

TEE-ONE TOPICS

Number 26 July 2003

THE JOHN GRANNALL MEMORIAL CHARITY DAY CAR SHOW

Sunday 22 June was cold and foggy; a disappointment as I had spent the day before licking and spit-polishing the blue car. Back from Sydney Bentley after a veritable total restoration of the body. Brian's boys had done a fabulous job probably looking better than new. The dank day however did nothing to highlight the quality of the finish.

I arrived ten minutes before the advertised time and only just beat Greg Whellum in his ice white Silver Shadow. We had only begun to chew the fat when Peter Smith drove up in his pretty white Silver Shadow. In short order, we had Peter Chan arrived in the beautiful blue '84 Silver Spur, Bill Coburn in Sid Drury's gold Silver Shadow, Neil Garvey in his blue Silver Shadow and Wayne Wardman in his blue Silver Shadow. All parked and right dressed in a fine display of opulence.



After a breakfast of-steak sandwiches and cold drinks, we had a sticky beak at the other club cars. There were some outlandish hot rods, clearly much loved by doting owners and some very well presented American marques. The Corvettes and Mustangs held our attention as did the highly polished Chevies. Some of the cars are a testament to the devotion of their owners. Doors fitted better and chromium gleamed far more than when new.

Our group took the opportunity to discuss the current contretemps over RR363 and exchanged news that is coming in from all over the world on the product. Bill Coburn took a very smug attitude to the whole business and recommended that we change over to mineral oil. He pointed out the parts common to

Shadows and Spirits Warwick Grigg was unable to bring his Silver Wraith 11 as the battery disliked the cold weather and wouldn't play. Bill Fleming had a similar experience. It was good to see them along despite their recalcitrant cars. Warwick mentioned that he intends to remove both his starter motor and alternator for overhaul. That began a small discussion on the pros and cons of what was involved and why it should be done. Bill pointed out that he intended to do the very same with the Spur noting that the items have been on his car for almost twenty years and probably have not been touched. Fixing it before it breaks is not a bad idea. According to Murphys Law, if they do break down, it will be in the middle of heavy traffic during a heatwave, or after a trip to the supermarket where you stocked up on fish, with a flat battery in your mobile phone.

The day wound down with the drawing of raffles and the awarding of trophies. We missed out on the raffle prizes and the Perpetual Trophy for People's Choice of Best Car (even though I voted for my car several times!!!) and even for runners up. We were beaten for most cars too. But we won the trophy for Best Presented Club. We were all very chuffed.

Modesty (and the fear of being branded "a gloater") prevents me from being too over the top about it, however, it was very nice to see that people other than the owners like our cars. I for one am quite proud of our group's efforts. All monies collected go to the "Adults with Cancer - A Simple Wish" charity, a worthy cause indeed.

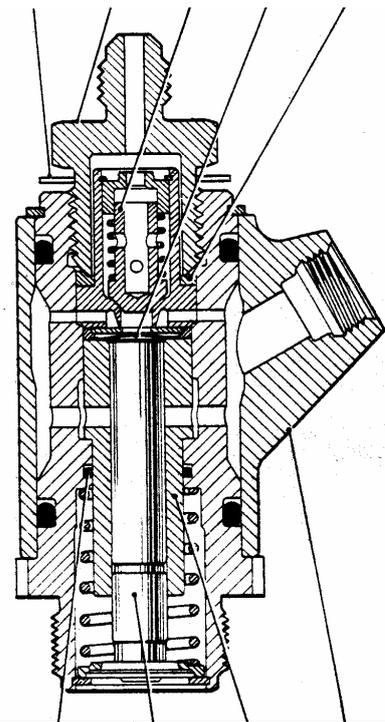
Thanks for the invitation must go to Steve Rowland and Frank Kelly who worked like mad as did their willing assistants. Congratulations too to the rest of the team at the Chevie Bowtie Club for the fifth -successful John Grannall Memorial Charity Day Car Show. Smugly, **George S.**



RR363 ????

When Rolls-Royce opted to use many of the hydraulic bits invented by Citroën they created a lubrication need that had not been seen before in the automotive world. This was a requirement to keep the plunger pumps well oiled while pumping this very thin brake fluid up to pressures approaching 3000 psi and temperatures nudging the boiling point of water. The initial recommendation, Castrol Girling Amber Brake Fluid 1738 was used until the late sixties until Castrol came up with the now well known RR363 which was used until the advent of the Silver Spirit in 1980 when the hydraulic systems changed to mineral (LHM) fluids. Prior to that the factory introduced LHM into some small production derivatives. The change was not without drama since LHM was a fairly novel application for hydraulics. The greatest hazard was the ignorant adding conventional brake fluid to the system and effectively ruining the car. This was countered by the use of wired and sealed filler caps and labels on every conceivable component.

