



Velocette MAC 350cc

Rebuild Project Part One, Year One

From October 2017

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Purchased on Sunday 15th October 2017 (at the Stafford Bike Show) and I took delivery of this MAC on Tuesday 24th October 2017:

This is a photo of my 1954 Velocette MAC 350cc. I think it's a really good looking bike and it's not far off original 'Trim', not exactly original, but it's near enough for me (ok! Not the original seat, mudguards or headlight unit – but everything else looks original, with matching engine & frame numbers too). And because it was first registered in 1954 this Bike is exempt from Road Vehicle Licence Tax (it has 'Historic Tax Status') and is also exempt from MOT Testing. Obviously, it has to be Roadworthy and up to MOT Standards, and more importantly, it is now insured for the Road.



I was only able to buy this wonderful little British-made Velocette 350 MAC due to the reluctant Sale of my BSA A65T Thunderbolt 650

Tuesday 24th October 2017. DAY ONE of OWNERSHIP:

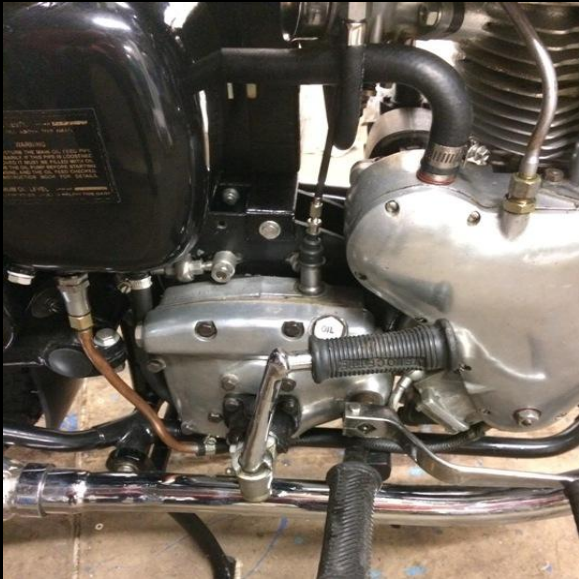
The Sales Advert said “. . . it will need running in and fettling and requires a good home . . .”

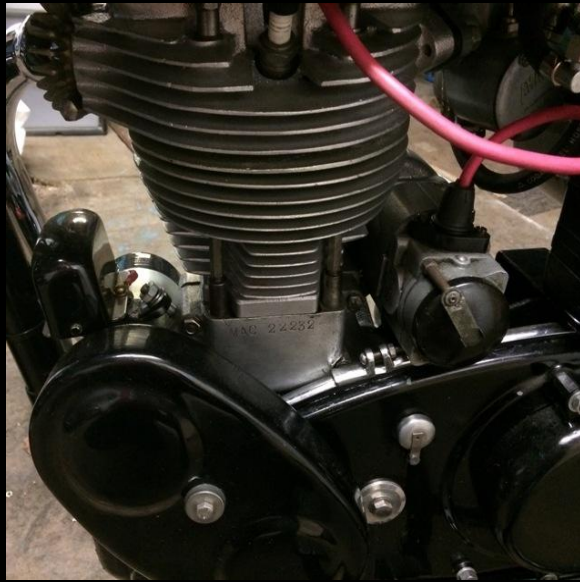
I've put this 'Blog' together, as a photographic record and diary of the work that I do to this wonderful old Velocette for future reference. The photos on the next Four Pages show the condition 'NOW' (at point of purchase & delivery), and before I start any “FETTLING Work” required (&/or any other work too).



Start Mileage / Delivery Mileage – ‘One Mile’ on the Clock (one point nine miles to be exact!)







Unfortunately, the Charging system does NOT work. The Ammeter does NOT register any charge with the engine running – but the Ammeter Needle does move to show a discharge when the lights are switched on, which indicates that the Ammeter still works, but the Regulator and/or Dynamo does NOT work. Although this bike looks really good, and on paper, everything seemed to be in order; i.e. all of the information received such as the initial sales advertisement, plus invoices for some of the work done and also the restored condition (and the obvious new parts fitted), but not everything was 'as it should be', or rather "as I expected it to be"! Because; right from 'Day One' this MAC engine has proved to be somewhat of a challenge to start and fire-up.



After a whole day of trying to find out this old girl's 'Starting Habits' and 'Start-up Procedure', my effort was rewarded with only a ten percent success rate (at starting); i.e. 100% effort in, with only 10% success rate out. "Very frustrating . . . to say the least".

DAY TWO: after resetting the ignition contact-points gap and timing, and then tweaking the carburettor, followed by 'Persistent' attempts at kick-starting, I eventually started to get the 'Knack' and improved my 'Engine-starting' success rate up to 80% plus ("vincit qui patitur" is Latin for "patience wins"). I was now ready to brave the Roads with reasonable confidence that I could at least start the MAC (having 'Sorted' this reluctant Starting Problem).

After several very short test rides (around the Block & Back): My first proper Ride-Out was to the National Motorcycle Museum 'Open Day' (4th November 2017). Well! That was the Plan. It started okay (the first five or six 'Kicks'). But; this journey was cut short due to Oil leaking quite dramatically from the Engine (I discovered later that this was caused by a faulty Oil Feed Check-Valve allowing Oil to pass from the Oil tank directly into the Crankcase). The excess engine oil that drained into the engine (*commonly known as 'Sumping'*) was then forced out of the Crankshaft Main Bearing into the Primary Chaincase (when the engine was running) and the result was = Oil 'P*ssed' through every orifice and dodgy seal that it could find, and it caused quite an 'Oil Slick'. This forced me to return back home where I changed 'Bike' and carried on to NMM in Coventry on my ultra-reliable Honda CB1000R instead).

This problem was later cured by my Velo Mentor Rick, who kindly 'refaced' the Oil Check Valve Face on his Lathe – reducing the 30 thousandth-of-an-inch plus seating (that was) down to a Gnats whisker. The Ball Bearing is now 'Seated' properly in the One Way Ball Valve Housing. An additional problem was the very tiny spring that pushes the Ball Bearing onto it's Seat was broken (it should protrude a quarter-of-an-inch above the Valve body), so we had to make a temporary fix to this tiny spring until I could order a new Spring. Fortunately, this *temporary fix* is coping well at the moment keeping the Ball Valve onto its 'Seat' and keeping the engine oil in the Tank (when stationary) and delivering the oil to the engine when it should do.



I made another temporary fix to the Headlight Dipper Switch that was fitted when I bought the bike (certainly NOT original Velocette). This 'Switch' was held on by a Cable-Tie (certainly NOT factory standard). So until I can source a proper Velocette one, my home-made *Fixing Straps* will have to do!



The next Job on my 'List' was to try and sort out the Non-Existent Front Brake. I WAS informed that the Front Brake DID NOT WORK (so no surprise there).

1) Wheel Out & Inspect Brakes. 2) OMG! Sit down, take an Aspirin & have a Cuppa, because the Brake Drum needs to be 'Skimmed' due to being both rusty & 'Oval'. 3) Fabricate New 'Over-Size' Shoe-Slippers & Fulcrum Spacers (as a temporary fix to get shoes to work). 4) Re-Fit Wheel & adjust Brake Cable.



Front Brake only slightly improved at this stage, but only marginally.

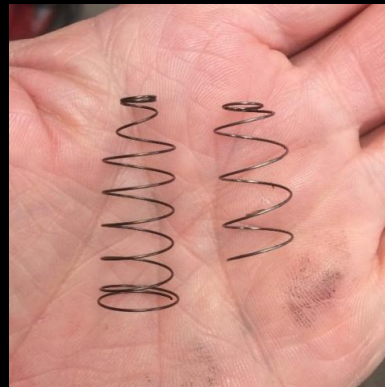
Sixty mph to Standstill = two days, three hours & 4 minutes approx. (only joking, because it does 'Stop' eventually, but only when an inordinate amount of pressure is applied to the front brake lever). Fortunately for me (and the general Public at large) the Rear Brake works really well.

It became obvious early-on that this Bike was going to need quite a lot more hard work & effort, plus a few more hard-earned English 'Quid' spent on it before it is all 'Sorted'. BUT . . . I still think it is a *Lovely Looking Bike* though. And even with all of the problems, trials'n'tribulations and hassle, I really do LOVE this 1954 MAC 350. And Yes . . . That Surprised Me too! I wanted a Venom or Viper, but ended up with a MAC and I really do like it. It is 'quaint & quirky' . . .



I picked-up some new spare parts from Veloce Spares Limited, in Huncote, Leicester (**11th November 2017**). I managed to get a new Miller Ammeter (just in case!!!) and a new Miller Horn / Dip-Switch. Plus a bunch of Dowty washers, Timing Cover Gasket & new Cover Screws, a spare Clutch Cable (and Clutch Cable Rubber Boot (Gearbox end) and some other bits too. But . . . the most important items of the day was the new Ball Valve Spring & Ball Bearing for the Oil Tank Main Feed-line 'Oil Tank Check-Valve'.

You can see the difference between the new longer spring (below) and the damaged spring next to it (which contributed to the 'Wet-Sumping' problem, together with the faulty 'Valve Seat'), now rectified.





Three 'Oil' related problems in need of immediate attention:

1) Engine leaks 'Oil' out at an alarming rate (from Chaincase & elsewhere else).

2) The Oil Tank empties its contents into the engine even when the bike is stationary & engine not running via the faulty 'Oil Tank Check-Valve'. And when the engine IS 'Running' . . . it appears oil leaks from the Rocker Box area and from the Rocker Oil Feed Union Pipe (from both ends i.e. top & bottom).

3) I found Grey Sludge and Muck in the bottom of the Oil Tank, which surprised me as the engine had been reconditioned and I would have thought that the oil tank would have also been cleaned-out, ready for the new oil?

At this point I thoroughly cleaned-out the Oil Tank & fitted the new Ball Valve Spring & New Ball Bearing to the Oil Check-Valve Unit (see previous page photos), and re-assembled & primed the Oil Tank ready for re-fitting to the Bike.

I drilled-out & re-threaded the engine/gearbox mounting plates (the two end photos on right), instead of using the two 5/16" nuts & bolts that were previously fitted.

Having these 'Plates' threaded makes life a lot easier, having to use only one tool to fit &/or remove them.



As can be seen from the above photos (middle photo & far right photo) after 'Threading' the engine/gearbox plate I added three rubber pads between the Oil Tank mounting bracket & the engine plate and once tightened, I *lock-wired* said bolts into place (I've got a thing about nuts & bolts coming loose and falling off – that's why I try and lock-wire as many nuts'n'bolts as possible these days). Yes I know . . . it's called Paranoia (synonyms: fear, suspicion, mistrust, obsession and terror). So if I haven't lock-wired it, it's probably got a self-locking nut securing it, or held together with thread-lock (i.e. Loctite, etc).

The first two photos (below left) show how clean the Oil Tank is now! And, the third photo shows the Filter Chamber being pre-filled & sealed (Tank off the bike).



I made a simple cutting tool to *re-face* the bottom Oil Union End of the Rocker Oil Feed Pipe. By using a Stanley knife-blade attached to a 'slotted' bar (an old bolt with a slot hack-sawed into it) with the same diameter as the internal diameter of the oil feed pipe (which acts as a 'guide' – keeping the cutting angle in place) allowing this home made tool (set at 45 degrees) to re-face the end of the oil pipe fitting. Yes! Basic – but Effective (last three photos, above right).

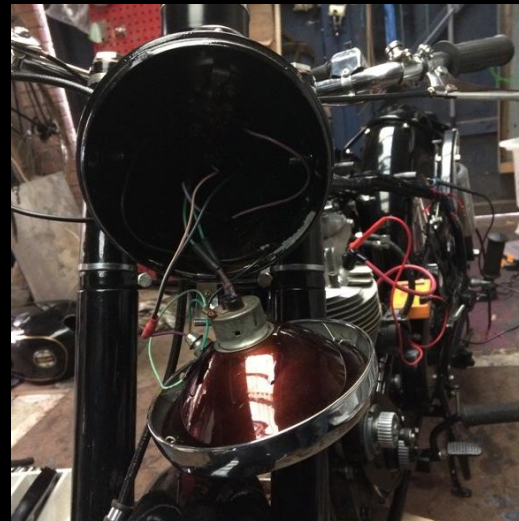
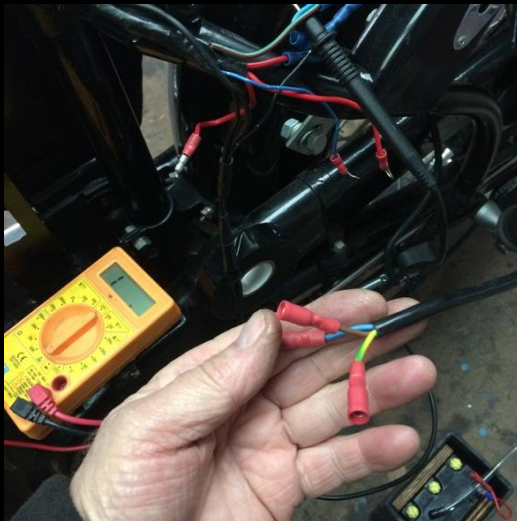
My next modification: was to add a Positive Crankcase Ventilation (PCV) Valve in order allow the release of excess crankcase pressure, whilst at the same time – to stop the usual ingress of air being drawn back into the engine (as the Piston starts to ascend on its reciprocal trip back to top-dead-centre). Yes! In other words, it's a simple one-way valve.



