

The ramblings of an amateur enthusiast to be shared with others who own, drive, mind or repair Rolls-Royce and Bentley cars, or those who simply love them.

## SAVILLE ROW SUITS AND DIRTY UNDERWEAR

I'll be in trouble again with my indexers who are valiantly trying to provide you with some reference list in order to find out how to fix your mcgubbin without have to scan through some 700 pages of this sort of drivel. But if I had a heading 'The Ethics of Restoring a Car Cosmetically without regard for its safe operation.' I think you would pass on quickly. But that is what this is about. As I mentioned in the last issue of these notes, here was an apparent concours car, a Cloud series with the most immaculate presentation in paintwork upholstery and woodwork. Fortunately I had occasion to tear into a roundabout just after I received the car and some idiot as mad as myself decided to do likewise on my right. Much leaning on the stop pedal and to my concern despite much dipping of the nose, I was getting ready to steer out of trouble as I was not going to stop in time. In the event we missed each other. The clue to the stopping power was that there was no skidding despite triple braking systems, mechanical servos and a jealously guarded reputation.



For those still into drums you will be aware that the English practice of separating the drum from the wheel hub saved disturbing the wheel bearing settings. And unlike later rotor and pad systems you have to remove the drum to inspect the linings and make sure there are no leaks and at the very least blow out the brake dust that accumulates there!

Sometimes the drum is quite tight on the hub which means screwing a couple of 1/4" UNF bolts into the holes provided with enough thread length to get the thing off. These are screwed in evenly until the drum is clear. On Pre-Cloud cars of course the thread is BSF – but you knew that didn't you!

Back home the car was hoisted, wheels and drums off and lo every one of the wheel cylinders was

leaking. The brake linings were almost down to the rivets. I had looked at the contents of the jam jars (the colloquial name for the brake fluid reservoirs on these cars) and these looked relatively clear so noting the general condition of the car, brake trouble had not been uppermost in my suspicions.

The brake shoes were ripped off and the wheel cylinders opened. Inside there was relatively clear brake fluid but floating in it were shards of rust.. Cleaning this muck out revealed that every wheel cylinder was scored through foreign matter getting into the brakes and the cylinders themselves rusting.



Brake fluid and brake lining dust abound. The left hand picture of a rear brake shows the working end of the adjuster. It is the other end of this thing that you twiddle to reduce the travel of the hand brake lever to avoid de-kneecapping yourself when you get in the car. These adjusters are packed with high melting point grease on assembly and it is not practical to lube them in the meantime. These ones were almost seized. Note the riveted linings an echo from the past. Nowadays all linings are glued to the shoes which takes away that quaint grooving effect when the linings wear to the rivets and the latter then gouge furrows into drums.



The gloomy picture at the right is the complete front brake assembly removed. This is a necessity to get the wheel cylinders off to re-sleeve. Given the neglect this car had in this department removal stripping and cleaning was probably essential. At left is the muck in the bottom of one of the 'jam jars'. An interesting story heard from the antipodes:- apparently some bright gentleman was touring in his Cloud at 100 mph for a considerable time in an ambient temperature of over 40 degrees C. It was apparently too much for one of the jars which cracked with the heat and dropped its contents all over the red hot exhaust manifold starting a terminal fire!!

The practice of syphoning out the contents of brake reservoirs and filling them with fresh fluid is an old used car dealer's trick. Worse it is even practiced in service procedures; change brake fluid it says on the bill and there is a charge for \$5.00. Tell them to change all the brake fluid not the stuff in the reservoir and the bill leaps to \$45 but then you drive knowing that your system is not being eaten alive by rust and that you have a good chance of always stopping when you want to!!