But to get back to the RR363 this was pedaled around the Clubs almost as a mantra. To this day new owners writing on the various web forums will enquire whether RR363 is compatible with DOT3 and DOT4 brake fluids and the advice has always been stick to the RR363 which was developed for the purpose. The main worry is keeping the plunger pumps lubricated; if they are not wear can be incredible and pumps are very expensive items to purchase.



Cross section of a mineral oil pump – only differing in detail from that used for the RR363. Contemplate the central plunger's activity and the need for lubrication.

Some little time ago our very own George Shores attended a seminar in the Hunt House – the repository of most things Royce and talk came around to the growing experience of hydraulic

clicks, bumps and thumps in Shadow systems which had not been there before. Moreover pump wear seemed to be on the increase even allowing for the age of these cars.

Further enquiries have found that some little time back a component of RR363 was no longer available and that the RR363 that we started out with was quite different to that being sold today. The Citroën people were obviously as concerned as our people and now the enquiry is becoming quite public. David Gore the Club's Technical Officer who is professionally qualified to pursue this matter is doing so with great vigour. Watch this space.



FROM ACROSS THE TASMAN



Roy Tilley, the Technical Officer for our sister club in New Zealand sent a number of pictures of a self levelling valve before and after. A not particularly accessible component, it is generally reliable except for the occasional seal failure evidenced by a drip on the garage floor about a foot ahead of the rear wheel. One is fitted to each rear swinging arm through the link shown at left which works the lever and in turn moves the internals of the valve to direct fluid to a ram or allows the fluid to exhaust to the reservoir. The link shown you will notice has two rubber boots to protect the swivel joints inside. These need cleaning and greasing from time to time which is straight forward. The screws and lock nuts seen at either end of the link can be released and the link lifted off. The only precaution is that the lever from which you detached the lever should be left where it is. If you swing it far enough from the datum position it will disengage from the pistons inside and the whole thing will need to be taken apart to reset it. The clinch bolt gripping the operating shaft is where the levelling valve is set. Holding the shaft with a screw driver inserted in the slot shown and moving the lever around the shaft will determine when the levelling valve will start to do its thing relative to the car height. Never use these valves to correct sagging rear springs. The correct adjustment is with the car at the correct height (by virtue of the rear springs) and unloaded the height control valve should just be about to work. The limit of the system is by the way about 600 lbs. So putting 20 bags of cement in the boot will merely make the rams extend to their limit and the springs to sag as predictable.

WHAT IS THE TEE-ONE GROUP?

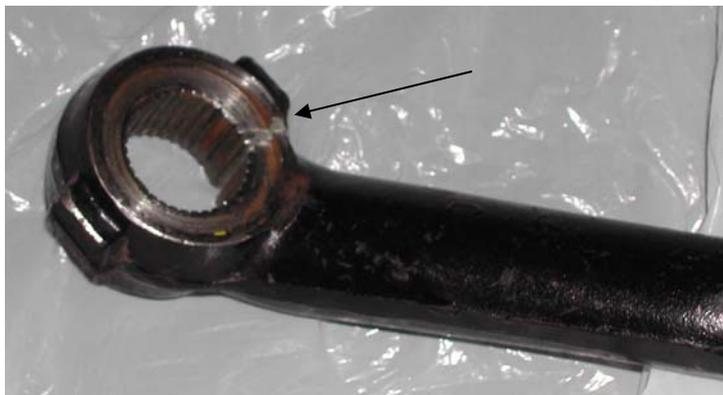
The Group is an amorphous collection of members who get together to fix their cars and help other owners maintain theirs. Our 'membership' extends across every Branch of the Club and our activities while usually in Canberra can be organised anywhere in the country if someone can get us to the site. We contribute to the Australian and US web sites with diagnostic and advisory help and publish this monthly sheet for the benefit of anyone who wishes to subscribe to it.

GEMS FROM BOWRAL

Malcolm Yell no doubt assisted by his lovely wife Lorraine organised a quiet Winter nosh in his home town on the last weekend in July. The weather was just wet enough to allow you to have a dirty car without being sneered at and although the writer did not partake of the myriad of activities the indefatigable Yell organised, it was clear that the sixty odd attendees thoroughly enjoyed themselves. My mate Peter and I sallied forth in the new chariot accompanied by the resolute George and arrived for the cleanest technical session I have ever attended. Presided over by David Gore the Techno/Supremo, the two principal sources of information were the Sydney based John Vawser and Neville Vasallo. John was weaned I believe in a Rolls-Royce and a transmission has yet to be made that Neville hasn't sorted out. So there we sat in a salubrious lounge waited on by bar-people determined that we could not claim to be sober until the following morning and all tried to out do each with our respective horror stories about THE CARS!!! Well John and Neville quickly out did the best of us and we retreated to hear a prediction of what is really going to happen to our wallets! Some of the goss that I remember follows:-

