

Notes on a 1939 Francis Barnett Cruiser Model 45

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For a while I have hankered after a pre-1945 bike so that I can ride in VMCC Post Vintage Class events. My ideal would be a late 30s MAC Velocette as I had a number of the rigid framed Velocettes back in the late 60s and early 70s. However, in 2012 such bikes command a price far beyond their value to me so I looked elsewhere. Browsing on Ebay I noticed an ad for a 1939 Francis Barnett Cruiser and thought it looked quite interesting.



After some prolonged discussions with the owner a deal was finally struck and ERK 236 became my latest bike. Getting my hands on it was another matter as the vendor lived in the far North and I live in the South West. Eventually I found a courier who would collect and deliver at something less than a second mortgage so I paid my money and sat back to await delivery.

In the interim (and probably belatedly) I started to research the Francis Barnett Cruiser which proved rather more difficult than I had expected. Very little detailed information is in the public domain about these bikes. The odd article and a few pictures but nothing useful like workshop manuals, parts lists, wiring diagrams, road test or indeed anything much else at all. I found this very strange as my last 3 restorations have been East German bikes for which there is a multitude of documentation freely available to download and loads of videos on Utube etc. I joined the Francis Barnett Forum asking for help, what I got was a suggestion to join the club and make use of its library. I was also

pointed to a recently published book by Arthur Gent called Francis Barnett – The Complete story as being a mine of information on the Cruiser. I bought the book which is indeed a history of the Francis Barnett company and the models it produced up to its demise in 1966. There is some information about the history of the Cruiser during its 1932-1940 life span, some pictures and the sort of technical overview found in sales brochures but not I felt a great deal of depth for an owner wishing to restore or even repair a bike. However, in hind sight you would not expect such detail in a book covering the complete history of the marque over nearly 70 years. I also joined the club and received along with my membership card (number 373 so not too many FBOC members) a library list on two sides of A4. Only one publication was listed for the Cruiser 45 and this I already had as part of the paperwork delivered with the bike. The slim booklet is entitled Hints & Tips & spares prices. Not a single picture nor a wiring diagram so really of very limited use. Worse still from my point of view, the Villiers engine fitted to this model is not mentioned in the spares list and a further check of the library list established there was no literature on the Mark 17A or 18A engines.

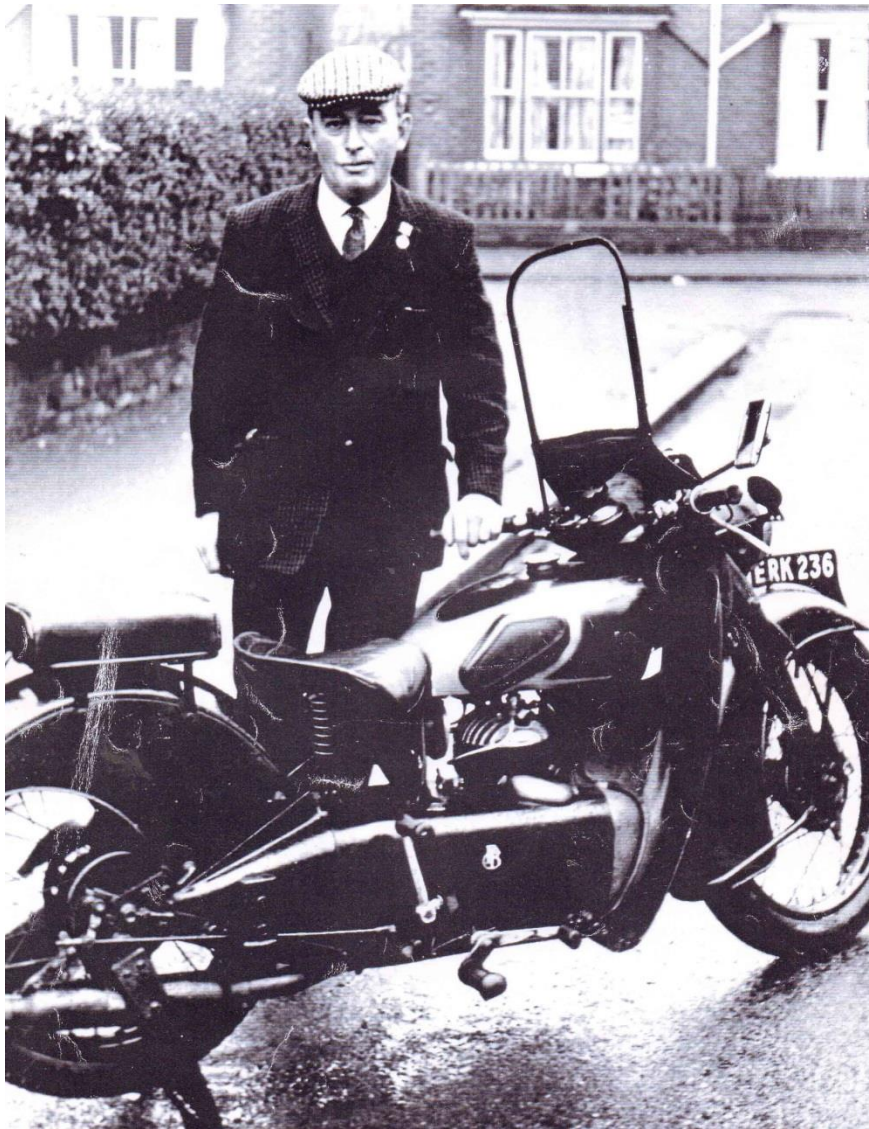
A further request on the FB Forum for sources of literature provided two responses, the first simply said it was hens teeth stuff the second mentioned a couple of books which did contain helpful material (provided you got the correct edition) and suggested watching ebay to buy myself a copy. A final request for a wiring diagram produced not a single answer. I get the impression that most FBOC members are interested in the post war 'green' models and only a small minority have any knowledge or interest in the pre wars bikes. Bit disappointing but I am sure with perseverance, I will get what I need.

