TEE-ONE TOPICS

Number 25 June 2003

FINDING OUR PLACE

It is barely two years since George Shores led us out of the wilderness and our little group decided to get down and dirty fixing our cars. Despite predictions that members would leave in droves if we tried to interest them in maintaining their vehicles, the reaction has been one of enthusiastic participation. We have aimed to help any owner with a Rolls-Royce or Bentley car who may have trouble with the vehicle or who wants information about it or who simply wants to have some general knowledge that will enable him

Your portly editor wondering how he got talked into buying this very nice 1984 Silver Spur H10059

to understand the foibles of the Marque and be able to discuss problems with a repair facility. The 'movement' has spread to all States in varying degrees and by practice we seem to have settled mainly in the Shadow/Spirit yard. We endeavour to field questions in any other category but all earlier cars seem to be well looked after with the exception of the Cloud/S series. Post-Spirits are still new enough to need little more than oil changes.

Practically all new members entering the Club come in with Shadows and derivatives as some of these are dropping to very affordable levels. If we can encourage the new owners to work on their cars or at least have an understanding of their shortcomings (the cars that is) we might just save a few more of these cars from the wreckers' hammers.

I have been a little alarmed at talk of us as a breakaway group. I am aware that in certain quarters this pejorative description is used out of simple envy which is understandable given the irrelevance of the authors. But as most will know virtually all Australia based 'members' of our groups are members of the RROC of A and those that are not in the Club I understand will be applying to join the New South Wales Branch in the near future. One other report I should counter is a spurious nonsense published elsewhere to the effect that we were not covered for public risk at the recent 'Wheels' exhibition. How anybody could imagine Shannons, the sponsors of the event, not covering everyone there by insurance confounds me. Generally we are covered by the Federal policy of the RROC as all our functions are now promulgated and approved by the Federal Executive.

I should mention the efforts of our volunteer Treasurer Neil Garvey who has attempted to put some order into our chaos of operation. Many of you will know that I started these notes partly out of sheer bloody-mindedness to prove that there was a population out there that did want to hear about how the cars go together, why they stopped, what to do when they did and what had happened to those that had had no TLC! It has been a most successful exercise albeit at my own expense. Some recipients of the Tee-One Topics have expressed embarrassment at this despite my dismissing them with a wave of the hand but George and many members fronting up for self help days called my bluff and insisted that money should change hands. Neil in a burst of enthusiasm offered to 'shake the can' which immediately brought in the problem of accounting for the money. This he has done admirably. Even more so he encouraged payers to associate themselves with what would have developed into a separate entity from the RROC. After lots of talk the 'members' decided that this was undesirable since the Club has far more to offer than our 'group' could amass and it was felt we could do more for the cars within the Club than outside it. Even so Neil's 'tin rattling' will continue to pay for the toner, paper and postage for these notes. Neil has also relieved us of the dreary task of collation, folding, addressing and postage. So given our involvements with other States in the 'self help area' we seem to have evolved into an amorphous group operating under the auspices of the Club, offering our assistance to those who want it and helping to encourage as many members to take part in what must be the fundamental aim of the movement as a whole – to preserve and maintain the cars! Elsewhere George Shores who must take credit for most of this initiative will be writing about our very successful day on 1 June at our place at Kambah. There was no fire this time which participants especially those from country regions suggested detracted from the excitement of the day but we touched on a wide variety of areas of concern with the cars, had a great time and all look forward to the next function.

These pliers are very common in the junky tool areas of many shops. They are incredibly handy – get a pair.

A MENTAL MEANDER (Cont)

A little historical account of the development of suspension from the day of bullock cart and the role Citroën played. More of relevance is the adoption of the basics of the Citroën system by Rolls-Royce. Co-incidentally I notice that the Phantom has pneumatic suspension, other detail not yet available.

In the 17th century, the French scientist, Mariotte, defined the elasticity of gases as:

> *'at constant temperature, the volume of a mass of gas varies in inverse ratio to its pressure'.(Boyle the great physicist also had a hand in this.)*

Three centuries later, the principle of the pneumatic spring was to be discovered, thanks to this observation. It has properties of flexibility a metal spring cannot provide. To approach the possibilities of one pneumatic spring as regards variation in flexibility, by the so-called conventional methods, at least three helical metal springs, each with different characteristics, would be required.

At a glance this is a common old S series Bentley albeit perfectly presented. Closer inspection will note the one piece air cleaner often seen in Australia but which marks a car as a private import since Australian imports always sported the cumbersome oil bath air cleaner packed down the left hand side of the engine. But a less obvious difference is the front of the air cleaner is tapered and the top radiator hose accommodates a different cooling arrangement. The result is a Bentley Continental rarely seen on these shores. This car was also the first to use a conventional pressurised radiator cap seen here just peeping under the edge of the bonnet.