The Next Job on the list is sorting-out the SPAGHETTI ELECTIX.

When I Read the 'Sales Advert' = "*Rewired and new cables fitted*" . . . my expectation was to see wires (to & from the various switches & electrical equipment) matching the correct colours as per the Velocette MAC Wiring Diagram. But what I actually found was more of a literal translation; i.e. new cables fitted! (none of which actually matched said wiring diagram colours). The First Photo Below (left) illustrates what I mean; with the three-core household 13 amp electric cable fitted to the rear light & brake light, and to the brake-light-switch. Whilst this type of wire may function adequately (regarding load capacity) I was expecting to see the correct colour-coded auto-cable used - as per the original Velocette wiring diagram (Silly Me!).

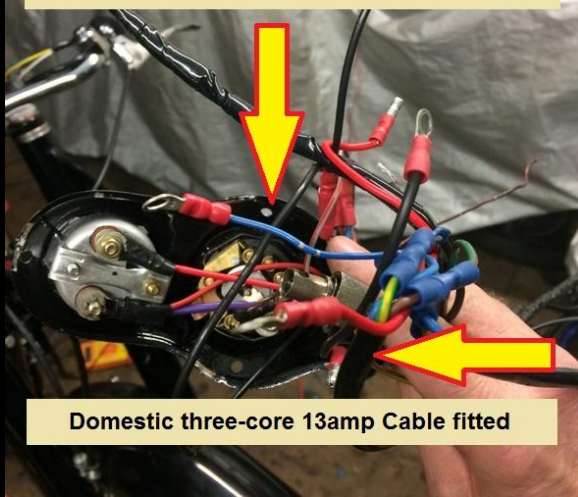
So, I decided to rip it all out. Yes, ALL of the existing wiring was removed in readiness for a complete 'Re-Wire' (as per the Velocette MAC Wiring Diagram).



MORE SPAGHETTI ELECTIX-PIX

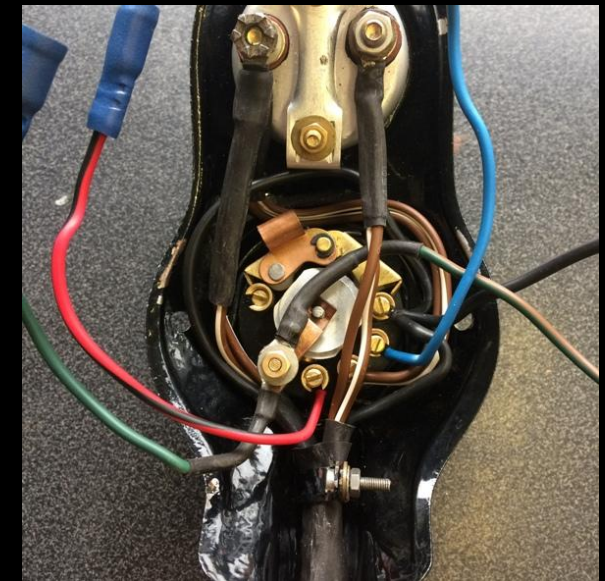
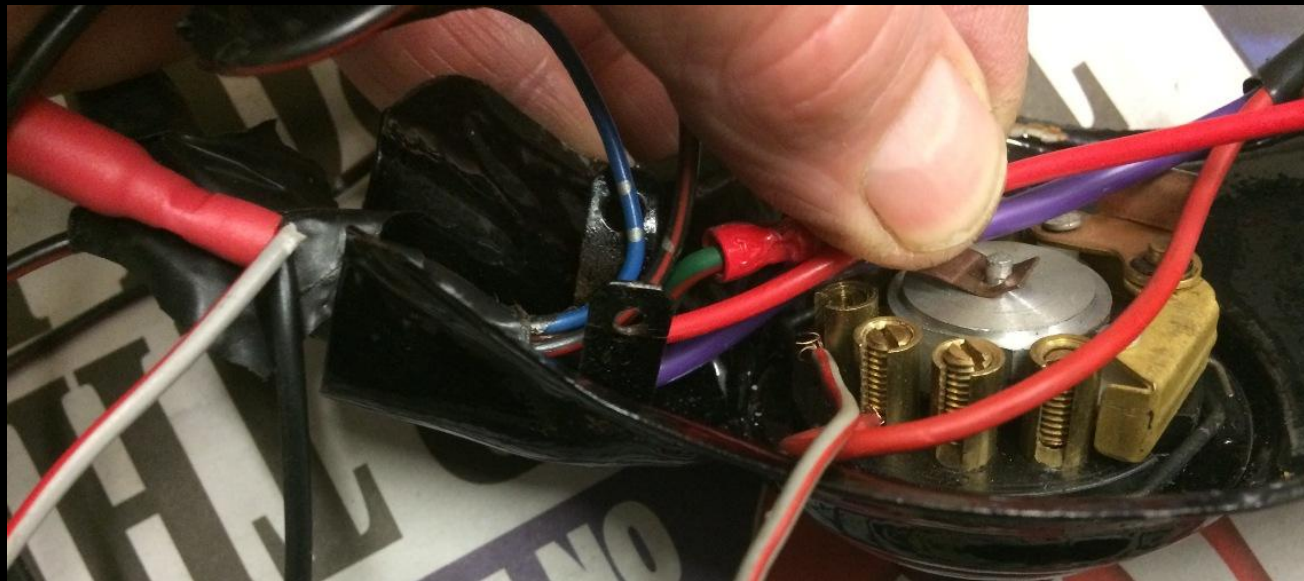
And sort out the Electrics properly.

Non-Standard Cables / Wires used throughout and none matching the original MAC Wiring Diagram



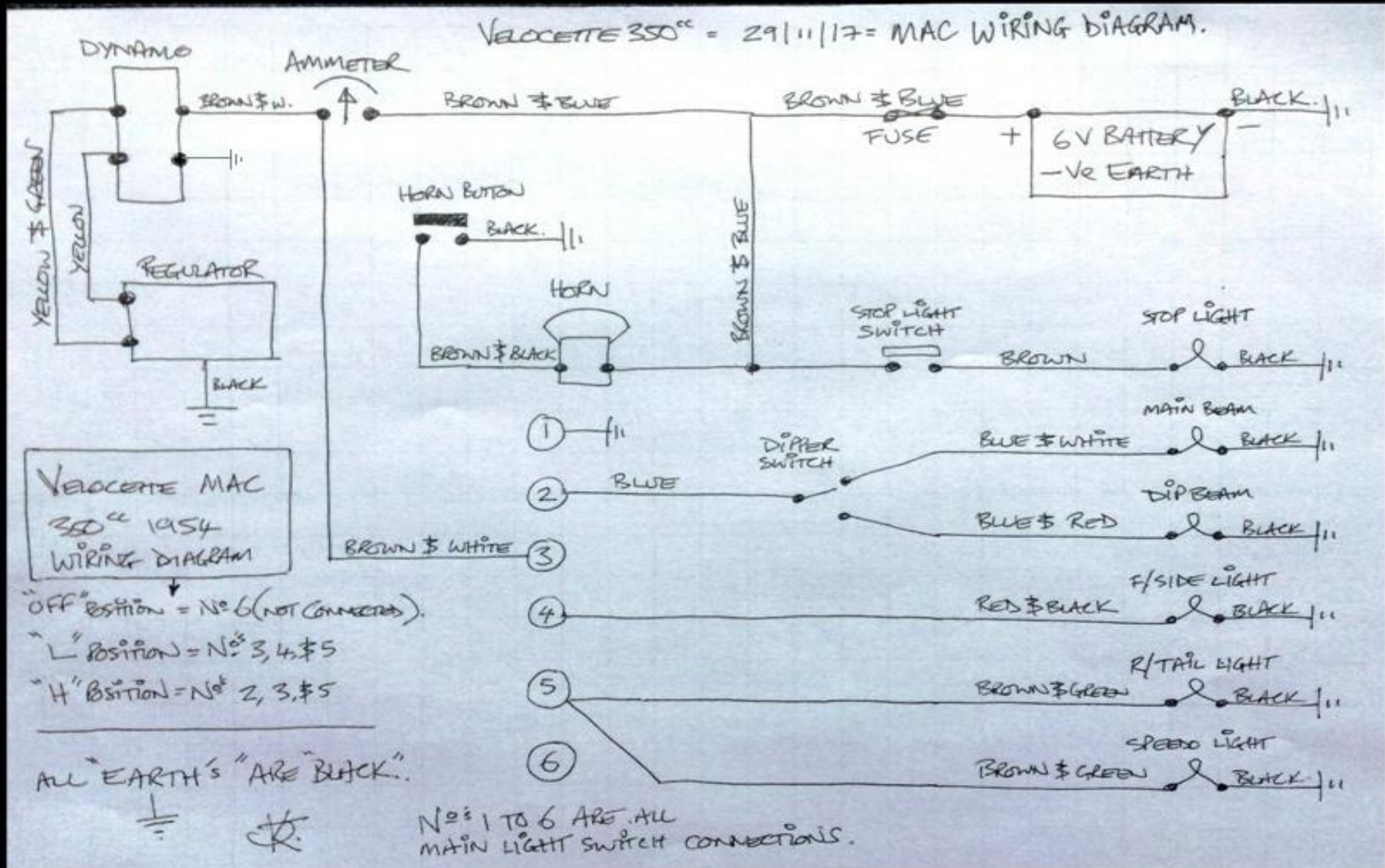
Domestic three-core 13amp Cable fitted

With the *Wiring Harness* removed; the next job is to match-up all this new Auto-Cable to the right Connection.



After lots of soldering, crimping & heat-shrinking the Wiring Harness together, the wiring loom is now ready for re-connecting to all of the switches, lights & other electrical fittings and put the whole lot back together again. But at least now, all of the 'Colours' will match the original Velocette MAC wiring diagram.

This is my 'Wiring Diagram' drawing used (copied from the Velocette Owners manual) with ALL of the wire 'Colours' matching the original Velo MAC scheme. I've also added a 'FUSE' to the system (although the term "closing the stable door after the horse has bolted" comes to mind).



The only problem is; the Dynamo is still not charging? And this was supposed to have been completely overhauled? And with a new JG Regulator Unit fitted. I suspect the JG Regulator had been well & truly 'Fucked' before I took delivery of the MAC – hence; No Charge generated when the engine is running.



Following a complete Re-Wire (completed December 2017) the MAC remained semi-dismantled until March 2018. The reason 'Work-on-the-Velo' stopped was because of 'paid-work-commitments', plus family health issues. Also, 'Two' other projects took priority over the Velo.

The first 'priority' job on my list (that delayed work on the Velo) was to get the BSA A65TThunderbolt finished & MOT'ed (after 29 years of being 'Off-the-Road). Especially after spending so much time, money and effort on repairing the BSA, to get it back on the Road. I managed to complete the necessary work on the Besa (ready for MOT) and for a 'Reluctantly Sale' of my 'Thunderbolt' to 'Fund & Pay' for the Velocette.

The second priority project that took over 'Velo-Repair-Time' was 'Time, Work & Money' needed to get the Defender MOT'ed (because it failed the MOT Test and needed quite a lot of work doing to it to get that back on the road again). But, finally (when these two priority jobs had been completed) I managed to spend some time putting this lovely MAC back together again and ready for some well-earned RIDING (which equates to "Loadzzz'o'miles" on the Clock - hopefully!)



By this 'Stage' in the proceedings, My 'Starting-Rate' for the Engine was now near-enough 100% success (Ok, at least 99% then). And it was now ready to put those MILES on the CLOCK! (see; 'patience wins').

March 2018:

The photographs below were taken on my second outing after the re-wire (outside of the Bridgenorth Bikers Café at Quatford on the A442). And I've now put the first 'One Hundred Miles' on the Clock. On the positive note: it feels great to be back on a British Single again. It rides well for a 1954 350cc and I am fully enjoying 'Tootling-around-the-Country-Lanes' on my MAC (I said "Tootling", this being the operative word because I'm 'running-it-in' as suggested by the person I bought this Velo from).

Everything works now except for the Battery Charging system? I'm not too worried about this because the Ignition Spark is provided by the Magneto.



BUT ... THE ENGINE STILL LEAKS OIL ... FROM EVERYWHERE!

On the negative side (re; my outings): the engine *'Leaked'* Oil out at an alarming rate (but at least NOT from the Oil Tank Check-Valve now). I was not exactly sure of where it was leaking from but appeared to be coming from under the Petrol tank and around the Cylinder Head & Rocker Box.

Obviously this was quite a concern, especially as I was told the engine had been rebuilt, re-bored with a complete Top-End Overall. My expectation from a recently rebuilt engine was for it to be relatively *'Oil-Tight'*. But Not to be!