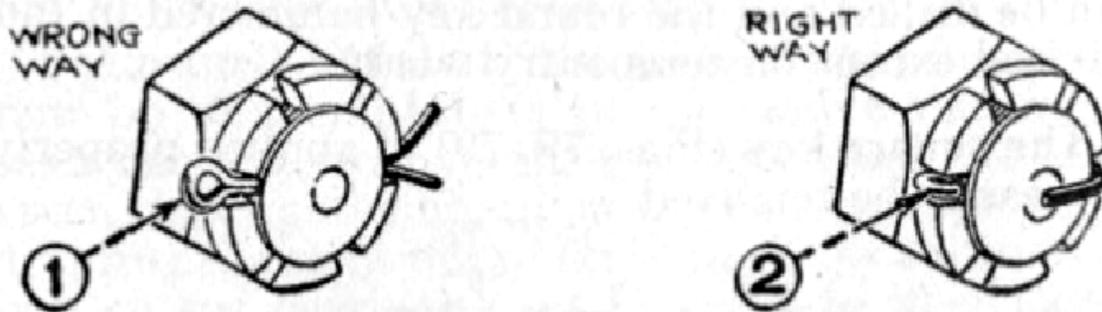
The tops of the reservoirs were removed, the brake fluid sucked out and lo, there in the bottom was a nice little pool of rusty water. The master cylinders were the final straw. They each had about half a teaspoon of silt in them so much so that the lower or smaller of the two master cylinders was jamming and the piston could not return far enough in the cylinder to replenish its fluid holdings. In short the car had about 55% of its normal braking power.

All cylinders were bored out and sleeved in stainless steel and the whole lot rebuilt with new seals and boots. Flexible hoses were replaced and new linings bonded to the brake shoes. These cars have a complex braking system but following the book the amateur mechanic should fare well with care in the exercise. And he should be able to drive the car anywhere regardless of its looks confident that it will stop as intended by the Factory!

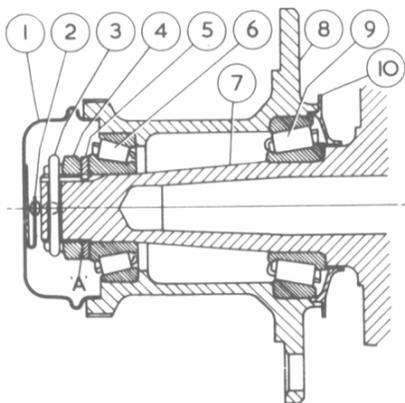
  
**SPLIT PINS**

I often wonder whether the University of Oxford considered compiling a dictionary of automotive terms. If there is a 'correct' term for split pins it would seem that 'cotter' pins would meet the bill. Cotter has a number of meanings but reading with some etymological license it seems that cotter implied keeping things together which is of course what split pins do. That illustrious journal *London and Derby* for September maintains a debate about the correct or preferred method of applying these fasteners. I will have my two bob's worth and quote a former Factory Chief Engineer Harry Grylls who observed that if a nut or bolt wants to come undone it will do it regardless of the fastening method. I presume that the designer then has to remove stresses that encourage undoing so that the 'fastening system' is merely a bit insurance.

A classic case of this occurs in the Silver Shadow Saginaw steering box. The Pitman shaft that does most of the work steering the wheels is held in by a plate which is bolted to the main casing. The plate is subjected to the swivel action of the pitman shaft and somehow these plates manage to work the four bolts holding it down, loose! Various methods were tried to stop the bolts turning until the modern and innovative engineers' glue 'Loktite' was plastered all over the threads before assembly. This seems to fix it.