DIPPING YOUR STICK Readers of the NSW monthly publication 'London and Derby' will be aware of the extraordinary story of Malcolm Yell's car a Shadow II which on receipt Malcolm was advised not to speed because the car tended to smoke a lot. The essence of the story was that by accident Malcolm discovered that the car had a faulty dipstick and that when filled to the indicated mark, the sump was actually significantly overfilled. Well coincidentally John Vawser added to the story with accounts of similar tales. You would think THEY could get the dip stick right wouldn't you after some 45,000 engines!!!! John's advice was empty the engine and drain it well overnight, change the oil filter put precisely the correct amount of oil down the chute then run the engine to fill all the galleries and leave the thing to settle overnight. Next morning see where the oil level is on the dip stick. I did this with the new beast and overnight the level did indeed nudge the 'MAX mark on the dipstick. But that was overnight. Now I envisage you pulling up to refuel at Gundagai after a fast trip up from the the big M, checking the oil after your cigarette and finding the level half way between 'ADD' and 'MAX' and without hesitation hurling a litre of the good stuff down the tube marked 'OIL'. You will I believe have just overfilled the sump. And thereafter the rotten thing is festooned in beads of Castrol's best efforts and the rest of the chassis is bathed in an oily vapour. If I may present a little empirisis I did this precisely and ignored descending levels on the dreaded stick. After some 700 miles the base of the sump is devoid of oil as is the trailing chassis. The lesson therefore is be very circumspect about pouring oil into these gaping maws but don't starve them!

THE PITMAN ARM DEBACLE



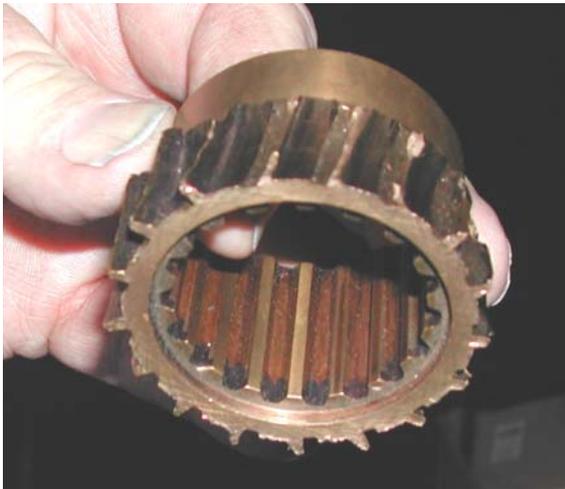
This was more closely guarded than Bin Laden's electoral records. It seems that chassis into the mid seventies had a lighter section Pitman Arm than later cars. A few owners and drivers parked up against a curb or trapped in the runners of an automatic car wash suddenly found that they had lost contact with the front wheels. The fault was traced to a snapped Pitman Arm, the very arm that hangs off the steering box and pushes the steering levers in the direction you wish to proceed. My father who

would be 103 if he were alive used to regale me with stories of broken Pitman Arms on cars manufactured circa 1920 and the dreadful accidents that ensued. So to have such an event in the second half of the last century was startling, to employ the best techniques of understatement.

Last century (I like saying that) I had three such events in Canberra – all thank God at near nil speed. The cars by arrangement were flung onto a transporter taken to the then agents in Sydney a new arm fitted, the car serviced and there it was waiting for your arrival – no charge! Not anymore methinks!



LOOK MA – NO BRAKES !



Pre-Shadow cars used the quaint Hispano-Suiza mechanical servo system for operating the braking systems. For those not familiar with the system the Factory installed a stout shaft across the rear of the car's gearbox connecting it with the output shaft by some beautifully crafted gears and used the end of the shaft to drive a simple clutch to apply the braking systems. Now after nearly 40 years the beautifully crafted gears are feeling their age to the point John Vawser informed us, of stripping the bronze gear driving the whole shebang! I believe you still have brakes but not much so those with the Clouds and earlier models check the servo shaft. A crude but effective test is

to apply the handbrake, get under and put a ring spanner on the end of the bolt that holds the servo on the shaft. Swing the spanner back and forth and if there is noticeable back-lash get the thing out and see where the wear program has got to!



YOU ASKED FOR TRIVIA

A cat has 32 muscles in each ear.

A crocodile cannot stick its tongue out.

A dragonfly has a life span of 24 hours.

A goldfish has a memory span of three seconds.

A group of geese on the ground is a gaggle; a group of geese in the air is a skein.

A "jiffy" is an actual unit of time for 1/100th of a second.

A shark is the only fish that can blink with both eyes.

Almonds are a member of the peach family.

Babies are born without kneecaps. They don't appear until the child reaches 2 to 6 years of age.

Cats have over one hundred vocal sounds. Dogs only have about 10.

Did you know that crocodiles never outgrow the pool in which they live?

