The BMW Club

Vintage & Classic News

Issue 20/2008

In this Issue – Post War Singles, Living with the 90S, Magneto Conversion on 1951 –1969 BMW Twins etc.



Helmut Dahne R90S I.O.M 1974

EDITORIAL

Firstly I must apologies for not including the promised articles on the Rennsport engine and R60/5 in this issue. I'm afraid time has been at a premium lately and I could not get around to finishing it.

Secondly, in the last issue there was an article on riding the Nurnburgring on an R69S in 1961. My thanks should have gone to the author and rider, Fraulein Goldmann.

On the 12th/13th July the VMCC are holding the Festival of 1000 Bikes at Mallory Park, Nr. Hinkley, Leics. where the Register will have a stand in the 'Avenue of Clubs. I usually get a few tickets so those who would like to show their machines for the Club please get in touch asap. Should be a good weekend with Agostini and many more famous names riding historic machines on the Sunday. Saturday is for public track sessions etc. Other attractions include trade stands, sprinting, wall of death etc. Please note there is a camping area from the Friday if you wish to make a weekend of it. Check out the VMCC web site www.vmcc.net

Thanks must go to Mike Silverwood, 'The Amateur Mechanic', Gerry Douglas-Sherwood, Rod Knight of The Cossack Owners Club and Terry Bradshaw for their contributions to the 'News'.



REGISTER DIARY FOR 2008

12th/13th July
VMCC Festival of a 1000 Bikes, Mallory Park Race Circuit, Leics.
(Register Stand)

27th July
VMCC Founders Day Rally,
Stanford Hall, Nr. Lutterworth, Leics
(Register Stand)

21st September
Stinkwheel Show,
Beaumanor Hall,
Woodhouse, Leics.

The following events are not organised by the Register. Details may be obtained from Bill Rodgers (01526 834480)

July 5/6th
Classic motorcycle section at The Waddington Air Show.

Sept 7th
Sleaford Historic Motorcycle & Car Show.

Please check that these events are going ahead before travelling

Leaking Oil Seals - Why Me?

by Rod Knight, Cossack O.C , Toowoomba, Australia.

"Hi-ya Sol! How's it goin'?"
"Fine boss - just...toppin' up the oil."
"Yeah? What's that?"
"That? Ah... that's the oil."
"What kind of oil?"
"Super multigrade."
"What kind of super multigrade?"
"Gee, I dunno boss - oils is oils."
"Oils ain't oils, Sol!"
"Uh..."

So began what was to become a very successful marketing strategy for Castrol when they introduced their GTX engine oil all those years ago, but the subject of this article isn't oils, but oil seals!

They've given me many headaches over the years - ever since I've owned a Russian bike, in fact - and I've often wondered why they've chosen me as their victim. After all, modern oil seals are well made, easy to fit, reliable and long lasting. Why do I have problems with them?

The first Russian bike I actually owned (as opposed to one I maintained for a friend) was a 1981 Ural M67.6.40 - the solo derivative of the M67/36 sidecar bike. I bought it new in September 1982 and before I'd run up 1,000 careful running-in kilometres it was leaking oil. It was also giving me headaches in other areas as well, to the extent where I wondered why I'd ever wanted to buy such a thing in the first place, but that's another story!

The oil was leaking from the gearbox output shaft seal, becoming worse with every 100 km travelled. I telephoned the dealer in Melbourne, 220 km from where I then lived, and was sent a new one under warranty. It didn't last very long either, so I decided to visit the local bearing shop and buy an equivalent seal from another manufacturer, reasoning that there must be a fault with the Russian ones. When it failed after just 300 km it finally occurred to me that I should perhaps look elsewhere for the cause. I discovered that the surface that the lip of the seal bore upon had one or two rough areas. The obvious place to look? Yes, but I never thought that a shaft surface designed to have the lip of an oil seal running upon it would be so poorly finished. This was one of many lessons I needed to learn if I wanted to continue "enjoying" the unique characteristics of Russian motorcycles!

I carefully linished the surface to a high standard of finish using progressively finer grades of wet-or-dry abrasive paper cut into strips of the appropriate width, but the problem didn't finally go away until I installed a new Russian seal fitted with a weaker garter spring from a locally sourced seal of the same inside diameter. I decided upon this course of action after discovering how hot the shaft became after even short runs, my reasoning being that the spring originally fitted to the seal was perhaps too strong. An unusual thing to do? Definitely, but it worked! However, in view of what I've learned recently that seal should also have given trouble, and I was very lucky that it didn't.

I kept the M67 for seven years and 67,500 km, and in that time I needed to replace a few failed oil seals elsewhere - with varying degrees of success.

Shortly after buying the Ural I acquired a dilapidated old Dnepr MT9 sidecar outfit, which I cosmetically restored and subsequently used on a regular basis, and it wasn't long before I had

to fit new seals to it as well. Not being a trained mechanic I didn't know that oil seals tended to go hard with age and lack of use - another lesson I needed to learn. It's also fair to say that I caused one or two problems myself, again out of ignorance - such as fitting a new rear drive hub seal without first taping over the drive splines with plastic packaging tape. The tiniest nick on the delicate sealing lip will cause a seal to leak, and having to pull everything apart again because of a stupid mistake like this was a humbling experience.

So the years came and went, and my knowledge increased steadily with each bike I either bought as a restoration project, or worked on for friends and/or club members. One of the machines in the latter category was a Dnepr MT9 I fully restored in 2001, but because its owner wanted to keep costs to an absolute minimum and the bike had covered only 11,000 km from new it was requested that I not replace any oil seals unless they failed in service. Of course, most of them did - and when I was asked if I could perhaps ride over one morning to "check out one or two oil leaks" I was not too surprised to see oil leaking from everywhere! It was so bad, in fact, that I had to bring the bike back to my own garage to effect repairs! In the ensuing days I replaced every seal apart from those in the front forks, three in the gearbox (gear change shaft, kick start shaft and the automatic clutch release plunger o-ring) and the grease seals in the wheel hubs. It was a lot of work but, much to my surprise (in view of my past record) not one of the new seals leaked afterwards!

This was a great boost to my confidence, so when I purchased an old gearbox from a friend in which to fit alternative high-ratio 3rd and 4th gears for my own Dnepr MT9 I expected no problems. This gearbox was one which had lain idle for many, many years so I took the precaution of replacing every oil seal and o-ring, plus all four ball races. I made up new paper gaskets for it too, rather than try to reuse the (undamaged) old ones. This gearbox is also completely oiltight - another boost to my confidence.

Because this bike had covered 93,000 km at the time and the rear main bearing oil seal had been weeping for years it made sense to replace it as well, so I took the clutch apart, removed the flywheel and extracted the original seal. With everything thoroughly cleaned I installed a new, double-lipped seal I'd bought from my local bearing shop, even though I had three genuine Russian seals on hand. I did this because I'd fitted one of these "wiper" seals to the aforementioned MT9, and it worked perfectly. Remembering the problem I'd had with the Ural M67 gearbox seals all those years ago I did, of course, inspect the surface of the flywheel hub before refitting it. It looked nice and smooth but I nonetheless decided to make it even smoother, reasoning that as this seal is literally in the middle of the bike and therefore the most difficult and time consuming to access, I wanted everything to be absolutely perfect! I carefully linished the hub with #1200 - the finest grade of abrasive paper I had - with the surface looking like it had been chromed when I'd finished!

Imagine my horror and disappointment then, when I noticed oil dribbling from below the flywheel housing after just 300 km of riding! I just couldn't believe it!

I continued riding the bike in the hope that, somehow, the new seal would "take up". Of course it didn't, so I was forced to take everything apart again. A careful inspection of the seal lip disclosed nothing amiss, but since seals are invariably damaged in some way when extracting them and should never be reused I discarded it in favour of one of my Russian seals and put the bike back together again.