Anyway, let me summarise what I have managed to glean about the pre-war Cruiser models from various sources. The Cruiser 32 was introduced in 1932 with a pressed steel frame, deeply valanced mudguards and the mechanical bits hidden behind panels. It was designed to be easy to keep clean and with integral legshields the rider kept clean and quite dry as well. The engine was a 250cc Villiers and had distinctive aluminium expansion box immediately in front of the engine fed by twin exhaust ports. It evolved to the model 39 in 1934 and this was joined by the model 45 in 1936. Model 39 and model 45 continued in production until 1940. Outwardly all these models looked very similar The differences were mostly under the panelling. The model 39 used a deflector type Mark 14A 250cc Villiers engine with automatic lubrication (though petrol was an option), coil ignition was powered by a Miller 36w dynamo. Gearbox was a hand change Albion 4 speed type.

The model 45, of which I am now an owner, used initially the mark 17A Villiers motor though this had become the Mark 18A by 1939. Both 17A & 18A are flat top piston 2-strokes using petrol lubrication. The 18A differs from the 17A only in details concerning its big end construction and the design of crankcase seals. Ignition was by Villiers flywheel magneto and a Miller 36w dynamo supplied lights, horn etc. From about 1938 model 45s had a foot change gearbox. This necessitated moving the rear brake lever to the lh side and fitting a cross-over shaft. One other interesting feature shared by all Cruisers is the quickly detachable kick-start lever. This is needed to allow the rh side panel to be removed. It uses an ingenious spring loaded cotter pin which is pushed and twisted to release/lock the lever to the shaft. Also an easy way to lose the k/s if not done correctly.

No real way of dating this picture of my bike but I would guess it was taken in the 1960s or 70s. The obvious differences are the pillion pad, footrests, mirror and screen none of which are now fitted.

The tank still has chrome plating as do the kickstart, saddle springs and gear lever. The footrests are adjusted quite low and I may try them in this position as the seat height is also very low.