"Dreamt" is the only English word that ends in the letters "mt".

February 1865 is the only month in recorded history not to have a full moon.

In the last 4,000 years, no new animals have been domesticated.

If the population of China walked past you, in single file, the line would never end because of the rate of reproduction.

In most advertisements, the time displayed on a watch is 10:10 .

Leonardo Da Vinci invented the scissors.

Peanuts are one of the ingredients of dynamite.

Shakespeare invented the word 'assassination' and 'bump.' "Stewardesses" is the longest word typed with only the left hand; lollipop" with your right.

The average person falls asleep in seven minutes.

The Bible does not say there were three wise men; it only says there were three gifts.

The giant squid has the largest eyes in the world.

The longest one-syllable word in the English language is screeched.

The microwave was invented after a researcher walked by a radar tube and a chocolate bar melted in his pocket.

The only 15-letter word that can be spelled without repeating a letter is "uncopyrightable".

The words 'racecar,' 'kayak' and 'level' are the same whether they are read left to right or right to left (palindromes).

There are 293 ways to make change for a dollar.

There are 336 dimples on a regulation golf ball.

There are only four words in the English language which end in "dous": tremendous, horrendous, stupendous, and hazardous.

There are two words in the English language that have all five vowels in order: "abstemious" and "facetious."

There is a word in the English language with only one vowel, which occurs five times: "indivisibility."

Tigers have striped skin, not just striped fur.

TYPEWRITER is the longest word that can be made using the letters only on one row of the keyboard.

Your stomach has to produce a new layer of mucus every two weeks; otherwise it will digest itself.



The Blue Beast.

(It was with considerable reluctance that I included the following by George Shores but when I realised how flattering it was I had no option!)

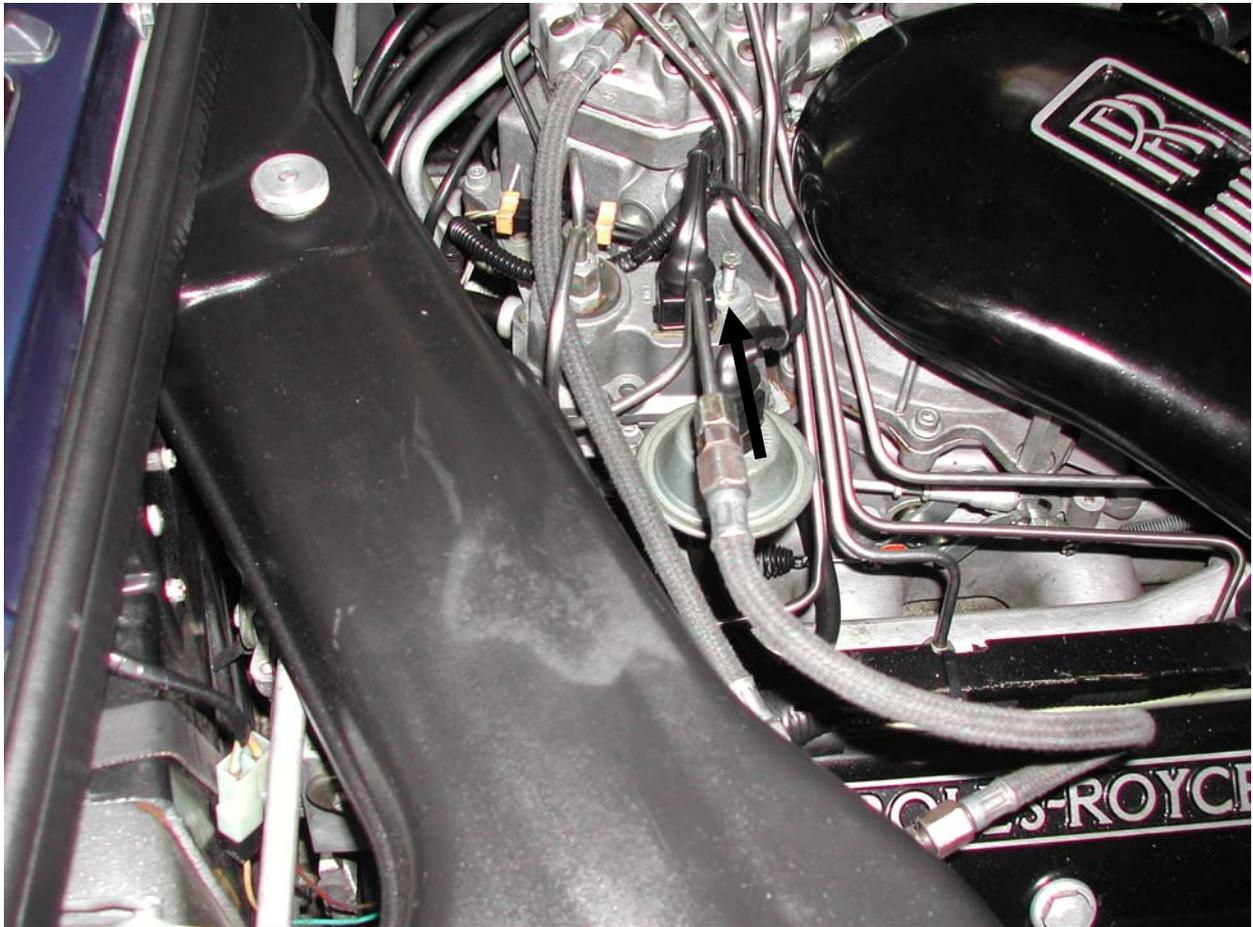
Peter and Bill have a Rolls-Royce. And what a car it is. A 1984 Silver Spur, it is a fine example of luxury motoring at its enviable best. Peter had spoken to me on several occasions on the advantages and disadvantages of making such a purchase, then one day last year, he test drove David Gore's Corniche convertible. He was quite delighted and I like to think that it was about then that he was (what else?) 'converted' from a wannabe to a haftabe.