It was when exactly the same thing happened - and after the same distance had been covered - that I first felt that something was seriously amiss. Conversations with both the chap in the bearing shop and a very knowledgeable friend disclosed this to be the ultra-smooth surface I'd carefully and lovingly imparted to the working surface of the flywheel hub, as it wasn't allowing the new seals to work properly. As you can imagine this went against all my logical reasoning - especially in view of past experiences - but since this was the only other thing I'd changed I took their advice and, after taking it apart again I carefully removed my glass-smooth surface with #320 wet-or-dry abrasive

paper, this being the grade suggested.

Again I fitted a double-lipped seal (this time pre-lubricated with Seal Plus - a special grease recommended by seal manufacturers as a "start up" lube) and with the MT9 back on the road I felt confident of being "third time lucky". Was I? Well, by the time I'd run up another 300 km oil was literally pouring out - to the extent that I had to wipe up a trail of oil spots from the garage floor after I'd returned the bike to its parking spot! I put a drip tray under it and walked away, with the thought that perhaps getting rid of the #*%# bike and buying a new Honda cruiser would solve all my problems with oil leaks!

One or two cups of tea and a meal later and my reasoning returned. I reminisced on what a lovely bike this MT9 is to ride, how comfortable it is, the way it attracts favorable comments from so many people, that it's been part of our family for 25 years etc. How could I just cast it out into the cold because of one miserable oil leak? I simply had to find the cause of the problem, and rectify it!

So, once again I set to the task of taking it apart, counting myself lucky that it's a Russian bike and therefore much easier to work on than other shaft-drive machines! I washed the oil from the flywheel and its housing, removed the seal and took it, my remaining two Russian seals and the flywheel to the bearing shop in the hope that they could give me a clue as to what was wrong. After lots of inspecting, measuring and talking it was decided that I fit a special stainless steel sleeve (called a Speedi-sleeve) to the flywheel hub. When the hub was measured with a precision digital vernier caliper we discovered two things. One, it was still perfectly round after my two linishing sessions, and two, it was slightly undersize for a 60mm seal at 59.9mm. I didn't think 0.1mm would make any difference but was told that it might, and by fitting a Speedi-sleeve this anomaly would be corrected. The sleeve would also provide a running surface specially designed for oil seals as it's actually made by an oilseal manufacturer - Chicago Rawhide (CR) in Michigan, USA in this case. I was to cement the sleeve firmly into place with Devcon to ensure that it would never move, and to allow this to set rock hard before fitting a new seal into the housing, lubricating it with Seal Plus and reinstalling the flywheel.

And what was the result of all this? Well, I'm now able to tell you that not one drop of oil has found its way out past the new seal, so the story has a happy ending and I've learned yet another very valuable lesson.

Now for a technical insight, and an explanation of why my belt and braces approach was wrong. Whereas the lips of oil seals appear smooth they actually have tiny ripples in them, these being necessary to trap and hold a film of oil. Similarly, the surface upon which they work must have a roughness, for want of a better word, of between 0.25 to 0.5 micro-metres (10 to 20 micro-inches) - also for the purpose of trapping oil. This oil then forms a very thin film upon which the lip of the seal runs, effectively keeping excess oil from escaping and protecting the lip from wear. When I linished the surface of the flywheel hub to such a high degree of smoothness I effectively removed the specially-finished surface so necessary for oil tightness, and because that oil film wasn't able to form properly the seal wasn't able to work as it was intended.

There's so much more to mechanical engineering than meets the eye!

Rod Knight

ODDS & ENDS FROM THE VINTAGE SEC.



The photo above shows my approach to draining the bevel box, or for that matter the gearbox, where space is restricted. I use an old 4 pint milk container cut away as shown. The advantage is that it can be positioned closely to the wheel and the cap can be removed to pour the old oil into the waste oil can ready for re-cycling.

The picture below comes from Gerry Douglas– Sherwood who had a job rewiring this R26 and was rather taken by the novel mounting of the carrier. As Gerry said 'On a bike with a solo seat I suppose there is no reason why the carrier shouldn't be affixed thus. It does rather help fill the empty space over the rear mudguard…. and it keeps the weight of luggage over the rear axle!'

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In (& Out) of the Workshop - 4

by 'The Amateur Mechanic'

Handling Problems.

I built my 1969 R60/2 from the usual 'basket case' over 7 years ago. A pretty straightforward re-build really as most of the parts were salvageable. Right from the start it never steered as well as an Earles bike should. The steering always felt 'heavy' and the bike had a tendency towards a slow weave at all speeds. It was almost as if the head bearings were over tightened or the friction steering damper was permanently on. I checked the damper and bearings, which both seemed OK and just kept riding the bike without actually enjoying the experience much. Some time later I began to suspect the forks might not be quite as they should be and removed the suspension units and front swinging arm only to find nothing obviously wrong. Next I re-checked the wheel alignment and everything checked out but the heavy feel to the steering persisted. Then I put the front brake on really hard one day for an emergency stop and noticed there was a 'knock' in the forks that suggested the head bearings weren't actually tight enough!

I had now reached the stage where any pleasure derived from riding this bike was ruined by the handling and (almost 7 years after the restoration!) action had to be taken. I decided to take the forks out completely; convinced the fault lay with them. Whilst they came out easily the same couldn't be said of the bearing shield over the top head-race. I suspect the frame had been generously powder coated and when placed in the oven the molten powder had run, forming a slow taper on the outside of the top race housing. When I had tightened the head-races the shield had just pushed down this taper giving the effect of tight bearings whilst acting as a friction damper. In fact the shield was remaining stationary with the fork stem revolving inside it. A bit of patience with emery cloth removing the excess powder followed by re-installing the forks resulted in another machine that is (at last!) a real pleasure to ride.

(More) About Plungers.

When I received the copy of the Register news with the article about plungers I thought (incorrectly of course!) that the Hon. Editor had left out the vital (?) explanation of how the lower shroud is held in place. In fact of course a combination of advancing years and the possible requirement for copy meant I had not actually written an explanation so here goes!

The lower shrouds have a thin flat washer dropped in before the rubber bush (which acts as a 'bump' stop) is inserted. The ground tube that is inserted from the top of the plunger through the whole assembly has a slightly reduced diameter on the lower end and a sharp shoulder that abuts the washer and therefore effectively 'traps' the shroud. As the hole in the lower shroud is slightly bigger than the outside diameter of the ground tube if this washer is left out (and I've seen a number like this) the shroud is free to move. Not something BMW intended. If the paint on your lower shrouds has score marks then a check would be worthwhile.

Gearbox Woes.

I like working on gearboxes. There's a real satisfaction somehow in assembling one. Especially if you have all the tools necessary to make the job a simple one. Apart from the handling problems with my R60/2 described earlier I had also been unhappy with a rather noisy gearbox on the over-run, so, having solved its handling problem I decided to investigate. The noise could be easily reproduced on the stand but I was at a bit of a loss to know what caused it. That is until I mentioned it to a fellow owner who confidently (and correctly) diagnosed that the problem was the input shaft moving backwards when the gearbox warmed up. So

I stripped the box.

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In the Earles and all subsequent 4 & 5 speed three shaft gearboxes used on the air-cooled engines the constant mesh input shaft helical gear is, effectively forced forward (towards the engine) in drive but this is reversed on the over-run. This tends to try and pull the bearing out of the casing whilst trying to push the rear input shaft bearing into the back cover. Now I've built an awful lot of gearboxes in my 40+ years working on these bikes and studied the workshop manual on numerous occasions, taking note of how to undertake various tasks. Whilst the shimming of the layshaft and output shaft is something I've done on all the boxes the input shaft isn't mentioned in the text. So the assumption was that, as there is a spring and washer to tension the kick-start ratchet shimming the end-float on the input shaft was deemed to be unnecessary. Not so! If you follow the pictures (rather than the text) in the factory workshop manual there is one showing the shimming of the input shaft!

