

**Spring is  
Here!!!!!!!!!!!!**

*And*

**Time for an  
On-line Scott  
Newsletter**



**Nice pic of Freddie Bossert on his  
Scott in the South Tirol.**

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**EJP**

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# News from Hackit and Weld

*(ie Parkin Engineering)*



After Roger had performed his magic on my original short stroke bottom end (*ooo er Missus!*)

I dismantled the slave engine (*purchased a few years ago*) and used temporarily. To find that the extremely good barrel I had fitted on the obtained short stroke engine had been scored by the circlips coming out. This had been caused **by the all too frequent** use of bent con-rods in an unknown previous rebuild. Sounds familiar Eh..

So! The barrel went down to Rogers workshop and in the

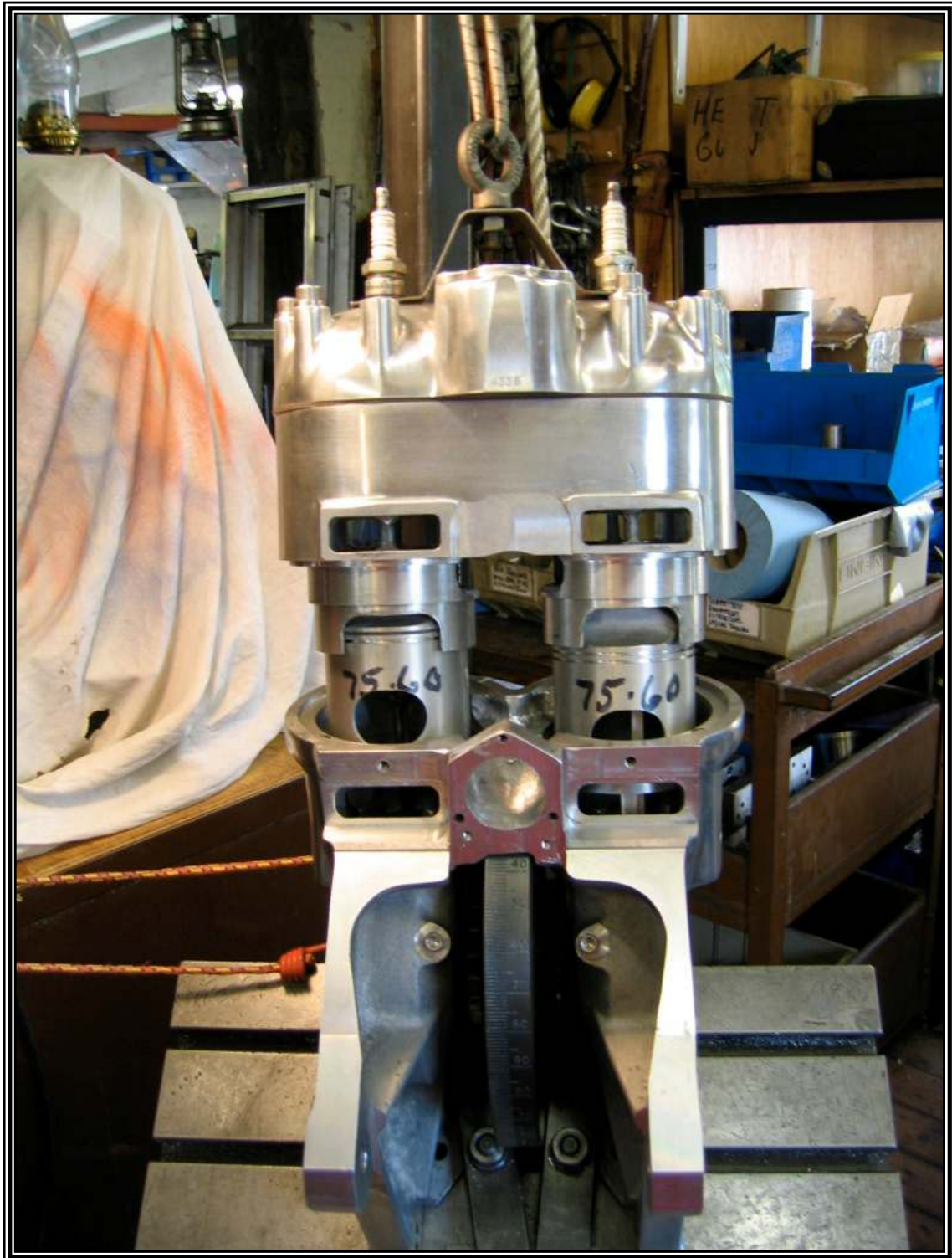
course of time 500cc pistons had been funded and machined up to fit the honed barrel. Back it came to Hopeman.