The Blue Beast as George has christened it. Built according to its codes for the Middle Eastern market I fancy it was originally delivered to Osama. Not in its original colour which was a darker blue, the car appears to be utterly original with no rust under-body bumps or even dirt. But even so there are a myriad of things to do to it all of which as George foreshadows will be recorded to my captive audience. It is pictured here in front of the palatial mansion of our self styled 'Treasurer' Neil Garvey whom I suspect covets the vehicle!

Bill, on the other hand was an old hand at ownership of our wonderful marque, having owned and restored such cars as the Silver Dawn and the S2 Bentley. The latter languishes at home quietly and patiently waiting for him to get over this new infatuation and return to his true love. And Bill, if you think I'm being fanciful, I remind you of the time that we all attended a club luncheon at the Country Comfort Inn at Murrumbateman when the proprietor was offered a ride in the car of her choice for the excellent fare provided. She chose the S2 without hesitation and it wasn't the food that puffed you up that day.....It was pride, so don't forget "Old Faithful"!!!!

Peter had been concerned about the costs involved, having taken note of the conversations at the many meetings held at his home, and seen first hand some of the bills Bill received from dealers who supplied spares to him for his and others' cars. I pointed out that with his experience, Bill would choose wisely and that most repairs would only incur the cost of spare parts as any labour would be provided by him. Peter agreed, and when looked at from that angle, the ownership of a Rolls-Royce daunted him not.



Yet another Rolls-Royce has moved to Canberra a very nice 1988 Silver Spirit complete of course with the dreaded Bosch fuel injection. For those not familiar with the system fuel is squirted into the intake manifolds just short of the inlet valves rather than throwing a bucket of petrol into a wind tunnel as with a carburetter. The Bosch K Jetronic system is mechanical as compared with the more favoured electronic systems. Porsche among others use this but apparently of late the system has had difficulty in meeting the emission standard imposed today. The picture was taken during the quest for poor hot starting – a not unfamiliar problem with the system. But here we see a small amount of butchery presumably done by a professional whereby a locked adjusting screw has been inserted as a local modification.

I don't think that they set out to find one, rather they were receptive to the idea, so that when the opportunity arose, they rose as a trout to a well cast fly. Wow, this Nyrang Hermitage '85 is making me verbose.

The truth of the matter is that when Bill was asked (by a fellow Tee-One enthusiast) to look over a particular 1984 Silver Spur, he gave it a very thorough examination. He reported the condition of the car to the prospective purchaser who, though keen, was distracted by other financial considerations at that moment. The sale did not proceed and having seen the car's potential, Bill quietly made an offer of his own, which was duly accepted. Oh well, Steve, one door closes and another opens. So what mate, you'll get to drive it many times and you won't even have to pay for the fuel. I did that very thing on the way down to the delightful weekend at Bowral (held by

the Sydney Self Help Group) and what a great car it is to drive. Poor Bill. Although I told Peter how impressed I was with the car, to Bill, I played parsimony to perfection. Not a compliment passed my lips causing his lower one to droop alarmingly. Sorry old bean, it seemed funny at the



I hope you can identify where you are on the same car. The rubber-wrapped round bundle to the left is the fuel pump for the fuel injection system. Fuel as is the practice on nearly all cars today circulates continuously. If the carburetters/injectors don't want it it goes back to the tank through restrictors until it is needed. To the right is the fuel accumulator – in this case the most likely villain in the system. Since the pump only works when the starter is operating, it is necessary to keep a pressure head up to the injectors when the engine is switched off. This is the function of the fuel accumulator. The starting problem does not occur when the engine is cold since a separate system provides fuel for this condition.

time. My stunt did backfire on me though. Peter and Bill shot through on Sunday without warning me and so I missed out on a drive back to Canberra. I had to settle for that loose formation of nuts and bolts that I rather grandly refer to as my car. All must be forgiven though, as I received a call yesterday, from Bill, informing me that he had just acquired a 5 litre tin of RR 363 and it was mine. What amazing generosity after my naughtiness. For the information of those who are not aware of the significance of the gesture, the old supply of RR 363 came in 5 litre cans while the new stuff is in plastic 1 litre bottles. There is serious conjecture as to the suitability of the new formula so old RR 363 is like vintage wine, scarce and expensive. So thanks Bill, old mate, owner of a magnificent Georgian Blue Silver Spur.

