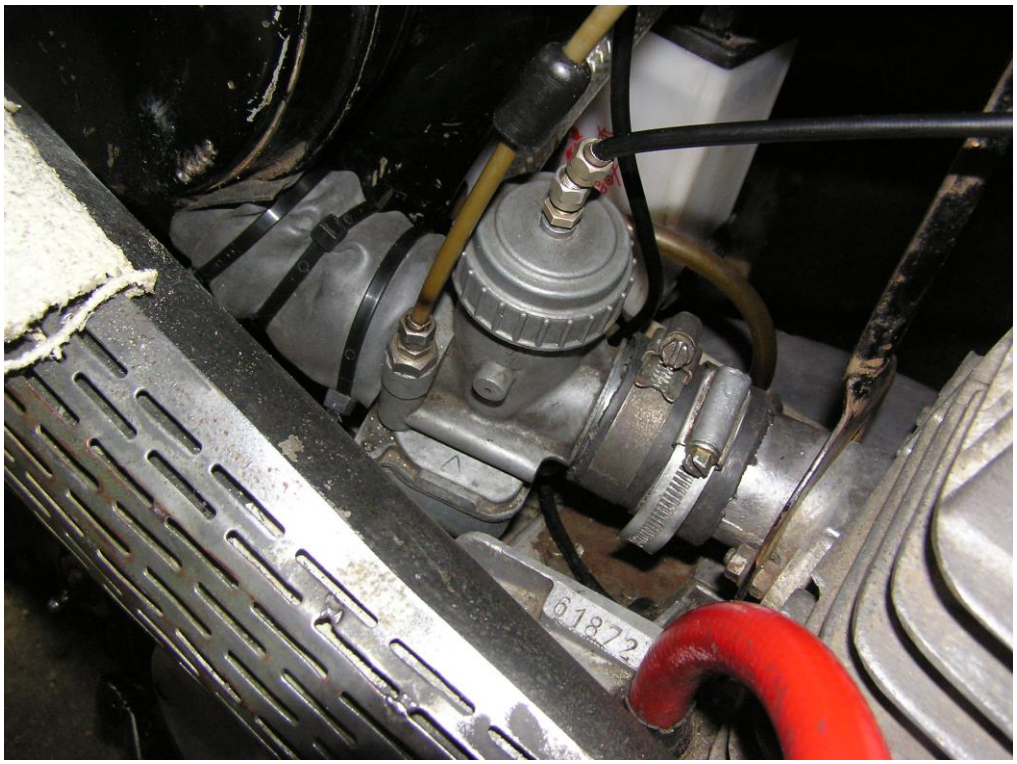
Obvious things I still need to tackle are: fitting the nearside comp number plate, respoking the front wheel, making s new canvas cover (the template I copied was clearly incorrect but it's now easy to see what needs to be done), getting the headlight rim and tail light cover re-chromed. Also doing the exhaust properly, I am not really happy with the BBQ paint finish though it does mask the rust.

Most important of all is to actually ride it and decide what needs doing to the engine. I would like to MoT it but really should wait for the new tyre to be fitted. I am still waiting for the V5C log book as well. Though it came with an old style V5, I could not find an entry when I did a vehicle enquiry on the DVLA site. Not sure quite what that means, possibly the number has been re-allocated and I may have to get a dating certificate or similar to get it re-registered as an historic vehicle.

Day 25

Decided to have ago at the carb today. The one fitted is a 28mm type as used on the road bikes and does not have a throttle stop meaning you have to maintain a tickover on the throttle. This is something I actively dislike as your right hand is constantly blipping the twist grip and its easy to stall the engine. Not to many other carbs to choose from in my spares box. Ideally I would have used a 30N3-1 as this is my preferred BVF type. Unfortunately friend John borrowed the last one a couple of weeks ago. The choice was between a 30N2-3 as fitted to the 4 speed TS250 or a 30N-5 as fitted to the ETZ250. Regrettably, neither had a 140 main jet (which would be correct for a 33:1 mixture). So I had to settle for the 30N2-5 with a 135 main jet. Next problem was the diameter of the inlet spigots. On the new carb it is 40mm whereas the inlet stub spigot is about 36mm. I found that a piece of 40mm water pipe cut to size and with a slot fitted nicely on the inlet spigot. A visit to a friends garage yielded a piece of tophose with 40mm inside diameter so we were in business. Physically the carb just fitted on the manifold and rubs on the crankcase flange just like the original. The main problem was fitting the rubber hose that links carb bellmouth to the air cleaner. After several false starts and fearing I would split the hose which is not in wonderful condition, I gave up trying to fit it. Instead I made a bandage out of a piece of inner tube. I wrapped it round air cleaner tube and bellmouth twice then secured with cable ties. Not very elegant but its not visible once the cover is in place and better than having the carb sucking muck and rubbish thrown up by the back wheel. Two further problems had to be overcome. The starter jet assembly from the original carb would not screw into the new carb. After a lot of searching, I managed to find the correct type for the new carb and indeed they are of a different tread size. Something else new learned today. Final problem was the throttle cable. The free length was too short to allow the slide to bottom. I could have cut back the cable outer to make it fit, but that would have meant it no longer fitted the old carb should I need to put it back. ISDT throttle cables are both longer and have different ends to normal MZ throttle cables so there was nothing quite right in my spares box. In the end I did find a cable

that would do for now albeit a little shorter than I would have liked. At last I was able to try the engine. A strong smell of petrol reminded me that in all the fuss, I had forgotten to fix the petrol pipe. Once sorted however, the bike did indeed start easily and settled down to an acceptable tickover once adjusted. So a reasonable result even though it took about 4 times as long as I thought. I will still have to sort out a better aircleaner-bellmouth connection but this will have to wait until the exhaust comes off to allow better access. I will also be able to relieve the crankcase wall at the same time. *Addendum: following a posting on the ISDT Owners web site, I have more information on the fitting of alternative carbs. It seems that the manifold I have is specifically intended for the original KN30-1-3 carb which has a female end with clamp to slide on the male end manifold. All the later BVF carbs have a male end that and the manifold has the female fitting with two 6mm clamping bolts. Fitting a later carb to an early manifold obviously moves the carb too far back, hence the fouling on the crankcase sidewall and the difficulty in getting the air cleaner rubber to fit. So I now either need to find the proper carb (hens teeth items apparently) or the later manifold. Ah well, at least now I know what I need to do and will avoid carving lumps out of the crankcase.*



Day 28

Talked to Fred Rogers yesterday and there is no clear indication of when the new front spokes will arrive. Decided to strip the wheel and clean up the old spokes so that it looked a bit tidier and fit the new front tyre. Dismantling went ok. The old inner tube was a Barum and bright red. Though it looked ok I decided to treat the bike to a new inner tube on the basis of safety first. Once rebuilt with the spokes painted silver, it all looked quite smart. I also cleaned up the brake shoes as they looked a bit oily. Once reassembled, it all looked fine but the front brake is now worse than before. Whether it just needs bedding in or some more serious treatment I do not know. When it stops raining, I will try a few laps of the garden with the brake used frequently to see if that helps. More serious is that the front fork action seems very stiff. I am going to try draining the present sae15 fork oil and see if that improves matters in which case a lighter oil is indicated. Also check that the forks are aligned properly. Need space in the main garage to do both jobs so it will have to wait. I am also increasingly concerned about the previous owners mod to use internal springs. The fork was not designed for this and the aluminium top fork nuts do not seem to me to be up to the stresses created by retaining the internal spring. In addition, the fork gaiters sag under compression as they do not have internal support. On balance I am inclined to convert it back to external springs; but first I have to locate some.