The new rings were **more springy** (*technical engineering term*) so I had to devise a clever idea to enable me to do the job single-handed. Roger suggested a way forward.

The barrel was suspended on a bungee cord nailed to the crossbeam in my workshop and suspended over the new pistons and bottom end. Elocant and simple!!!! Just my sort of engineering!!

**Ted Parkin. CDM (*Cadburys Dairy Milk*) and Bar**





How it should be done a la Moss Engineering

# An interesting Scott modified with a water pump and a Bill Cull oil pump





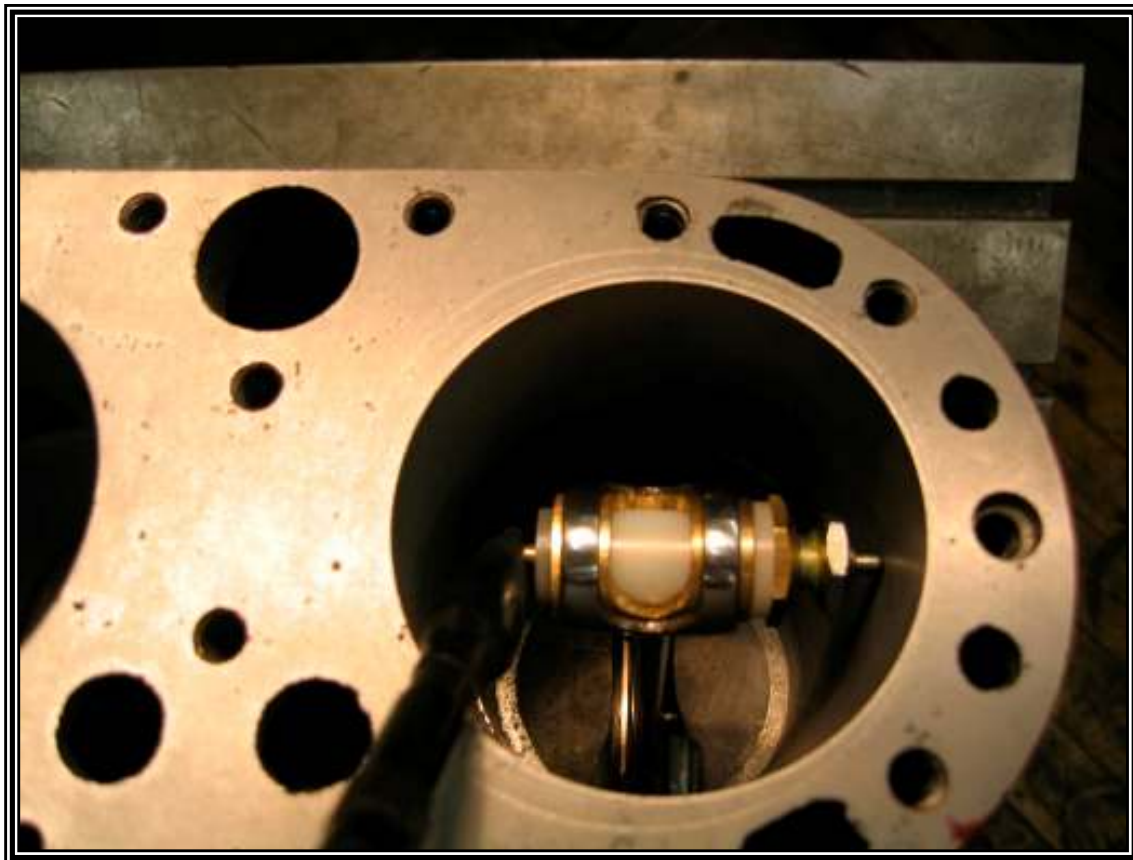
I understand that the above bike is available at Pembroke Classics. *(Pics used with permission)* Gen below from the seller

