1937 AJS Model 37/12

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I have been trying to find a pre-1945 bike for some time as I would like to ride in the post Vintage (1931-1944) class in VMCC events. My ideal would have been an MAC Velocette as I had one of these back in the 1970s and it was a cracking little bike. However, after casually looking out for one for over 12 months nothing suitable had come to notice so I have widened my horizons over the last 3 months or so. I was beginning to favour a WD Matchless G3 as being a good alternative, especially as I am a member of the AJS/Matchless Club but anything suitable always seemed to be sold before I even got to hear about it and as is normal, the ones still available were frankly over-priced and not particularly appealing. Then I spotted an ad on the Jampot website for an AJS model 37/12 and started investigating. This model turned out to be a 250cc bike very similar in size, weight and appearance to the MAC Velo. The 37 prefix is the year and the 12 suffix is the model number denoting what is basically the cooking or entry level model with a single port head and coil ignition. The sports model had a 22 suffix and had twin hi-level exhaust and a magneto plus in later 'Silver Streak' form a lot of chrome.



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2.46 h.p. Single-port O.H.V. (for full specification see pages 2 and 3) **40** GNS

There is not a huge amount of information about them but there is a very active yahoo group focussing on the Pre-WWII AMC bikes so I joined and posed a few questions about known weaknesses and things to look out for. In fact there were no special health warnings about this particular bike and a number were in the hands of group members. I then had a

chat with the vendor of the 37/12 on the web site and got a warm glow about him as a seller and the bike. Computer problems got in the way of emailing pictures so Bob kindly posted some together with a bit more info on the bike. I must say it looked pretty good but there is always the worry that pictures can flatter. The only obvious divergence from the 1937 catalogue pictures I had downloaded from the AJS & Matchless Archives (http://archives.jampot.dk/ a most useful reference site) was the replica headlamp which in



fairness was stated in the original advert.

Although clearly some other things had almost certainly been repaired or replaced over the years it all looked satisfyingly authentic. I duly showed the pictures to a number of knowledgeable friends together with the facts I had gleaned and everyone agreed that the asking price was fair for the condition and provenance (original log book and regn, matching numbers etc).

A visit was arranged for Tuesday 28th February and my friend Mike came with me as minder. I deliberately took the car rather than the van so that I could not bring the bike home immediately as an precaution against over enthusiasm. The vendor lived at Woodcote which is north of Reading just off the A4074 Wallingford Road and only about 60 miles away. However, getting there was a cross country trip on minor roads as there was a bridge closure on the obvious main road route via Pangbourne. Pleasingly the trip though slow, wet and muddy was without incident as I had done a virtual drive on Google maps the night before and written up some notes. We did take the Sat Nav but it was not needed. What we found was the bike pictured above. I must hasten to add that this is one of the pictures sent by Bob and between his poorly printer and my scanner, it is not the best. In the flesh the bike is far superior in appearance, most of the chrome is pristine and the paintwork of a high order. The tank was professionally painted by JBS in Yeovil, the wheels have been rebuilt with new chrome rims and stainless steel spokes. Bob was rather disparaging about the former as they are Italian Radealli's done by the previous owner but they looked fine to me with no rust and they were done some time ago as Bob has owned the bike for at least 10 years. He bought it already restored in memory of his first bike (a similar model) but was not happy with a lot of the things that had been done so over the intervening years has gradually got it back to what he considered original condition and sorted out a number of issues. In my judgement he had made an excellent job and I was already smitten before even starting the engine.

The engine had been given a +40 rebore and the compression was so good that the decompressor was need to get it over tdc. A good tickle, full choke, ignition on and it caught on the first kick but I was so surprised I let it die. Another brief tickle and it burst into life easily second kick and soon settled to a steady tickover. Rather disappointingly, the exhaust was quite smokey, more so that one might expect after a rebore however, it had been standing for some time and it may well be the engine has wet sumped. I was trusted to take the bike for a test ride which was essential to make sure it was comfortable for my 6ft ample frame. I had expected trouble with the riding position as it does look a small bike but in fact it was fine. I only rode it ½ mile or so to make sure I had a full set of gears a working clutch and brakes. The latter were not really tested as the road was wet and slippery and I did not want to risk a tumble but I think they will be fine. Two there things emerged when I returned, the ammeter was not registering a charge and there was a small oil weep from the de-compressor spindle. Bob was surprised about the charging which is obviously rather critical given the coil ignition. The oil leak had obviously occurred before as he mentioned that there was no seal for the spindle. Anyway I decided that none of these 'features' were serious enough to make me walk away from the bike after a bit of haggling we agreed a price fair to both parties. I left him with a deposit and agreed to pick the bike up the following week. So much for my good intentions, maybe I should have taken the van and saved some time and diesel!