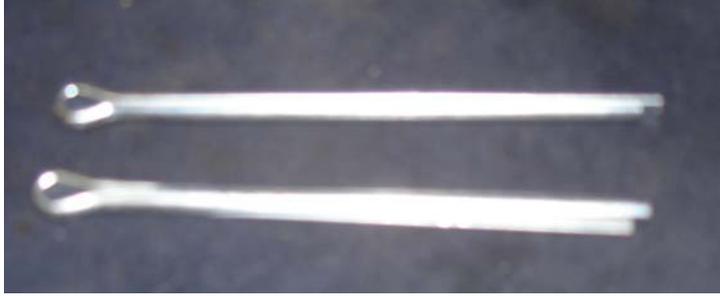


But back to split/cotter pins. As has been observed these really are quite lethal if not fitted properly. The debate in *L&D* seemed to refer only to prewar cars which tend to show off their cotter, like some comely tart; I mean to say suggesting that zinc plated cotters been de-zinc'd and coloured black made me wonder what I have been doing all these years. Truth is I am sympathetic. I quite recoil from the sight of new pins shoved into castellated nuts and spread anywhere on a job at the local wheel aligners even though they can't be seen by mere mortals. So if they are stuck out for the world to see, it does behoove one to do it neatly.



But one area in all conventional Rolls-Royce hubbed cars does demand split pinner of the highest order and that is the item used to hold the large nut securing the front wheel bearings to the stub axle. All post-war cars have a spring loaded contact riveted to the inside of the front wheel bearing hub cover. The contact rides on the centre of the stub axle. The last thing it needs are the stout legs of a 5 mm diameter split pin to be rotating about its contacts. The solution is the 'twisted' pin. And I note that there appears to be some query as to whether this is an approved method.

The above drawing from our Mark VI manual should settle that argument. Item '3' is the split pin duly wrapped around the nut! Note the sprung contact '2' which would be quickly wiped out if the pin was fitted the 'right' way as illustrated above.



These are the pins for the front hubs. They are available from most machine shops and specialty fastener shops. They are tough little mothers (5mm diameter)so be prepared for a struggle in bending them.

Below is the method I use. Clamp the pin tightly with the 'slot' vertical in the vice and at about half way down the shank. Avoid trying to twist near the head as it will probably shear off. Turn the head through 90° and fit the pin as seen in the right hand picture. If you want to be really neat clip the tails so that the ends can be tucked into a castellation. You never know it might win you a point. Actually I have wasted a good deal of carefully selected expletives on split pin installers and their Mothers! Small items I usually give up trying to remove and simply undo the nut and shear them off, poking the bit in the middle out later. But large pins you can't do this and if Jeremy Posthewaite the renowned restorer of fine cars has spent an hour fitting a split pin it will usually take two hours to get it out. Henry Royce and his little helpers seemed quite unaware of the value most people attach to time!



**Footnote:** One of the curious security precautions the Factory took was to seal the settings on the front hubs. The seal actually appears as a part, complete with its own number. The late Bert Ward then Service manager for York Motors in Sydney was corresponding with a very pompous senior official in the Factory about the standard of cars arriving in Australia during the production of the Mark VI Bentley of which nearly 300 were delivered to this country. Bert advised the official that he had actually opened front hubs on newly arrived cars when they appeared to running somewhat noisily and very freely only to find they had no more lubricant in them than the packing oil from the bearing producer. To do this he had had to break the hallowed seal! Absolute outrage followed with complete denial that any such omission could take place. Bert ignored the Factory.



## SPRING CLEANING

Spring has sprung. Whilst our servicing schedules are not normally timed to the seasons they are a good aid memoir. The conditions they bring in themselves are a reminder to think where your car stands. Spring and Summer bring hot weather, dust and heavy rain (hopefully). So what about checking the charge in your air conditioning, your coolant age, condition of the wiper blades, condition of the tyres, muck in the scuttle air intake, thermostat age and belts and air cleaner?



## GEAR CHANGING NICELY

When the harbingers were warming up after the introduction of the Silver Shadow, they seized on the electric gear change. It was not only unreliable and a mechanical and electrical liability it separated the driver from the very mechanical guts of the vehicle. Spin merchants extraordinaire were quoted recalling 'knives through hot butter' 'gentle engagements' positive control' and any other analogy that came to mind. The Factory of course were writhing with insecurity to the extent that a 'get you home lever' was provided in the earliest of cars. This proved to be quite unnecessary and was dispensed with very early in the piece! Overall the gear change mechanism which was carried through to the end of production was never a source of concern.