Day 29

Last night I modified the leathercloth cover to make it fit a little better and indeed this seems to have worked. For Now I have just stitched on an extra bit as my remaining piece of Red Material was not big enough to make a complete cover. Looks ok and is now a perfect template for a replacement which somehow I doubt will ever get made. Thinking about the fork problem over night, the penny dropped on what had happened to make the forks so stiff. As with all MZs, the spindle slides through the LH fork leg and is supposed to centre itself before doing up the locking bolt. For some reason the fork end had jammed on the spindle and was effectively pulling the end off the fork inward so the forks were no longer parallel. I slackened the clamp bolt applied some oil and bounced the forks a few times at which point there was a ping and everything sprang into place. Not only do the forks now work much better (they will never be silky smooth like modern bikes) but the brake seems better as well. Maybe I can risk an MoT next week after all. However, I still intend to explore converting the forks back to external springs. One other thing that worries me slightly is the fit of the brake back plate on the fork leg. I have applied some tape to take up the slack, but you can still hear a clonk as you bounce the forks with the brake applied. It looks to me as though either the brake plate does not fit into the wheel quite far enough or the centre spigot for the wheel spindle is slightly too long. Either way, this is something else that will need investigation when the wheel is next removed for the new stainless spokes.

(though the silver painted ones look pretty good in the picture).

Day 33

Well the great day dawned and with some trepidation I set of for the MoT station. As a precaution I had put the battery on charge the night before as it occurred to me that I had never put the voltmeter in the circuit to make sure is was charging properly. Having the charge light go out above tickover is a good indicator, but not proof of a fully functional charging system. First impressions were not too good, the front brake was definitely feeble and the four speed origins of the gearbox were very apparent, it was clunky and easy to find false neutrals. However, the ride was better than expected, quite comfortable and stable in fact and the engine pulled well. Then I tried to look in the rear view mirror and promptly remembered that I had forgotten this essential item. Progress to the test was steady and fortunately without incident, I doubt we got above 45. The engine rattle noted previously did not seem nearly as obtrusive when riding and I am pretty sure it's either piston slap or little end (or both). The bottom end felt fine and there was much less vibration than I had expected. The engine clearly had a lot more punch than I was using yet seemed able to pull easily from quite low revs. I rode for much of the way with the front brake partly on to try and bed in the linings.

Well, I must have succeeded as a nice green pass certificate was provided in exchange for £25 so we set off home via a friends house to increase the mileage a bit. On the way back

a nasty buzzing noise developed which decreased markedly if I gripped the tank firmly with my knees. Once home I made a list of the jobs which needed immediate attention:

Fit rear view mirror
Glue down the rear tank mountings
Adjust LH footrest to make gear lever easier to reach
Lower the tickover speed
Fit a bracket to hold an oil container and a measure
Check charge system
Fix oil leak from clutch adjuster

Longer term I will want to experiment with a 28mm Mikuni carb I bought recently, this is a bit shorter than the BVF and may be easier to connect to the air cleaner. It is also reputed to be a far better carb. Some new brake linings will also be fitted when the front wheel gets its makeover.

So nothing desperate and no more than you might expect from a bike that has not been on the road for over 30 years. Biggest obstacle really is the lack of a V5c so I cannot tax the bike. The good news is that I really enjoyed riding the bike and I am looking forward to the next trip with the above points sorted. Something else I have just realised, it did not display any lurching on the overrun and yet it is running a standard late type BVF carb with a tickover enabled. Given the high state of tune this was entirely unexpected. I wonder if the existence of the auto advance unit has any bearing on this.

Day 35

Had a day off yesterday to do a VMCC navigation road trial on my TS250 outfit. The bike ran very well apart from a total lack of electrics other than sparks just before we got to the last control (thank goodness for the MZ-B electronic ignition which does not need a battery to work). First job today was to sort out the outfit electrics which was nothing more than the battery strap slipping and shorting out the +ve terminal. Thank goodness MZ fit earth line fuses as well as feed line fuses. Anyway the main reason for adding this piece of trivia is that it reinforced my desire to fir an MZ-B unit to the ISDT bike, batteries will be an irrelevance. As you may gather, this is in part because I finally checked out the charging system on the ISDT bike today to find that it was putting out barely 6.5v instead of the 7.2 needed to maintain a healthy charged battery. A new electronic 6v regulator is £32, a full MZ-B full system is £220, both a good deal more than last year (£25 & £150 respectively). The recession and the fall in value of the £ are largely to blame. Still agonising over which way to go.

I did make a start on the issues list. First task was to remove the back wheel to attend to a puncture which had appeared since the MoT. I think it must be the valve as I could find no holes in the inner tube once removed. Fitted a new inner tube and all now seems to be well. The oil leak from the clutch adjuster cover was easily fixed.; the large O ring was missing but has now been replaced. Adjusting the tickover was also easy as was gluing on the rear tank rubbers. I found an old TS style bar end mirror which is now fitted and made up a bracket behind the LH competition plate to hold a ½ litre oil container. Have still to solve the design and fitting of a measure – the ISDT tank cap does not carry one unlike the later MZ models. I also failed in my attempts to adjust the LH footrest. Moving it forward to a more comfortable position resulted in it fouling the gear lever – back to the drawing board on this issue.

Friday 30th April

Having lost the plot on how many days we are into the project, I am resorting to recording the actual date. Having not had any sort of response over the V5 from DVLA, I finally rang them a few days ago. What an expensive and frustrating exercise with premium rate numbers and endless menu options. However, I did finally get to speak to a helpful young lady who promised to investigate. Things have now moved on, the bike details have finally appeared on the DVLA web site (albeit not showing as an historic vehicle) so a V5 should be imminent. No explanation as to why it's taken so long, nor why it needed a phone call to kickstart the process. Fired with enthusiasm, I have tackled the charging problem by fitting a solid state regulator 'borrowed' from friend John. Reluctant to actually buy one as I want to put the money towards a Powerdynamo. I am now getting over 7 volts at not much above tickover so I think we have reliable electrics. One step forward, but the top end rattle seemed more noticeable today so the issues list now is:

Monday 10th May

Though I have done nothing to the actual bike for a week or so, I have been busy on the V5c front. The V5c finally arrived but my delight was tempered by a number of errors in the details the most significant being that it was still not classed as an historic vehicle. After yet another phone call to my very helpful lady at DVLA, we managed to get one of the errors correctedbut she could not alter the others. After checking with a colleague, she told me that I would have to take the paperwork to my local DVLA office (Bristol in this case) as they were the only people with the powers to correct the tax status and the model description. As a precaution, I have sought written support from the MZRC Classics Officer about the corrections and when this arrives, I will make the trip to Bristol. Very Frustrating as I had hope to ride the bike to our section meeting on 9th May.

Anyway, give that the V5 is fairly close, I decided it was time tackle the carb manifold issue. The chances of getting a correct one for the later carb are small so I have acquired a TS250 manifold which I will alter to fit. Basically it is angled the wrong way, to the left rather than the right and simply turning it over is not possible due to the internal shaping. So I set too with hacksaw and cut through the flange, then the filed and shaped the ends until I had a correctly shaped and sized manifold – only in two parts. These have now been joined together by a couple of ali plates which are drilled and tapped into the actual manifold. Its not a perfect join but the shaping position are correct, any small gaps will be filled as part of the welding which is a job I will have to get done tomorrow.

Once this is done I will have to clean up the internal bore to remove the steps/ridges here the two parts are joined to open out the throat a little as the ISDT barrels have clearly been gas flowed, if somewhat crudely.

12th May

At last a positive result. I was very lucky to find a local fabricator who made an excellent job of welding the new manifold and for a very reasonable price. Back home I spent an hour or so re-profiling the inside though I have not yet opened it out quite as much as the original . The manifold fitted perfectly and the car lined up just right in respect to the air cleaner and without fouling the crankcase. Getting the air cleaner rubber back in place was a bit fiddly but I eventually worked out a system. As everything looked good, I re-connected the fuel pipe and found no leaks. So choke on, three kicks, choke off, ignition on and she started second kick and sounded absolutely fine. Final tighten up of al the bolts and the job was

done. One thing did surprise me, which I need to check. There was no heat proof washer between carb and barrel. Tried fitting one but the studs are clearly not long enough so settled for a new gasket only. One thing off the too do list:

19th May

Checking with a friend I find that his G5 does have the heat proof washer, but does not have the plate which acts as the curtain guide. Looking at the spares book also shows no guide. However, the guide plate is a properly made item in my view, not some bodge job. Brain now in gear, if I use just one set of nuts to hold, manifold, guide plate and heat washer, it should all fit. A job for another day.