Sunday 9th February 2014

I have been rather busy on so not had type to write up any notes since first creating this diary. I collected the AJS on Tuesday 4th February together with a box of assorted bits and the paperwork. It still looked as good as I remembered and was much admired by a friend who helped me unload it when I got home. It went straight onto my work bench so that I could investigate the problem areas I noted when I bought the bike. I had also sought advice about some of these points via the wd-prewar-ajandmatchless@yahoogroups.com web site.

The enigma about the brake pedal stop was looked into. The brake pedal itself rotates ona shaft which is probably an extension of an engine fixing bolt and runs right through the



chaincase. Mine has nothing to limit its movement backwards except when it collides with the dome of the clutch cover. A thick rubber tube had been fitted which both limited the travel and stopped the pedal rubbing paint off the dome. My queries elecited a variety or responses including one which I thought initially the most sensible in that one owner of this model had a stop bracket welded to his chaincase. Seems most likely however that this was a later mod

(bodge?) and not correct. For 1937 only the spares book does specify a piece of rubber to fit on the brake pedal. No pictures so no one knows for sure the dimensions. It seems that bizarrely in my view that there is no adjustment at the brake pedal end and the piece of rubber specified is purely to stop paintwork damage should the pedal spring back to hard. Adjust is apparently done at the brake drum end by shimming the brakes shoes so that very little movement of the brake arm is needed to operate the brake. The position of the brake pedal is then set effectively by adjusting the position of the brake a arm on its splines and the brake rod length. The brake shoe springs seem to be the only thing pulling the brake off. As the brake actually works ok I have left it as is for now and will investigate further if there is a need or the wheel has to come out for some other reason

All the responses to my query about oil leakage from the decompressor shaft indicated that this was not a common problem and the cause might lay elsewhere. Excessive crankcase pressure caused by a breather problem was suggested and bearing in mind that the engine was smoking a little more than one might expect after a rebore, this seemed feasible. However, the vendor assured me that he had checked the breather when he rebuilt the engine and replaced the diaphragm so perhaps less likely. Access to the breather requires the entire drive side to be stripped. I decided to leave that as a last resort. One other area of investigation was the oil supply to the inlet valve which is a common feature on AMC machines. When I looked at this I found two issues. Firstly there is some complex plumbing to connect rocker box to the valve area and the assembly was not fully tightened at the

valve end. Closer inspection showed a considerable oil leak from here which had actually run along the fins and may well have finished up in the area of the decompressor. Tightening the nut required grinding down a spanner as it's virtually inaccessible. If this does not stop the leak I will have to fully strip the plumbing to fit a copper washer as none is evident. I also checked the setting of



the inlet oil feed valve and he may lie the cause of the smoking. The book states no more than half a turn out from closed whereas mine was set to probably 1 ½ to 2 turns. I stripped it out and the tapered screw etc all looked fine so it is now set to just under ½ a turn. Not yet run the engine long enough to prove my diagnosis and cure but hopeful.

The third issue is proving the most challenging so far in that the dynamo obstinately refuses to charge. By the way if all this sounds depressing I am not disheartened. The bike itself is delightful and the quality of the work that has been done is very good, much better than I would have achieved. What is missing is the final commissioning after a rebuild as the vendor had only done about 12 miles when I bought it.

I have done extensive reading about dynamos and much consultation with experts. All the tests which can be tried with the dynamo in situ have been done with no obvious fault found. Although originally a 3 brush Miller DVR unit, it has been converted to 2 brush operation with a V-Reg2 electronic regulator wired in. Al this work has been very well done and conforms exactly to the instructions and revised wiring plans. I am pretty sure it's not the regulator because the usual test of connecting F & D terminals via a bulb to earth still shows no output whatsoever even after flashing the field coil. The signs are pointing to a failed armature as everything else including the brushes look perfect. I now have no option but to remove the dynamo for bench testing but this requires at least a partial strip of the primary drive side since the dynamo is driven by chain from the crankshaft and sits inside plates between engine and gearbox.

Monday 10th February 2014

Well I worried unnecessarily about getting the dynamo out as it g proved straightforward



and primary chain all look in excellent condition and the cover does have one of the patent rubber oil seals developed by a Jampot club member. It was completely oil tight before removal, hope it remains so when

and only took ½ hour or so once I actually started. The drive chain has no split link so I had to find an extractor to get the sprocket of the spline but once this was done and the dynamo clamp was slackened it slid out easily. Pleasingly, the clutch, engine sprocket



reassembled.