Now, the type of air spring to be adopted must be determined, as there are two possibilities: a constant volume and a variable mass of gas, or a constant mass and a variable volume. The difference is important. Citroën's hydropneumatic suspension has sometimes been confused with pneumatic suspensions of the former type. This is a mistake; Citroën's hydropneumatic suspension is unique in its kind.

The principle of the current so-called pneumatic suspensions is as follows: if a certain quantity of air is introduced into, or withdrawn from a given volume, then the pressure of the gas will be decreased or increased in proportion. Generally, this type of suspension is combined with metal springs.

It usually needs an air tank and often a compressor to handle the air pumped from the atmosphere and also an exhaust device to allow for the variations of the quantity of air in the constant volume.

This has got to be a concours boot installation in a Spur. Not without some work though. At some time this car carried a CB system and the installer spotting that nice little cubby box in the boot installed their transformer thing therein firmly screwed to the floor. That having been removed, cables snaked their way towards the front of the car and needing to bring them out of the battery box a large piece was broken out of the piece of plywood seen near the petrol tank to allow a large plug to pass through. It apparently did not occur to the installer that removal of the four screws seen here would have allowed the cable through without damage! And so a new piece of wood was made and installed. But not before the battery tray was removed and the whole area was cleaned de-rusted and painted.

The car had very recently had a new battery installed and did not fit in the tray being some 3/8" too long – again some recent lack of attention to detail. Off to my friendly battery man who confirmed that there was a better and shorter battery available and with a lot of chin wringing took the old new one and sold me a new one which fits with ample room either end. The longer battery had been perched on two small blocks of wood to clear the indents seen at the end of the case. They didn't do what has been visited on my local favourite Spirit and simply hack out the ends!!! Finally all the old tape around the cubby hole was replaced, the carpet lining cleaned and the cover boards painted. Bring on the judges!!!!!

Citroën's hydropneumatic suspension is based on the opposite principle: the mass of gas remains constant and the volume is increased or decreased to obtain the corresponding pressure changes. With the Citroën suspension, air is not pumped in from outside, to be routed under pressure into a volume already containing compressed gas. Thus, it cannot be affected by the ambient temperature or the humidity of the atmosphere. It is sufficient unto itself and does without any auxiliary metal spring with the greatest success. Its reliability and the speed and precision with which its springs respond, make it by far the most satisfactory design. This is because it utilizes a hydraulic control device. The Citroën suspension combines the action of a gas (compressible) with that of a liquid (non-compressible).