But prior to this the Cloud series with its automatic gearbox really pulled out all stops in the design department. On right hand drive cars, four separate linkages all capped with elaborate joints, were used to connect the driver to the gearbox. Properly adjusted the manual changes are almost silent, very firm and certainly positive. But like all good things they need maintenance and given the age of the last car made with this arrangement – some 40 years there are a lot of chassis out there with crappy gear change mechanisms that the most ham fisted amateur can fix!



At left is the most simple component. It is the cover for the flywheel. The bracket swiveling off of it supports the whole mechanism.

It is well known that one aim in the Factory's design area was to separate the whirring bits from the listening bits (you). Hence

the body was mounted on rubber as was the engine, the steering column and as far as possible the control mechanisms for the transmission. Hence the bolt seen through the pivot on the cover above had two small top hat rubber grommets fitted as insulators. Invariably these are missing, immediately giving rise to transmitted noise and looseness in the gear change mechanism. They are still available.



Above is one of the linkages with its adjusting nut. What is not shown is the ball joint that the end of the linkage grips. Look closely and note the hardened button at the bottom of the joint. The base of the bolt is similarly shaped, both are designed to accommodate the ball joint. The adjustment needs to remove all internal movement and with the slightest nip. The whole assembly is packed with high melting point grease and covered with a rubber boot. If the latter is damaged in any way replace it



And here is the support bracket ready for assembly complete with the rubber isolator. Note the spacers which give the correct tensions for the assembly.



## SEEING WHERE YOU ARE GOING



Most will admit that lighting for our cars really did not come of age until the four headlight sealed beam units were introduced in 1964. Prior to that semi sealed units which despite careful design still deteriorated through atmospheric corrosion, complete with the correct marque badge, were installed. Even new, by today's standards the lights were poor not only were the units expensive now they are unobtainable. I had my S2 lights opened and re-silvered. They are now sealed with silica gel and stored for the next owner or if I go completely

mad for the next concours! The solution otherwise is to fit standard semi-sealed units in which you can fit quartz iodide bulbs which are simply excellent. But have a mind for the lighting switch. While beautifully designed and built they are not made to carry large currents. If you elect to go for the biggest candlepower put the lighting circuits through discreetly hidden relays and you should have no trouble. The lights shown are current Cibies and look quite appropriate.



### **A FAIL-TO-PROCEED WAITING TO HAPPEN**

I would guess that more accounts of breakdowns in our cars involved the electric pumps than we would want to admit. The original pumps involved complex sets of points, indifferent diaphragms that shrunk, condensation and just contrariness. They were only dispensed with in the SZ cars and the fuel injected Silver Shadows. When they stop so do you and lying on your back on the traffic side of a busy highway belting the pumps with the heel of your shoe in the vain hope that they will spring to life is not a situation one would aspire to.

The salvation appears to be the pointless pumps as they quaintly described. This among other improvements involves using electronic switching of the pump current rather than the ingenious but waiting to get you technology used on the previous

models. If you current pumps are five years old and of the former technology, get yourself the new ones and you will thank me the next time you pass a fellow owner lying on his back .....



### **WHAT IS THIS LITTLE PACKAGE?**

At least five English cars to my knowledge use these gadgets, they are at the bottom of their food chain and your last resort as you go careering down the alpine pass in your Cloud series of car.

Without them you may return to your car to find it has departed under its own terms and again in your Cloud when parking you may have to develop a technique for dealing with the owners of cars that park at either end of you.