When these gearboxes were new there was probably enough of an 'interference' fit between the outer race of the bearing and its housing to ensure that, at normal operating temperatures, the races wouldn't move. But 50 years on and after a few rebuilds…

The effect of the input shaft moving can be seen in the accompanying photo. The bearing on the input end of the input shaft is harder than the hardened helical gear on the layshaft hence the wear highlighted.

Having found what I believed to be a solution to the problem (i.e. restricting the ability of the shaft to move by correct shimming) it seemed a good idea to strip several other 'spare' gearboxes. In fact, I looked at four others, three 'S' types and one low ratio (sidecar), finding all of them with the symptoms shown in the photo.

In order to measure the end-float easily, the friend previously mentioned came up with the idea of making a 'dummy' bearing that was a good push fit on the shaft and was accurately ground to size. With this in-situ it is a relatively easy job to take accurate measurements and work out the shimming. It is important to note that the press fit washer that compresses the small spring on the kick-start pawl *should* be replaced each time it is removed.



With the re-assembly of the gearbox completed all that remained was to re-install it in the R60/2 and then road test. Having had a success with this one I have another four awaiting rectification and a further three currently in machines that also need checking….As I said at the start of this piece, I like working on gearboxes!

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'Tears before bed-time' by Mike Silverwood

The time had arrived: I'd finally bitten the bullet. I'd been putting it off for ages. It had to be done. It was only a matter of time before it let me down. What am I talking about? Isn't it obvious, I'm talking about replacing the rubber bellows that goes from the drive-shaft to the gearbox!

The rubber of the bellows was past it's best; it had turned really soft and delicate. In the past, that old trick "glue the split" had been employed and had worked; but now, it looked like "terminal disintegration" was about to happen at any moment.

I phoned Frank my mate to come over and give me his professional opinion. His laughter confirmed my fears – it had to be done.

The trouble was that the time and effort required was huge, just to replace a part that costs about five pounds. Also, the patient in question was a 1971 R75/5, a short wheel base model, which means that there is very little room available in the area where the operation was to take place.

A time and date was arranged with Frank and we "leapt into action" – after a second cup of tea.

The old bellows was slashed apart with a Stanley knife, after a bowl was placed underneath to catch the old oil and the four small bolts were disconnected that hold the drive-shaft flange to the gearbox. To lock the drive shaft in place to allow the bolts to be undone the bike was taken in and out of first gear. (Somehow, the "jubilee" type clips that hold the bellows in place had grown together and were extremely reluctant to be parted, but eventually they did part. Strange what happens with age).

To allow more room in the area where we were going to work, the silencers were removed. Easy enough as there are just two cap screws holding the silencer to the rear quadrant plate and a jubilee type clip holding the silencer to the exhaust pipe.

Blocks of wood were placed under the centre stand legs to give a bit more room to remove the rear wheel and the bottom bolts were removed from the shockers.

After removing the swinging arm pivot point bolts, the drive shaft and the differential were then removed in one lump.

This is when the fun really started! The swinging arm was put back into position, but the rubber boot defied all of our best efforts to get it over the two ends. The swinging arm was again removed, the boot placed into position on the drive shaft end and the clip screwed up tight.

The swinging arm was again offered into position and the four bolts were fastened to the flange. The pivot point bolts were screwed in and efforts were made to get the rubber boot over the gearbox end. Then, more efforts were made. The problem is that there simply isn't any room. Hacksaw blades were broken and bent into "L" shapes to create a tool that could lift the edge of the rubber boot into place. Lo and behold, it jumped into position – yahoo! That definitely merits another cup of tea.

Sat outside in the sunshine, (yes, really), drinking tea, Frank's eyes went wide as realisation dawned on him.

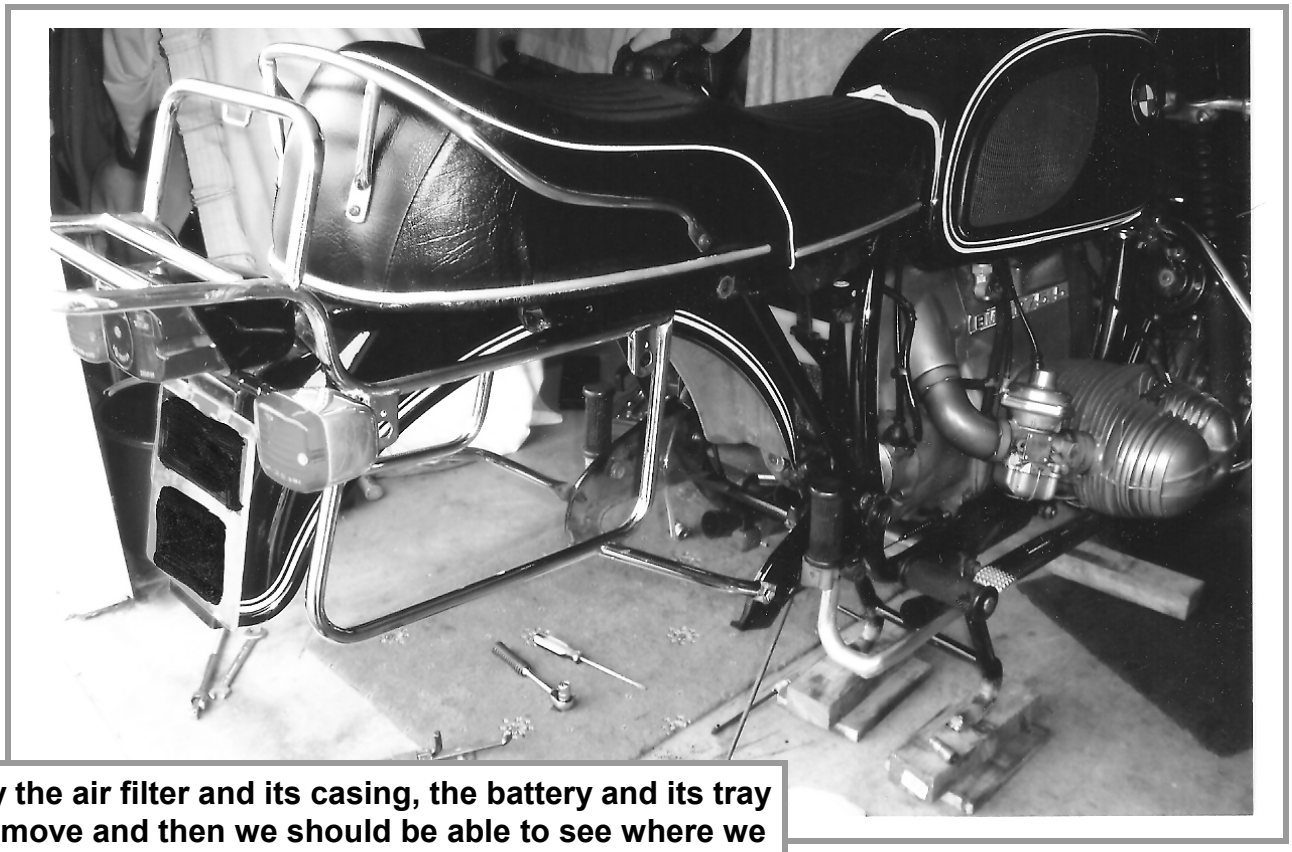
"Did you tighten those drive-shaft bolts up"?

"Me? No. Didn't you"?

Yes, you've guessed it, the rubber boot had to come off again.

This time, the rubber boot really decided to act awkward. We laid on the floor and tried to work up; we stood and tried to work down. The gearbox end of the rubber did not want to resume it's rightful place in life. Threats and pleas were offered to the rubber boot, to no avail. Prayers fell on deaf ears.