Back to the car. I won't go into detail here as over the next few issues of Tee-One Notes I'm sure there will be adequate coverage of it to make us all feel part owners of the blue beast. There are several important advantages to be enjoyed by fellow members. For those who already own Spirits/Spurs, Bill will sweep you along on his voyage of discovery as he brings his car up to the highest standard. He has assured me that all will be recorded and revealed in the Tee-One Notes

as it happens. Spirit owners will learn much more about their cars now that Bill has one. As for potential owners, very soon you will have an excellent example to use as the benchmark when searching for “the one” just as Shadow enthusiasts used John Begg’s and Eric Hart’s cars.

I’m done. See you at the next working bee or run

George S.



IDIOTS ABOUND

Striving to get the Blue Beast fundamentally serviced I have so far flushed the hydraulics replaced the accumulators changed the engine oil and filter and the oil in the back axle. The transmission is always opened on a strange car since examining the bottom of the oil pan can be more frightening than a clairvoyant reading your teacup.



The new filter and the supply pipe that plugs into the case. The grommet at the base of the tube is firmly installed in the filter casing but the O ring at the top of the tube is easily overlooked. Having recently read and heard reports of these filters disintegrating with age and blocking off the oil supply, I have committed myself to an annual change. Filters are cheaper than transmissions.

And so it came to pass, off with the pan – no nasties so back with it including a new filter and sump gasket. Smug and self satisfied I set forth to the local hamburgery and had to stop for some traffic only to be treated to volumes of smoke pouring out from under the bonnet. Frantic switching off and inspection revealed the very hot ‘A’ bank manifold covered in transmission fluid. Must have got the fill level wrong I decided. Readjusted it and had the same thing happen three times. The fluid was being pumped out of the filler pipe at the right rear of the engine apparently with enough pressure to lift the dip stick partially out its tube. Opened the box again after consulting numerous specialists and discovered that while crawling around

under the beast I had omitted to replace an 'O' ring at the top of the supply tube between the filter and the casing. Although the tube is a close fit in its hole it apparently could suck some air into the system. This built up until the accumulated pressure of air simply blew out the filler tube taking a lot of oil with it!

Ready to leave the country in disgrace I confessed my incompetence to a much valued professional who told me of one of his past experiences that even eclipsed mine. I felt much better!



FRACTURED DOUGHNUTS



From the advent of the Spirits the cars seemed to be plagued with differential whines. No amount of adjusting seemed to fix the problem until the factory gave Hardy Spicer universal joints away and fitted rubber couplings to the propellor shaft. The noise it seemed was amplified by echoing up the hollow tail shaft and this was prevented by the insulation of the rubber in the coupling (affectionally known in the trade as the doughnut! But they are not as durable as the Spicer joints and the accompanying picture shows the ravages of wear on one of these units. The joint shouldn't come adrift in the event of failure since there is a spigot between the two members to prevent this!

But if it does start to break up you will certainly know. The message here is check or have



Just a note to be aware of your car's needs as regards antifreeze if you live in the colder regions. Even so you need at least inhibitor in the cooling system to prevent corrosion in the engine. And no, the picture was not taken in Canberra

checked the condition of the coupling say once a year and if you are going on a long trip certainly have a good look before you set out. These items are generally not available half way

across the Nullabour! The other advice I have received on these bits is that it is not unknown for the the securing bolts to loosen – again setting up a vibration to be remembered. The Factory introduced special serated-head bolts and nuts as a counter measure but I suppose a little Loktite wouldn't go astray.



POLITICS AND SPEEDOS

The new blue beast for reasons best known to the Arab world, enjoys an imperial speedometer. Having grown up with rods poles and perches, sixty miles an hour means much more to me than one hundred kilometers per hour. Similarly when you were 'doin' the ton' you certainly were aware of those mile posts flashing by. But as an aside I note to this day that after nearly 50 years of metrication the male of our species still prefers imperial measure to metric for a personal dimension. Enough digression. The idea of replacing the blue beast's speedometer with a metric unit really appeals to me and in my public quest a North American correspondent sent me a reminder of the early days of Ralph Nader's world in that country.