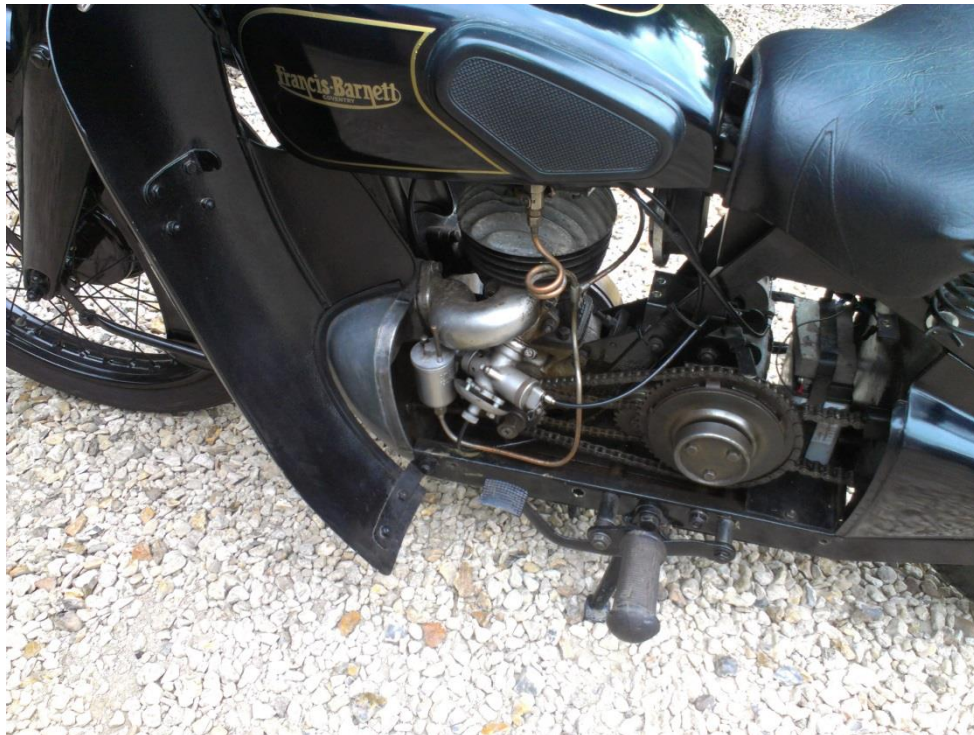


My bike came with a lot of original paperwork and seems to have been owned by the same man from Redhill from mid 1940 (so not the first owner) until the mid 80s; the last MoT when it was still in Redhill is dated 1986 and shows 17885 miles (second time round). He was obviously very proud of the bike, used it daily and records that it completed 100k miles in 1971. The speedo still works and now reads 17889 miles so it has hardly been used since its last MoT. The log book shows 4 owner's prior to me only one not currently not accounted for. There is a receipt dated 1995 from the second owner (someone living in Beccles, Suffolk) who sold it to the 3rd owner for £1400. The 4th owner bought it from a bike dealer called Don Law in Hull in 2010 who in turn bought it from a Bonhams auction at some date unknown. Not often you get so much history about a bike and it makes this one rather special. It even has its war time petrol coupons.

Anyway the bike duly arrived by courier on 12th September, well within the target of 10 working days. I was rather relieved that it looked so nice as I had bought it purely on the basis of photos and word of mouth.



I could not resist taking the covers off to see what was underneath and this is what you find:





Monday 17th September

Had the bike for 5 days now and as you would expect I found a few problems which have kept me occupied for the past few days. The first was an awful knocking noise when kicking the engine over. My initial thoughts were something terminal in the clutch or the primary drive area but closer inspection showed it to be the actual k/s hitting the brake crossover shaft. Fortunately this dismantles quite easily and I made up some new spacers to move the whole shaft 1/4" sideways. The k/s now operates without fouling the brake.



The engine actually started fairly easily much to my surprise and sounds really sweet, no nasty clonking noises in fact the whole thing is commendably quiet. Once I had figured out the order of the light switch, the lights and horn all worked and it even showed a charge on the ammeter. Putting the bike on the rear stand I was able to engage the gears which all selected. Encouraging so far but when running the bike in

3rd or top gear a nasty clonking noise could be heard. Eventually I found it was the rear chain which was bouncing up and down at certain revs and hitting the tunnel through the bodywork. I had a new chain of the right size on the shelf so this was fitted and correctly adjusted. Not much improvement so I guess the sprockets are worn as well. One good thing about the bike is the ease with which major chunks can be removed without the need of tools. The whole rear mudguard assembly is held by 4 thumbscrews and can be removed in seconds. After studying the chain run for a while inspiration struck. I found an old MZ rubber chain guide which I cut to size/shape. This chain was threaded through it and it was then jammed in position. The result was just what I hoped, the chain was still trashing about but the rubber tube prevented metal-metal contact so no nasty noises. You can just see the forward part of the rubber tube in the picture. The rear part has a trumpet end which stops it sliding right through the tunnel.