Hi Ted, thanks for the call earlier re the 1930 Scott TT Rep we have for sale.....I've attached the first of a few images as requested. This machine was purchased from the deceased estate of an elderly gent who'd owned it for many years. It's been extensively modified and features a detachable head from a later model...plus it has a larger radiator and water pump fitted. It also has a swash plate oil pump attached which was designed by Bill Cull whilst working at the Scott factory. Frame number is 2076M and engine FZ233A (this engine number dates



from 27/28 so it would appear it's either had an engine from an earlier bike or parts thereof). From memory we ran it very briefly on the rolling road but the spark was weak, so the mag will require an overhaul amongst other things. The tank fitted is from the other TT Rep he had...from memory it had a slight weep...but it is in original paint etc. The tank that was on this bike has been fully restored and is like new... This Scott could be used as it is after re-commissioning and has a lovely patina.

## **Fitting Thrust washers**

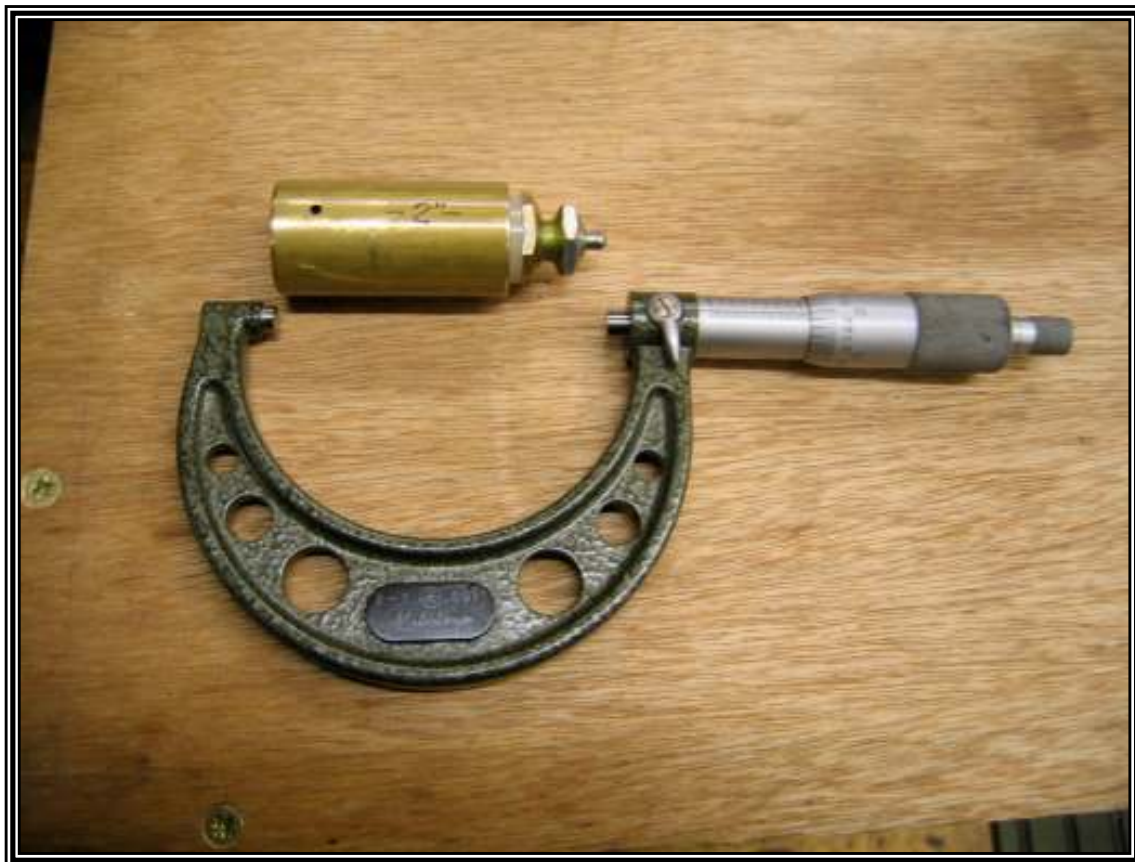


Years ago I used Nylon 66 for shim washers either side of the LE of the rod. It did work, but I could see that, on some occasions, the temperature was approaching the limit for the material. In this case, as I was only dealing with small washers, I just used aluminium instead.