I also went to DVLA Bristol today hoping to lay the ghost and finally get an historic tax disk. I went armed with all the paperwork I possess including the MoT certificate, Insurance certificate and photos of the bikes, VIN plate etc. Everything went swimmingly, the clerk agreed to all the changes and was ready to issue free tax disk. Then she checked the Insurance Certificate and found it had an error in the regn number; two characters had been transposed. So close and yet I came away with nothing. Entirely my own fault of course but the whole business of getting the V5c correct and the taxing of this bike seems like a continuing nightmare. I have spoken to the insurance broker and a new cert is on its way. I could now post all the paperwork to the DVLA (The clerk kindly gave me an address slip and stamped up all of the paperwork) but I just know that if I tried it something else would go wrong. All of my previous letters went unanswered so I will have to drive to Bristol once again to be sure. It will teach me to read the insurance paperwork more carefully.

Friday 28th May

This week has seen real progress. Armed with a correct insurance certificate and the rest of the paperwork I made a second trip to DVLA Bristol, No problems this time I was in and out within 15 minutes clutching my historic vehicle tax disk – new log book to follow. Just to curb my enthusiasm the bike I rode to Bristol (My A65t BSA) stopped with totally dead electrics on the way home. Fortunately it was only the earth lead falling of the battery due to a loose nut/bolt. So I was quickly on my way home again. Lucky that did not happen when I did the Jampot Night Trial back in March on this bike.

I have now put about 20 miles on the clock of the ISDT bike. Some things are great, the suspension is much more compliant and comfortable than I was expecting and the engine, though a bit clattery at tickover and just above pulls well and is surprisingly smooth. Its actually a much nicer bike to ride than I was expecting not at all peaky though its clearly has plenty of power is you wind it up. The problem areas needing more work are:

- A flat spot if you open the throttle too quickly, it can be overcome by backing off the throttle and letting the revs build up more slowly. I am not sure if its just me not revving it hard enough in the lower gears or signs of an incorrect mixture. It is of course wearing the wrong carb and there is no air cleaner fitted at present. Step one will be to source an air cleaner; apparently its the same type as fitted to a Trabant.
- The gear change is very difficult between 2nd and 3rd compounded by the gear lever being too far from the footrest. I have adjusted the clutch to give more clearance and moved the footrest to improve its relationship to the gear lever. This latter required some angle grinding of the footrest to stop it fouling the lever. Road test needed.

- Front brake remains poor. I stripped out the front wheel assembly. Nothing obviously wrong though you could see that the linings are only polished over a part of their surface. I decided to fit some thin shims to see if that helped. Seemed better but only a road test will establish if it's enough.

Not too bad really and I hope to use the bike for our MZ section annual Ramsbury Run on 30th May.

Friday 18th June

Well, for a variety of reasons, I did not take the bike on the Ramsbury Run. Indeed there has been virtually no riding or any other activity on the ISDT bike until the last couple of days; Summer has brought a lot more demands on my time but I finally received the spokes and the new brake shoes yesterday so allocated some quality time to the G5 today. The wheel has been rebuilt with shiny new spokes. The new shoes have been installed and I have filed a small amount of the backing plate to make it sit better against the fork. All has been reassembled with a new brake cable. I also rearranged the manifold so that we now have a heat proof washer as well as the curtain guide bracket. A road test had to be deferred due to the heavy rain, Oh yes, the V5c arrived from DVLA this morning with the errors corrected so that's one more problem put to bed. The list is getting shorter:

Monday 21st June

Took the bike out for its first longish run today (about 20 miles). Went well, no problems, front brake bedding in nicely. Surprisingly flexible but needs a lot of revs before changing up if you want to move quickly. Seems to go flat if you give it too much throttle in the higher gears but picks up if you back of a little. Still running without an air cleaner so I suspect the mixture is a bit weak at wide throttle. Have located a supply of filters but they will not be here for a couple of weeks. Steering felt a bit odd at first, think it's a combination of a steep head angle, and the x-country tyres. Will check out the wheel alignment and adjustment of head bearings just to be sure. Overall impression was very positive; not much vibration, no lurching on the over-run, suspension firm but comfortable. As the engine is an unknown quantity I am treating it with great respect for now. Clearly it loves to rev and you can feel it coming into the power band if you wind it up in the lower gears. As there is no rev counter fitted, it's a bit difficult to know exactly where the power comes in. Highest speed I risked was 90kph (about 56mph) and there seemed lots more to come despite the low overall gearing.

Monday 19th July

The ISDT bike has taken a back seat for a couple of weeks whilst I wrestled with other problems. On 11th July I rode it to Ham in Glos for the monthly MZ club meeting; a round trip of 90 miles including a diversion to Berkeley to drop some bits off for a friend. No mechanical or other problems but the longer run did highlight the flat spot when opening the throttle making it hard work to get the bike up to a decent cruising speed and even harder to keep it there if balked at all. Discussing this at the meeting we concluded that it was running too weak at the top end. I also felt the back end was a bit bouncy and there seemed to be a mouse squeaking away somewhere in the rear suspension. So a few more things to sort.

The bouncy rear end has now been fixed. MZ shocks can be dismantled for servicing if you have right tools – which fortunately I have. Stripping them revealed about 30c of fluid in one and about 10cc in the other. The manual suggests 80cc but does not specify a grade. All I had in stock was some 5 grade left over from a BMW fork service. Probably a bit light but it

had to be better than what was in there previously if only because the quantity was much higher. I found that 90cc seemed to work better. With 80 cc loaded there was still no real damping at the very end of the travel. Anyway both shocks now serviced and the back end feels much firmer and will get better as they settle down.

The air cleaners I had ordered some while ago turned up couple of days ago and this seemed an omen to tackle the weak carburetion – up till now it has run with no air cleaner, A test run with the new filter did provide some improvement but the flat spot was still there and I suspect that the reduction in intake noise was the major improvement. I then tried lifting the needle to its richest setting. This definitely improved matters but was not a complete solution. The only other adjustment I could try was to close the pilot air-screw down to about ¾ to 1 turn from closed. For optimum tickover its is usually set to 2 ½ to 3 turns out. I know that the pilot jet is only supposed to influence mixture settings up to ¼ throttle but some research by Roger Badland recently suggests it may have an effect across a wider spectrum. Anyway a further road test indicated that this had indeed helped so I went for a 20 mile run. What a difference from my previous run - a much nicer bike to ride. Still feels a little weak at very wide throttle settings so the next thing is to establish exactly what main jet is fitted (I expect it will be a 135 as the carb came straight of a TS250) I know I should have checked but at the time I was just grateful that I had found a carb which would fit and which seemed to work. Fred Rogers confirmed that he has jets up 150 in stock. The manual suggests a 145 is standard with options of 140 and 150. However, that is based on a 25:1 fuel mix and I intend to run at about 40:1 using modern semi synthetic oil. My plan is to go up one size on whatever is currently fitted so I plan to order a 140 and a 145. for more experimenting

Saturday 28th August

I have been very busy with other peoples bikes and domestic issues for some time so the ISDT bike lanquished at the back of the garage. However, over the last week or so it has received some quality time and some intensive use as well. The carb was stripped, thoroughly cleaned and the 145 main jet fitted. A road test showed this was a very successful mod. The bike is much more responsive and really screams up through the gears if give its head. Real power comes in with a rush above 4000rpm.There is still some fussiness if the throttle is opened too wide at low revs, but the tendency to go faster if you back off has now gone. I think I's about as good as I can get it and the plug is a lovely mid brown colour. As a digression, I spoke to the previous owner to try and find out why he had changed the carb. It transpires that the 28mm carb (from and ES250) was already fitted when he bought the bike and he also had the same problem of running faster on a closing throttle.