On any old British Bike the *'Odd Oil Leak'* is *'Par-for-the-Course'* and almost inevitable in a lot of cases (even expected & accepted as the norm to some degree), But . . . Not this amount of Oil Leaking everywhere (especially after an extensive engine rebuild?).

It reminded me of the SS Torrey Canyon disaster ☹️



This MAC Engine requires a lot more TLC & a Lot More Than Just *'Fettling'* (Not to mention copious quantities of Oil). One Velo owner suggested that “at least you know the Oil is circulating . . .”. And . . . “on the plus side” he said “you know its not gonna go Rusty any time soon . . .”. I think he was joking . . . or at least I hope he was joking!

I just keep saying sheepishly “yer, I’ve only just bought it . . .” and; “ it was like this from day one”. Adding; “but it is Sixty Four Years Old”!

This was the 'Start' mileage / delivery mileage – 'One Mile' on the Clock (as delivered on 24th October 2017). And 'One Hundred Miles' later I'm still enjoying the 'Riding Experience' of this lovely looking MAC (yet at the same time quite frustrated with it). Below is a copy of the Sales Advertisement (on Yellow Card) for this MAC.



Forks Stripped cleaned and overhauled

Gearbox Stripped cleaned Bearings replaced, new kickstart.

Clutch overhauled new plates, and thrust bearing assembly.

Engine overhauled, new barrel and piston, valves, seats, plus crankcase breather, exhaust system, and replaced rockerbox.

Mudguard's new, Dynamo complete overhaul, and VOC Club Toothed Belt and J. G. Unit fitted.

Paintwork Powder coated, hubs, frame, etc.etc.

Wheels, new rims tubes and tyres.

Rewired and new cables fitted.

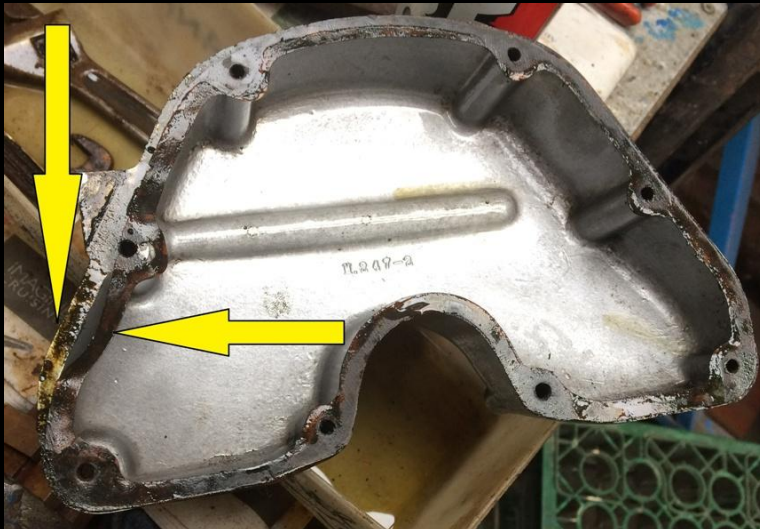
This Velocette has not been used except the 1st MOT.22.11.13.

It will need running in and fettling and requires a good home.

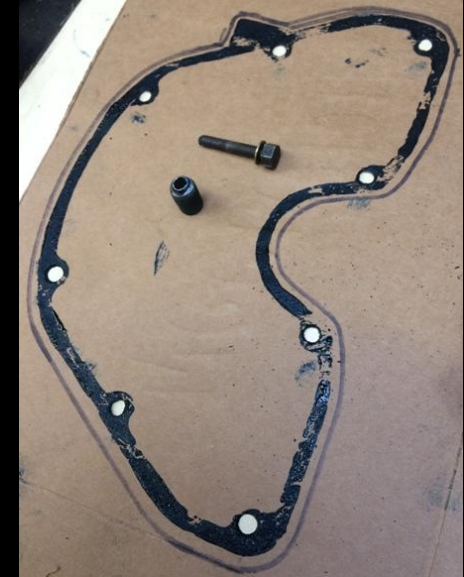
V.5. C. and 1st MOT



The 'obvious' answer was to start my search for this annoying oil leak at the top end of the engine – and work my way down until I could find the source of the leak. I removed the Rocker Box Cover quickly found the culprit. You can see on the photo below left - where the Rocker Box Cover 'Gasket' had moved when fitted (by previous builder) and had been pinched tight, but unfortunately – missing the sealing face of the Rocker Box – allowing oil to escape all over the engine. So, fingers crossed; my new home-made gasket does the trick & stops this oil slick.



With the Rocker Box Cover 'Off' the Bike I took the opportunity to 'Lap' the Base Surface (using fine grinding paste, oil & paraffin) this was done on a 'Flat Machined-Base Plate'. I then gave the Rocker Box a quick 'polish' on the Bench Polisher before washing the whole lot down in Petrol. Finishing-off with compressed air to blow-out & clean all of the oil ways & stud-holes prior to reassembly. Using 'Engine Blue' I marked out & cut a New Rocker Cover Gasket from brown gasket paper (photo far right).



April 2018:

My first 'Ride-Out' after completing the work to cure the oil leak problem (14th April) was to Quatford Bikers' Café again. The MAC rode-well to Bridgenorth & the weather was Gr8. And, more importantly it appears that the engine oil leak repairs have been a 'success' (finally!!!).

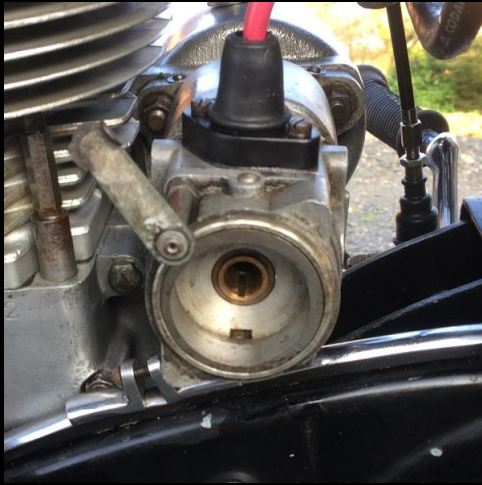


Met-up with my friend Rick (on his Velo KSS) for Coffee & Catch-up before the ignominy of having to *Push-Start* my MAC after it 'Refused' to start.



I managed, with help and a BIG Push – to get the MAC push-started. Rick offered to help me trace the 'Poor-Start' problem via the ignition system (because the Spark at the Plug was so very weak). So we rode to his house & worked on the Magneto where we cleaned the points & discovered a few magneto bits were missing? We also took the top 'Off' the Carburettor and raised the needle by one notch to help 'Richen' the carb-mixture.

The photos below; show the Lucas K1F Ignition Magneto and Points Base Plate (removed).



When the Ignition Points Base Plate was removed we discovered the Contact-Earth-Brush & Spring had not been fitted. Fortunately for me, Rick has accumulated quite a collection of Velo spares over the years and had just the right part to reinvigorate my Magneto – at least - enough to get me home.

However, it still would not kick-start, so after yet another good ‘Shove’ push-start, I set-off for home. It was quite an eventful late night journey - as the lights got dimmer & dimmer (due to the non-charging Dynamo) as the battery power ebbed away to zero volts.

Somehow, against all of the odds - I managed to get home – riding along pitch black roads, with only bicycle lights (additional to the original ‘failed’ Velo equipment) to alert other motorists of my existence) . . .

. . . but at least I’ve put another 60-odd miles ‘on-the-clock’ .



The Next Day; I did a ‘Compression Test’ (as you do) and found Cylinder Compression was below 20psi??? So, once more I removed the Rocker Box Cover I found a problem with the Exhaust Tappet. There WAS a gap – but only just! At this stage, I was convinced that I had discovered the reason why the bike started so easily when cold, but stopped as soon as the engine reached full working temperature (i.e. the Exhaust Valve not closing fully - hence the loss of compression). I presumed that the lack of cylinder compression when engine hot, was due to expansion of the valve gear, making it virtually impossible to start it with the Kick-Starter (but obviously, with a Push-start, there was just enough momentum to build up sufficient pressure inside the cylinder for it to ‘Fire-up’ and to start the engine running). Well . . . That was my theory anyway!

I reset the Exhaust Tappet to 6 thou’ just to make sure (even though the Velo Manual listed this as 5 thou’ for both Tappets) . . . and at the same time I removed the Carburettor completely and cleaned it out thoroughly (just to make extra-sure the ‘Carb’ wasn’t a contributing factor in all of this). I also fitted a new High Tension Cable & Cap, plus new Spark Plug - in an attempt to eliminate any weakness in this part of the ignition system.



I took the opportunity (whilst the Tank & Seat was 'off' the bike) to replace the original Rocker Feed Oil Pipe with a new / improved Flexible Reinforced Braided Oil Pipe and new hydraulic fittings (crimped and tightened into place).

'RESULT' . . . It looks like I've finally sorted this 'OIL LEAK' problem as well as from the Rocker Cover too.

So, Fingers & Toes 'Crossed', over the next couple of ride-outs I should discover if I have cured the 'Oil Leaking' problems, and hopefully should have improved the reliability element of this temperamental old MAC too by adjusting / re-setting the 'Tappets' (re; 'No Gap' problem).

It started first 'Kick' and on subsequent (in garage) start-ups too. So! I thought, I've finally sorted the Bike out now. It's ready now for those elusive '*miles-on-the-clock*'.

Thursday 19th April 2018 . . . The Good News & the Bad News:

My next ride-out provided me with 'Recurring Unreliability' problems. Yes! It broke-down again.

First, the Good News:

Hooray! I've '**SORTED**' the oil Leaks and I've covered another 20 '**DRY**' miles. Plus the weather was really Hot & Sunny with Cloudless Blue Sky. GREAT RIDING WEATHER!

Now for the Bad News:

The 'Begger' let me down yet again, because when the engine gets hot. It Stops? And, '*IT*' just will '**NOT**' Start-up again (until it cools down fully). Obviously NOT the Tappets.

When the engine is Cold, it starts really easily by Kick Start? So, the ONLY thing to do was to leave it Cool-Down by the road-side and get some enforced R&R Sunbathing done before I could continue with my journey.

After speaking to various knowledgeable Velo owners – they all felt it was probably – more than likely – to be down to the Magneto. So, I decided to invest in a reconditioned BTH Magneto (if I can pick one up at the right price) and hopefully, this should cure this annoying 'Unreliability' problem once and for all (fingers crossed).



On Saturday 21st April 2018: I went to the Stafford Bike Show & Auto Jumble and managed to find a “reconditioned & upgraded BTH Magneto” with what appeared to be a much better ‘Spark’ than that of the Lucas K1F (that is presently fitted). I was told it had been reconditioned by ‘Brightspark’ with one of their end-cap condensers fitted (see photo No.4). I purchased a steel Magneto Drive Wheel Pinion (without the auto-advance & retard mechanism fitted – see the 1st two photos below). This ‘Steel Pinion’ replaces the original Fibre Drive Pinion that was fitted to the Lucas K1F model.



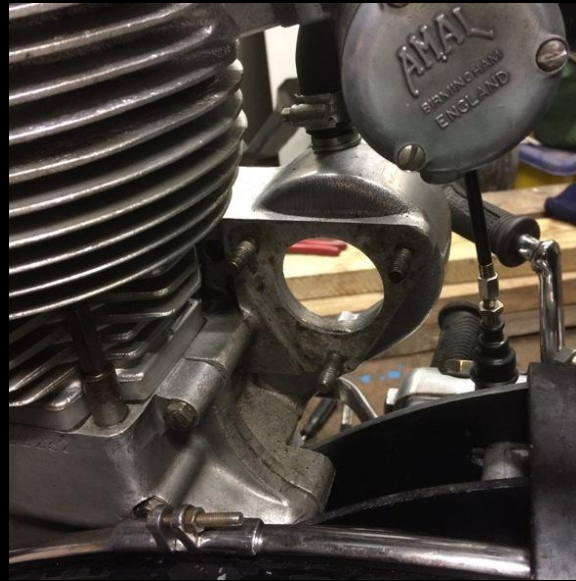
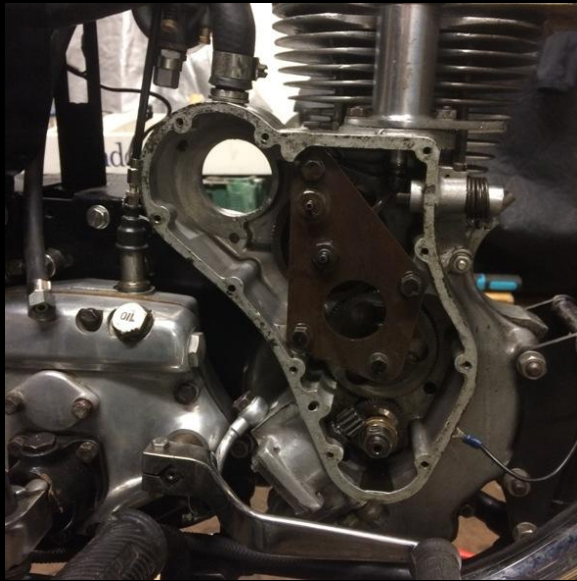
I bought some new parts from the ‘Amal’ Stand at Stafford Show Ground for the Carburettor. I also managed to buy some other bits’n’pieces from my ‘shopping list’ too (including a Helicoil Kit to repair the worn-out, dodgy Spark Plug Thread).