“ I have a similar problem with my North American issue Spur. Some dam fool in our government decided that if the Speedo only displayed to a maximum of 70 MPH, and we placed an orange coloured (SP), just for you, 55 at the 12:00 O'clock position, we would all drive at 55 MPH and save gasoline (petrol). Billy the preacher Carter was in charge at the time. He said, during an interview with Playboy magazine, that he only lusted in his heart, but that's another story. Clinton... we won't discuss. I have decided to keep originality over replacing the Speedo. Also, the cost in the US took my breath away. My parts manual shows only one generator for all models from 1981 through 1989. I would think that the signal generator would be OK, and just change the head.”

with an orange overlay. But before we condemn the American bureaucracy one should remember the damn fool direction by their Australian equivalents by directing that speedometers for this country had to be smaller than the standard. This was because the powers that were, decreed that the whole dial had to be visible at all times!!!



FROM NICK LANG



Nick has been appointed Registrar for the Shadow Group and is about to move into his own business. But that has not stopped him sending in some interesting observations on the Shadows, the latest of which follow.

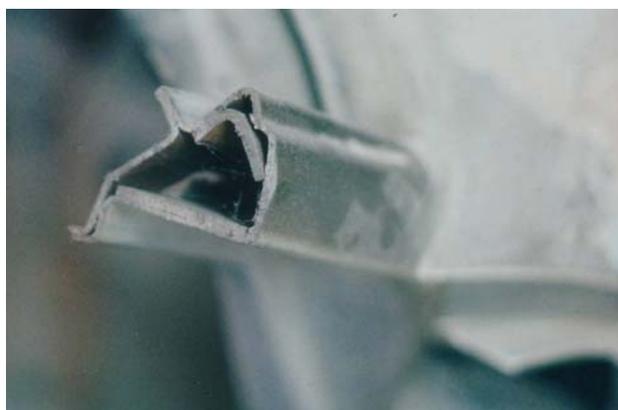
Here is a VDO temperature gauge fitted in lieu of the standard ammeter. Probably not

a bad idea since if the alternator stops charging the worst problem you will have is a flat battery. If the engine overheats your worst problem could be pennury! Temperature gauges were taken off the Shadows with the enlargement of the engine to 6.75 litre. Allegedly this was because owners got very nervous at the apparently very high temperature at which the engine runs..



To the left – the end of the line. A Shadow being cut up for parts by drilling out spot welds. Keen eyes will spot the kinked ‘rail’ just to the rear of the left hand toe board presumably from a really decent front ender at some time.

And below we see an ‘A’ post cut open to show the reinforcing internally. These are incredibly strong members yet never publicised by the spin doctors. Mercedes and Volvo boast of the safety of their vehicles I suppose Rolls-Royce just expect customers to take it for granted.



Here we are in the boot of an early Shadow. The suspension ram is to the right and to the left of the reinforcing bracket is a gadget that came out with the intention of brightening the stop lights in day light. Actually it was actuated by switching on the side or head lights which caused the lights to dim. I am not aware of any other car trying this trick. It was not successful because the dimming units were unreliable and if they failed you usually finished up with no stop lights!

THE NEW PHANTOM (Continued)

(This seemingly interminable description of the new car is still read by many. It certainly is a lot more informative than anything issued on the old cars. I have lifted it from a press kit I bought but if any reader is sufficiently keen send me \$10 and I will copy the disc to you. My address is Post Office Box 8 MAWSON 2607 ACT Australia. Read on in the meantime.

Chassis

The long wheelbase and rigid body structure help guarantee superior primary ride comfort, but the Phantom has also been designed to appeal to the demands of the driver as much as the passengers.

A subframe-mounted, all-new front suspension layout is based on the double wishbone principle, and features a tension link and lower control arm with a high mounted wishbone. The wishbone has a real pivot while the tension link and lower control arm have a virtual pivot enabling a small positive scrub radius to minimise steering forces.

The subframe is fabricated from steel tube, diagonally stiffened and rigidly mounted to the body at six points. Rack and pinion steering with speed sensitive variable rate assistance is mounted to the subframe, forward of the axle.

Oriented towards ride comfort and low transmission of noise, the front suspension also ensures neutral handling and stable behaviour under braking. Exemplary straight line running is matched by balanced steering loads while a hydromount in the tension link damps out wheel vibration which could otherwise be felt through the steering wheel.

At the rear, multi-link suspension with an integral control arm fulfils the demands for comfort and stability as well as providing the good anti-lift and anti-dive characteristics expected from a Rolls-Royce.

Also mounted on a subframe – aluminium in this case – the rear suspension controls the wheels via four links and features passive rear steer. The suspension arms are aluminium with the lower cast swing arm sitting parallel to the road where it has an aerodynamic effect in smoothing the flow of air from the back of the car.

The subframe is located by four large bushes, which isolate chassis-borne driveline noise and vibration from the structure, and forms the mount for the rear anti-roll bar, which is attached via roller bearings.