I make LE bush blanks x 33mm long which is about the same as was used on pre WW1 engines. The wider the LE bush, the more controlled the stance. Later wide rod engines tend to build wide so I leave a bit less sticking out the outer side than the inner. I then machine to clean up the inside of the gudgeon pin bosses of the piston

Then I set up and measure the sides of the rod to the barrel bore. With luck, I can adjust the outer to give 0.1mm clearance from bush to piston pin boss without a spacer.



I usually have to use an aluminium spacer on the inside. Of course this takes time and the making of some measuring apparatus, but this, when combined with close attention to accuracy and alignment of all relevant components, does result in a very durable engine.

This is especially important if a customer has requested that the rebuild includes a gas flow job that increases power. I attach pics of measuring kit for your general interest.

Kind Regards **Roger**

# Want to Build a competitive Scott Racer???

## Read On

First let me give you links to our Newsletter, as if you are new to Scott's, you might be interested in information. This newsletter is sent out free and if you wish to be on our circulation list, just tell me.

I suggest that first you sample one past edition at [http://www.mossengineering.co.uk/newsletter/Scott\\_Newsletter\\_41.pdf](http://www.mossengineering.co.uk/newsletter/Scott_Newsletter_41.pdf)

Next I suggest that you Google Steve Plater interviews Roger Moss

This shows by race bike

Next I suggest that you visit my son Richard's site at <http://www.racingoutoftime.co.uk>

I could give you many Internet addresses where information can be had

I have hundreds of drawings by Scott and our company to help you if you are doing work yourself

The Scott engine is unusual and I suggest that you take great care and perhaps seek advice before making big changes.

More than 45 years of racing a Scott together with being an engineer, I have learned much and I will try and help you with advice as much as I can.

First some data

If your bike is 1934, it is most likely that it is a Long Stroke engine, but it is also possible that it is a Short Stroke engine

Original Scott bore, stroke, capacity, rod length etc

SS Flyer 500 FZ	68.25 x 68.25	(2.687" x 2.687")
SS Flyer 600 FY	74.6 x 68.25	(2.937" x 2.687")
SS Flyer Rod length	142.87	(5.625")
LS 500 RZ PZ	66.67 x 71.4	(2.625" x 2.812")
LS 600	73.02 x 71.4	(2.875" x 2.812")
LS Rod length	147.64	(5.8125")

Original output of a 600cc Short Stroke engine was about 15.5 bhp

Original output of the Long Stroke engine was about 17.5 bhp

With gas flowing and some internal modifications, the long stroke Detachable Head engine can be raised to about 29 bhp with a road silencer. And 31 bhp with a twin branch manifold.



If your bike is a single down tube type, there is very little space between the engine and the single front down tube for a carburettor that is big enough for racing. The Vee manifold will pass each side of the central tube, or between the outer tubes of the duplex frame.



My best output was with an aluminium barrel and a high compression head and this gave 41.9 bhp on a Heenan and Froude water brake dyno, but unfortunately this barrel was ruined by a mistake at the platers and I estimate that my current engine only makes about 36 bhp I hope to make a new barrel with the same characteristics as the best barrel sometime this year.

Please accept that racing a Scott is my passion and passion does not count cost, so the law of diminishing

return applies.

I make complete race engines with my own crankcases with better internal passages but identical outside. These are from high strength heat-treated modern alloy.

If you are an engineer with good machines, I could sell you a casting, but I have too much work to machine one up this year.

I must tell you that with modern tyres the bottom section of the frame is too low and can dig into the track, so it will have to be removed and some compensating strengthening produced and fitted.

Also, when you produce more power, it is absolutely critical that the braking must be improved.

Either you must fit a complete front wheel from a later bike that looks reasonably period, or you must make new double sided hubs, as I did.

To make a Scott into a racer is a lot of work and expense and usually more than common four stroke bikes. However if done reasonably well, it is a very satisfying race bike and it will always be welcome in any historic race meeting.