Pushing the bike around the garage I noticed a grating noise from the rear end which at first I thought was the chain rubbing. However the work above eliminated this as the cause so the back wheel had to come out. The problem was the brake back plate rubbing on the brake drum. Gentle tapping round the edges saw no improvement so I spent a very frustrating hour playing around with combinations of spacers to get the optimum clearance between drum, back plate and rear subframe area. Eventually I got it right and the bike now pushes around without undue noises. A spares book or workshop manual containing an exploded diagram for the rear hub would have made the job a lot easier.

After all this testing I finally noticed that the electrics had failed and running the engine did nothing to help. Initial culprit was the battery which was a strange device made up of 5 AA rechargeable batteries connected series and taped together. Ingenious and when I tried charging it up later it did hold 6.5v but clearly with only limited capacity. In its place I fitted a standard 6v 11ah battery which immediately restored lights, horn and stop light. Whilst doing this I disturbed some of the wiring connections which were rather frail so I remade them all properly. The loom is clearly home made with an interesting but non-standard set of colours and some connections which do not share the same colour on both sides. I think a new loom is in order once I get my hands on a wiring diagram to establish the correct colours. In the interim few labels have been added to make it easier to reassemble any disturbed wires. None of these efforts restored the charging, there were no obvious loose wires or other dodgy connections so I retired to do some research.

It turns out that the F-B is fitted with a Miller DM3G dynamo of the 3- brush type. There is no separate regulator, just a cutout built into the end of the dynamo. As far as I can discover this effectively gives two rates of charge controlled by the lighting switch which has a built-in resistor. The switch has 4 positions. **Off** which means no light son and no charging at all. **CH** provides charging at full rate without any lights on. **HL** gives head and tail lights and presumably full charging and finally **TL** provides side and tail lights with a reduced rate of charge. This is similar to the post WWII alternator systems which link 2, 4 or 6 coils according to switch position. Anyway, the words of wisdom suggested pressing the cutout contacts together to see if this produced a charge, which indeed it did. The charge rate was very good even balancing the headlamp load at quite low revs. However when the engine was restarted, the whole process had to be repeated, not quite what I wanted. The book recommended adjusting the cutout air gap in this case. Adjustment is very crude; involving bending the metal tag which limits the amount of travel. After several very gentle taps with a drift, I finally got to a situation where the dynamo would start charging without manual

interference by me. Let's hope it stays that way but at least I know where to look if it happens again. The only real problem is that the outer cover has to be removed to get access to the dynamo so not something I really want to be doing on a regular basis. It seems that 3-brush dynamos can be converted to 2-brush with separate regulator and I may explore that option if it continues to give me grief.

Another niggle was the fact that the rear stand fouled the securing strap for the silencer over part of its travel, trying to force it backwards and scratching the paint on the silencer. The silencer itself is very securely fixed at the expansion box end so moving it inwards a tad is not an option. For the moment I have remade the strap (which is just a s/s strip) so that it is a very tight fit round the silencer. It still touches slightly but is now so tight that it does not move. Longer term I need to look at the rear stand pivot to see if it can be moved out a little to give better clearance.

Not bad progress for the first day. I did notice that the rear brake shoes are well worn; almost to the rivets. The drum is quite badly corroded and could probably do with a skim eventually. The other known issue is the front brake which was stated as being very poor when I bought the bike. There is only a sidestand and the rear stand so getting the front wheel out presents a challenge. What I need is the help of a friend to get the bike onto a pair of axle stands under the footrests which should do the trick.

Tuesday 2nd October 2012

No mechanical progress, I did play around with the front brake adjustment and the lever angle to make it easier to operate. This improved the front brake performance sufficient for me to risk taking the bike for an MoT on Friday 28th September. The tester considered it just about ok, everything else was fine so he issued a certificate so that is one more thing sorted. I took the old log book and supporting paperwork to the DVLA local office in Bristol today and they have issued a tax disk and reclassified the bike as an Historic Vehicle so now't to pay which was good. A new V5c will come through the post in due course. I will still be looking at the front brake linings before venturing on the road, just need a friend to call so I can get it on the axle stands.