The rear differential is suspended in rubber bushes at its front and rear, the rearmost bush having a variable rate characteristic to provide different vibration responses vertically and horizontally.

Air springs on all four wheels help provide the cossetting ride expected from a Rolls-Royce. Automatic level control provides a constant ride height no matter what the payload, as well as uneven load compensation side to side, levelling the attitude of the car if only one of the rear seats is occupied, for example.

The system also allows the driver to raise the ride height by 1 inch (25 mm) to provide extra clearance for ramps. If the driver forgets to reset the ride height, the system reverts automatically once a speed of 40 mph (60 km/h) is reached.

Continuous control for the electronic dampers gives minimum damping forces when the car is running straight on smooth surfaces, but higher forces are applied over uneven surfaces or when cornering. The system monitors both the way the car is being driven and the road conditions a 100 times a second, then adapts the damping forces automatically. The system's reactions are so fast that at 60 mph the dampers optimise their settings every 12 inches.

An integral part of the chassis is the adoption of the Michelin developed PAX tyre system – the Phantom is the first car in the world to feature the run flat system as standard.

Special beading ensures the tyre will not come off the rim even if there is a sudden loss of pressure. By incorporating a solid composite band within the tyre, control can be maintained as the tyre never fully collapses.

As well as obvious safety-at-speed considerations, the major benefit of PAX is that the Phantom will never have to be stopped in an exposed or dangerous position if a flat tyre occurs – it can simply be driven home or to another safe place to await a replacement. A spare wheel is not carried.

The run-flat capability is at least 100 miles at 50 mph when the car is fully loaded. Because a loss of air might not otherwise be detected by the driver, the system incorporates a tyre pressure alert on the dashboard.

The wheels and tyres themselves are not only unique to the Phantom but, with a diameter of 790 mm or 31 ins, are also the largest to be found on a current production passenger car. The tyres themselves have a high aspect ratio chosen for the optimum ride comfort.

Massive 374 mm (14.7 ins) ventilated brake discs are fitted at the front with 370 mm (14.5 ins) ventilated discs at the rear. The braking system incorporates two-piston alloy callipers at the front and single-piston callipers at the rear, as well as the latest generation four-channel anti-lock system. An electromechanical parking brake is fitted, which is automatically applied when the gearbox is moved to Park.

As well as electronic damping control and anti-lock brakes, the Phantom benefits from a raft of modern electronic chassis and stability control systems. The anti-lock brakes are supplemented by emergency brake assistance which ensures maximum braking force is applied immediately in an emergency.

Using sensors measuring engine, road and wheel speeds as well as vehicle yaw, dynamic stability control uses the anti-lock brakes and engine management systems to prevent wheel spin and reduce the possibility of loss of control, while cornering brake control regulates the anti-lock brakes to ensure a chosen course is maintained when braking in a corner.

Safety and peace of mind

The Rolls-Royce Phantom has passed all current and anticipated crash test requirements with flying colours. The aluminium space frame gives significant benefits in occupant safety. Front impact loads are progressively absorbed by crumple zones and directed into Y-shaped chassis members and the main understructure. Side impact intrusion is minimised by the double floor, strong side sills and impact beams within each door.

On-board passive restraint systems include three point seat belts on all five seating positions, belt pre-tensioners and belt force limiters on both front and the outer rear seats and active head restraints in the front.

Intelligent Safety Integration System (ISIS) uses a decentralised optical network of sensors to permit intelligent triggering of the airbags. Dual stage front bags are complemented by door mounted side airbags in the front and window airbags running the length of the interior. No side airbags are needed for the rear passengers who sit inside the body structure rather than beside the rear door.

In the event of a collision of sufficient force to deploy a front airbag, the main electrical power supply is disconnected to avoid the risk of an under bonnet fire. As well as the advanced electronic chassis stability and braking controls, active safety features include faster reacting LED brake lights. LEDs also have the benefit of long service-free operation. The bi-xenon headlamps incorporate automatic self-levelling and power wash.

(To be continued)

RETRACTION

In the June edition on page 346 I made the statement "Generally we are covered by the Federal poloicy of the RROC as all our functions are now promulgated and approved by the Federal Executive. Our Federal President Bryan Inder has pointed out that this is not correct. Through my loose mouth I use the term 'federal' as meaning covering all States whereas in the above context, it referred by default to the specific governing body of the Club. I apologise for this misinformation. Since our activities are directly related to the cars and the aims of the Club, when we intend to hold a function be it technical or social I ask the New South Wales Branch Technical Officer David Gore for permission to hold it and if he agrees it is promulgated and takes place under the auspices of the Club. The NSW Branch functions are of course intrinsic to that part of the Club and not the Federal Executive



If undeliverable please return to Post Office Box 8 MAWSON 2607 ACT AUSTRALIA

**POSTAGE
PAID
AUSTRALIA**