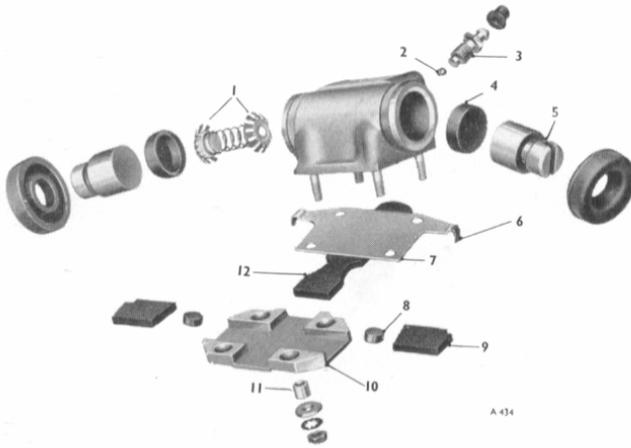


Fig. G28 Expander unit — exploded view

- |                  |                    |
|------------------|--------------------|
| 1. SPREADERS     | 7. SANDWICH PLATE  |
| 2. STEEL BALL    | 8. ROLLER          |
| 3. 'BLEED' SCREW | 9. TAPPET          |
| 4. RUBBER SEAL   | 10. TAPPET GUIDE   |
| 5. PISTON        | 11. DISTANCE PIECE |
| 6. TAPPET STOP   | 12. DRAW LINK      |

same time to the hand brake beside your knee.



rubber bungs in the backing plate, first that they are there and not rotten and secondly if they are going hard you may be able to ease them out and soak them in Armoural which seems to do wonders with drying rubber. And of course you would follow the rods and joints back to the brake servo oiling the joints as you go – wouldn't you!

And here it is exploded! It is a combined mechanical and hydraulic expander used on the rear wheels of the Cloud series of cars. Some owners may not realise that most of the braking needed on any car is on the front wheels since most of the weight is there. But there is still some effort required at the back wheels which is why the braking bits there are much smaller. But this installed system goes one step further and uses the mechanism for the handbrake immediately before the hydraulics start doing their thing.

Item 12 is a very strong bit of metal with the end that you can't see, because it is under item 6, is connected to the brake rods from the mechanical servo on the side of the gearbox and at the

Pulling this same bit of metal forces the plungers (9) outwards applying the brakes. At the same time the hydraulic plungers (5) are also pushing on the toe of the brake shoe.

This is all very well when it is put together with some high melting point grease. The four nuts you see in this picture sit on spacers which keeps the whole assembly reasonably loose and avoiding early gumming up. Overall it is a bit primitive but effective. If there is no evidence of leaking in the hydraulics, consider a couple of cans of brake cleaner available at your local friendly car bit place, put a tray under the hub and get stuck about the whole assembly with the good fluid. This will also clean the brake dust out. Using a small screw driver when the assembly is dry you can replace the lubricant by poking a bit into the faces between the handbrake plunger and the cams. While you are there check the

## PURGING THE BRAKE LINE

Ever heard of a brake line blocking? It does happen and I am not talking about old flexible hoses whose guts have come loose and created a one way valve. A good friend recounted the trials of a Mark VI Bentley that despite a very complete and thorough brake job still pulled sharply to the left under heavy braking.

Approaching desperation he pulled the hydraulic line off of the front wheel cylinder jacked the rear of the car up ran the engine in gear and got someone to stamp on the stop pedal. The right hand line remained virtually dry with a mere oozing appearing. The other side of course shot out a commendable stream.

In the original brake rebuild of course the lines had been bled but with a bottle or two of clean fluid coursing through the lines, loose rust scale came off the walls of the brake pipe and eventually blocked the line solid. There is a message for restorers here for these now quite old cars. When you have the engine out remove all the brake pipes and have them remade – a small cost and quite a simple job without the encumbrance of an engine. Remember the lines are steel and with a neglected brake system there will be water – what more does it need?

The background to these words is the filter cloth I used in flushing out the lines of a Cloud that had quite a bit of water in the lines. I initially blew them out with compressed air then rigged up a pressure vessel I normally use to check engine lubrication in a newly built engine. I filled the tank with about 10 litres of acetone and put it through using compressed air at about 60 psi. This was followed with a similar amount of methylated spirits and then blow dried. Hopefully this removed all the loose rust and future annual brake fluid changes will prevent further corrosion.