As you can see on this page, I used a Timing Disc to find the correct ignition timing position (38° BTDC).

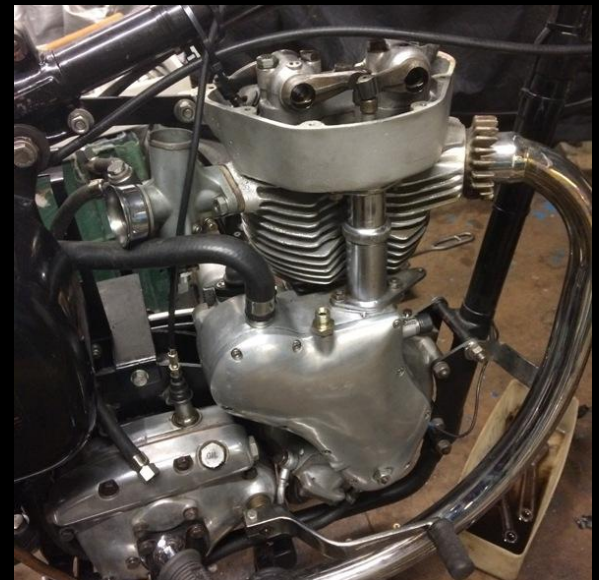


The last photo (far right) shows Two Tools that I made from two old Spark Plugs. The (top) one is a ‘Positive Stop Tool’ with an adjustable threaded inner stud and two lock-nuts that can be adjusted up or down (& locked-in-place) to aid finding a fixed point either side of Top Dead Centre (TDC), measurements are then divided equally to find true TDC. This method is supposed to be the most accurate (unless you are using a DTI).

The other TDC Tool is a second Spark Plug ‘Body’ drilled & reamed-out to accommodate a ‘Sliding Inner Bar’ (a long bolt with the thread cut off) that comes into contact with the Piston, so that when the piston moves up & down a Dial Test Indicator (DTI) ‘Dial Gauge’ can be used (on top of the sliding insert) to find TDC. Obviously, both of these tools require careful use so as not to damage the top of the Piston. Both tools work equally well at finding TDC, but obviously, a decent ‘Timing Disc’ is then required to translate that information into a ‘readable format’ to set the ignition timing ACCURATELY. As it happens, I own five different timing discs (collected over the years).



Another KJ-home-made 'Tool' was fashioned using an old spanner (bent into a new shape with the help of some 'heat', a vice & hammer) made specifically to fit & tighten-up the three Magneto fastening nuts. I replaced the Timing Cover 'cross-head-screws' (3/16" Whitworth) with a full-set of new 'Cap-head / Allen-headed' Screws (& obviously a new Gasket). I had to re-thread several 3/16" Whitworth threads as some of these threads had already been 'Stripped' and so was in need of slightly longer screws in order to refit & secure the Timing Cover.





As the compression is quite low (only 6.75 to 1 on the MAC) I cannot see the need for the Exhaust Valve Lifter . . . so, I've taken the Valve Lifter mechanism 'Off' and sealed the 'Hole' with a home-made 'Plug'. As you can see from the above photo I've used an old cap-head bolt and ground a 'Groove' in it to take an 'O' Ring, together with a Slot where the original Valve Lifter Lever Screw fits (& then for good-measure I've *lock-wired* it up).

I had to re-tap each of the eight (2BA) Rocker Box fixing threads in the Cylinder Head, and also remove '*three-sixteenths-of-an-inch*' from the top of the Rocker Box (Bolt Hole nearest the Rocker Oil Feed inlet) to enable the new cap-head bolt to have a full half-an-inch of thread (once the hole had been re-threaded that is!). So now, both the Timing Cover and the Rocker Cover have new Cap Head / Allen-headed Bolts securing them in place.



The next job on my list was to replace the old main oil feed pipe and union fittings (changed because of the small but constant 'weeping' of oil from these fittings and connectors that I found difficult to seal), so I decided to replace both pipe & fittings with the same type of reinforced stainless Braided Oil Pipe and new Connectors that I used for the Rocker Oil Feed Pipe. It's starting to look a bit more civilised now with a few 21st Century improvements fitted. A beneficial by-product of this latest modification was yet another Oil Change (the second oil change since last October).



New Spring-Retaining-Clip fitted to the top of carburettor & new cables fitted, plus a 2nd handlebar control lever for the BTH Magneto Manual Advance & Retard mechanism.



I fabricated a home-made tool for undoing / tightening the Crankshaft Main Drive Shock-Absorber Nut, using an old half-Inch drive Socket (that the business end fits over the 'Castellations' to act as a centralising guide). I then welded a couple of 'Wings' onto the Socket to engage with 'Two' of the 'Four' outer slots in the Drive Nut allowing the Drive Nut to be tightened (or loosened) using an half-Inch-drive Ratchet).



The previous 'Engine Builder' had not fitted a 'Split-Pin' to secure this Castle-Nut? Presumably because when the Nut was tightened, the Castellations did not line-up with the hole in the Crankshaft. So, rather than sort this problem out, they just left-out said split-pin!

I tightened up the 'Nut' fully and made a mark on the Nut to identify the 'position' of the 'Hole' in the Crankshaft, then filed a 'Groove' between the Castellations – just enough to be able to insert a 'Split-Pin' in to secure the Nut.

I've obviously decided NOT to put the Dynamo back on just yet. I'm going to run it as a 'Day-time-Only' Bike with no lights.



I re-purposed / recycled a strip of aluminium by drilling two holes, set at eleven & a half inch 'Centres' (as suggested in the Velo Maintenance Manual) in order to 'Set' the Rear Chain 'Tension' correctly. I finished off by replacing the old MAC Rear Shock Absorbers with a pair of New Hagon Shock Absorber Units. I think they look great and they perform well (having tried and tested them over the years on previous bikes I've owned).



I've also removed the Positive Crankcase Ventilation (PCV) Valve (that I fitted a while ago) as it did not work-out the way that I thought it would (if anything it caused more of a restriction) so I decided to fit a temporary 'Plastic Oil Catch-Tank' on the bike to see how that works-out (above photo). I don't mind *'trying new ideas out'* but also don't mind admitting that I got it wrong, when things don't turn out like expected.

p.s. The Plastic Oil Catch-Tank works a treat!

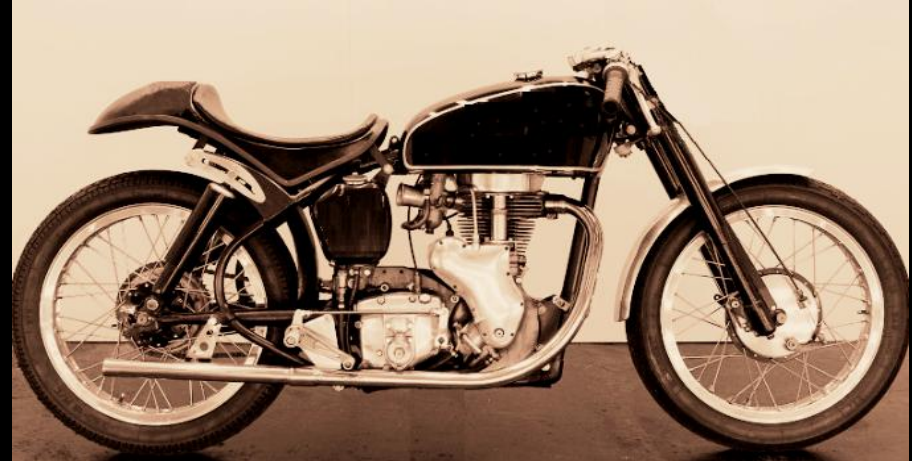
I realise this is going to upset many Velocette owners, enthusiast and traditionalists . . . (but I'm still probably going to do it anyway), I really like the look of this 1950's replica MAC Racer (sepia photo below right), and am thinking of turning my MAC into something very similar to the one in the sepia photo below. I do like the straight exhaust pipe, but still may keep the Fishtail, or even try a Megaphone Silencer? (maybe?).

FROM THIS . . .



TO

THIS (or something very similar)



Just to put ALL of the Purists' Minds at rest . . . Whatever I do IS reversible! I am keeping ALL of the bits'n'pieces that I take off the MAC and storing them safely in Boxes, just in case (if &/or when) I decide to put the whole thing back together again, back to its original purchase condition (as none of these modifications will be permanent) and it should only take a couple of days (maybe a week at most) to put all of the original parts and equipment back onto the Bike. Well! That's the Plan. I've started by replacing the MAC seat with an old single seat (I've had for over 20 years).



I've removed both Rear Foot Rests (the Pillion Foot Pegs) and will leave them off . . . as I do not intend to take anyone on my bike as a Passenger.

I much prefer to ride 'Solo' as I really enjoy my Riding, and therefore, this bike isn't for sharing.

It's for ME !!!!



This is only a 'Temporary' transition, until I can locate the appropriate bits'n'pieces to achieve the desired result (as in the sepia photo of the 1950's MAC Racer – previous page). It is as they say "a Work in Progress"! As you can see from the photos below, I've replaced the head light with a flat plate (& located my VOC 60th Anniversary Badge on it).



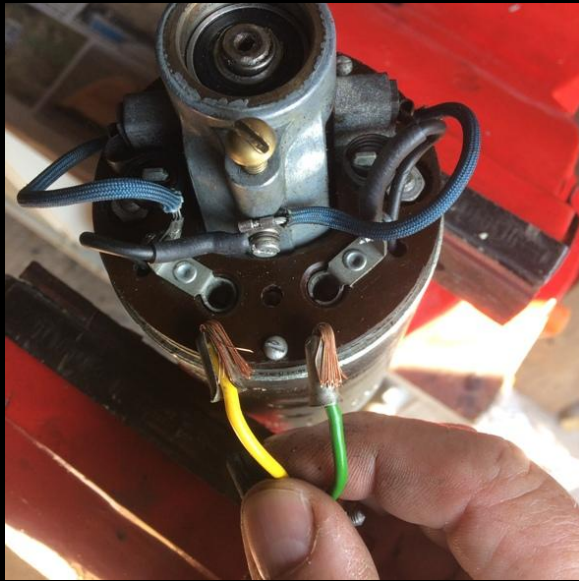
Unfortunately, my MAC 'Unreliability' problem is still to be resolved. I went out the other day and only managed to do six miles before it 'packed-up' and stopped working yet again. I was hoping that the BTH Magneto (that I bought at the Stafford Bike Show) would cure this engine problem. But, obviously, this did not do the trick.

It looks like I have been sold a 'Dud' BTH Magneto' and the words "Caveat Emptor" springs to mind ("Let the Buyer Beware")! So . . . it looks like yet another repair coming up again soon (and yet more hard earned cash being thrown at the bike).

It's a good job that I have the patience of that bloke mentioned in the Bible (his name rhymes with Lobe).



Oh Come On! You must agree . . . It looks really lovely like this (?)