Anyway now that the bike was performing so much better I decided it was time to fit a tachometer so that I had some idea what revs it was doing. This was a fairly straightforward job using parts from a Super 5. I used the speedo mounting bracket and replaced the speedo with a bicycle digital type for now. One day I will make up a second mounting bracket and refit the original speedo. I thought it would be revving very hard at normal road speeds with the 15t gearbox sprocket, but in fact its not that bad. Assuming I programmed the bicycle speedo correctly (which I checked against the original), the 4000rpm is just over 55mph and 5200rpm is about 72mph. The engine feels very willing at these speeds but in deference to its age and unknown condition I have not tried really hard or for long at the higher speeds.

Final workshop activity was to fit one of the MZ-B powerdynamo's that I had left over from a previous project. In reality there was nothing wrong with the 6v dynamo powered system except that it was dependent on having a functional battery whereas the powerdynamo has elecronic ignition powered direct by the alternator. With 6 other bikes in the garage, keeping on top of battery charging is a chore so one less is a bonus. These are pretty straightforward to fit but tidying everything up to be unobtrusive time consuming. I wired a simple on-off switch to kill the ignition and fitted the switch where the original coil transfer switch was located. The bike now of course only has a single operation coil connected to the centre plug. The coil for the side plug has been left in place to disguise the alteration. The original ignition/lighting switch is retained but is left permanently on the headlight setting.

This work was all finished on the Friday evening and a short test run indicated all was working well. On t Saturday we had a run scheduled across the Imber ranges so I decied to take the ISDT bike and see how it performed. The answer was brilliantly. It handled really well across the unmade roads and tracks. Though there was not a lot of power low down, the engine was quite happy to trickle along at slow speeds in high gears if required. I came back after a 60 mile run with a big grin and a firm convert to the ISDT bike. Pity I now have to clean the bike as well.

With the MZ-B Powerdynamo and the digital speedo fitted, I was also able to remove the speedo gearbox and fit the cast alloy timing cover from the later models. I just happen to think it makes the bike look slimmer and neater and as I had been given one by a very kind friend, on it went.

I was also given another tank which though cosmetically challenged on the outside is immaculate inside. This is going of for shot blasting and a proper paint job when funds allow. Other jobs still to do:

Investigate top end rattle
Re-chrome or replace headlamp rim
Re-chrome the exhaust system

Saturday 28th December 2013

The diary on the ISDT bike has not been maintained since 2010 partly because it has not needed much attention partly because it has not been used much and mainly because I have ben involved with several other projects. One of the reasons it has not been used

much is the gearbox which is reluctant to change up, particularly into 3rd & 4th though downward changes were usually ok. This made it not very nice to ride though in other respects it was a fun bike. Anyway, as I always do at this time of year I made a list of the things I would like to achieve in the next year (2014). Near the top of this list was to sort out the ISDT engine and tidy up a few other things on the bike.

Accordingly today I moved the bike from the back of the shed to my workshop and started work. Getting the engine out was fairly easy the only problem was the lack of a centre stand which made it impossible to use my bike lift. I did manage to get it mounted by the footpegs onto a pair of axle stands so that I could turn the back wheel to find the chain link but it still means crawling round the floor instead of being at a comfortable working height. The only surprise at this stage was the fact that the rear engine mounting bolts were 10mm diameter. Every other MZ 250cc engine I have stripped used 8mm bolts. This temporarily scuppered my backup plan to use a spare Supa5 engine in case the ISDT engine proves difficult tor rebuild quickly.

Once the engine was out of the frame I was able to give the frame a good clean – it was remarkably free from rust and will only need a bit of touching up. With the engine on the bench I could start the strip down and very quickly ran into snags. Firstly the drive side cover was quite difficult to remove; I had to use the hide mallet and some wedges to encourage it to come off. The main sticking point was the gear change shaft. Which was very tight on the hole through the outer cover. At first I thought it was a perished ‘O’ ring but one was not actually fitted. Then looking at the shaft I could see that the last 50-60mm were rather thicker in diameter than the remainder of the shaft, almost as though a new section had been welded on. Also the slot in the splines is something not previously seen on an MZ engine. Indeed it is not really required as the fixing bolt for the lever does not extend into the shaft at all. It may be something unique to the ISDT motors or I may have a bodged repair, first of many questions.

The next problem was the nut holding large primary drive gear. It was desperately tight and would not respond to any of my spanners or sockets and I was afraid that applying to much pressure could damage teeth on the drive gear. I also tried using a chisel to get it started but without success. Finally I had to drill through the nut on each side then chisel the nut apart and even then it was reluctant to come of the shaft. I had already checked that it was a normal thread not LH incidentally and fortunately I do have a spare nut.

The drive gear itself is special to this engine being made of steel, the road engines use cast iron gears and this may go some way to explain the rattling noise I noted when I first restored the bike. The gear itself was very tight on the input shaft and my normal two-leg puller would not do the job so I had to make up a special tool to pull it off. The next obstacle was the clutch which made the puller really grunt under the strain before finally coming

loose. It was quite clear that the primary drive side had been worked on by a previous owner and I am beginning to feel that he was a gorilla. The other odd thing about the quite is that it was a perfectly standard 4-speed steel clutch of the type fitted to all 250 MZ road bikes of that era. I was under the impression that the ISDT engines had lightweight alloy clutches – something else on my list of things to check. The tapers on the crank and inside the clutch body seem fine though there was evidence that something had been used on the tapers to help adhesion.

Anyway the major bits on the drive side were now removed so I turned my attention to the head, barrel and piston. No real surprises here as they all came apart easily enough. The bore is clean but does have a wear ridge at the top which I need to measure in case its rebore time. The piston does have some brown burn marks below the rings so this may well be another source of the rattle. A quick poke at the big end suggested that this was still fine but it will get a more thorough check later. Last job today was to remove the inspection plate on top of the gearbox. Next step will be to split the crankcases.

Monday 30th December 2013

Quite a successful day both in terms of information gathering as well as stripping the engine. It seems that my gear change shaft is not a bodge job but is the correct design for this engine. I found a good picture of it in the spares book and it clearly shows the double diameter and the groove. I have also heard from someone else who has a G5 and he told me his has a steel clutch as well so maybe the aluminium type is a later fitting.

Anyway back to the stripping which proceeded without incident. I took photos of various parts especially the arrangement of the gear selector mechanism. This has to be ‘timed’ correctly otherwise you cannot select all the gears. I will include a selection of these photos when I get to the rebuilding stage in case they are helpful to other G5 owners. So far I have not been able to find a manual for this particular engine in English. The actual gearbox is unique to this engine and has a selector mechanism based on the 4 speed engine but with 5 gears; t through totally different to the later 5 speed boxes used in the TS and ETZ models. Everything came apart quite easily, the only slight difficulty was pulling the selector shaft through the selectors. I had to tap it through yet later when I tested it in the lathe it span true and the selectors all slid on smoothly; puzzling.

All the gears and selectors looked to be in perfect condition which was a relief but when I looked on the bench after tidying up I noticed some small pieces of metal. After some investigation I established that they are actually the remains of a shim or thrust washer that fits behind the circlip retaining second gear. They would have been held in place by the sliding part of 2nd gear but would also have been able to move outwards and block the gear selection when this happened. Exactly mirroring the problems I experienced when riding the bike and the reason for the strip.

Finding this was a relief as I half expected to find something far more serious like bent selector arms. You can see the wear marks in the washer in the first picture. The second picture shows where the washer came from (behind the circlip).

The next problem is to locate a replacement thrust washer. I checked the spares books for the other MZ 250 engines but the part number (19-46.068) does not appear in any of them. I also checked an old MZ dealers price list dating from 1996 but the part number is not listed – as far as I can see any part beginning 19-** is specific to the G5 motors as there this series does not figure anywhere else. I have contacted a couple of possible suppliers, one in the UK and one in Germany and posted a message on the G5 Forum. I am not overly optimistic about the latter as the group has been very quiet for years and I have only had one response to another query I posted and that was of limited help.