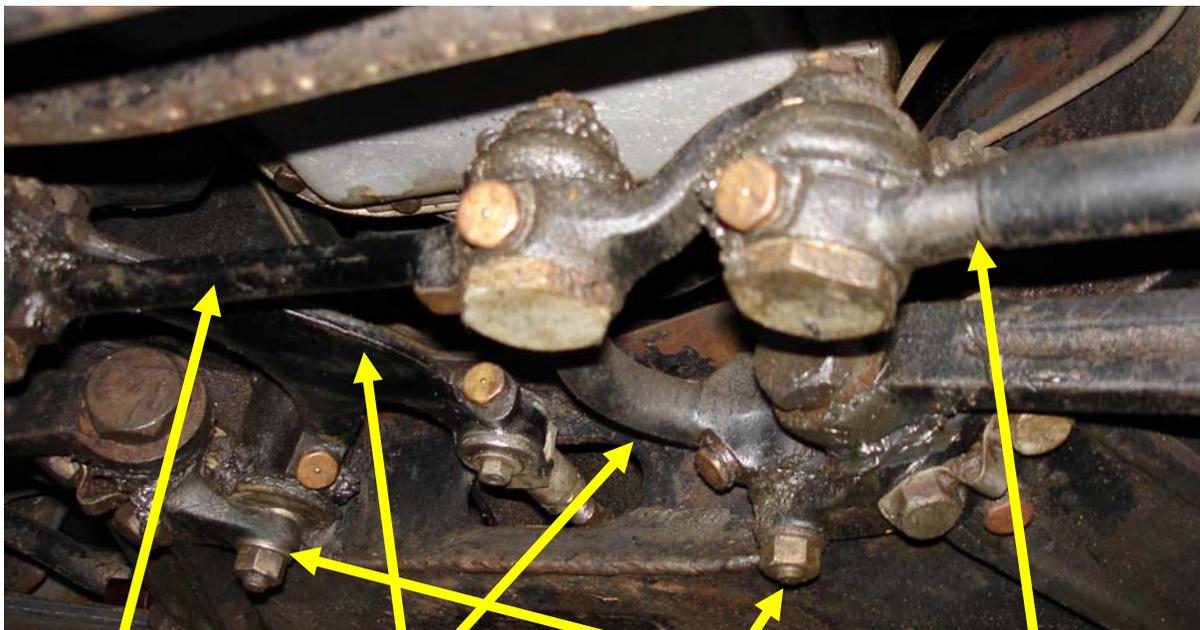


Crude but effective. An old barbecue cylinder adapted to the task. The air line is to the left and the out line controlled by the valve is to the right front. This can be filled with engine oil hooked up to the engine oil gallery with a suitable adapter, the air pressure regulator can be set to the pressure the oil normally runs at and the valve is opened. Turning the crankshaft slowly will give a very clear indication of which bearing is getting oil and how much. A flood coming out of a bearing (usually a camshaft bearing) explains why you have lower than normal oil pressure. The idea is not original but was a feature of Packard (Ask the man who owns one) engineering.

## TARTING UP THE STEERING RELAY LEVERS

Spare a thought for these bits of iron, they do an important job. Each wheel has a steering lever bolted to it and these are connected to the steering box by track rods and ball joints. They do not connect directly, however, other wise in a right hand drive car you would have a very long tie rod on the left side and the reverse on the other side. Consider the car traveling straight ahead hitting an almighty bump. The rising wheel takes its steering lever with it and that is fastened to the tie rod. The net effect is that the wheel turns outward while rising and returns as it drops. Not a recipe for great stability.

The solution is to have equal length tie rods as short as practical. In the Cloud series of cars this is achieved by using two relay levers, lashing them together with a yoke and have the steering box push that yoke back and forth to effect steering.