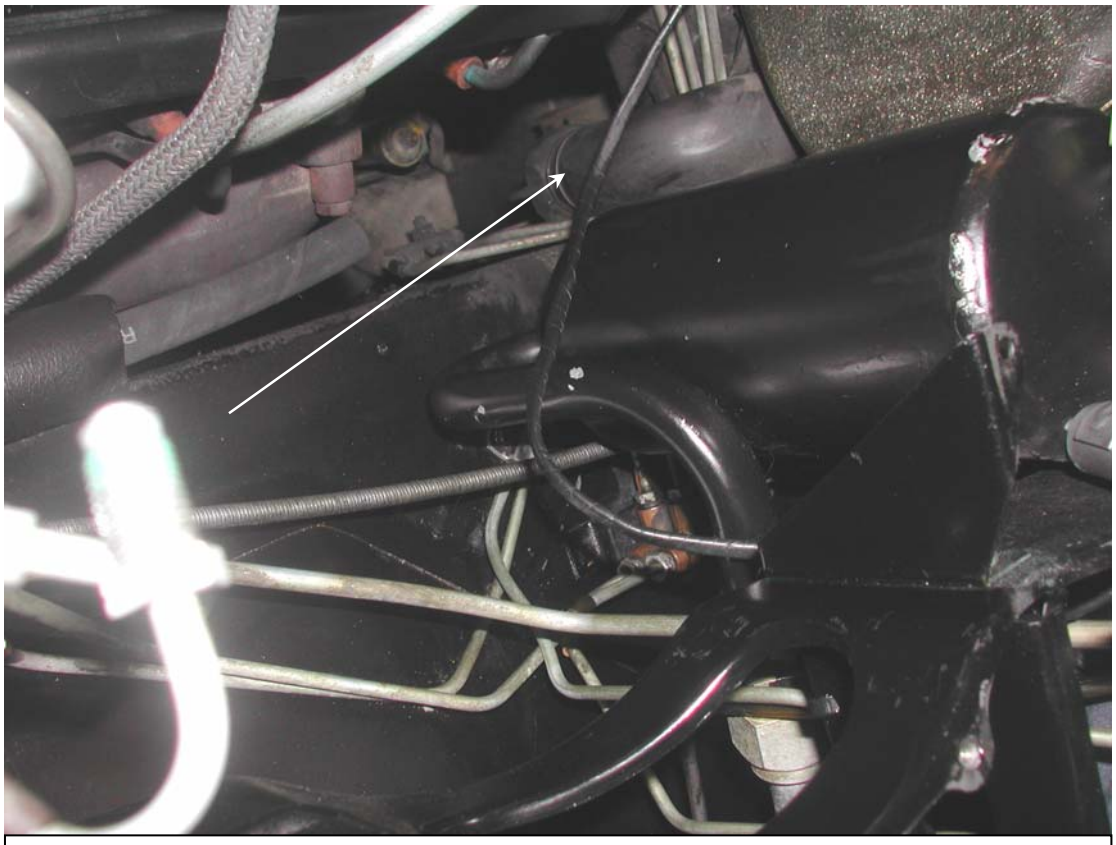
SOME BASIC HYDRAULICS

From the principle that liquids are non-compressible, if a certain quantity of liquid is poured into one end of a tube, the same quantity will be recovered at the other end. This means that, provided the tube is long

enough, a motion can be transmitted to any distance desired, following any path whatsoever, so long as the tube is flexible. The motion can be multiplied or diminished by varying the cross section of the piston in the receiving cylinder, in proportion to the one in the emitting cylinder. It is also possible to vary the speed of the movements by varying the cross section of the tubes. This speed can be adjusted, following a law of continual variation with an accuracy that could never be obtained by mechanical means.

Owing to their flexibility, hydraulics are used nowadays for many applications in very different fields: from old-fashioned hydraulic lifts, to the controls of a supersonic plane, without mentioning all the cranes, steel presses, machine tools, radar aerial controls, battle ship or tank gun turrets, jacks, rams, dump trucks, scrapers, agricultural machinery, lubricating ramps in service stations, etc., and even the base of the Eiffel Tower in Paris.

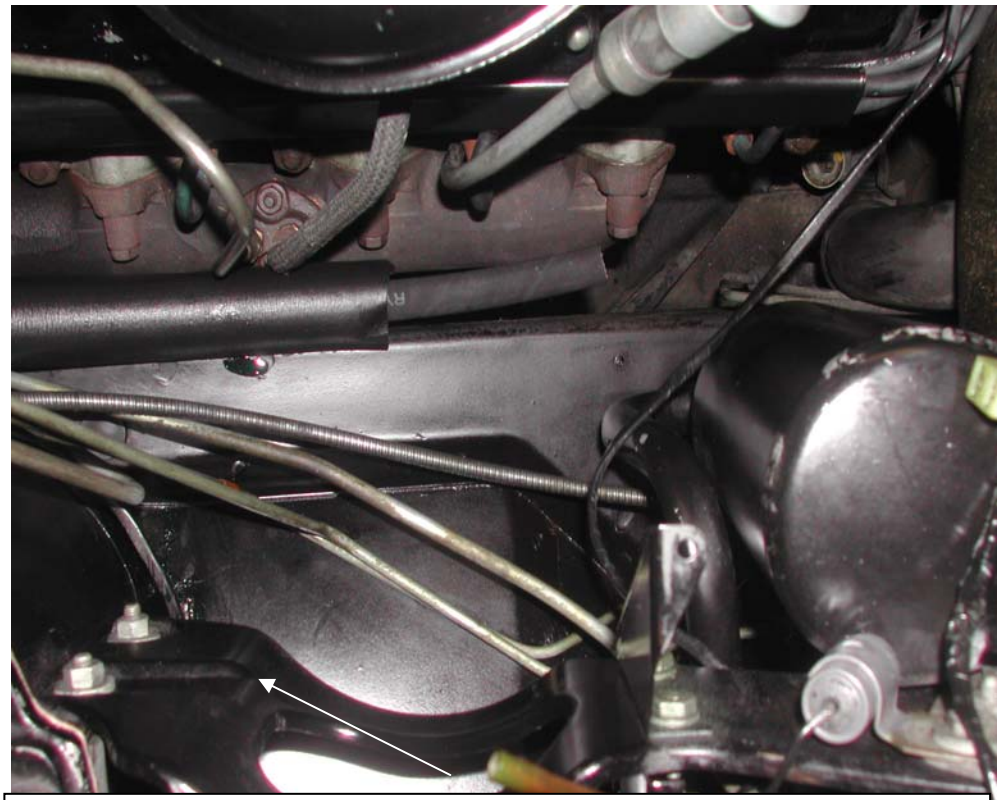
Hydraulics appeared in motor cars some 80 years ago, with the first brake systems. The advantages of hydraulic brakes are so well known nowadays that they are in general use and it is hard to imagine how they could be replaced. At about the same time, hydraulic shock absorbers appeared, as the auxiliaries of conventional suspensions, together with diesel engine injection equipment, hydraulic starters, etc., to culminate finally in Citroën's Air-Oil suspension, Technical trends moreover are evolving towards solutions which appear more complicated from a functional standpoint. It is sufficient to consider the number of devices that would have to be installed to fulfill all the functions Citroën's hydropneumatic suspension performs on its own. In practice, the Air-Oil system proves far simpler than any conventional process which could never succeed in playing so many parts on its own, since all these controls require both precision and power in addition to an almost immediate response.