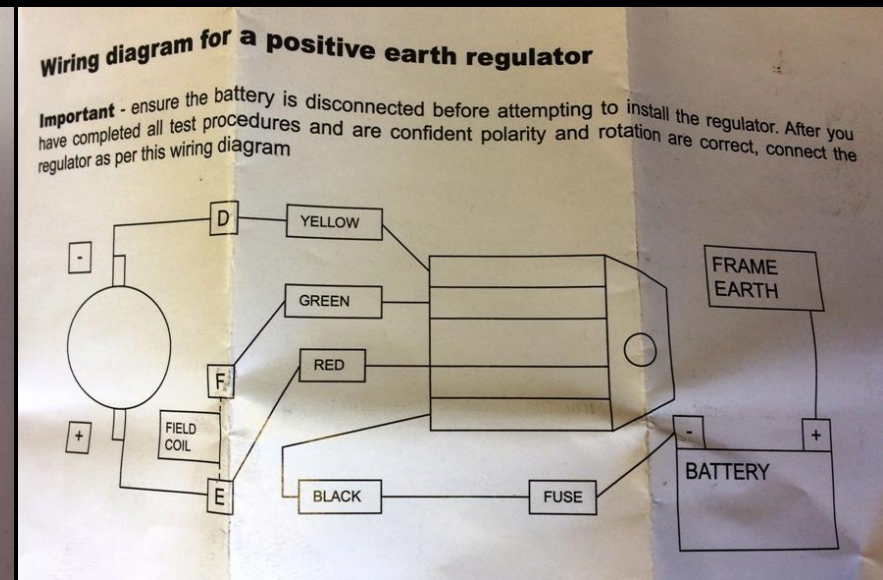
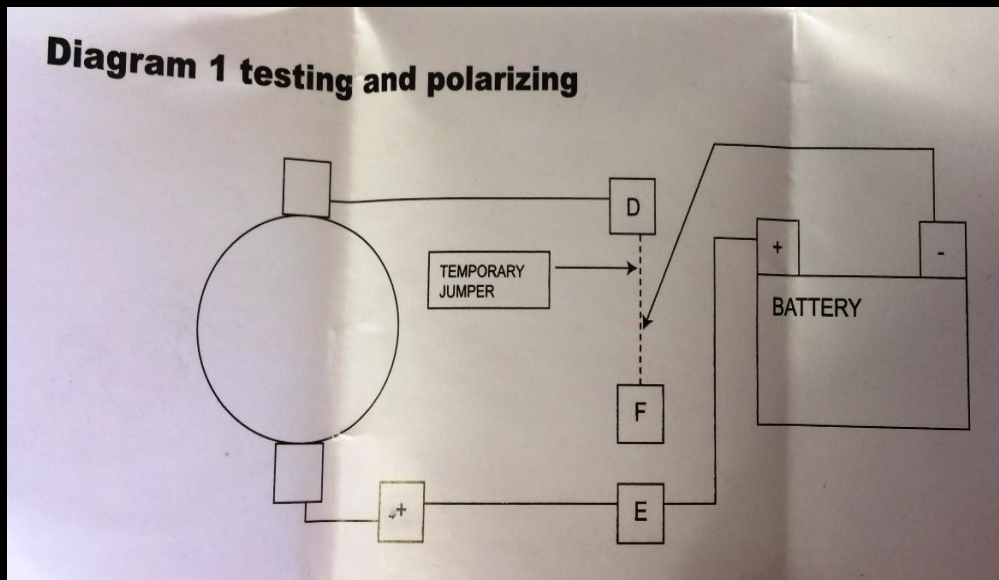


Following a visit to my very good friend's workshop - Velo Mentor Rick (in my MX5 this time), we stripped-down the Dynamo and checked-out the inner most workings (aka. *the Innards*). Mechanically, everything seemed to be as it should be, but we could not get the motor to spin (when connected directly to a Battery)?

After some time, we managed to sort-out the problem and then - with the aid of a Wassell Regulator Wiring Diagram - we managed to get the Dynamo working once more. We then proceeded to change the 'Polarity' of the Dynamo in readiness for fitting it back onto the Bike connected to a DC Regulator as a 'Positive Earth' electrical system.

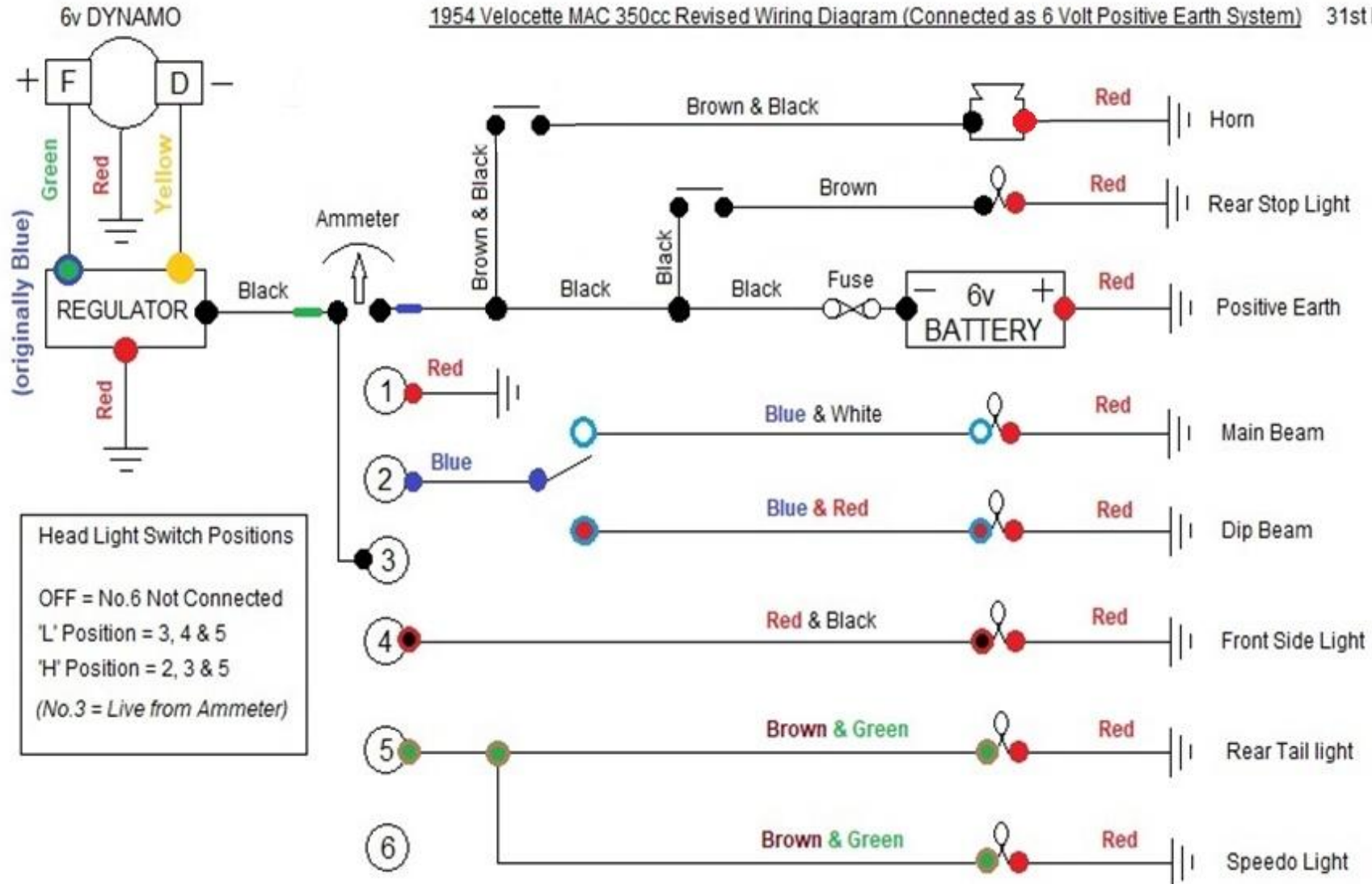
If you remember, the original JD Regulator that was fitted to the MAC when I purchased the bike Never actually worked (and the bike had been wired-up' as a 'Negative Earth Bike' which is more than likely to have been the cause of the JG Unit being well & truly 'Fried' beyond repair. But . . . I'm hoping that when I fit Rick's Regulator, all will be sorted regarding the 'Charging System and that the new system will once more generate electricrickerly!!!

I have 'Revised' and neatened-up the wiring diagram to accommodate the Wassell Regulator wired-up as a positive earth system. See Wassell diagrams below & my revised Wiring plan.

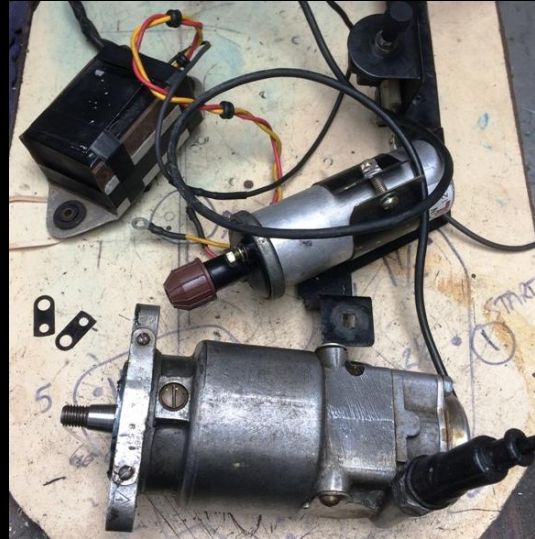


My revised and neatened-up wiring diagram to accommodate the *Wassell* Regulator

1954 Velocette MAC 350cc Revised Wiring Diagram (Connected as 6 Volt Positive Earth System) 31st May 2018



The first photo (below left) shows the new auto-electrical cables fitted (i.e. yellow to 'D' connector & green to 'F' connector) using a 'Durite' waterproof quick-release connector. Also, until I can get my BTH Magneto checked-over properly and reconditioned, I am going to use the Magneto 'on-loan from Rick. My BTH Magneto works *perfectly* when the engine is Cold. It starts **FIRST-time EVERY-time** when Cold, but as soon as the engine reaches full-operating temperature the Begger **JUST Stops!!!** And **TOTALLY REFUSES** to kick-start again until the engine has cooled fully.



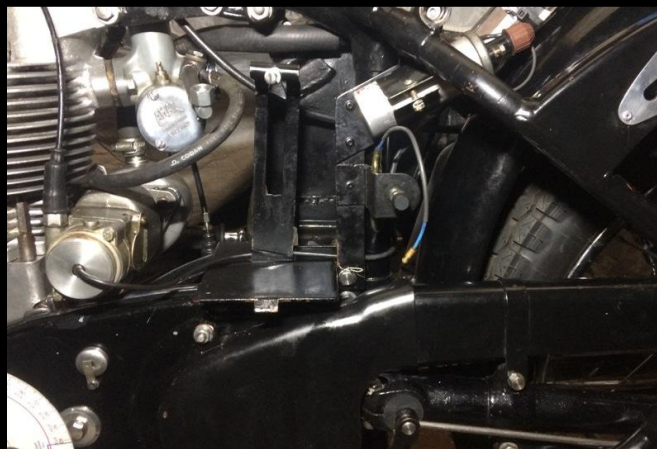
Rick's Magneto (above photos) has been converted to 'Coil' ignition, and I have every confidence that this Magneto & Coil system will work and will Not let me down.

Also, Rick's Dynamo Regulator ready to fit (2nd photo left) with yellow, blue, red & black wires, and this should rectify my electric charging problems too.

As you can see, I've managed to clock-up 192 miles in total since last October.

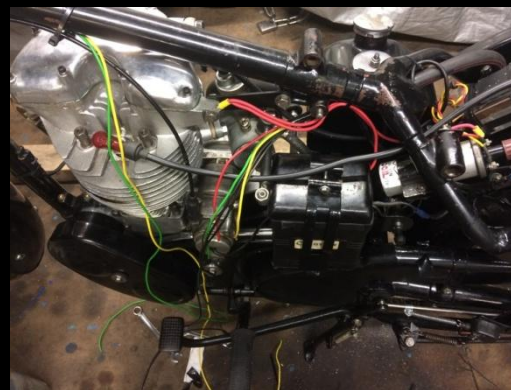
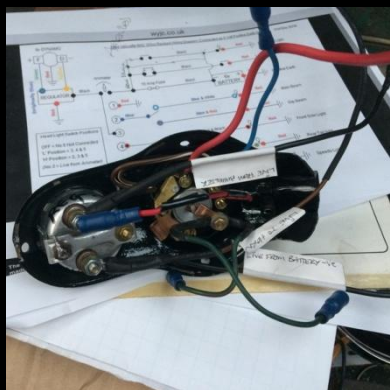
Timing Cover 'OFF" yet again . . . But at least I'm not worried about the timing cover screw 'Threads' this time as I've already sorted this problem out (by re-threading & fitting new Cap-head / Allen Screws). The timing cover was removed to gain access to fit the 3rd Magneto to go on in Two Months (in April I changed the Lucas K1F Magneto with the BTH N4 Magneto that I bought at Stafford bike Show).

And . . . now I've fitted the 'Loan' Magneto to see if this cures the unreliability problem that has plagued this bike from *Day One!* This one is an old Lucas K2F Magneto converted to single-fire contactless electronic ignition timing, with an external Ignition Coil, powered by a 6v battery.



Monday 18th June 2018: The new 'contactless' magneto / coil set-up was 'Timed-up' after connecting this new system to a fully-charged-battery. But before I could try to start the engine, I had to refit the timing cover , the rocker-oil-feed pipe (& Prime the Rocker-oil feed Pipe), then refit the petrol tank and make sure everything connected the way it should be – before I did anything else. *Next job was to complete the rewire (as a Positive Earth Bike).*

RESULT: It started FIRST KICK . . . Well impressed = 100% Starts EVERY TIME now.



However, *the real test* will be to see how many miles I can now cover without it 'Faltering and Stopping' on me (as in previous journeys). And as can be seen (in the photos below) on **1st July 2018** I managed to put the whole lot together again 'in time' to ride-out to the Annual Velocette Rally at the Burntwood Rugby Club, Staffordshire. Although I didn't finish working on it until the early hours of Sunday morning (2am), its now ready.

Annual Velocette Rally 1st July 2018.

I am pleased to report that Rick's contactless Magneto / Coil system works extremely well and makes the MAC so easy to start, and so far (fingers crossed) I have not had any problems with the bike cutting-out as soon as it reaches full working temperature.

So **EVERYONE** who told me it was the Magneto. **YOU** were **CORRECT**. It was the Magneto!