With the dynamo on the bench I repeated my previous tests and used the electric drill to drive it all with no positive result. Out of curiosity I connected up a rather tired 6v battery and bingo it did a very good impression of an electric motor. Though I had cracked it but further tests for dynamo functionality still gave no charge. Now totally stumped as I had



always thought that a dynamo that would work as an electric motor would normally charge ok. A friend has arranged for Ray Carter, the AJS guru and ace restorer to look at the dynamo for me so it's going to him on Wednesday. I did notice that the main drive bearing felt a bit rough so at the very least this will need replacing. I hope he can fix it and am intrigued to find out what is actually wrong. The dynamo does appear to be the original or identical

in type as it's stamped DM3G. In the bike it looked to be a long shaft type but now it's on the bench it is quite clear that it is the short shaft 36w model.

While I was in workshop mode I decided to have a look at the headlight mounting. Having studied various pictures it was clear that it sits far too low emphasising that it is also the wrong shape having too much of the shell forward of the fixing holes. In the box of bits

which came with the bike was a selection of headlamp brackets so I experimented with these and found using a shorter top bracket and a longer bottom one I could get the unit higher and closer to the fork much more like the 1937 catalogue picture. I only had one of each but there were enough oddments in the box to make up a second pair and after a bit or drilling and bending they were a good



match. The picture shows the result including the front number plate which now fits properly.

Friday 14th February 2014

I had confirmation yesterday that the dynamo was now in Ray Carters workshop so all I can now do is wait for his diagnosis. In the interim I have discovered that I was mistaken about the type of dynamo fitted and mine is incorrect. For 1937 AJS switched from 3-brush to a 2brush unit with a CVC unit. Indeed the bike does have a CVC box fitted in the correct position behind the battery though it now holds a V-reg2 electronic regulator. The dynamo should be a Miller DVR which is a 2-brush type rather than the DM3G now fitted. Picking the brains of the previous owner it seems he did not do the 2-brush conversion, this was already done when he got the bike but he did fit the V-Reg2. Bit by bit the true history of the bike is emerging not that any of this really matters.

One other thing I had completely overlooked was the lack of a rear view mirror. I really struggled with this omission when I test rode the bike. My first thought was to fit a bar end mirror as I favour this type and I have one in my spares box. The AJS does present a challenge to this approach. Firstly it has 1" bars whereas the mirrors are designed for 7/8" bars and secondly the ends of the bars are solid or at least completely capped. I was tempted to drill the end cap out but decided it might be prudent to make more enquiries about this first. So I have bought at vast expense a mirror that fits on a long arm clamped top the handlebar. Not sure I like it now that it's on the bike and I do worry about how much it will vibrate given the14" length of the arm. Time will tell and I may yet have to drill out the end of the handlebar.

Thursday 20th February 2014

I had a brainwave a few days ago and located a box containing some old dynamo bits in one of my sheds. I had no great hopes that it would contain anything useful as years ago (probably 15-20) I had played around with its contents without much success. Anyway the box proved to contain bits for a Lucas E3HM dynamo and a Lucas E3L dynamo. The E3HM is a 36W short bodied dynamo intended for mounting on a MagDynamo. I got this assembled and working fairly easily but sadly it was no use for the AJS as it has a parallel rather than a tapered drive shaft. In the end I decided to put in on Ebay to raise some cash to pay for repairing the Miller dynamo.

The E3L was a complete wreck and initially I thought there was little chance of getting it running however there was little to lose by trying. First problem was the field coil which was shorting to earth. With my impact driver I managed to get the field winding screws undone to be greeted by a soggy mess. All the fabric wrapping for the coil was oil soaked and rotten and you could see odd bright patches where the wires had chafed on the body of the core. I cleaned it up then re-wrapped it in self amalgamating tape. When assembled it no longer leaked to earth but the resistance was down to 2.80hms whereas it ought to be over 30hms - not good. The armature looked equally grotty but did the commutator did clean up nicely in the lathe. I also had to recut the thread on the end for the lock nut as it was partially stripped. The commutator end bearing was badly worn so I ordered a new one for the princely sum of £2.02 inc postage. The fibre base for the brush boxes was also broken this was repaired with araldite which seems to have worked to my pleasant surprise. I also had to drill a couple of holes to mount studs for the Dynamo and Fields connections to the regulator – not sure how it should be done on this dynamo as the end cover etc is missing. Final problem was brushes and springs. I managed to salvage a couple of the latter from another spares box and found one brand new brush bought originally for my Star Twin but

never used. I cut down a pair of MZ brushes for the other side. Total Heath Robison but against all the odds it performed as an electric motor when I connected a battery and after some enthusiastic rotation by the electric drill it also managed to make a 12v bulb glow quite well. I should add that all the trials and errors in this process meant it took nearly two full days to get to that stage. During the process I had cause to talk to several people and one of them gave me a fright when he told me that AJS/Matchless had to use short dynamos post war as there was insufficient room for the longer E3L; he was not sure about pre-war models. Needless to say I rushed down to the garage and offered up the dynamo to its carrier – it fitted perfectly to my relief.