Monday 22nd October 2012

Too busy with other bikes and a holiday to get round to the F-B until last weekend, I did get the front wheel out and send the brake shoes to Villiers Services who advertise in OBM. They came back whilst I was on holiday and a very good job it looked. They had even shot blasted and powder coated the shoes. The drum itself was pretty sad looking with a lot of corrosion and what looked like deep pits. My first thought was that the drum needed skimming and that still may be the case. However, in the interim, having discussed it with a friend, I have cleaned up the drum with a flap wheel and it does look a lot better. Reassembly was quite straightforward though while it was apart I did clean & grease the cam spindle the speedo drive and wheel bearings.

The original brake springs were I thought much too strong so I retained an original one for the pivot end and used a slightly weaker for the cam end. Initially I thought I might have to skim the linings a tad as they seemed oversize but in fact they did fit perfectly with just a tiny amount of lever movement before biting. I had to take out ½" of the cable outer to get enough slack to re-fit the cable which gives some idea of how badly the original linings were worn. Other than that it all went

back together fine. Not tried it on the road yet and new linings always take a while to bed in but pushing it up and down the garage did inspire more confidence than with the old linings.

I also removed the speedo and partially dismantled it to see if there was anything which I could fix. Chronometric speedos are full of gears wheels and springs rather like a clock so seeing nothing obviously wrong, I hastily put it back together again before I broke something expensive. Using the electric drill to give it a bit of exercise did no good either so I guess for now it's a bicycle speedo for now. The chap at the Shepton Mallett autojumble quoted circa £150 for a full overhaul so this will have to wait until I am sure the bike is going to have a permanent place in the garage.

Tuesday 23rd October 2012

Bought a bicycle speedo and fitted it to the F-B today. Also found out that my local car spares shop stocks 18mm plugs. Need to take the one from the bike so they can match it for me. This turned out to be bum information, they could order 18mm plugs but none of the ones in their book were suitable for the F-B. I did find a source of plugs from Villiers Services.

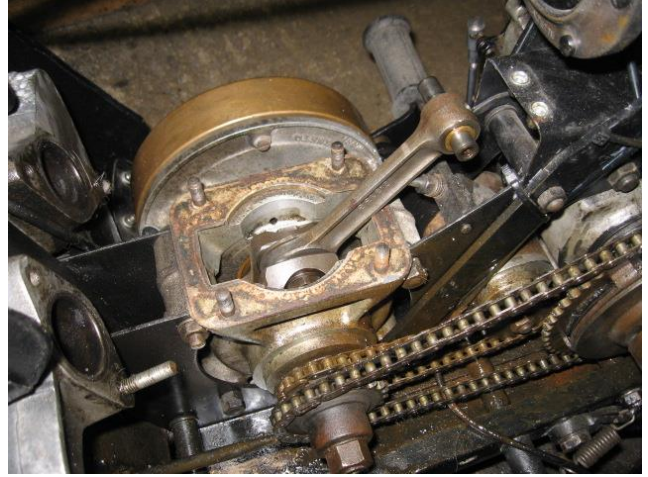
Friday 1st March 2013.

The F-B has sat in the garage under blankets for most of the winter as other projects took priority. It finally saw the light of day yesterday when I pulled it out for a checkover and in truth to consider its future. The bike started easily enough once I put some fuel in the tank and sounded sweet enough but reluctant to rev and smoked horribly. The battery still retained some charge which was a surprise. After a couple of minutes running, the ammeter showed a charge which was an even more pleasant surprise but not for long as the engine then started rattling; not badly just something not heard before. My first thought was something had caught up in the chains so I stopped the engine and removed the side cover. Nothing obviously wrong so I tried to restart the engine and it immediately locked up. Rocking it backwards in gear freed it up but after a couple more kicks it locked up again and whilst it was turning over worrying noises could be heard inside the crankcase. Clearly something has broken. Not sure what yet and no immediate plan to investigate either as I have enough bikes in bits already. Back to the shed it went and is now wrapped up in its blankets again. This of course has put any idea of selling the bike completely out of court. I imagine I will strip it to investigate eventually but right now I wish I had not bought the bike.