### **To your questions**

First I would suggest that you make sure that your crankcase is strong and free of cracks

Q -A massive tuning crankschaft! (with the necessary bearings to the case fitting and also the steel sealings!)

A I make strong crankshafts in special aerospace steel of 110TT with high resistance to alternating stress fatigue. It is the most important item if power is to be increased.

These are made in several options

With standard Scott design for main bearings using standard steel cups

Or designed to use ball bearing main bearings

Or either design but with Tungsten heavy metal balancing slugs.

Q -My cylinders are not bad , and I can arrange the bore, but I would need the pistons that I saw at the homepage with the little windows ! what sizes do you have? (and of course I need the rings and the pins as well)

A I can make pistons to suit the size of a rebored barrel. Note bores must be in good alignment and preferably bored on a boring machine not a portable boring rig  
Porting of pistons can be done, but please understand that a considerable amount of work must be done to go with the piston ports. It is one part of a tuning process only.

Q -I saw your double manifold setup ! I like it! with two good carbs...

A This is a good system, but the final size of the carbs depend on the amount of gas flowing work done.

Q -And last but not least I would need some advice on the exhaust! As I have experinced so far that is one of the most important parts of a tuning set up! so Do You have any recommendation to change or to stay with the original !

A The exhaust system is very important. I am not an expert on exhausts, but George Silk gave me an exhaust



made for his Scott derived engines that was designed by Doctor Gordon Blair of Queens University Belfast. This raised an engine running with an open exhaust from 30 to 35.4 bhp.

Later I had another made to the calculations of Gordon Jennings in his book

“The two stroke tuners handbook” which can be downloaded in pdf from the internet

It was using these calculations that a second system was made which was used when the engine made 41.5 bhp on the dyno

The Scott “Day Cycle” deflector piston engine makes good torque but will only give power to about 5000 rpm. Because it is a slow revving engine, the exhaust needs to be long and quite big in diameter. Under our racing rules, the end of the tailpipe must finish within the outside diameter of the rear wheel. This means that it would be difficult to fit in two separate systems in a way that they would neither scrape on the ground or burn the rider’s legs.

Having considered that snowmobiles and similar devices used a single siamesed exhaust system, we decided to use a single system as the best compromise. It is likely that the slow revs of the Scott will result in any reflected pulse that arrives back at the opposite cylinder, will do so before that exhaust port is opened and thus will not have any negative effect on power output.

I have basic measurements of my system and you can see the different arrangements on my bike and Richard’s bike

Q Do I need something else?

A You will need to put an extra weight ring in the flywheel and make sure that the tapers in the flywheel are good and that the cranks do not rock in them.

I engrave the outside of the flywheel in degrees to make accurate ignition timing more easy and I balance the flywheel and check truth of running

The primary drive sprocket is changed from 20T to 22T to speed up the clutch

The gearbox should be OK but the clutch release can be improved to give 50% less pressure at the lever to work. The clutch might need better plates and some careful work if it is to handle the increased power.

Alternatively, my friend George Silk is having more modern clutches made for the Scott and I have one on order for my bike.

The gearbox can be converted to have needle roller bearings instead of a simple bronze output bush and this saves power loss

Remember that the magneto on the Scott runs at engine speed so is running at twice the speed of a four-stroke engine. Traditional rotating armature magnetos will not handle tis accurately and have a short life. We have found it necessary to use an electronic magneto for reliability and power.

These are the main subjects that are needed to make a Scott racer that is a proper racer, rather than a bike to tour round on at regularity events.

Before you start, you must consider if this is what you really want and if you do, do you have both the determination and the money to complete the project

If you seriously wish to continue, I will do my best to advise you on a step by step basic, if you wish.

Please understand that it is my practice that if I spend so much time giving advice when otherwise I would be working on customer's engines, then I like others to benefit from the information.

I will use this as helpful copy for a future newsletter, unless you object to this.

If you do not object, then please know that I would be pleased to receive reports of your progress with photos to include in our newsletter for the benefit of others.