As far as I can see the other things I will need are fairly standard items common to the 4 speed motors – gaskets, seals, bearings and piston so if I can get the thrust washer it should not take too long to rebuild the engine. If the washer does prove impossible to locate then I may have to proceed with the Supa5 option.

Wednesday 1st January 2014

Not a lot of progress over the last couple of days. I have found a chap in Germany who says he can supply a replacement thrust washer and I am waiting for him to confirm if he can supply the other bits I will need (piston, seals and gaskets). Hopefully he will get back soon now that the holiday period is at an end. In the interim I have given all the other components a good clean and checked them for wear or damage. Nothing untoward found fortunately. I polished up the selector shaft in the lathe nothing obviously wrong to account for why it had to be tapped out and the operation is smooth enough now. I also put the gear change shaft in the lather and cleaned up a rough patch where it went through the outer cover; a nice smooth fit now.

With no further engine work possible I turned my attention to the exhaust system It is very sound but the plating at the exhaust pipe end Is peeling of so I gave the whole pipe section a thorough wire brushing and several coats of BBQ heat resistant paint. It will not last long but provided you keep it regularly it keeps the rust at bay. The other end had been modified by the previous owner to add the back part on a Ford Escort silencer box to cut the exhaust racket down. It may have worked 30 years ago but the whole thing is now well rotted and the fact that it extends the already lengthy exhaust system is another reason to think about replacement. I had an old TS250 silencer from which I cut the end section and after some further fabrication I had a new end can which incorporates some of the road model silencer baffles. I will have to wait until the bike is back together to test it. If it does not work I still have the original end can to fall back on.

Friday 3rd January 2014

Still no word from the chap in Germany about the spares; I sent him another email today in case the first one did not get through. In the interim I remembered another little job that had

been long outstanding The headlight had a couple of dents, one present when I bought the bike and the other caused by me when the Matchless brake lever fell against it. In addition, the paint on the headlamp and its bracket wee both poor but I had chickened out on this task first time round because of the very cramped access to the switch and wiring. I started out by taking some photographs of the switch connections and the disposition of the wiring. The switch and all the cables were then disconnected and removed. I was going to take the shell to my friend Mick for panel beating but having recently acquired some leather and wooden dollies I decided to have a go myself and was pleasantly surprised at how easily the dents came out. Both shell and bracket will be powder coated as soon as I can get over to the paint shop.

When disconnecting the electrics, I noticed that the wiring was a bit frayed where it located into the screw fixings. I cleaned it up and then soldered the ends to make a tidier job. I also removed some of the worn plastic outer covering and replaced this with new shrink wrap. Should now be a lot easier to re-assemble and look much tidier. Nothing much I can now do until the powder coating is done and the engine spares are acquired. Maybe I should strip down the Supa5 motor and drill out the crankcases for the 10mm bolts just in case. The oversize holes can always be sleeved back to 8mm!

Sunday 5th January 2014

Well the second email to the guy in Germany has not produced a result. I used the tracking option and got confirmation of delivery so I guess he just either too busy or has changed his mind. Just wish he had the courtesy to tell me so I can start looking elsewhere. Anyway I decided to go ahead with the conversion of my Supa5 motor as a backup. The engine was due to be stripped anyway as it has always seemed a bit noisy. It is the original motor from my 1980 Supa5 which I y bought when it was 3 months old, sold it in 1982 and bought it back again in 2002. I rebuilt it in 2002 and did a few thousand miles on it including touring in France Ireland and Scotland. Though it was always very reliable and incredibly quick it also had a strange rattle which I could never track down. In the end I built a replacement engine which is now in the Supa5 and this engine has been used a spare by me and other people to keep them mobile while I was rebuilding their engines.

Stripping the engine was quite easy, with the right tools It normally only takes well under two hours a lot of this time spent cleaning of the external dirt. In this case the engine was surprisingly clean it was mostly mud, hardly any signs of oily dirt which was encouraging.

Initial inspection showed no obvious reasons for the rattly buzz which if my memory is correct stopped at around 4k revs. Don't think it was something in the running gear as it did the same thing in at least two other bikes. I don't remember for sure what I did when I last rebuilt it but it must have included a rebore as there is no wear ridge at the top of the barrel and I can barely get a 4thou feeler gauge between barrel and piston at tdc and under 3thou at the bottom. There was a very slight rock in the small end which I doubt was the cause but I have a new long needle small end bearing which removed all trace of slack and will be used for the rebuild.

The main bearings were replacement SKF C4 fit resin cage items which were both in perfect condition which I would expect given that they have done under 8k miles. The gearbox bearings were also replacement items and 3 of them were perfect. Frankly the other one was only very slightly worse but I intend to replace it just in case. That was it,

nothing else worn broken or loose. I am pretty sure it's not the primary drive gears as these along with the large needle roller bearing in the small drive gear were all replaced during previous (unsuccessful) attempts to get rid of the noise. The only other slightly odd thing was the presence of two plates behind the timing side main bearing instead of one. I remember that the guy I bought the bike back from mentioned that he had once rebuilt the engine without the seal plate and it used to seize up when it got hot due to the flywheel rubbing on the crankcase. Indeed you can see the evidence of that even today. Whether he then put in the two plates or I did is now lost in the mists of time and I will have to decide whether to use one or two plates in due course. The big end has clearly been replaced as the flywheel is engraved by Steve at Piston Broke. I don't think I put a new big end in it but anyway this one is perfect.

So there is no reason not to put the engine back together even though I doubt that one small end bearing and one gearbox bearing is going to cure the rattle but at least I know there is nothing to worry about inside whatever noises it makes.

While it was all apart I decided to go for broke and carry out the modifications to enable it to fit the ISDT frame. I am documenting my experiences in case anyone else needs to do a similar job in future which given the special nature of the ISDT 5 speed gearbox is highly likely. Fits job was to remove the steel locating tube from the LH crankcase to mounting hole. Left in the crankcase I felt it could have caused the drill to wander and saw no reason to risk it. I had to heat the case in the oven before it could be extracted as it was a tight fit. Securely mounted in the chuck of the lathe it took only moments to open it up to 10mm. I left refitting until later otherwise it could have created problems getting the case level on the lathe bed.

Next job was to wind the slide on the lathe back as far as it would go to create the largest possible flat surface on which to mount the crankcases under the drill head. Even so it was not really far enough and the cases had to sit at an angle. I also have to make up a frame to clamp crankcase to the lathe bed. You can see this in the picture and it's a very thick steel tube under the bed tapped 8mm for long studs and a piece of 40mm square wood suitable drilled for the top of the clamp. This worked for me but I guess each lathe will offer its own challenges in this respect. Once the clamp was manufactured it was fairly easy to get the crankcase lined up under the drill head. I used an 8mm drill in the chuck to get it lined up properly before tightening the clamp and then made sure it would slide in and out fully without fouling. It was then just a case of working though the drills from 8.5 to 10mm in stages to open out each hole.

Once cleaned of swarf I put the cases together and offered up the 10mm bolts. The top hole was perfect but the bolt was binding a little in the bottle hole so I ran the 10mm drill through the whole assembly after which it was fine.I was pleased with this as My makeshift clamps had obviously kept everything in-line for the drilling, something I had been concerned about. I had assumed it would be necessary to open the holes out to circa 10.25mm using an imperial drill to give a little slack but this was looking less likely so I decided to hold off for now.

Getting the cases into the frame did give me trouble. I could get either the top or the bottom lined up but not both at the same time. Finding out why proved tedious as the bike was on the floor and I had to crawl around on hands and knees. (Mental note – figure out how to fit a centre stand to the ISDT bike so it can go on the bike lift and stop this crawling around). My initial thought was that the drain plug was fouling the bottom of the frame as it's located differently to the ISDT engine. Eventually I realised it was a projection at the back of the crank case causing the problem. I am not sure what purpose this lip serves unless it to provide something to hit when separating the crankcases. With the proper tool this is not needed and in any event the ISDT motor does not have this lip.