Also, for the very first time = The Dynamo is now finally working as it should be and is 'CHARGING' the Battery, thanks to the Voltage Regulator (also provided by Rick) and last night's rewire.

The *weather* was excellent riding weather (very warm & sunny cloudless sky) and 'The MAC' rode 'Well' today. The Company was excellent too.

I've managed to put another 37 miles on the clock and hopefully, this latest work has now appeared to have 'sorted' the MAC's 'unreliability' problem out.



Velocettes, Velocettes and even more Velocettes . . . **Now! Where did I park my Velocette?**





Since the Velocette Rally, I have now ridden my 'Reliable' Velo as much as I can and have managed to knock-up another two hundred & twenty-three miles on the clock. Making a total of four hundred and thirty miles completed since I bought the MAC (see photo below left for latest mileage). And . . . I'm pleased to say – my MAC has not once let me down with poor starting and/or breaking down when it gets 'Hot' (Thanks to Rick). It starts virtually every time now with just one (or two) kicks.

Also, in the two end photos (bottom far right and on next page) I've started to make a small-lightweight Rear Carrier Rack, to fit directly onto the rear mudguard. This should enhance the look of the bike (I think) and this bit of utilitarian fabrication work should come-in useful for carrying light luggage'n'stuff. (Finally, somewhere to attach my trusty old Flip-Flops to . . . whilst in transit – obviously). Did I mention it NOW Starts.



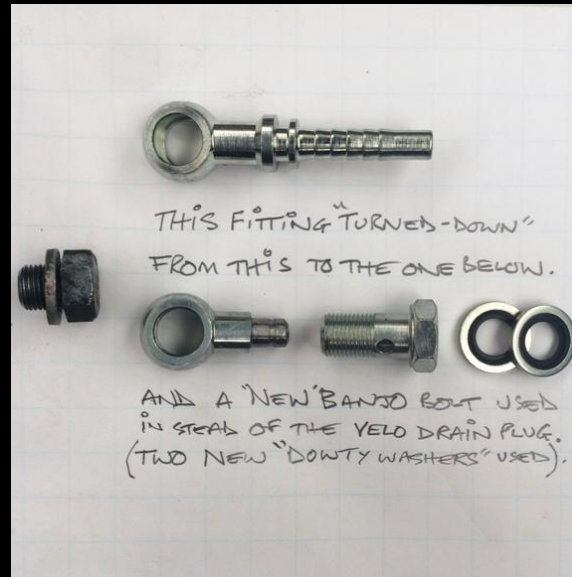


All material used to construct this rear carry-rack was all recycled from 1/4" steel bar that I have salvaged from Filing cabinet and office draw locking bars (and a bit of flat strip out of my scap-box). **Doesn't everyone have a 'Scrap Box' where they keep all of the useful left-over bits of metal?**

I already had the welding rods, so the whole job cost me very little to put together (apart from a couple of hours).

&; Yes! It's Official. This rear carrier rack is just the right size to carry a pair of Flip-Flops.





First photo (above left) = after 473 miles covered, the gearbox drained & refilled with new clean SAE 40 oil (as recommended). Next two photos (above right) show the latest improvement; a new Chaincase Oil Level Indicator made from hydraulic 'Banjo Fitting, Banjo Bolt and plastic pipe'. I shortened the Banjo fitting in order to be able to see the correct level of oil in the Chaincase. I did this by cutting-off the end of the banjo fitting and reducing the size of the fitting to accept a translucent plastic pipe (lock-wired into place). This 'banjo fitting' then screws directly into the existing Chaincase 'Oil Drain Plug'. And it works.



Four photos above show front brake work: Until I can get the brake-drum 'Turned' in a Lathe & new brake shoes fitted - my next mod was aimed at improving poor front braking issues by making a slightly longer brake lever arm. I've also made it slightly thicker (because the existing lever was too thin & wobbled-about - even though it had been 'Packed-out' with a couple of washers). RESULT! For the first time ever, when the front brake is applied, the front Forks actually dip & compress under braking conditions (which NEVER happened before). It's still not brilliant, but at least 50% improvement on previous braking.



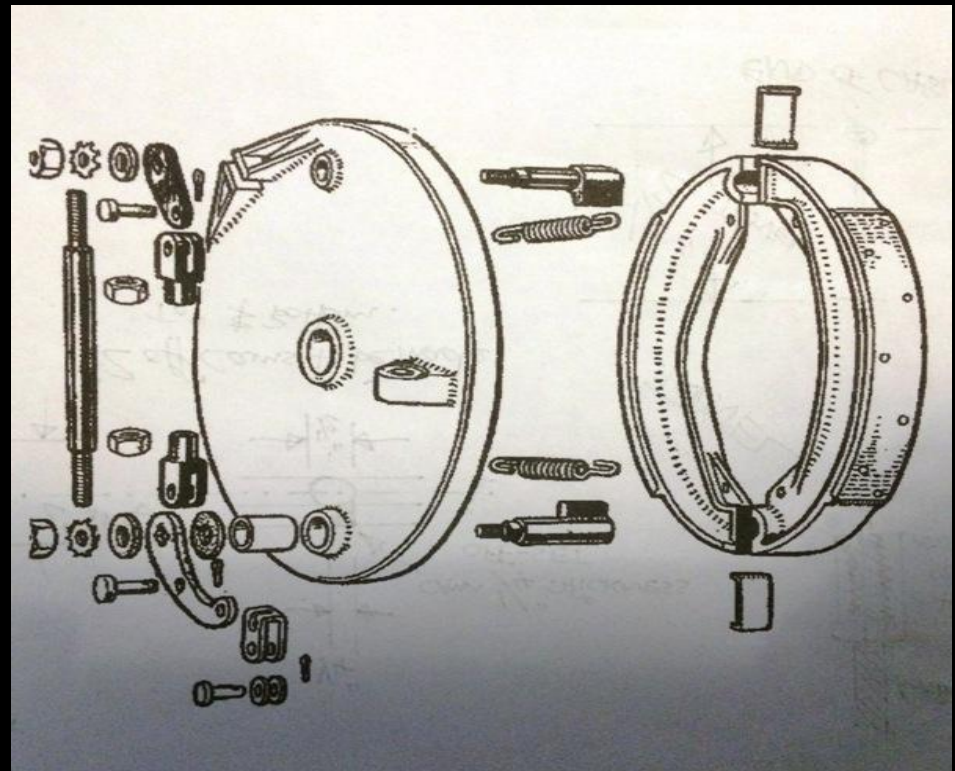
The Rear Carrier works a treat and the brakes are *bedding-in* nicely after the recent modification & adjustments made to the brakes and longer lever.

I've ridden my MAC virtually everyday since the Velo Rally and have clocked up my first thousand miles.



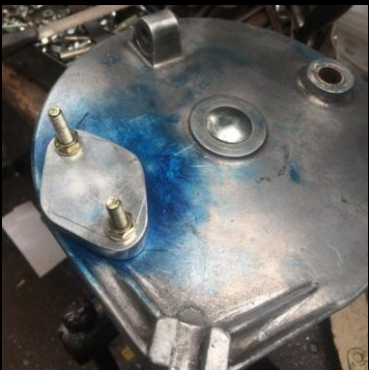
The drawing below accompanied an article from an old Fishtail Magazine (supplied by my good friend and fellow VOC member Rick). It describes how to modify a MAC front brake plate and how to turn it into a Twin Leading Shoe Brake (TLS).

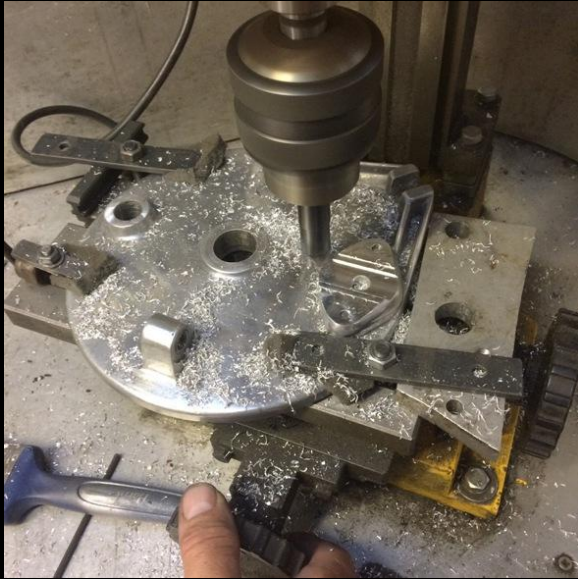
I've drilled-out the Rear Wheel Retaining Nuts and have Lock-wired them together (photo below).



I managed to buy a spare Front MAC Brake Plate (advert in last month's VOC Fishtail magazine). This is the basis for my TLS Front Brake project. But on further inspection I discovered there are several considerations & challenges to doing this conversion based upon the drawing & article. This is what I found:

- The Pivot point & Fulcrum point are at different 'Centres' (from the centre Wheel Spindle Bearing) and are different diameters; i.e. the Pivot Bolt is 3/8" diameter and the Fulcrum Cam-Bolt is 1/2" diameter (fitted in a half-inch bronze Bush). The different spacing is to allow 'Sufficient Travel' at the 'Fulcrum end' and 'Less Movement' at the Pivot end. But after measuring up and a good long 'Think' about this new system, I decided to set both Fulcrum & Pivot Point Centres 'Equidistant' from the Centre Spindle. This then brings both leading edges of the repositioned shoes to locate in the correct position to work. Without this alteration / modification – it is virtually impossible to get the shoes & brake back-plate to fit back into the Drum (because of this offset).
- The original Brake Shoes are 'Sided' and will only fit on 'One-Way', so a second set of shoes are required to make this TLS work successfully. I tried fitting the Shoes as in the Fishtail Diagram but found that the shoes just would not fit the drum safely, in the configuration stated in the drawing.
- The top pivot point (in the drawing) shows the smaller diameter hole (i.e. 3/8") without the use of a Bush (& only the Brake Fulcrum Lever Hole is 'Bushed'). But I felt it necessary to increase the size of the original pivot point to 1/2" and to install a Bush to match the original Fulcrum Point (that is fitted to the lower part of the Brake Plate) to act as a proper bearing area for the top lever too. This will help with increased braking loads at the old (top) pivot point.
- Unfortunately, there is insufficient material at the top of the brake plate to accommodate a new oversized Bearing Bush, because the Brake Plate is too thin to house and support such a Bush and Joint Fulcrum-Pivot Shaft). So, my answer to this was to add a piece of Aluminium Plate (13mm thick) capable of carrying the new Bush (& Loads) for the new Joint Fulcrum-Pivot shaft. This new Plate to be 'Bolted & glued with Araldite' in-place before 'Milling' (to get correct height) and 'Reamed-out' to 5/8" for a bronze Bush to be fitted. The inside diameter of both Bushes to be Reamed-out to 1/2" diameter.





The next step was to 'Mill' the new 'Fulcrum/Pivot Bearing Plate' to the same height as the original Fulcrum point bearing housing height.

And then make two new Bushes for the (yet-to-be-made) fulcrum shafts. The Bushes should be $5/8$ " plus a 'Thou' oversize to allow interference fit into the brake back plate.

The new brake Actuating Levers & TLS Linkages (to be made as per Fishtail drawing design). These new actuating levers will be 'Improved' versions (i.e. slightly longer levers to give the effect of more leverage).

Obviously, I've 'Lock-wired' the two Allen Cap-headed bolts into place, just to make sure that they stay in place once in action (see the photo below right).



Finally, when all of the machining & fabrication is completed, & reassembled . . . the Plan is to 'Try-it-out'.

In order to Move the Old Fulcrum Point Centre 1/8" further out from the Spindle centre-Line (to match the corresponding Pivot Point measurement) I Drilled-out & Reamed the old Fulcrum Bushed area out to 3/4" and inserted a slightly oversized Aluminium Bar (using a little heat) to ensure an interference fit into the Brake Plate.



The finished Bush sizes are: 5/8" Outside diameter (plus one thousandth of an inch) with a 1/2" Inside diameter. I've used the same size Bush for both bearing holes and had to use two sets of brake shoes to get 'One Good Set' (because the brake shoes being 'Sided' and 'Off-set' – therefore two sets are required just to get One Set that 'Lines-up' properly). They look good now I've cleaned them up, removed the old Linings & polished them ready for the new Brake Shoe Lining material to be fitted.

New Cam Pivot (2nd photo below) made from 1/2" bar, with 1/4" steel plate welded into place to act as a 'Half-Cam' (as per the Fishtail Drawing). The end of the bar turned down to 5/16" and then 'Threaded' to accept a 5/16" BSF Nut. After a terrible 'failed' attempt at threading, I made up a 'Guide Steady' tool bolted to an old Die Tap Holder, with success (3rd photo below). After lots of Filing, I ended up with a pair of new home made Cams (4th photo below).