This is when common sense took over. Frank stated that as there wasn't sufficient room to do the job, we would have to make it! Gulp.



'Only the air filter and its casing, the battery and its tray to remove and then we should be able to see where we are working'.

The two rear parts of the engine "shell" that hold the air filter in place were removed, to allow the battery to be taken out. The two separate sections that make up the battery tray were removed. In comparison, there now was enough room to hold a barn dance! Between us, the rubber bellows was simply bullied into place, now in record time!

At this stage, there was so much of the bike laid on the floor it looked like it had been stripped down to be sold as spares.

However, here's where this story ends. The rest of the bike went back into place in text book fashion.

If there is a moral to this story, it is simply that if you intend to replace the rubber bellows on a short wheel base R75/5, accept that space is of a premium. You would be well advised to remove the battery and tray to start with (and that is made easier by removing the air filter and it's casing), in addition to all of the parts that you will obviously have to remove. That way you can work on the rubber boot from above.

Thanks Frank; more tea ……...

Continued from page 7

Data Plates

There's no doubt (in my opinion!) that post-war machines with matching engine and frame numbers are more desirable than those that have had an engine or frame change. Even better if the machine in question still has its original factory data plate on the head stock. So it came as something of a surprise to me to be informed at a recent MOT that the original data plate on my R75/5 didn't correlate to the engine and frame number. Perhaps more of a shock as the bike has only had one owner from new…me! In fact whilst the numbers stamped into the frame and engine matched each other (as well as the DVLA computer record and the V5C) the data plate had a 0 in place of an 8 in the numerical sequence. So even BMW couldn't get it right every time!

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THE R27

At the end of the Second World War there was little left standing of the BMW works in Munich where all motorcycle production had taken place until an R75 assembly line was moved to Eisenach in 1942. As is very well documented elsewhere the Allies initially prevented the production of any machines over 250cc. This restriction was eventually relaxed in 1950 and, in order to get back into motorcycle manufacture as quickly as possible, BMW simply took the chassis of the last pre-war 250 (the R23), undertook a major redesign of the engine, then launched the resultant hybrid as their first post-war model, designated oddly enough the R24!
Although the rigid chassis of the R23 received little attention (other than re-positioning the horn) the engine was completely revamped and modernised. Pre-war the R23's oil feed to the valve gear was by an external pipe but this was now incorporated in the cylinder barrel. A new crankcase was cast, with screwed in cam follower blocks, short pushrod tubes connecting these to the cylinder head. The pushrods themselves now ran through the head fining, rather than externally as on the R23, necessitating casting a new head, barrel and rocker box cover. The rocker box cover became a split two-piece item held on with a strap and single nut, instead of the one-piece cover previously used. Developing 12bhp @ 5600rpm, an increase of 2bhp over the previous model, this redesigned engine formed the *basis* of all BMW's single cylinder range until 250cc production ceased in 1967.

Although the R24 was manufactured for only one year (1949), some 12,020 machines of this type were produced. Quite an achievement under the circumstances!

In 1950 the R25 with its plunger rear suspension became the first all new post-war design. Although BMW had first used plunger rear suspension on a production machine in 1938 it had never been fitted on any machine of under 500cc capacity until the R25 launch.

The R25/2 was introduced in 1951 (from Chassis No.245001) and incorporated minor chassis and engine improvements. In all 23,400 R25's and 38,651 R25/2 models were manufactured between 1950 and 1953. Major changes took place in 1953 when an increase in compression (from 6.5: 1 to 7.0: 1) and changing the air intake system (by placing the air cleaner/choke under the front of the tank) increased the engine power to 13bhp. The forks were changed to a similar pattern as the (then) current twins and the new full width cast alloy hubs with cast iron liners replaced the half width items used on all previous post-war 250's.

By the time of the R26 launch in 1955 BMW had already produced (and, we must assume therefore successfully, sold!) no less than 111,771 250cc machines in just 5 years! Obviously a very popular bike in some countries but think of the number of examples that have survived here and it soon becomes apparent exactly how few were purchased, but why? I believe there are two possible reasons, firstly (the least likely) as the war had been over a relatively short time there may have been some hostility to purchasing German made products and secondly the high import taxes levied on foreign made items priced the goods inordinately high. When, in 1951, an R25 cost £275 at a time when the equivalent (?) 250cc BSA (C10) could be purchased for as little as £113. 0. 8d. and a new Triumph 6T (Thunderbird) was over £55 *cheaper* than the BMW at £219.15.7d no wonder they didn't sell any quantity of R25's! Only the most discerning rider would spend his hard-earned cash on the BMW…

By introducing the R26 in 1955 BMW made a radical (and brave) departure from the "old" models. Motorcyclists are notoriously conservative and by incorporating the Ernie Earles designed front fork to what was basically the R25/3 plunger frame adapted to swinging arm BMW designers gave the new machine a unique look. Even if the engine was the same in many respects as the R25/3. A certain amount of updating was carried out with another increase in compression ratio (up to 7.5: 1 to take advantage of the higher octane fuel available) and an increase of 2mm in the carburettor choke size from 24mm to 26mm. These modifications obviously worked as the BHP increased once again from 13bhp to 15bhp, not a huge amount but at least something to compensate for a weight increase of 18lbs over the old model! In the R26's 5-year run, until the R27 appeared in 1960, 30,236 left the Munich works, destined for all parts of the world, many being sold to the utilities, some covering enormous mileages.

Once again the R27 was merely an update of the previous model and tried to address the major criticisms levelled at the R26, namely excessive vibration and (relatively) poor performance. Rubber mounting the engine solved the vibration, at least for the rider, whilst BMW resorted to the (by now) familiar remedy of upping the compression ratio to increase power output. These final 250cc singles ran at 8.2: 1 and developed 18bhp although the weight had also increased by 9lbs.

The R26 is, in my opinion, both the most common and the least desirable of these post war 250's. Before I get pilloried for writing that comment I should point out that I do, in fact, own and ride one! Long term ownership hasn't changed my views in any way. Now single cylinder machines generally vibrate to some extent but all the R26's I have ridden over the years simply give you little or no respite throughout the whole rev range. I once asked the staff at BMW Mobile Tradition in Munich how you stopped the vibration on an R26. They told me it was really easy. Sell it and buy an R27! At least one of our Register members has had an R26 engine 'blueprinted' to overcome any possible imbalances and did report some improvement in the level of vibration experienced.

In spite of my comments re the R26, all the 250's form an interesting part of BMW's post- war revival and as such are desirable, rideable, reliable machines. If you've never ridden one please try "half" a BM if you get the chance.

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The following article was submitted by Gerry ages ago, in fact after issue 12 of the newsletter had been published, so I must offer my apologies especially as I'm always 'banging on' about lack of articles. Anyway, basically the subject was the handling capabilities of the Earles fork machines when pushed to the limit. The late Bill Lomas, twice a TT winner and twice a World Champion, wrote an article for us about the racing BM's with Earles forks and this sparked some debate within the Register. (Editor)

Suspension of Belief

by Gerry Douglas-Sherwood

In response to Eric Rance's invitation to compare Earles and tele-forks in Newsletter No. 12, I have to say I have had direct and parallel experience of both types. My R50 has Earles forks, while my friend's R60US was fitted with teles. I say "was" as the R60 was sold on years ago. However, I did ride each machine concurrently.

Bill Lomas's appraisal of racing Earles-forked machines simply highlighted potential problem areas of that design when pushed to the limit. That is not to say teleforks are perfect by any means, they are not. Each has its own merits. It would be interesting to find the motivation for BMW introducing leading link forks in 1955. Anyone who has ridden a plunger or un-sprung- framed BM' will praise their wonderful stability and spirited handling.