A short session with the hacksaw and a file removed the bulk of the lip after which the engine would go fully into the frame and nothing else now fouled though getting the drain plug out may be a struggle. The picture shows the case after the lip was removed. Pleasingly, the top bolt now lined up perfectly and could be screwed in easily by hand. The bottom bolt was binding, it could have been forced in but I decided to remove the cases and open out the bottom hole to 10.25mm which solved the problem. The next stage was to re-insert the steel tube, and try the crankcases one final time. The top bolt was a little stiffer this time but not enough to worry about so I left the top hole at 10mm. One other helpful factor was that the rubber rear chain tubes fitted the Supa5 crankcase extension perfectly. A relief as I half expected this to be a problem; it was when I fitted a Supa5 engine to an ES25o Trophy.

The final test was to attach the front down tube. This proved difficult to line up but I was not surprised as I had exactly the same problem when reassembling it to the original motor after it was powder coated. I suspect that the frame is slightly out of alignment after its hectic life as an enduro machine. I am not entirely sure what purpose the front down tube serves anyway; the engine is very rigidly mounted in the frame even though only held by the two rear bolts and I doubt it needs front support. Perhaps it is in fact using the engine as a stressed member to support the steering head of the frame? The original fixing bolt is 10mm and rather than force things I may try an 8mm bolt on final assembly as I found it easier to get one of these in place regardless of which engine I use.

Anyway that was it, nothing done that is irreversible and with some steel sleeves the motor can be fitted back into a Supa5 (or more likely in this case an ETZ) frame. In fact I will make up the sleeves as soon as I have found some suitable tubing. The flu bug is beginning to

bite so I packed in the garage work for today in favour of writing up my notes in the warm. Tomorrow I will rebuild the Supa5 motor and then make the decision on whether to fit it or keep waiting for the ISDT motor parts.

Wednesday 5th January 2014

Due to a dose of flu I have not felt much like working in the garage so not a lot of real progress since Sunday but some things achieved. I have rebuilt the bottom end of the Supa5 motor but only the minimum components to keep the weight down whilst I fitted the engine into the frame. Heavy stuff like clutch, barrel and head can be added later. Since I am not making much progress on getting the ISDT gearbox fixed (more about this later) I decided I may as well continue the rebuild using the Supa5 motor. If it works, fine if not then the problems and issues will be recorded for anyone else trading this path.

Two things became apparent quite quickly. One was that the gear lever shaft seems to be a bit longer on the Supa5 than the ISDT motor and it does not have a grove for the fixing bolts (and yes it does need that groove despite my statement to the contrary above). Both problems were solved fairly easily. I spaced the footrest out with 10mm ali spacer. It needs to be something soft so as there are serrations on frame and footrest to prevent the latter moving round. The ali is soft enough to allow the teeth to bite in. The groove issue was solved by using a 5mm bolt instead of the original 6mm bolt. The other problem was fitting the front down tube something I expected as I had this problem with the original motor. I agonised for ages over sophisticated ways to address the problem but in the end I took the simple route and elongated the fixing holes. I added 3mm at each end (there was plenty of meat in the clamps) and this gave me a firm but easy fit.

I was getting pretty cheesed of crawling around the floor so decided to take time out to investigate fitting a centre stand to the ISDT frame. In the end it turned out to be a fairly straightforward job based around an old TS250 (or it may have been ETZ250) stand. I cut the top section of the pivot tubes and opened them out so that they fitted round a convenient tube on the frame under the engine; a large cable tie held it in position. This proved to be perfect in terms of balance and height of lift but suffered one major snag – there was nothing to stop it going over-centre. I tried using rope and nylon straps and they worked up to a point but kept stretching. I then bought a length of chain and after a few experiments with the number of links I got a result. So now I could put the rolling chassis on the bike lift and getting a more comfortable working position. It's not pretty but it is functional and I doubt if it can be left on as a permanent fixture but it does work and has made life much easier.

I was then able to assemble the primary drive and fit the outer cover. It was a relief to find that the clutch still worked properly and gears all selected cleanly. I had planned to use the complete Supa5 top end but a trial assembly has shown that this is not feasible unless I

build the complete engine before fitting it to the frame. Like with the ES250 motor on which the ISDT engine is based short studs with long sleeve nuts to clamp the head are used. This arrangement is essential if you want to assemble or dismantle the top end in the frame as there is not enough clearance to get the head on with long studs. I paused at this point to consider my options which are either to use the complete ISDT top end or removed the Supa5 motor from the frame to complete its assembly then manhandle the whole assembly back in.

However before giving up for the day I did put a barrel on the crankcase fitted with the genuine ISDT manifold which I was given some time ago. The result was good in one way as the carb cleared the gearbox filler (though the rubber bung will need to be trimmed back) but the presentation of the carb does not line up with the tube on the air cleaner. I tried the manifold I made and this would line up better (but still not quite correct) but then the carb float bowl fouled the filler so that was not an option. On the ISDT motor the filler is on the other side and it is a perennial problem when trying to fit a 5spd MZ motor into a frame designed for the 4spd motors.

To make the air cleaner tube line up with the carb bell mouth I need to rotate the air cleaner box but the frame top tube limits the amount of movement. The obvious solution is some surgery on the air cleaner box to allow more movement. It is unlikely to affect performance and would not be seen as the fabric skirt hides this area but I am taking time out to think around the problem. This time it's nothing to do with the Supa5 motor as I would have exactly the same problem with the original ISDT motor.

So a lot of effort but not a great deal of progress for three days work.

Thursday 9th January 2014

Overnight I decided to build the Supa5 engine completely standard rather than use the ISDT top end. Though it will look a bit odd with the toast rack head at least its 'honest' and will save a further strip when the ISDT motor is ready to be re-installed. This meant removing the engine from the frame so that the rebuild could be completed on the bench. Not a difficult or particularly lengthy job and within half an hour it was back in the frame fully assembled. One further task was necessary however. The ISDT exhaust pipe fits on a stub rather than being held in the head by a screwed collar like the later models. The stub in the ISDT barrel was well corroded in and risked damage to get it out so I had to make a replacement out of an old screwed collar and a piece of old exhaust pipe. The end result is partly shown in the photo (most of it is now in the barrel or under the exhaust pipe). I was then able to fit the exhaust system which to my relief still lined up correctly and overall looks

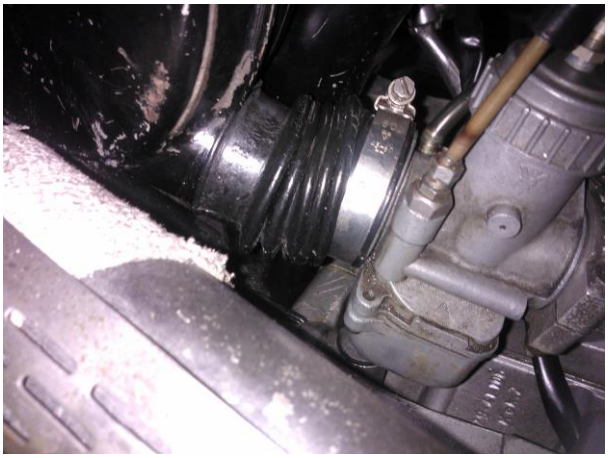
much better with the new tail can and s/s clip at the front. Next was the messy job I always hate, fitting the rear chain. This time it all went together quite easily and the rubbers fitted the Supa5 crankcase perfectly unlike trying to fit a Supa5 motor in the ES250 frame. I noted that the chain was well worn and will have to be replaced shortly. I will have to check up the spec as it's a different size to the normal MZ chains and may not be a standard size. Last technical job was to fit the Powerdynamo electrics which I managed to make a complete mess of initially. It all seemed to go on ok but sparks were noticeably absent. I went through the whol process again but could find nothing obvious wrong. I even fitted an additional earth wire from the motor. Finally I realised that I had wired up the connector plug incorrectly It is a 4 socket plug with only three wires and I had put one wire in the wrong socket. I must have a blank spot with this connector as I have done it more than once.