The 1st photo; (above left) shows the Cam end being Filed-down into a Square shape, to act as a secure Drive Point for the brake Lever to be attached. The 2nd photo along shows the main brake Lever being made, and the centre hole being 'Filed' into a Square, to fit the square drive end of the new Cam. The 3rd photo shows the original 'Brake Adjuster Anchor Point' being permanently removed with a Hacksaw, and then filed-down before polishing. And finally . . . The 4th photo (far right – bottom row); just in case you are wondering 'Why' the writing is on the back plate & brake shoes; well, that's for the benefit of the person who will be tasked with re-lining the brake shoes because the positioning of these 'Linings' is most important. I've also asked for them to be oversized material and to be 'Bonded' and 'Riveted'. Those who know me will no doubt confirm (if you haven't already guessed) that I am a sort-of-a 'Belt & Bracers' man.

The TLS Link arm - between the actuating Levers (see photo below left) is a temporary 'fixed position' one (fitted just for the benefit of the re-lining process) and the intention is to make a fully adjustable 'Link Arm' (i.e. a threaded rod), before I refit the wheel back into the bike. My initial thought was to use a couple of 'Rose Joint' ends, but I may follow common Velo practice by using two threaded 'Yokes' (held together by two clevis pins).



My intention was to send the Wheel off to have the Brake Drum 'Skimmed' on a Lathe (as suggested way back in November 2017) and for new brake lining material to be fitted and the Lining matched to the skimmed wheel (end photo - top right). I've been told it will take at least two or three weeks to complete the job.

So the next time I make an entry to this blog I will be letting you all know . . . the brakes are done and the wheel is back in the bike and . . . EITHER;

(a) it's worked brilliantly and stops on a shiny penny . . . RESULT 😊

Or; (b) I'm in hospital, in traction with all of my extremities in Plaster, due to the accident caused by severe brake failure 😞 NOT the RESULT I Want!

As you can see, I decided NOT to send the wheel 'off' somewhere else to have the Drum 'Skimmed'. Instead, I decided to 'Do It Myself' and to this 'end' I made up a Jig (No, not an Irish Folk Dance!) but a Frame to hold the wheel & a suitable tool head in place – in order to 'Skim' the Drum (back to 'True').



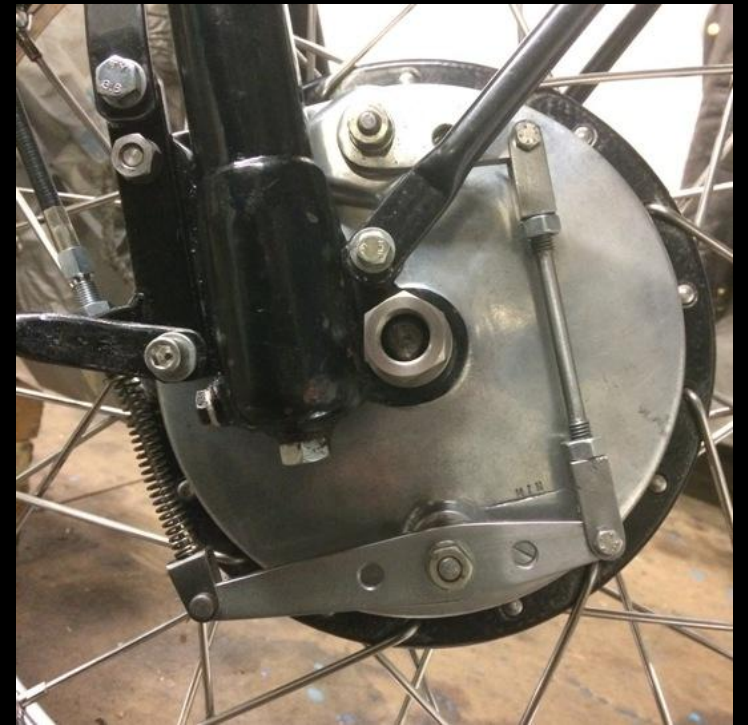
I used two-inch Angle Iron (re-cycled old Security Fence) to construct 'Two' separate 'Tee-Shaped' arms. Drilled and bolted together before welding each individual 'Arm'. I then set about bolting them together (with appropriate spacers) at the right distance for My Wheel. Once Bolted-down to my workbench I then modified an old Lathe 'Compound Rest & Tool Post' to fit this home-made Jig. I had to drill & tap new threads into the bottom of the Compound Rest – to attach it to the Jig Platform (the black plate bolted to the Jig shown in 3rd photo above), and once everything was 'Squared-up' and in-line, I just rotated the wheel by hand and gently set about removing the oval and very 'Pitted' and rust-pocked-marks from the Drum surface (see below - lengthy process).





This Wheel Jig is also great for 'Balancing' the wheel and for 'Truing-up' the wheel; i.e. re-adjusting / re-setting and/or fitting new Rim Spokes, etc.

I used 12mm square section mild steel bar to make the Brake Link Threaded Yokes (filed & drilled) and a length of 8mm threaded bar for the joining Rod.



The next job was to make a new Bracket to secure the Brake Cable to. I also modified the mudguard brackets & stays, and added a couple of spacers (in order to gain a bit extra clearance around the new brake 'Linkages' & fittings). I intend to take the MAC for a Test-Ride sometime tomorrow, but . . . at the moment, I'm feeling quite optimistic and confident that this latest upgrade will be well worth the time & trouble taken fixing these unimpressive brakes out.

The first *Ride-out* after skimming the front brake Drum & fitting the new brake shoes onto my twin leading shoe (TLS) back-plate was to the Quatford Café (Saturday 8th September 2018). This was a 36 mile round trip. The idea being to '*Bed the brake shoes in*' and then upon return to my workshop, to get the wheel out again to file-off the brake shoe high spots and balance up the brake linkage. I'm pleased to report that it was option (a) that prevailed, and although it worked better than before, it still didn't stop on a shiny penny (Yet), but non-the-less, a RESULT by my reckoning.

Plus . . . The Front Brake does look good (even though I say so myself) and is quite unique I think!



My second ride-out (& brake test); was on **Sunday 9th September 2018** when we (*me on the MAC & my business partner on her Honda CB1000 RA*) rode over to Cleobury Mortimer to the Annual Vintage Bike Show held at Lacon School. We met up with fellow Velo enthusiasts Rick, Steve & Rob. The show was very good and the weather remained dry for most of the day (it rained whilst in the School Hall – hence the raindrops on my bike – photo above). The new TLS brake once more '*Dips the Forks*' when the brake is applied and more importantly slows the bike down when needed (RESULT again!). Upon return to my workshop I re-adjusted the brake cable and linkage (yet again) and this further improved things. I'm sure that 'Once run-In' these brakes will be awesome.

I am pleased to report that the Front TLS Brake has bedded-in a little bit more now and it works much better at stopping me and my MAC.
The MAC Brakes are obviously not as good as my Honda Disc-brakes . . . but it is *MILES* better than it was. And they are improving with each & every “Mile’ the Bike does!



As you can see from the photo (Left) I ‘Chalked’ the brake shoes, so when fitted and the brake is applied, this ‘highlights’ where the shoes touch – and then carefully file-away the ‘high-spots’, to get ‘Even-Contact’ all around the Shoe ‘braking area’. This obviously helps and speeds up the bedding-in process. Did I mention; the Front Brake is Really Good Now!

My next set of ‘Improvements’ / ‘Modifications’ are:

- 1) To make a new Single Seat, but with “Ears” on the sides (similar style to the Thruxton Seat). Home-Made of course & made to measure.
- 2) To increase the gearing with a 22 tooth sprocket, giving a slightly higher top speed / higher cruising speed.
- 3) To fit M17/8 Cams & Followers (& new Spindle).
- 4) To modify the Inlet Manifold & Head so I can fit a bigger Carburettor (from 15/16” to an Inch & 1/8th).

Well! That’s the Plan.



Just a bit of FUN with Numbers! Recalculated Yet again !

I’ve re-calculated the MAC purchase price plus the cost of parts bought so far to repair it and, in relationship to the mileage covered, these are the latest results (below):

It is working out at a ‘cost’ of only £3.35 per mile now (1,568 miles covered to date). And as stated elsewhere, the more miles I do . . . the cheaper my Velocette motorcycling experience becomes.

(Providing I don’t keep spending more money on repairs, that is!)

I can’t wait to get this ‘Figure’ down to a negative sum. It will be just like the 1950’s all over again; i.e. ‘Cheep-as-Chips’ motoring.

OMG! Back to the 1950’s when my MAC first came into being.

WOW! Pre-Japanese Bikes, Pre-Decimalisation, Pre-Common Market, Pre-Single Market, Pre- EU, Pre-Brexit, etc. etc. Oh! But hold-on . . . I wonder what 2019 will have in store for us all????

(Ok! Not pre-Japanese Bikes, I think ‘they’ are here to Stay).



The only problem is . . . I fear there is some BIG SPENDING coming up soon . . .

No Joke

Breaking News . . . My Velo has Broken !

On the last day of September, Sunday afternoon, on the return journey from a 'Ludlow' ride-out the MAC Clutch 'Packed-in' approximately five miles from home, so the only option was to limp home – nursing the *no-clutch-gear-changes* back to Base. I won't be able to inspect & identify what has happened to 'The Clutch' until next weekend (due to work commitments). But, I will keep you informed.

Rick suggested that the Gearbox Bearing Retaining Ring had 'come-undone' – allowing the whole Clutch Body to move away from the actuating push-rod (as the Clutch Cable was still intact and had not broken, and was still attached at both ends; i.e. the handlebar lever & the gearbox end) but with loads of 'free play' at the handlebar lever, making disengagement of the clutch impossible.

This latest little set-back ain't gonna help keep the 'Figures' down re; my cheep-as-chips motoring cost!!!! And that's 'No Joke' either.

Monday 1st October 2018

I've ordered my new M17/8 Cam & 22T drive sprocket from Nick Payton (Velocette Specialist Engineer), who I can highly recommend because of his excellent & extremely quick 'next-day-service' (providing he has the parts 'in stock') as well as his vast Velocette knowledge which is of the highest order. I have purchased several Velo parts from him in the past and have also phoned him on numerous occasions for advice and guidance which he has always given (to this Velo newbie) unconditionally. "Thank You Nick". Unfortunately, both of these items are 'Not in Stock' at present.

BUT . . . In the meantime (on Monday morning – before going out to work) I had a bit of light relief (excuse the pun), because I took advantage of this small amount of spare-time to do a little Cam Pinion 'Tip-Relief' work on an old M17/8 Cam Pinion (given to me by my Velo-mate Rick). Did you 'spot' the damaged Cam Lobe (1st photo below left, probably the result of 'Oil Starvation').

I started by using 'Engineers Blue' marking dye on the Pinion Teeth (to see how much material was being removed), but it just kept rubbing off, so I sprayed the Cam wheel pinion with black paint, to enable me to see where I had lightly 'relieved' the tip of each tooth. This black paint was used purely as an *aide memoire* so I didn't continue on Teeth already relieved. I then pressed-out the old damaged M17/8 Cam and cleaned-up the gear.

On closer inspection; the black paint highlighted some 'Pitting damage' on several pinion teeth which can be seen on the 4th photo below right (if you enlarge the image). I think this Pinion still has plenty of 'life-left-in-it', but I might order & fit a new one anyway to accompany the new M17/8 Cam.



1)



2)



3)



4)



5)

I'm looking forward to fitting these new cams and setting-up the 'Valve Timing' (obviously using a Timing Disk & Dial Gauge on top of the Valve gear) and I am looking forward to finding out if there is the 'expected' power increase due to the new valve overlap, etc. All this Cam-work will be supported by improving the 'Breathing' by fitting Larger Carburettor and doing a bit of 'Inlet Port-work' & an extended Manifold (to match the larger Carb aperture).

Clutch in Bits

I managed to find a bit of time in between paid-work (mid-week) to start dismantling the chain case & clutch. Upon disassembly, I discovered that the Gearbox Bearing Retaining Ring (aka Sleeve Gear Nut) 'had' come loose and I am hoping that when the Gearbox Bearing Retaining Ring is retightened, and everything goes back together again and adjusted properly, etc. etc. ALL will be well with my MAC once more. Well !!! That was 'Plan'. But, unfortunately, on closer inspection, All was NOT well with the majority of the MAC bits that I had just dismantled. The whole of the Clutch thrust bearing assembly (MAS57) was totally 'fucked' – not just the spherical thrust ring – but most other clutch parts too needed loads of TLC and/or replacing. It also needs a new primary chain.



With some expert advice & guidance from my good friend & Velo Mentor Rick, we checked the Crankshaft 'End-Float' with a Dial Gauge. (see the photos on the next page).

Because there is so much movement on the Crank, this now leaves me with NO Alternative but to remove the Engine and split the Crank Cases for further investigation.



So Far . . . with less than a year of ownership, I have had to 'Sort-out', 'Rectify' and 'Repair' so many unexpected major mechanical & electrical problems with this Bike. But more annoying and frustrating, is the fact that according to the Sales Advertisement (that came with the bike) most of this work had already been done (?). Probably . . . but to what standard is the question (?). Anyway, as a very good friend of mine keeps reminding me, "the only way to know that a job has been done properly, is to do it properly yourself". It's a good job I've got the Tools, the Expertise (i.e. Velo Friends & the VOC) and 'The Will' to do the work my self, otherwise, this so-called 'Fettling Project Bike' would have faltered in the first Month of ownership. It's a bloody good job I love Velocettes.