There is no doubt BMW Earles forks provide exemplary comfort and insulation from most road irregularities. The steering tends to be slower than tele-forks but the much-lauded, inherent anti-dive geometry works brilliantly, allowing perfectly smooth, level, safe braking. In fact once that feature becomes familiar, the dive of a tele-fork layout feels quite crude and alarming. The frame and forks are matched to perfection, in spring rate, durability and aesthetics. With fully shrouded spring-damper units and tapered-roller swing arm bearings, maintenance is virtually nil. The Boge dampers on my R50 are the originals, fitted 46 years ago. Earles-type forks are still considered the bee's knees with an outfit, which testifies to their strength, solidity and stability. The other year at the BMF Rally I saw an Ariel Square Four outfit sporting BMW leading link forks.

Yet there are acknowledged downsides to Earles forks. Yes, I've experienced weave, flutter and a potential tank-slapper, but each time at a walking pace and under correctable circumstances. Loose head bearings, an under-inflated front tyre and too much weight beyond the rear axle were all causes easily remedied. Having learnt those lessons early on, I have carried great weights on the back of the R50 with no adverse effects, although I have to say a turn of the steering damper knob makes a psychological, if not a dynamic difference.

At first sight, tele-forks fitted to a familiar "Earles" frame on the R-US series looks a complete mismatch. It's like placing the head of a gazelle on the body of a bear. Rolling the bike off its stand, the long-travel tele-forks settle with a gasp of escaping air from the rubber gaiters. Once astride, one feels at home, apart from the cast handlebar clamps. Once under way, however, the harshness of tele-forks compared to Earles forks is immediately apparent.

The problem is that all road shocks, cornering and braking forces are transmitted straight to the handlebars. Wheel deflection, spring compression and twisting moment have to be dealt with by two sliders and two hollow tubes, dispersing their force to the frame via the top and bottom yokes. The hefty stanchions and leading links of an Earles forked set-up absorb all forces except the vertical deflection of the front wheel.

US forks give lighter and more responsive steering, but such considerations mean little on what is basically a heavy-weight touring machine. The teles require regular maintenance due to their homogeneous dampers, and the fore and aft, side-to-side action of the sliders inevitably leads to noticeable bush wear, the falling off of performance and the emergence of "clonking".

Due to the very nature of mono-track vehicles, and I include bicycles here, all factors contributing to their proper function must be correct. I have ridden bicycles, modified for racing, that have demonstrated a predilection for shimmy and instability. Many of you might have seen that film featuring one of our motor cycle sporting heroes coming a cropper at (Cadwell Park?) when the big Vincent he was hustling over the brow of a hill suddenly went into a violent tank-slapper. Scary. My R75/6 decided to develop an unsettling weave once as I was riding north through Jedburgh, heading towards Edinburgh, although it had behaved perfectly all the way up the AI and across the moors. That was due to a slightly loose head bearing. Those /6 tele-forks used to twist themselves in knots under heavy braking (not helped by the single disc), something that never happen with the R50. The 75/6 ultimately went, the R50 stayed.

BMW acknowledged that a problem might exist when riding their Earles forked bikes at high speed by introducing an extraordinarily complicated hydraulic steering damper to their top of the range R69S. Can we assume then that the lack of a similar damper on the R50 and R60 meant that they otherwise considered speeds of up to 95 mph perfect safe?

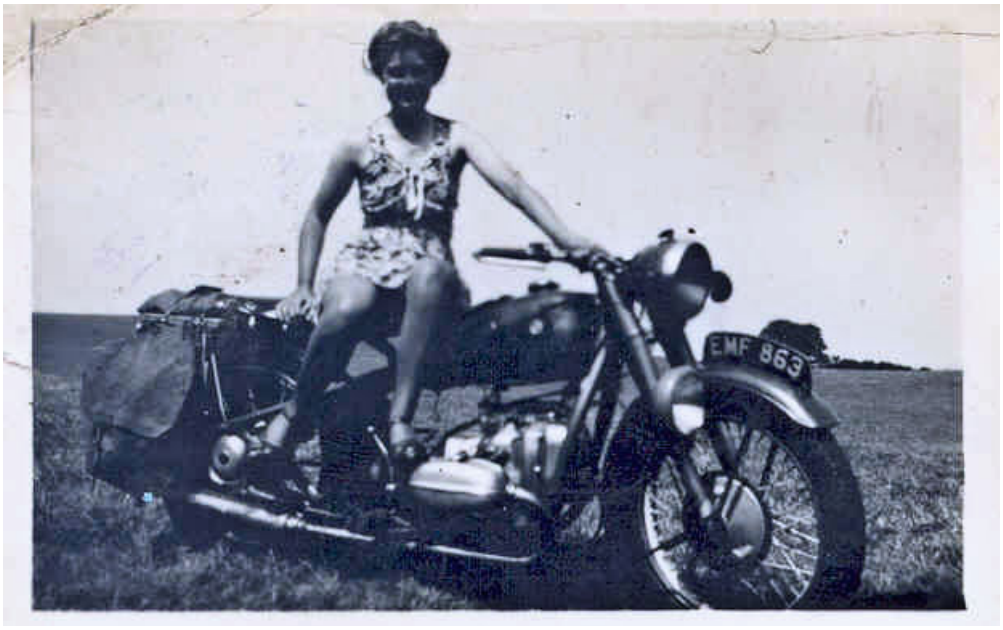
We know now that the US tele-forks were a sop to the American market. By the 1960s leading link forks were looking decidedly dated and old fashioned. The radical new design that emerged in the /5 series that adopted the R-US tele-forks was a huge marketing, engineering and esthetic success. But whether you like the R-US models or if you prefer a "real" BMW with Earles forks is entirely a subjective choice.

How could BMW have foreseen in the mid-1950s that by following a contemporary fashion in line with other manufacturers they would produce an icon of such potency it would lead to passionate, enduring loyalty and endless controversy over one component? Or that they had spawned a design feature that would eventually epitomise all the eternal qualities BMW motor cycles represent?

Having sampled and lived with both types, I know where my loyalty lies…

Gerry Douglas-Sherwood

……..



I thought this shot of a young lady on an R5 might be of interest. She is the wife of the original owner. The machine in question came on the market through the Register and has now been rebuilt from a box of bits by a Register Member. A major job it was as most of the smaller items had gone into the skip!!

This article came to me via Terry Bradshaw who has used the conversion himself with satisfactory results. With the unreliability of new coils and the increasing failures of old ones this may be the route to take for some. Personally I'm with the electronic ignition and 12v brigade and with the likelihood that BTH will be producing a small batch of units in the future I would take that route again with any rebuild.

Conversion of the Magneto System on 1951 –1969 Machines to 'Energy Transfer.

The following instructions and drawings cover the conversion of the magneto system on pre-1969 engines to an "energy transfer" system in the event that the high-tension coil fails.

Symptoms of H.T. coil failure are often vague and hard to diagnose, as they are not always constant. The symptoms will vary with such things as temperature, how long the machine has been ridden and how long it has been parked. The symptoms almost always show up if you have to get some place quickly or if you are about to get rained on, etc. (The bike won't start).

Symptoms usually include the following (assuming points, condenser, timing, carbs, etc. are in good order):

Hard starting, weak spark on one or both cylinders, "dropping" one cylinder under load, coughing back through carbs, popping of exhaust and general misfiring, Poor running, especially at low speeds. Vibration for which no good cause can be found, especially around 4,000 rpm (60 mph or so)., fouling of one or both plugs if everything else seems in order. Excessive sensitivity to moisture (Not enough spark power to overcome the losses due to moisture), and others. *(others includes poor starting when hot. Ed)*

This system has been tested for 75,000 miles , mainly in the States and to a lesser extent in the U.K., and has been reliable, giving equal the need of a battery since it relies on Low Tension current generated by the original magneto.

In the event that the external H.T. coil should fail, it is much easier and cheaper to replace than the original magneto coil.

Please read all of the instructions and drawings carefully before starting this project.