**Yoke**

**Relay levers**

**Pivot pins**

**Right hand tie rod**

I apologise for the graphics but let's face it they are not my forte! The two relay levers on the Cloud are quite different in shape but perform the same function. This is because the power steering ram, that strange protuberance that pokes out from the middle of the front cross member, actually pushes on the left hand relay lever. The linkage can be seen in the picture coming through the member. Given the extra load on the left hand lever by virtue of the power steering task, the pivot that it swings on is that much stronger. This rarely wears provided it is kept well lubricated.

By contrast the right hand lever is much lighter, runs on relatively small bronze bushes and is prone to wear.. The repair is simple. Remove the pivot pin by removing the nut and washer and tapping the 'bolt' upwards with a long drift. The 'bolt' or pivot pin will fall to the ground when it clears the top mount and the entire pivot lever can be pulled free from the cross member. Note the washers that pack the lever top and bottom as it is important that they be replaced as they were on reassembly.



And here is the lever clear of the front axle. To disconnect it from the yoke usually requires a scissors type tie rod end splitter. There is sufficient room to work and once off, take all the bits to your friendly fitter and have him rebush the lever. The overall height of the bushes is important as the packing washers that were at the top and bottom were selected to give a tight fit. When fitting the lever it helps to cheat a little and lever the top flange on the cross member up a little to help line everything up. The bolt can then be dropped down from the top and tightening up the nut will provide the necessary nip.



## **ROTOR SKIMMING ON SITE**

I had put off skimming the rotors on my Spur for God knows how long. There was a ridge around the periphery you could not jump over and I had new genuine pads!

A called up my friendly local machinist who arrived with his equipment seen here mounted on one of the hubs of the Spur. I was required to remove at least one of

the calipers but I removed both. The grinding took 20 minutes and all was done. Apparently this is preferable to off car grinding as it guarantees concentricity with the front stub axle. Lastly keep an eye on the minimum thickness of the rotors which is stamped on the periphery of the rotor.

## **AFTER THE TUMULT AND THE SHOUTING HAVE DIED**

Well this is the second issue of 'Topics' produced 'electronically'. I imagine there have been several ritual disembowelments when former readers found out that I had succumbed to the blandishments of the ePeople. To my shame I have yet to write to all my former fans and explain what has happened. One dividend I hope will come from this is to have people actually sit down and enjoy the work put into the various web sites who have carried these issues. It is no excuse to say that the computer is all beyond you; I am so old I am registered by the National trust and have to get approval before I can change my mind – and I can do this computer thing so if you haven't got one get one. They only cost a bit over a tank of petrol!!

Some people comment on the style of my writing and I often wonder about the depth of content. If you want to understand your car the basic reference is clearly the workshop manual. But reading one is usually done after you have gone to bed since most of the content is the best soporific obtainable outside a chemist shop. The old Factory were worded so precisely with never a lax expression such as 'fix it' or 'dump' but then they had to cope with many of the world region where the use of the English language was a game rather than a necessity. And so this writer as amateurish as I am chooses to keep the words light, thrown in a little humour and hopefully relax the reader.

One slight embarrassment is that in the early days of 'Topics' we were trying to get a message across which in retrospect was a bit personal and at times petty. I do not apologise I simply try to explain why such material was included in these pages.

There are now four locations where these notes are to be found. In Sydney [www.rroca.net.au](http://www.rroca.net.au) , in Melbourne [www.rrocavictoria.net.au](http://www.rrocavictoria.net.au) in the UK [www.kda132.com](http://www.kda132.com) and now also in the UK <http://www.RRBEW.co.uk>. It is all very gratifying and I have to thank the webmasters (whom I shall not name since they are then plagued with offers from Hollywood) for their encouragement and assistance.

Lastly if anyone wants to contribute to these pages please email me [spur84@bigpond.com](mailto:spur84@bigpond.com) or just send me (Post Office Box 827 Fyshwick 2609 Australian Capital Territory) a pic with a query if there is no story and I will endeavour to make something of it.

Meanwhile enjoy our hobby and look after our cars. There will be no more!

Cheers

Bill Coburn