I am a little worried about the condition of your crankcase and what is the type of engine you have

Kind Regards

**Roger Moss**

## **Riding KD.**

After much too long I had decided that the time had come to recommision my short stroke Flyer KDxxx. The reason it had been off the road was because I had got around to replacing the slave SS engine with the original one Roger Moss had re-engineered for me. I found however that the slave SS engine fitted earlier had, unbeknown to me, bent rods which had scored my really good original barrel. Hey Ho! The barrel goes off to Roger to be rebored and new pistons fitted when they were in stock.

The reason for the engine rebuild in the first place was

described in Vol 1 of “Scotland” in that I had been racing a couple of blondes in an MG sportscar on the M6.

A “**Bad Move**” I now know!

While waiting for the pistons to be sourced and made. I fitted a slave Long Stroke 600. Together with a car radiator to get the bike mobile again.



So now its time for a road testette. An easy start after its 3 year sojourn in the workshop and the yowly yowl was an aural feast!!! The wreath of Castrol “R” wending its way skyward, then **unfortunatly** towards my neighbours washing, adding to the joy. OOPS!!!!!!!!!!!!!!!!!!!!!!

I have ordered a new radiator but decided to use an old car one, which had been lying up in the loft for a while. With a quick repaint and rebuild it was quite sound and presentable. More importantly **“Did not Leak!”**

With a quick fuel and oil check, tyres pumped up and chains adjusted we were ready to go.

She started after the judicious use of the ridng glove laid in front of the carb to richen the mixture. An old Titch Allen wheeze!

Clutch in. A bit stiff. Into first gear and off we go.

What a joy to be back on the road on a good bike! A sunny day, not much traffic and clear country roads. We tootle out of the village and give it a bit of throttle.

Now! The 500 engine was pretty good but this 600 was outstanding. It is a mix of standard parts I had from many years Scotting. In fact I do believe that some of the bits may be from the Klausen Rennen sidecar engine. Who knows? Anyway the push in the back took me back to when I bought the bike from ex VMCC editor Ian Young maybe 20 years ago.

It was sublime, amazing and really flippable round the corners. I was a happy boy. As the bike settled down I opened the throttle wider and the flow of power kept on coming. So now I'm thinking that my old 500 may have been not so good! Sacrilegious!!!!

I did about 5 miles then returned home to pick up Alison

Walton to hop on the back. See the pillion gear?

Ali had not been on a vintage 1929 bike before and we tootled out of the village before I wanged open the throttle. It was ecstatic!!!!!!! Ali had to clutch my sides (**Nice!**) to hold on as we zoomed around the lanes and all too soon back to Hopeman for its post ride check up. We were impressed!!!!!!!!!!!!!!!



## Post ride check

The oil settings needed a little tweak. Plugs checked and gapped, chains adjusted and lubed and various fittings adjusted. All in all a great first ride and subsequently,

after a few more rides, is set up till my new radiator arrives and I can fit the Moss engine at the same time..

**KD Lives!!!!!!!**

**Ted Parkin**



## **News from South Croxton**

A good few years ago I suggested to Eddie Shermer that he took over the job of Editor of Yowl. Eddie is a good man, engineer and friend, so when I understood

how little support in the way of copy from readers he was receiving, I felt uncomfortable. I decided to submit copy to help Eddie fill the pages of Yowl under the heading "News from South Croxton". Eddie is giving up the editorship of Yowl when he has produced the April 2016 edition and it is hoped that another selfless person will come forward to take over the job. If so, I do hope that he or she receives more support than Eddie did.

Of course, all this is no surprise, as it is the same story with the Newsletter which has become something of a monologue and so loses something of it's sparkle. Do please remember this if you have anything you could contribute. You would gain my sincere appreciation.

So where are we now? Well, I think that as some readers are not members of the SOC, although both Ted and I recommend this for the modest cost involved, I would repeat the piece I wrote for April 2016 Yowl, with some additions. So here goes

I had a bit of a tragedy this week, but I have found in life, that if you let things get to you, then you will soon find yourself up to your neck in difficulties. A good customer had sent me a number of blind barrels that shared on thing in common. They were on their last legs. Either bored out to the extreme, or with smashed skirts, or both.

I had selected one that looked reasonable with still some thickness on the skirt, or at least the skirt that was not broken off. I removed the wreckage and made new skirts and had them silver soldered on.