1. Removal of Necessary Parts

(A.) Remove front cover of engine and small cover located just in front of the air cleaner.

(B.) Remove centrifugal advance unit from magneto.

(C.) Disconnect high tension leads from magneto coil and pull them out of the engine housing. Leave rubber grommets in place.

(D.) Disconnect "killer" wire from low tension terminal of magneto coil. (At upper left when facing front of engine).

(E.) Remove two M6 nuts and washers from studs holding magneto body and remove magneto body. Do not remove the magneto rotor..

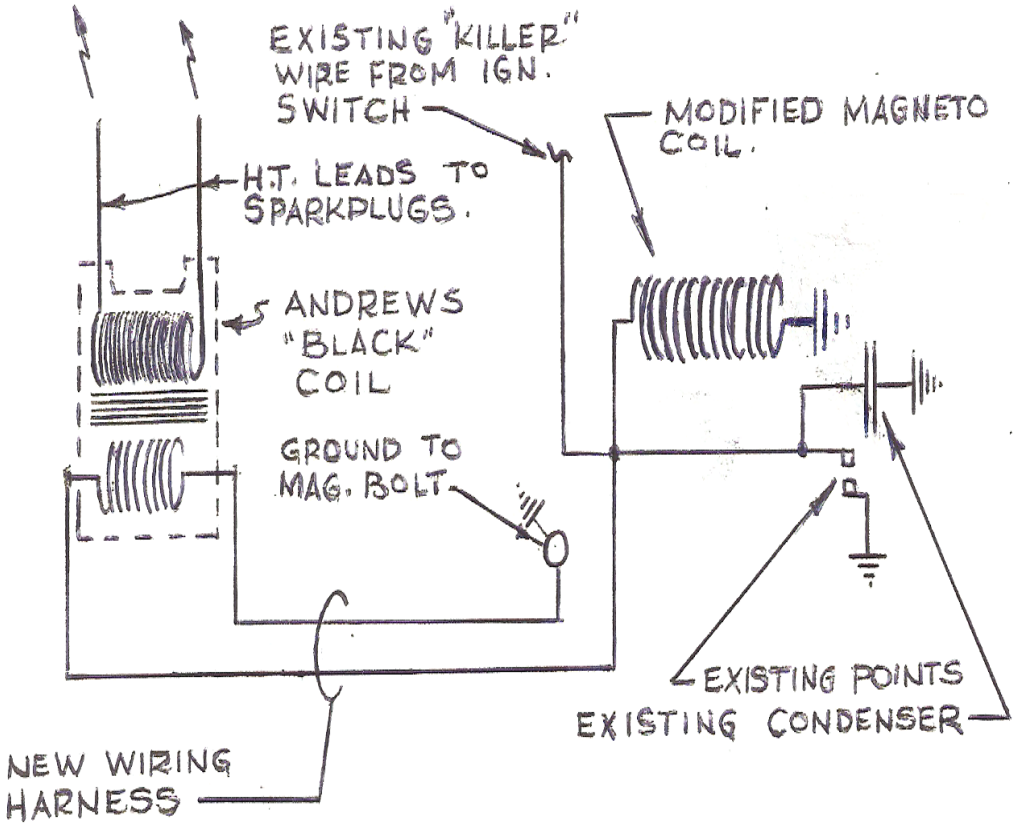
(F.) Disconnect low tension side of coil from the points and the condenser.

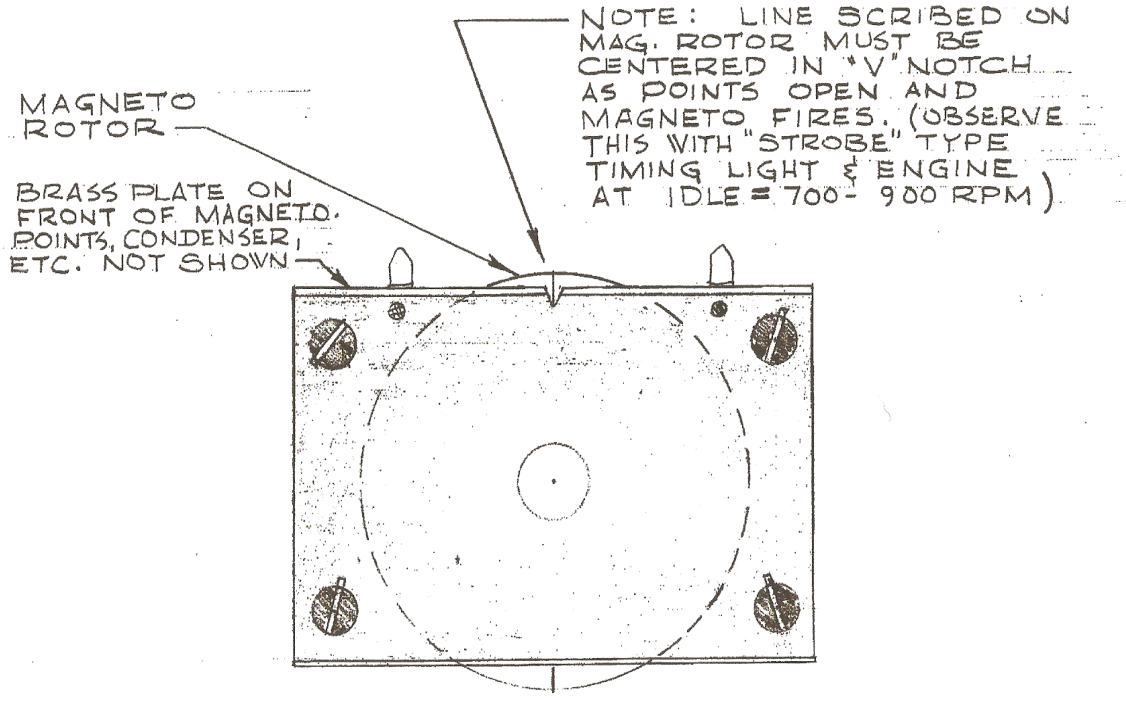
(G.) Remove two screws at clips on top of coil. Remove coil.

2. Preparation of Coil

(A.) Unsolder low tension wire from its terminal on the end piece and remove both fibre end pieces from the coil. Take care not to damage the end pieces for they will be reused.

(B.) Remove all high tension windings from the coil by carefully sawing longitudinally along the coil with a fine hacksaw and peeling them off a few layers at a time. (These windings are very fine, approximately the diameter of hair). Beneath these fine windings is another winding made of much coarser wire of approximately 0.5mm (.020) diameter. This winding must be left in place


EXISTING "KILLER" WIRE FROM IGN. SWITCH
MODIFIED MAGNETO COIL.
H.T. LEADS TO SPARKPLUGS.
ANDREWS "BLACK" COIL
GROUND TO MAG. BOLT
EXISTING POINTS
EXISTING CONDENSER
NEW WIRING HARNESS


NOTE: LINE SCRIBED ON MAG. ROTOR MUST BE CENTERED IN "V" NOTCH AS POINTS OPEN AND MAGNETO FIRES. (OBSERVE THIS WITH "STROBE" TYPE TIMING LIGHT & ENGINE AT IDLE = 700 - 900 RPM)
MAGNETO ROTOR
BRASS PLATE ON FRONT OF MAGNETO. POINTS, CONDENSER, ETC. NOT SHOWN

and it must not be damaged or the ignition system will not work.
(C.) Clean up any residual paper, High Tension winding, etc. and reinstall the fibre end pieces of the coil. They may be shellacked into place if desired.
(D.) Re-solder low tension wire to its terminal. The coil is now ready for reinstallation on the magneto body.