Photo (above left) shows me 'Reading' the Dial Gauge attached to the Crankshaft in order to measure how much 'Free Play Travel / End Float' there is on the Crankshaft. Sadly the Crank moved Seventeen Thousandths of an inch (.017") side-to-side.

Bummer!!!!

This Confirms it . . . the Engine has to come out !

The next three photos on this page (and the following three photos below on the next page) show the Engine being unbolted and taken out ready for the Big Strip down.

If you haven't already worked it out yet! All of the photos with ME in the picture have been 'captured' on my Workshop security CCTV Cameras. I have six cameras viewing the outside of my property & four cameras viewing the 'Inside' spaces (24/7).

You can't have enough 'Security' these days . . .





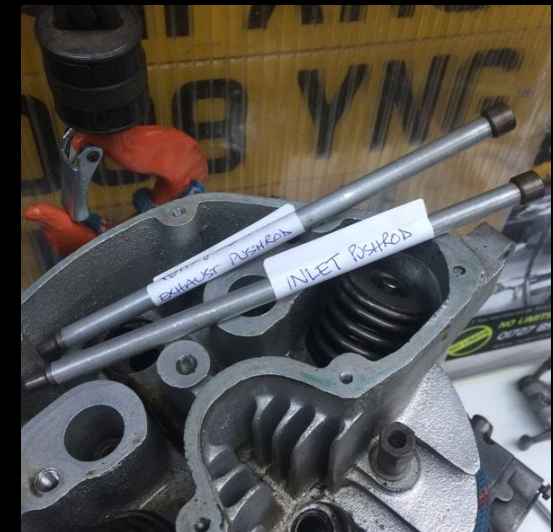
10-08-2018 15:19 In



10-08-2018 17:06 In



10-08-2018 17:12 Out



With the engine on a clean bench, I started the MAC strip-down . . . The main reason for this course of action was the need to identify the cause and reasons for the massive 'Crankshaft End-Float' situation. And also to identify further problems and the extent of mechanical condition and general wear & tear of this MAC engine. But it is already becoming obvious that there is a lot more wrong with this engine and gearbox than originally thought.

After removing the Rocker Box Cover the first thing I discovered that was in need of remedial work was the 'Rockers'. Both Rocker Shafts (and the aluminium bearing seats that they rest-in) show considerable wear and should have been sorted at the same time of the Rebores & Valves had been replaced. The wear was measured (with a micrometer) which was over .008" to .0010" in places, with quite bad pitting & 'Visible' ridges along both rocker shafts. Criterion Ltd offer a re-grinding service for worn Rockers and an up-rated bearing housing with an improved oil delivery system.

Very Worn Rockers (See first two photos below left). But what is not so apparent in the photos is the MASSIVE Ridges on both Rocker Bearing Shafts.



When the Head & Barrel was removed I was pleased and relieved to find that the engine 'had' been re-bored, and fitted with a new piston, gudgeon. The valves & springs appeared to be new too. At this stage, I couldn't find any apparent up & down movement in the big end bearing (Yet!). But more will be revealed when the crankcases are 'parted' and the Crankshaft and 'Bearings' are fully inspected.



When the Engine has been fully re-conditioned and rebuilt, I have decided to 'Upgrade' the Oil Filtration System with a 'Remote' Full-Flow Oil Filter (to be fitted between the oil-return-line and the oil tank) with 'screw-on' disposable oil filter canister (mainly for ease of use, but also partly to 'upgrade' this sixty-four year old methodology to 21st century technology. I have successfully used this type of remote oil filter before on previous machines. An added advantage of this system is a slight increase in Oil capacity (in the system - to the overall Tank capacity). Plus; 'No Need' to Re-Fill the Oil Pressure Feed Pipe every time the Oil Filter is changed.



My new M17/8 Cam & Pinion with Cam Bearing Shaft (left) and the new 22 tooth sprocket, with the original 21 tooth sprocket next to it (photo right).

They arrived safely in the Post) from Nick Payton (excellent service, and highly recommended for your Velo engine parts).

As a matter of interest the original Cam fitted to my Velocette MAC was an M17/5 (with a 30° / 60° / 60° / 30° profile).

In comparison the new M17/8 Cam profile is 45° / 55° / 65° / 35° and has a tad more lift too.



My Next job was to split the Crankcases & find out what is happening 'Down-there'? Unfortunately, what I found was a shoddily-put-together engine.

I found one crankcase bolt had been broken off, and someone had tried to drill-out the broken Stud, but without success (see the last photo below right). So! They just glued (Yes! I did say **GLUED!**) the rest of the Bolt back into the crankcase bolt-hole (to make it look as though it was bolted in).

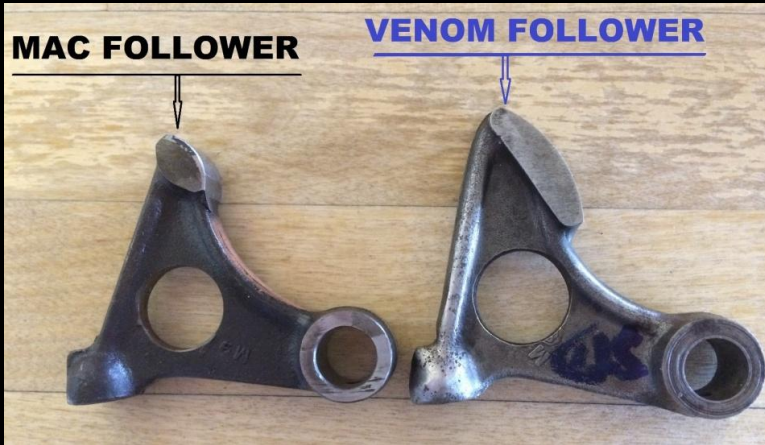
That wasn't the only crankcase bolt that wasn't attached to anything. I discovered yet another bolt that wasn't screwed-in (that was also just glued into place, to give the impression that all of the bolts were bolted-down). The 'Glue' resembled something from one of those Hot-Glue-Guns? (or similar). This time, it was the bolt that passes through the left-hand side crankcase and should have a *nut & washer* fitted inside the Timing Case (just behind the Cam Gears). But that was also missing???

Shoddy work or What! – its bad enough to forget to put a nut on this bolt, but it would have been easy enough (once discovered) to remove the Timing Case Cover again and fit a new Nut & washer to finish the job properly – rather than just 'Glue' the 'Loose' bolt into place. Yet 'Another Horror Story' = the 'Cases' had been Silicon 'Sealed' together, leaving 'Loads' of solidified silicon overhanging the inside edges of the engine, with the potential for coming loose & entering 'Oil Ways' . . . with disastrous results. The Flywheels had also been abused, with hammer & chisel marks, etc.



Until I can spend more time on this engine, my 'Cursory Look' couldn't find the reason for the massive end-play – apart from one possible answer: i.e. whoever re-built the bottom-end, had probably not even bothered to 'Shim' or check the Crank end float? The MAC isn't like the Venom & Vipers (with a 4 thou" bearing pre-load), the MAC should have 'Zero' Crankshaft end-float. However, an article in Fishtail (#455) suggests a small pre-load is preferred.

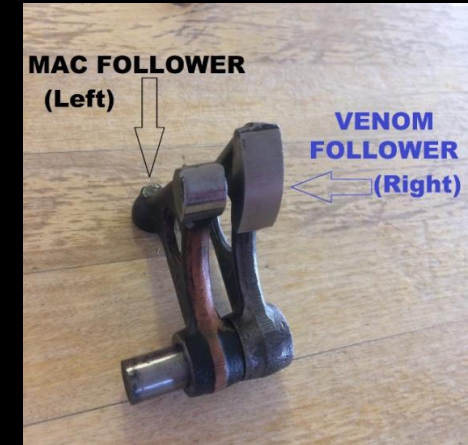
Don't you just love a challenge . . . ?



Comparison between the original MAC Cam Follower (Bottom Rocker M9/3 designed for the M17/5 Cams) and the Venom Cam Follower (Bottom Rocker MAS118 designed for the M17/8 Cams). The illustrated Venom Follower was 'On-Loan' for the photo.

These Venom Cam Followers are needed with the M17/8 Camshaft in order to obtain the correct 'Opening & Closing' Profile.

The longer / extended Cam Follower 'Heel' (shown on the right-hand side of each photo) is also designed to act as a 'quietening ramp' which hopefully controls unwanted valve bounce and will help achieve the required overlap.



Home-made Engine/Gearbox Stand (photo below Left) hastily made out of recycled heavy duty wall brackets & a length of angle-iron. This 'Bench Tool' is most useful when working on the engine and/or gearbox. Plus, I managed to drill out the broken Engine Stud and 're-Tap' a new thread to 5/16" BSW (British Standard Whitworth thread – see middle photo below), the original (broken) engine stud was 1/4" diameter.



Photo above (right) shows the partly cleaned-up and partly de-coked cylinder chamber & valves.

It appears the Inlet Valve & Valve Guide (& Valve Springs) had been changed (quite recently, probably at the time it was 'Re-Bored'), but the Exhaust Valve 'Stem' showed noticeable wear, with quite a lot of play in the Exhaust Valve Guide (which didn't look new at all). So, because of this, I decided to replace both Valves & both Guides (as part of a 'Quality Rebuild'). By using 'Better Quality / Much-Improved' Parts I will be giving the 'Cylinder Head' the very best chance of 'Being the Best it Can Be'.

You can see from the photos below 'How Much' material I have removed from the Inlet Manifold & Port to improve the MAC 'Breathing'. Plus: plenty of polishing to help with 'Gas-Flow'.



(photo left) Valves out for a bit of 'porting work'.

This is the part of the rebuild where the Inlet Port aperture has been increased to accommodate the larger carburettor that I intend to fit.

The size of the original carburettor fitted to the MAC was 15/16", and the one that's replacing it is an inch & an eighth" So, with the bigger Carb & the M17/8 Cams, an increase in the compression ratio and slightly higher gearing (provided by the 22 Tooth Gearbox Drive Sprocket), this little 350cc MAC is going to *Fly*.

Well . . . that's the Plan !



The next stage is to have a New Big End Bearing Assembly fitted into the Flywheels. Obviously, this work I need to leave to the Specialists, who have the appropriate equipment, facilities and experience to do this important job properly. I have also decided to replace both Main Bearings whilst the engine is completely stripped-down to this extent. I've made my 'Wish-List' of parts needed, that I intend to purchase at the earliest convenience from Veloce Spares Ltd (VSL). Their Next 'Open Day' at Huncote is in November 2018.

This is the state of play at the end of the very first year of ownership, exactly One whole Year from when I bought this MAC in October 2017 until NOW . . . the end of October 2018

If you would like to continue reading-about the progress of my Velocette MAC (in Part Two, Year Two) and to see how this project develops just 'Click' onto the Link-Photograph below to go back to my 'Projects Page'



<http://www.wyjc.co.uk/bikes.htm>

Velo Joke on next page . . .

“Have You got a Seven Hundred & Ten Plug for a Velocette”!

Have you heard the one about the bloke who phoned his wife and asked her to go and get him a part for his Velocette (from the local motorcycle dealer). He tells her that he wants a Plug for his bike and has written-down what he wants her to get, on a piece of paper which she will find on the kitchen table. She reads the note and off she goes.

When she gets to the motorcycle dealership, she goes in to the parts department and asks the bloke behind the counter if he’s got in stock a “Seven Hundred and Ten Plug for a Velocette”?

The parts-man looks at her rather bemused and asks her if she knows if ‘that’ is the parts number of the Plug?

She replied “My husband wrote the number down on a piece of paper for me, and I can remember looking at it and remember the number clearly”.

“Okay, have you got the piece of paper with you”? He asks.

“No” she replies, “but it definitely said Seven Hundred and Ten on the paper”.

“Well Madam, I’ve worked on Velocettes all my life and have never heard of a Seven Hundred and Ten Plug”!

She remained adamant and said “It definitely read Seven Hundred and Ten on the piece of paper”. She continued “I remember seeing it, and saying the number to myself over & over again in my head so I wouldn’t forget it”. “It was definitely Seven Hundred and Ten”.

“Okay. I will get the parts books out and we can look for this part together and see if you can identify the part you need Madam” he said. After quite some time looking through various parts books and brochures, looking at the pictures from across the Parts Counter she finally saw a picture and shouted in excitement “That’s IT”!. “There, See it”? “Yes, That’s the One . . . It’s clearly got Seven Hundred and Ten STAMPED ON IT” . . .

At this point, the parts-man fell about laughing (I know, that’s not very professional of him, nor is it polite) but he couldn’t help himself and he shouted over to his co-workers to share this gem of wisdom with them all.

Scroll down to see what ‘Part’ she identified with the ‘Number’ she clearly remembers seeing written on the piece of paper.

‘Seven Hundred and Ten’

(see next page below . . .)

This is what the parts-man 'read'



This is what she 'read' on the piece of paper