This enabled me to machine in the type of inlet tract I use on my racer to give it a bit more "go" I had had the block polished so it could be nicely sprayed up the traditional finish and had put a minimum skim down the bores to blend in the new skirts. To be honest, I felt quite pleased with myself and in retrospect, this could have invited some comeuppance.



I put the “Flexhone brush” down the bores to take the sharp edges off the ports and to impart a surface texture that would best hold oil. I always squirt some oil down the bores first, so at the end you have dirty abrasive oil everywhere. So a good clean down to get rid of all the abrasive so I could put the pistons down the bores, as I had just made a new set to suit.

I always put the pistons down the bores head first, so I can put the rings in the bores afterwards. I then raise the piston, so the skirt pushes the ring square and I can get an accurate assessment of the gap. I use small taper pins as ring stops and these are tapped in the last amount to finish up about 40% up the ring groove. I gap first to about 0.009” then notch the ends of the ring to fit over the ring stop.



But wait!, I must have missed a spec of dirt in the bore. I try to wipe it off, but no success. Is it a bit of porosity perhaps? I get my angle-ended scriber and gently probe the blemish. The scriber end disappears into the water cavity.

I realise that if the wall was so paper-thin here, it might well be similar all over. What to do? These barrels are not economically viable to make new, unless that is, someone has a deep pocket and passion in his heart. You know about passion, it is when you take no account of cost or time in your quest. I go on the internet and contact a couple of companies who liner barrels and will go to see them next Monday. It does not matter if they put quite a thick liner in to take the block back to whatever I guess it started out life as. I have an uncomfortable feeling it might have been a 500 short stroke!

I have put a lot of time and expense into this, so I suppose it is worth a try and at least I can pressure test it to some degree.

It is obvious that there are quite a lot of blind barrels bored to their last gasp so it will be helpful to see if we can sort out this problem. Pistons are no longer a problem, so this is the next in line if we are to ensure Scotts a working future. As regards DPY barrels, I have some new castings pending in both iron and Aluminium, which can be Nickasil coated. You may ask why I do not put a liner down DPY barrels? Well, I prefer to make the different inlet tract rather than be restricted by the port layout of whatever we can find. It does make quite a difference.

I visited Coventry boring and metalling with the block described above. They seemed to know what they are doing, but when I was told that their boring bar needed to have about 5/8" free space beyond the cutting tool point, I thought it might be helpful to describe what I use which does not have this restriction.

In the past, if you needed to bore holes accurately for size and position, you used machines specially built for this purpose. Examples from Switzerland were Genevoise, Hauser, Dixi etc.

and from Germany Lindner et al. These machines would generally not remove any amount of metal, they were fine finishing machines only. In USA A company named DeVlieg produced what we came to call a “Jigmil”



This was a machine that had the strength to shape metal by “milling” and yet had the accuracy to bore and mill to high degrees of accuracy. You could put a workpiece on such a machine and machine it accurately without needing to do metal removal on a milling machine beforehand. They were great machines and achieved accuracy of movement before the introduction of rolling element slide elements.

The boring operations were done using a sturdy boring bar with special cutting tools with a threaded body mounted in a graduated ring / dial. I use these boring bars in my five axis Thiel 162 jigmil for boring cylinders and can bore accurately to the end of a flat headed blind bore.

Of course, having spent a good part of my life designing and manufacturing special machine tools, this subject is something of a passion, so I described this type of boring bar, but I immediately noticed the boss drumming his fingers to clearly indicate a lack of interest. Personally I like to learn so I can finish each day with a little more knowledge than I started it..



The next step was to go and visit PJ motorcycle Engineers in Wolverhampton to meet boss Paul Vetere. Paul is a man of about 45 years old and who has been involved with two strokes since he was 16. This meeting was quite different, as it was two enthusiastic engineers bouncing ideas and knowledge back and forth with the objective of finding the best solutions to problems. I confess that I felt that I was discussing things with a kindred spirit and so had some confidence to do business.

My conclusion was that where a blind barrel had been considerably overbored, then if I could put a clean bore down, it would make more sense to put a sleeve down the bore to bring it

back to under original size. I would do pegging of the liner and subsequent boring as it was obvious that I had better equipment than either of these contractors. I will let you know how we get on.

**Roger Moss**