3. Installation

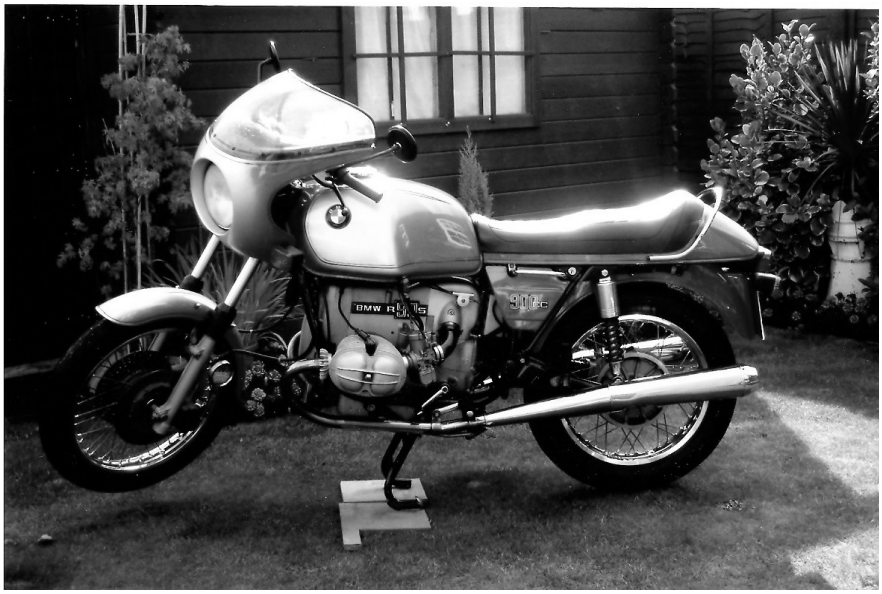
(A.) Reinstall modified magneto coil on magneto body and reconnect to the points and condenser. (You may wish to install new points at this time).
(B.) Reinstall magneto body on engine. Leave the two M6 fixing nuts slightly loose.
(C.) Clean and check centrifugal advance. Lubricate. Reinstall on magneto and tighten the fixing screw to 8-10 lb-ft.
(D.) Mount the new coil. On the original American document the coil was mounted underneath the petrol tank but the choice is up to you, but it may be advisable to insulate the coil mount on rubber washers and not to over tighten.
(E.) Plug the new high tension wires with tower caps into the coil and connect to the spark plugs.
(F.) Connect the low tension wiring harness to the new coil which you have just installed. (See Schematic Diagram). Route the harness through the existing high tension wire grommet on right hand side of engine and then toward the front, running it in the tunnel from which you previously removed the old high tension magneto wires.
(G.) Connect the plain end of the new wiring harness along with the existing "killer" wire to the low tension terminal of the modified magneto coil. Connect the harness wire carrying the ring terminal to the right hand side magneto fixing stud (beneath the m6 nut).

4. Setting up the Magneto

(A.) Set the points to 0.4 mm (.016").
(B.) Set magneto body to its approximate position before its removal and tighten the two magneto fixing nuts.
(C.) Start the engine. Check the points for heavy sparking. If points spark, they may be set incorrectly or you may need to replace the condenser.
(D.) Using a strobe-type timing light, observe the magneto at idle speed. The straight marks on the magneto rotor must appear in the V-notch of the brass plate on the front of the magneto body. (See drawing). If the marks do not appear in the V-notch, you must adjust the points so that they do.
(E.) Use the timing light now to observe the engine timing mark on the flywheel after removing the rubber timing hole plug. The "S" mark should line up with the mark on the flywheel housing at idle speed. If the "S" mark is not correctly aligned, loosen the two magneto fixing nuts and rotate the magneto body to line up the "S" mark.
(F.) Tighten the magneto fixing nuts (M6) and recheck [1] the mark on the magneto rotor and [2] the "S" mark on the flywheel. Re-adjust as necessary. Replace timing hole plug.
(G.) Recheck the tightness of all nuts, screws, connections, etc.
(H.) Reinstall the front cover of engine.
(I.) Reinstall small cover at front of air cleaner housing.

NB. Coil failure may be diagnosed by checking the resistance reading between the two H.T. terminals. An open reading a failure of the H.T. winding. I have not yet seen a low tension winding failure. H.T. resistance 20k ohms may indicate a possibility of failure in the near future.
Although an ‘Andrews’ Black Coil’ is specified, almost any coil with a primary winding resistance of 4 to 4.5 ohms will work.

LIVING WITH THE 90S
by Mike Silverwood



That's it — my mind is made up. When I can't get my leg over any more, I'm going to have it mounted and display it on the coffee table. What? No, not that! My "Daytona Orange" R90S! A lot of people love paintings, I love my bike.

I've still got the advert out of "Motor Sport" magazine from when the bike was first launched — the one with the young couple banking over on their "TT Smoke Silver" model. The one where it states that the bike accelerates from 0 — 60 in 1.7 seconds quicker than a Maserati Bora and finishes off with the statement: "The world's finest ride". Thirty four years ago, that did it for me — I was hooked.

The first "real live" one that I saw was in Paignton, whilst I was on holiday. I was amazed by the "Cafe Racer" style; the tiny nose cone fairing and the humped race style seat and that paint! It looked brilliant.

About five years ago, I realised the dream. I bought a beautiful orange one in very good condition. Everywhere "we" went, the bike attracted comment and performed faultlessly.

Yet, with the honeymoon period now over, what's the bike like to live with? Would I recommend one to a prospective purchaser?

Physically I stand five feet ten inches tall, but with a relatively short inside leg measurement of thirty one inches. Sat on the bike, my twelve stone weight compresses the suspension so that I can get the front half of my foot flat onto the floor. This gives me the psychological feeling of being safe and in control. It's not too big — whereas the newer models seem to be both a lot taller and a lot heavier.

Getting the bike on and off the stand is easy. It's as if the centre stand is perfectly positioned to pivot the weight of the bike, you don't have to struggle. Yet would anyone trust that side stand? I know I don't. It's as if the leg is a couple of inches too long. When in use the bike is very nearly vertical. I get the feeling that if anyone walking past inadvertently brushed it, it would be over. Sit on the bike and raise it just a few degrees and ‘WHAM‘, the stand flies back into it's raised position. I have no faith in that part of the design.

Starting the bike is instantaneous, maybe even quicker. Follow the technique stated in the handbook: petrol on, choke on, ignition on, two quick twists on the throttle and press the starter button. There's no churning or whirring, it erupts into life, much to the surprise of the 1000 cc twins owners.

However, getting the engine to warm up is a different matter, it seems to take ages. Near my home there is an incredibly sharp corner that turns back on itself, climbs steeply and has adverse camber. At the same time, when you go up it, you have to avoid the "kamikaze" drivers coming down it. I've had some anxious moments when the bike has nearly cut out before it has

warmed up when banked over and trying to take evasive action, all at the same time. The advice is — don't be too quick off the choke and keep the revs up

"Horses for courses" is a phrase that comes to mind when riding the bike. "Pottering about" on lanes, clutch in and out all the time and running at under 3,000 rpm, (such as when on an organised "convoy type" run) is a pain. On fast, sweeping open roads, the bike transforms. Keep the ride smooth and flowing and the machine is exhilarating. In these conditions the bike totally belies it's age and can surprise many newer motorcycles; (I don't mean the missile types obviously).

Handling is good, as long as you keep everything smooth. Fierce braking causes the front end to dip by a huge amount and doesn't do much for your rate of progress. Mentally plan ahead and it's amazing how the miles easily roll by. Develop the fighter pilot's 1,000 yard stare.

Compared to an earlier drum braked model, the braking set up is very efficient. Twin discs at the front which have been drilled and a drum at the rear work well. "Line astern", in an emergency braking situation, you could end up with something like an R75/5 stuck up your exhaust pipe, which could be a painful experience.