With the tank back on the bike and the fuel line connected it was time for a test. Pleasing it started on the third kick. The new end can seems to work fine, not too noisy and no rattles. I did notice some leakage at the exhaust pipe connector. Not overly surprised as this type of joint has always been a weak spot with MZs and I much prefer the later flanged screwed joint. However, with luck it will carbon up pretty quickly; failing that I will have to remove it to fit some exhaust paste to help seal the joint. I have just remembered something: when sorting the carburetion on the ISDT motor I eventually finished up with either a 145 or 150 main jet. This is way too large for a standard Supa5 motor so I will need to find a fit a 135 main jet and check the needle position.

As far as I can see only two things need sorting before I can ride the ISDT bike again. Firstly some surgery on the air cleaner to enable it to connect with the carb. Secondly collect and fit the headlamp so that I have an ignition switch and lights. Longer term I still have to rebuild the original motor but until I can source a replacement for the broken shim that will have to wait. Overall a good day.

Friday 10th January 2014

No sign of the powder coating so I cannot rebuild the headlight unit yet. So I tackled the carburettor and air cleaner issues. Stripping the carb to replace the main jet and give it a checkover was easy enough. Finding the correct 135 main jet was tedious as I had everything but this size in my spares tin. In the end I had to strip several spare carbs before finding the right jet. What I took out was a 145 so it would have been far too rich and smokey. All was not wasted however as I found a couple of 130 main jets which I will need for the ETZ300 once I can get it in the garage and on the bike lift.



Next task was to panel beat the air cleaner

to allow it to rotate and line up with the bellmouth. I ground of the welded ridge in the area I needed to indent as this would have made it hard to bend. After that it was just a question of a little tapping followed by a trial assembly until it lined up ok. The final result can be seen. Some blu-tac to seal the slight gap and a coat of black paint to stop rust finished the job. When the bike has a full frame makeover, I will have the indent welded up properly and then powder coated. For now it cannot be seen behind the canvas skirt anyway. I also put a couple of self tappers in the end of the exhaust can to stop the cone from falling out. It was pretty tight but this engine has no rubber mounting and makes a lot of back pressure so better to be safe than sorry. The bike now starts easily and is a bit quieter now that the air cleaner is fitted, just the headlamp to go and then I can road test it.

Wednesday 15th January 2014

I picked up the headlamp and bracket from Steve the powder coater on Tuesday and the metalwork itself was quickly fitted. I had fortunately taken photographs of the wiring layout and connections to the switch so armed with that and a bit of patience it was soon all done. Normally I run this bike without a battery but to test the lights etc I wired in a temp 6v battery and to my great relief everything worked, even the stop light and horn. So that was another job done and no excuses left to take it for a ride. Just round my short test circuit but everything worked fine and it was a great relief to have a gearbox that actually selects gears without hassle. Ihad to adjust the gear lever a tad and re-route the clutch cable as it was restricting the steering movemnegt but both were two minute jobs. Al being well I will ride the bike to a VMCC meeting on Sunday to give it a longer test.

Regarding the original engine, I have not really made a lot more progress. I have ordered some new bearings and seals and a set of piston rings, I found I had all the necessary gaskets already in stock which was helpful. I had what may be a good idea concerning the gearbox shim and bought a 22mm external circlip for the grand sum of 50p which with some carfeul grinding down to the external edges now fits alongside the original circlip. It was exactly 1mm wide, the same as the broken shim so all the end float on the driven gears has now gone and in theory everything should work. I am a bit concerned that the original circlip is now fulfilling the role of thrust washer and I want to discuss this further with an engineer friend before doing a final rebuild. As far as I can see there is not actually a significant end thrust and the gearbox always functioned perfectly well even with the broken washer once you had managed to get it into gear. In fact I do wonder if I could have simply rebuilt it without replacing the washer at all. I may well try a temporary rebuild of just the gearbox assembly to see if I can actually rebuild it and how well it works. Having the inspection cover on the top of the crankcase means it is easy to see what is going on.

ISDT Engine Rebuild

I have given this section a separate title as it may be useful to other owners of a G5 who like me have no previous experience of stripping or rebuilding one of these engines. I have given no timescale as It was a trial and error process over a couple of days though now I

know (or think I know) what to do it should take only a little longer than any other MZ 250 engine.

This is not intended as a complete guide to rebuilding a G5 motor I am assuming that the reader does have some familiarity with MZ 250 engines and I am only documenting any differences or unusual features I found. It would be prudent to read the genuine MZ workshop manual for either the ES250/2 or TS250 (4 speed models) as much of the detail is the same and is well described in those pages. The process for bench assembly of the gearbox in the Supa5 or ETZ250 manual is also useful.

With the gearbox I found it helpful to try a ‘dry’ assembly first without the crankshaft. I did it several times before being sure I had it correct. Each time I was able to try out the gear selection and initially I thought I had it all wrong as selection was difficult if not non-existent. Sadly this is normal; in the words of Dave Morris who is/was an ISDT guru ‘on the bench the gearbox feels like a pile of poo’. Really the selection only works properly when everything is spinning and there is load on both input and output shafts. Otherwise the dogs balk and nothing moves. With patience I was able to get a number of gears and neutral though not in a single sequence and often I got a series of neutrals. I remember this same problem with the last 4 speed engine I built but did work properly once on the road. The only thing that gave me confidence was building it as described below, working through the box to neutral and then dismantling to confirm it was indeed timed correctly for neutral position.

Assembly starts by cleaning and warming the LH crankcase halves to replace the 6203 and 6204 gearbox bearings and the 6305 main bearing (C3 fit though my old ones were not marked as to fit). The gearbox bearings are retained by circlips so do not forget them. The main bearing has to be pushed firmly against a retaining circlip leaving room for the oil seal which is inserted until it is flush with the crankcase wall. Both main bearings on these engines are lubricated by gear oil so are isolated from the crankshaft/flywheels. Be aware that these motors use seals 10mm wide which were originally metal bodied. MZ changed to 7mm seals for the TS motor and though these could probably be used they would need a 3mm packing piece. I would strongly suggest using 10mm seals which seem to be still widely available.

I am lucky in owning the genuine MZ tool to locate the oil seal. If you don’t have it then make sure you enter it square and use something to spread the pressure over a wide area as you tap it in - an old 6305 bearing would do. To insert the crankshaft without damage the factory instruct you to use the seal insertion tool (heated in the oven first) to warm up the inner track of the 6305 main bearing and I was able to do this. If you don’t have such a tool then just warm up the whole crankcase assembly to about 80 degrees C and the crank will go in quite easily (especially if you put in in the fridge overnight first). DO NOT heat the bearing centre with a flame and don’t use an oven temperature above 100 degrees C for anything with a bearing installed to avoid any chance of losing temper in the bearing steel.

Next thing is to assemble the complete gearbox assembly on the bench. I do not believe it is possible to build it up piecemeal within the crankcase and have never tried so can offer no advice on this method. Assembly needs to be done upside down and back to front as the selector drum etc actually lie underneath the cluster when fitted. I use a simple metal frame shown below to hold the gear assembly (originally made for the Supa5/ETZ cluster but it fits the G5 cluster perfectly).