Monday 4th March 2013

Quite a lot of progress in the last few days. The first positive step was meeting up with Trevor Wells at the Shepton Mallet a/j last Saturday. Trevor is a past president of the F-B Owners Club and very knowledgeable about the pre-war bikes. In fact his very first bike was a 1934 F-B Cruiser which he still owns along with a number of other models. Talking to Trevor restored my enthusiasm for the bike, reinforced by the fact that he actually had most of a Villiers Mk 18A engine for which he had no immediate need.

So today the Cruiser was recovered from its shed and moved to the workshop where I stripped it down. Getting the tank off was the hardest part as the fixing bolts are all inside the frame channelling. The top end of the engine came to bits quite easily and thankfully I did not need to remove the large alloy silencer box.



The cause of the rattle and the subsequent lock-up was immediately obvious, There was a chunk missing from the piston above the top ring , most of the top ring had disappeared and bits were still embedded in the crown. The reason the engine locked up was because of these ring fragment which fouled the cylinder head and stopped the piston going over tdc. You can also see indents in the piston crown where bits of ring have been trapped. There is no obvious sign of damage to the bottom end. The

crank spins over smoothly and there is no apparent play in the big end or main bearings. I cannot see any evidence of bits of ring or piston in the crankcase so hopefully the missing bits were actually blown out of the exhaust ports. However, I will do a more thorough check before reassembling everything.

Quite what caused the damage is less clear. The barrel itself is unmarked and only has a slight wear ridge, Apart from the visible damage, the rest of the piston is in good condition with no signs of previous seizures. It is marked as 30thou oversize and a check with the micrometre confirmed this to be correct. A phone call to Trevor confirmed that he has a barrel and piston in good condition though there are no rings. This too is 30thou oversize. I have contacted a dealer in Swindon who is optimistic that he has a set of rings. I have also asked if he could provide a complete new piston. He has promised to ring me back tomorrow after he has checked his stock. I am tempted to go for the complete piston to use in my old barrel. Failing that I will get just the rings and buy the other parts from Trevor. Either way, it looks as though the F-B could be up and running fairly quickly.

Tuesday 5th March 2013

I collected the bits from Trevor this morning, almost a complete engine apart from the conrod and big end assembly which he had already passed on to another deserving cause. Interesting to see the



spring loaded oil seals in the flesh and the main bearings are massive double ball races which look as though they are well over-engineered for an 8hp engine. As promised, the barrel and piston proved to be in good condition so all I

needed to do was clean up the barrel and spray it with BBQ paint to tidy it up. All being well I will be collecting a set of rings from Dave Turner in Swindon tomorrow. As my wife is away all day Thursday and the met Office is promising rain that could be the day to rebuild the F-B.



Wednesday 6th March 2013

As usual I had no patience to wait and the F-B was put back together this afternoon using the replacement barrel and piston plus a new set of rings picked up in Swindon this morning. A bit fiddly to get it back together but I learnt a few tricks along the way so if I have to do it again then it will be a lot quicker. Pleasingly the engine started almost immediately and sounds fine. I took it for a short test ride round the block and everything worked well. So this particular episode is now over (I hope). Sadly the test ride reminded me that the bike is really too small for me and that my original reason for bringing it out of storage last week was to clean it up with a view to a sale. Cute though it is, I think it will still have to go but maybe not just yet.

Click the picture below to hear the engine running



[F-B Cruiser Video](#)

Friday 22nd March 2013

The Cruiser went to its new owner today. I finally made up my mind it had to go about a week ago. Put a classified advert on Ebay at 9am and it was sold before midday. The strange thing was that there were three others being advertised already but frankly none were as good as mine and their asking prices were in fantasy land. I priced the F-B at what it had cost me plus what I had spent on it and was quite happy to break even. It has gone to a good home. I could have sold it several times over and for more money but it was clear that many of the potential buyers were really only after its transferrable registration number. Glad I experienced the bike but not really sad to see it go as I realised very early on that it was not something I was going to enjoy riding.

So ends this saga but I still need a pre-war bike so it's back to studying the adverts.

Peter Fielding

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