Many of the early road tests praised the efficiency of that nose cone fairing. Personally I'm not very impressed. At speed, the benefit compared to a naked bike seems minimal, there's still plenty of buffeting. But it sure looks good and plenty of other manufacturers must have thought so too, because the design was copied mercilessly.

When new the bike was frighteningly expensive, but with the benefit of hindsight, it was obviously worth it. Looked after, the overall finish is extremely durable. After thirty one years, the chrome and alloy on mine still look really good. The original, individually applied paint scheme is still deeply lustrous. Recently, I was complemented on the quality of the restoration, deeply



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satisfying when it hasn't been done.

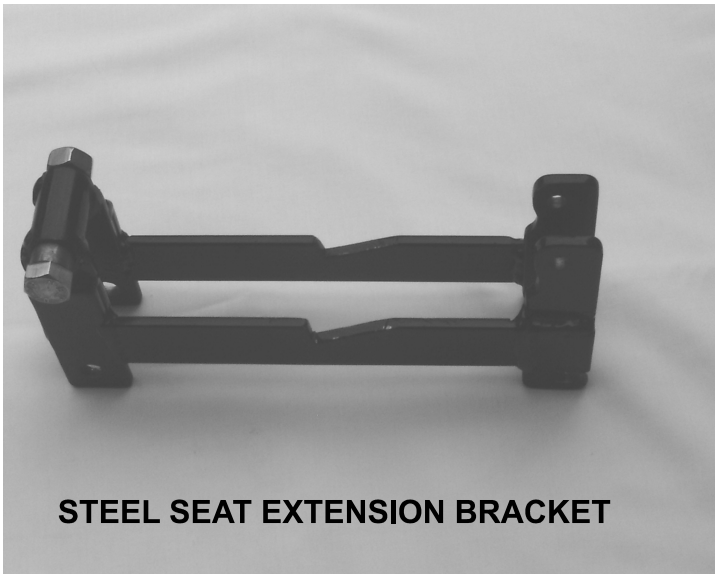
The quality of the mechanical components is superb and not part of the hype. I've seen two recently, one with over 150,000 miles on the clock and the other with over 200,000 and both looked great. I would have given a home to either of them. There's obviously a lot to be said for religious maintenance.

Yet one factor positively bugs me and that is the side panels and how they are held on. Two rubber bands, for heavens sake.

In summary, I would definitely recommend the R90S to a potential owner, but would advise, don't expect too much success in ‘concours’ events; they don't look old enough to be lined up and competing with other bikes of the same age. At one show, a Kawasaki owner stated that the R90S "looked well" and that his bike was two years newer than mine. I quizzed him as to which model he had and he was totally surprised when my "P" registration was out of the series that came out about twenty years earlier than the one his bike had belonged to.

ODDS & ENDS FROM THE VINTAGE SECRETARY

In last months Journal I mentioned the fact that the riding position on my R67 was uncomfortable mainly due to the fact that my legs are long and consequently to avoid the inlet tubes I have to position my toes as far back as possible on the footrests. The position was a great disappointment as I found the seating on the Earles machines to be almost perfect. This is not to say that it is the only machine I’ve owned with an awkward seating position; even the Vincents were par-



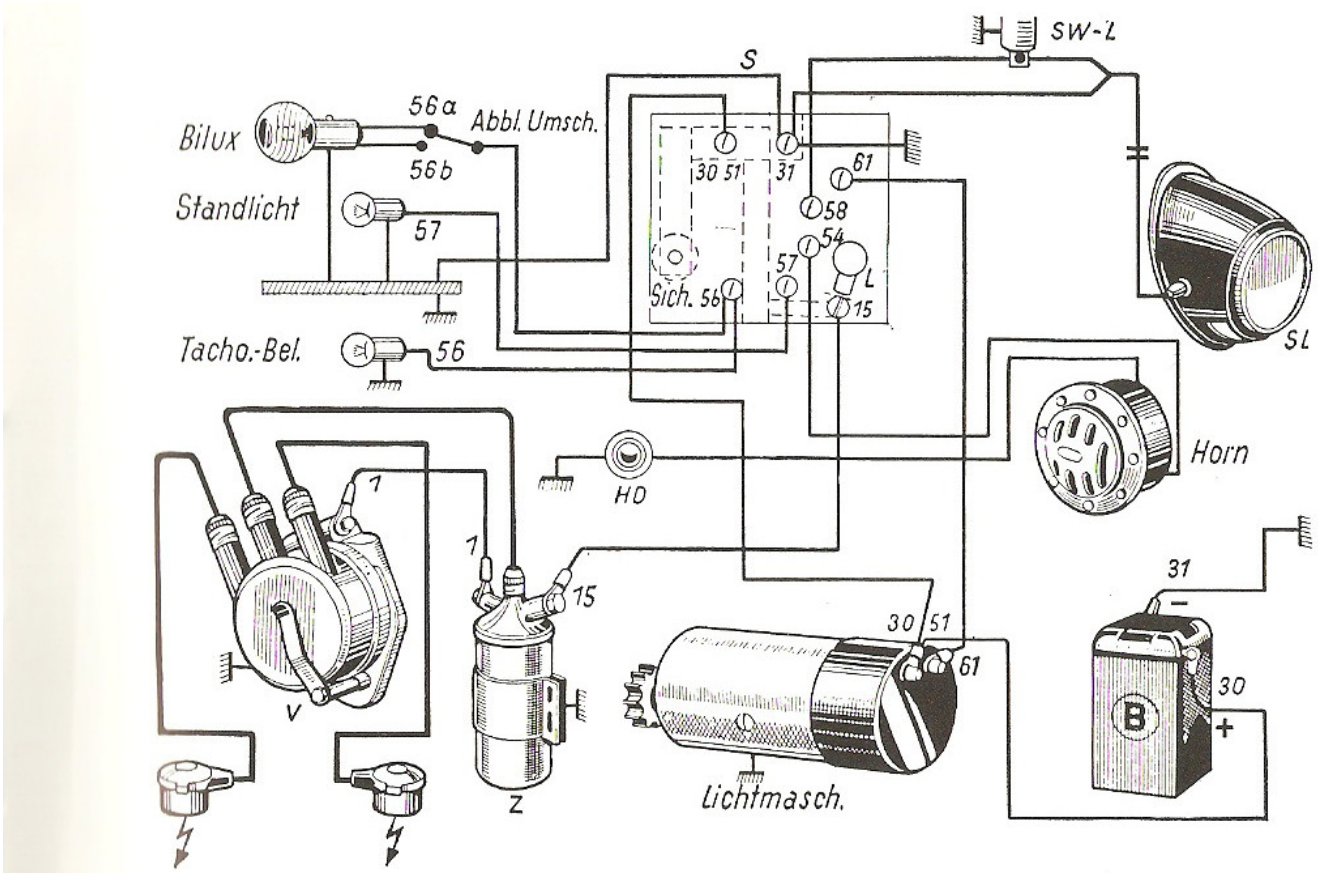
STEEL SEAT EXTENSION BRACKET



ticularly difficult. Anyway, Terry Bradshaw kindly sent me an extension bracket he had made, with the comment that ‘it would transform the riding’. How right he was! The bracket, although not the prettiest of items, has raised the height by 2” and riding is now a pleasure. The original teardrop fuel tank exaggerates the bracket a bit but one of the larger after-market Hoske or Heinrich tanks would help it blend in. With my tank bag strapped on the extension is not immediately obvious however.

While at the Stafford Classic Show I was given a copy of a new BMW magazine that is published in Germany and will only be printed a couple of times a year. Well, it’s glossy, fairly thick, can only be ordered online and the price is approx. £5.50 an issue. Interested? Go to the web and have a look at www.bmw-motorcycle-magazine.com

Now, I've been asked a number of times for a wiring diagram for pre-war machines such as the R66, R5 etc but have been unable to help, so here is a diagram for a1951 R51/2 that has the same ignition system. Should help the few.





The 1951 R67

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