In the interim I had also sent the V-Reg2 regulator back to AO services. I did not think it had any bearing on my Miller problems but for the sake of a few £s in postage it seemed a sensible precaution. That came back today with a clean bill of health but a comment that it was an old model made in 2005! This was a surprise as I had gained the impression from the vendor that fitting of the electronic regulator was a fairly recent enhancement.

Anyway this afternoon I was able to fit the regulator and the dynamo to the bike and reconnect the primary chain. I was very hopeful that I now had a working dynamo but initially there was no evidence of it charging. I double checked all my connections but found no fault, then ran the bulb test. This glowed nicely with the engine running so it had to be something in the regulator circuit causing a problem. I wondered if it was a polarity issue so flashed the field winding as recommended in the V-Reg2 fitting instructions. Whilst doing this I felt that the current through the field winding was a bit weak so I made up a dedicated earth wire for the dynamo. Not sure which did the trick but next time I ran the engine I finally saw the ammeter move into the charge zone even with full lights on - success at last. I have no proper end cover for the E3L (though the Miller one may fit when I get it back) so I have made a temporary one out of baked bean can. Sounds dreadful but it does not look that bad and will keep the worst of the weather out.

One other thing I noticed whilst doing this testing was that the exhaust is not smoking nearly as badly as it did so I think cutting down the oil supply to the inlet valve has helped a lot. The engine is also clearly running far too rich which I think accounts for quite a bit of the remaining smoke. The richness is probably due to flooding as there was petrol dripping onto the gearbox. I did remove the float bowl to check float and needle. Nothing obviously wrong but I did some light grinding of needle to it's seat.

I also felt that the primary chain was too tight so adjusted both chains. The rear appears to be new and had no obvious tight spots. The primary chain on the other hand is probably due for replacement. Tomorrow I should be able to complete the assembly and give the bike a test ride.

Tuesday 25th February 2014

Weather and life in general stopped me riding the bike for a couple of days then I got message to ring Ray Carter. He now has the dynamo charging correctly and apart for a bearing nothing else needed replacing. The main problem was the commutator which had become glazed. There was also an issue with one of the brush holders, not sure what but he has fixed that too. He needed to confirm which direction of rotation (anti- clock) and which polarity (-ve earth). This surprised him as apparently it is currently wired +ve earth. He will call me in a few days when it's ready for collection. Decided to defer the road test until the Miller dynamo is back.

I have struggled a bit over the primary chain as it has an odd number of links and I have yet to find a source. I do have a practically brand new chain of the correct size removed from one of my MZs and I may try cutting this down to 66 links to see if I can get away with a slightly longer chain. According to the spares book the 350 model uses a 66 link chain but then it has a larger engine sprocket. Alternatively it's the Shepton Mallet Autojumble in a few days and there a couple of specialist chain suppliers I can speak to.

Wednesday 5th March 2014

Quite a rewarding weekend. On the Saturday I talked to the people at Sprockets Unlimited and they were able to make me a 65 link chain by riveting in a half link so it only needs one spring link. I also ran into Ray Carter and arranged to lick up the dynamo on the Sunday. On Monday I was all set to finish the AJS and finally get a test ride. Fitting the dynamo was quickly done and it was connected up using the rather neat special plug. Engine started first kick and the ammeter stubbornly refused to show any sort of charge. To say I was disappointed was the understatement of the year. I ran some tests and sure enough a bulb glowed brightly when connected to earth across the F & D terminals. Visions of blown regulators or other horrors passed through my mind but then common sense prevailed and I



looked carefully at all the connections and the penny dropped. Ray had sensibly wired up the dynamo connection sockets so that they agreed with the embossed labels on the cover. The connection pins were wired up the opposite way. Turning the connector upside down immediately restored charging – huge relief. I have now swapped the wires in the connector so that it can be fitted correctly.

With the dynamo sorted I fitted the new primary chain and reassembled the chaincase. Then I found that the new heavy duty rear chain I had fitted was marginally too wide and you could hear it rubbing on the back of the primary chaincase periodically. So back on went the original rear chain which fortunately was in pretty good nick. By this time it had started to rain so a test ride was deferred until today when I ran it round my test route. All went well, even the smoking seems to have all but gone away. I will need to look at the gear lever setting as I found it difficult to get my foot underneath to change upwards but that was all. With some better weather promised I hope to go for a longer run shortly.



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