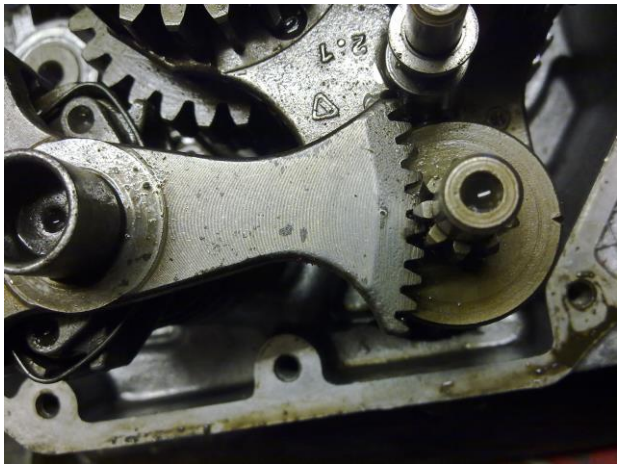
Though it looks daunting, you will find that there is only one way to assemble the selectors and gears. As a clue, the 2.7 selector will be facing the RH crankcase and the selector with a central guide for the drum goes in the middle.when correctly assembled.

Another clue – assuming my gearbox is standard there will be a small mark on the outer edge of the selector drum (see picture right). Line this up initially with the mark slightly to the left of the selector shaft as this is very close to the neutral position. Do not forget the small thrust washer for the selector shaft – this should be put in place in the LH crankcase first. Then pick up the complete assembly and offer it up to the LH crankcase – it should still be warm from the previous work if not re-heat to 80 degrees C for a few minutes first. Be warned, you could do with three hands when trying to line up all the shafts, main problem is the large gear at the bottom which is not positively retained and will slide off the shaft unless you hold it. On the later 5 spd boxes this gear is held by a circlip). Eventually everything will slide in place, a gentle tap with a rubber or hide mallet may be needed to get the shafts firmly into the bearings. Remember to insert the hollow bolt, spring and ball bearing for the gear detent locator. If you followed the advice above, it should be lined up with the neutral position detent. If all is well and you have neutral then the output shaft should spin freely without driving the input shaft. You may have to turn the selector drum a little to get this position and you can see the cut-outs on the base of the selector drum for each of the gears and neutral to help the process.

Now fit the primary drive cover of the engine, it will help if you remove the rubber O ring which seals the gear shaft as this should be replaced anyway but in the interim makes the next stage a little easier. The reason for fitting the cover is to provide support for the gear lever shaft which otherwise wobbles around like a jelly and is very difficult to keep in line when fitting the RH crankcase. This is something I found out the hard way and not mentioned in any manuals I have read. You don't need to fit any of the primary drive bits for now, just the outer cover. You can now fit the gearchange shaft and its spring loaded pawls, make sure the return spring is

correctly fitted on the shaft and that it slides onto its location peg in the steel insert which is bolted to the crankcase. Do not fit the selector arm yet.

Next stage is timing the gear change. If you look very carefully, you will see on the selector arm a small dot between the middle teeth. Now look at the selector drum and you will find that one of the teeth has been ground down slightly more than the other, its easy to miss but on my box there was small nick on the opposite diameter of the outer drum (mentioned above) which was in the 3 o'clock position when the ground tooth was in the correct position to line up with the dot on the selector arm. The picture shows how it finished up for me. *Do not try to time it in the neutral position as the selector arm will foul the RH crankcase when you try to fit it as the bottom part of the arm actually protrudes slightly into the drain hole.*



After fitting the selector arm there needs to be a small washer on top of the selector drum and the another thrust washer on the selector shaft. I normally fit bearings to the gearbox shafts at this point. The larger 6204 bearing goes on the output shaft. Do not tap this all the way down as it may foul the gear on the input shaft (see below). At this stage I normally coat the LH joint faces with sealer – my preference being Wellseal and there is no gasket.

Now work on the RH crankcase; heat it to no more than 100 degrees C and at the same time heat a mandrel or bar which is the same diameter as the inside of the 6305 bearing. This will be needed to heat the inner track. I have shown a picture of the pukka MZ tool above which is also used to drive in the oil seal. While the RH case is still hot fit the main shaft oil seal with the lip facing out towards the dynamo end and flush with the crankcase. Also put the heated mandrel into the 6305 bearing to get the inner track hot. Then as quickly as you can fit the RH crankcase onto the LH crankcase. You may need to fiddle with it a little to line it all up and tap with a mallet to encourage it to settle down fully. Put a couple of screws in to hold it tight and give the gearbox output shaft a turn to make sure it's still free. There will be some resistance as it in gear so driving the input shaft as well. Now offer up the 6305 bearing and drive it firmly onto the crankshaft and the crankcase at the same time. Use something like a large washer or even an old 6305 bearing to spread the load over the inner and outer cages otherwise you could distort the bearing as you push it in. The bearing will abut the inner edge of the crankshaft leaving a small amount still protruding from the crankcase, this is normal do not try to drive it in flush to the crankcase. Try to avoid excessive force at this stage. If you followed the instructions (mine are virtually identical to what's in the MZ manual) then it will all go together fairly easily. If it gets stuck it's probably because you either did not warm everything up correctly or were too slow and it cooled down. Only option is to carefully dismantle and start all over.

If you got this far ok then the rest is pretty straightforward and covered well in the MZ manuals. The outer cover for the crankshaft needs a special gasket but it's a standard 4 spd type. You also need to consider shims to make sure the bearing is fully trapped but not pinched. In my case I removed two shims when I dismantled but found I could only fit one on reassembly. I erred on the side of slightly less rather than slightly too much shimming as

you can only play with the sizes you have to hand. Within reason I do not think it is that critical and you can easily dismantle and add more if it is needed. If you try to use too many shims you will either distort the cover or leave a gap which will leak oil onto the dynamo. Too few shims and the crank could move to far to the right under clutch pressure and foul the crank wall but common sense will avoid both extremes.

Similarly in theory the cover for the gearbox output shaft needs a gasket and shimming. In my case there was no shim present when I dismantled and I found that there was no need for one on reassembly. In fact the opposite was true because if you assembled without a gasket present (which I did to use the cover to gently press in the bearing) it was enough to force the bearing outer race into contact with the gear on the input shaft and everything became a bit tight. With a gasket in place and a gentle tap on the other side of the output shaft to move it towards the sprocket end everything loosened up nicely again. I did wonder if there should be a spacer or shim between the gear on the output shaft and the bearing but nothing is shown on in the spares book. If this still does not work then try two gaskets.

That's it really, the reassembly of the primary drive is standard MZ 250 procedure, The drive gear on the G5 is steel rather than cast iron and was very light on the shaft but that was the only difference I noted. There is no external detent assembly in the primary drive area on these engines unlike the Supa5/ETZ. Drive gear shimming is the same as is the fitting of clutch which needs to be tightened up firmly first and the nut removed before trying to fit the outer cover; remember to fit a gear shaft O ring. On my engine when dismantled there was no curved (belleville?) washer between the thrust washer and the clutch body so I fitted a new one as the G5 spares book shows it in place. . My motor seemed to run perfectly well without it but it must have contributed a lot to primary drive rattle.

The picture shows the motor as currently assembled. Top end awaiting some new rings before rebuild.

I hope this helps anyone else seeking guidance on rebuilding G5 motor. However, I must stress that it is based on my experience of rebuilding my 1972 G5 motor with some helpful comments from a few others. It is not guaranteed to be definitive or correct nor to cover other model years. No responsibility is taken for any damage caused by following these instructions. If you do not feel confident I strongly suggest you get someone else to do the work for you but please do not ask me as once was enough.

Friday 31st October 2014

After a review of the bikes in my garage I decided 11 was just too many and reluctantly decided to prune a few. The ISDT bike has not been ridden except for its MoTs for a couple of years and for most purposes the Trophy or the Supa5 are more practical bikes to ride. The G5 is therefore now up for sale. I did debate whether to refit the original motor now it is rebuilt but in the end decided to compromise and just refit the G5 barrel, piston and head partly because I have need of the Es250 barrel/piston it was using. Gave it another blast up the road to test it and very nearly changed my mind.

I advertised it on the MZRC club web site and in the Yahoo groups but very little interest so far. Won't break my heart if it does not sell but at least my conscience is clear in that I tried.

Skip to Beginning