Not usually this visible, but used on Shadows onwards, this is one of two drain tubes that allow water that gets into the heater intake grill to escape. The end of the tube (the other one is on the other side of the engine) has a rubber teat on it that allows water out and stops dirt getting in. In very dry times the lips of this teat tend to stick together and in the worst case allow water to dam up. The first sign of this problem is a very wet front floor. The teat is best accessed from under the car and usually a bit of a squeeze and a rub will suffice.

HYDROPNEUMATIC SUSPENSION

On the Citroën DS 19 or ID 19, each of the independent wheels is connected to the body by a lever arm, integral with a piston. This piston acts, in a cylinder, on the hydraulic fluid, which compresses, to a varying degree, following the action of the piston, a constant mass of gas in a suspension sphere located above the cylinder and fixed on the body. These spheres do not contain ordinary air as in the majority of other so-called pneumatic suspensions, but an inert nitrogen-gas. A perfectly tight rubber diaphragm separates the nitrogen from the hydraulic fluid, while at the same time allowing considerable changes in volume, owing to its elasticity. Any vertical movement of the wheel acts on the piston, which discharges the transmission fluid into the cylinder and the lower portion of the sphere. It thus acts on the separator diaphragm and decreases the volume of gas to a varying degree following the initial movement of the wheel. The gas then reacts in accordance with the inherent properties of pneumatic springs, i.e. with great flexibility. The hydropneumatic suspension is extremely soft. It is understandable that if the car is loaded, the suspension sphere will move down with the body to which it is fixed and the piston will compress the gas in the spheres, by means of the fluid.



An innovation brought in to the Spirits was to insulate the low pressure feed lines between the pumps and the reservoirs. The material is that used by plumbers on external hot water pipes. The line here to the front pump is ready to connect to the bottom of the reservoir which has been removed for cleaning. The round object to the right is the receiver/dryer for the air conditioning.

If the gas volume is decreased by half in this way, its pressure is doubled. If it is divided by four, the pressure quadruples. It can be seen that the flexibility of the nitrogen sphere decreases very sharply with a reduction in volume.

The hydropneumatic suspension is of the decreasing flexibility type (decrease in flexibility with an increase in load).

Also, the pressure can be controlled by varying the quantity of non-compressible liquid.

The central organ of the system is a high-pressure pump which maintains a controlled circulation in a network comprising a buffer tank, an accumulator and the suspension assemblies, with a return line to the tank. The high pressure pump takes the fluid from the tank and discharges it into the accumulator, via a connector-disconnector (which maintains the accumulator at the correct pressure by opening or closing, as the case may be, the pressurized liquid line from the pump). This assembly constitutes a real hydraulic plant. Why are this plant and this circuit necessary? Because we shall need them to keep the body at all times at the same distance from the ground.

The front wheel support arms are connected by a stabilizer bar, as are the rear wheels. In addition to its normal function as a stabilizer, following any changes in load this bar operates a slide valve which immediately re-establishes the balance of the suspension, by adjusting the volume of fluid, either by injecting liquid from the accumulator (slide in intake position in the height corrector) or by discharging to the tank (slide in exhaust position). In other words, if four people get into the car, the weight increase makes the stabilizer bar rotate and, by means of a control rod, opens the sliding valve in the height corrector, which at once routes the necessary pressure (additional liquid) to the suspension cylinders, to make the car rise to its normal height. The sliding valve is then closed by the stabilizer bar. The suspension cylinders are isolated. When the four people get out of the car, the opposite will occur: the excess liquid being routed back to the tank. The height corrector automatically maintains the car at a constant height above ground level - the reason for Citroën's constant level ride.

Some vandals got to the front lining of the boot on this Spur wrenching the panel away because they were too lazy to undo the two screws holding the panel to the supporting frame behind the rear seat – a not uncommon event. Short of replacing the panel which now had a large hole in it, the careful gluing of a thin steel washer under the carpet covering did the trick and resulted in an improvement on the original. A careful squirt of spray-on adhesive held the carpet back in its rightful place!

The damping action is obtained by having the fluid passage through a two-way restrictor valve located between the cylinder and the sphere. The lamination of the fluid reduces the rate of movement and the result is an almost viscous action, thus extremely sensitive, continuous and progressive, always proportional to the speed of fluid displacement. The Citroën hydropneumatic suspension is thus a self-damping suspension. From the triple standpoint of safety, comfort and appearance, a suspension can only approach perfection, as we have seen, if it offers:

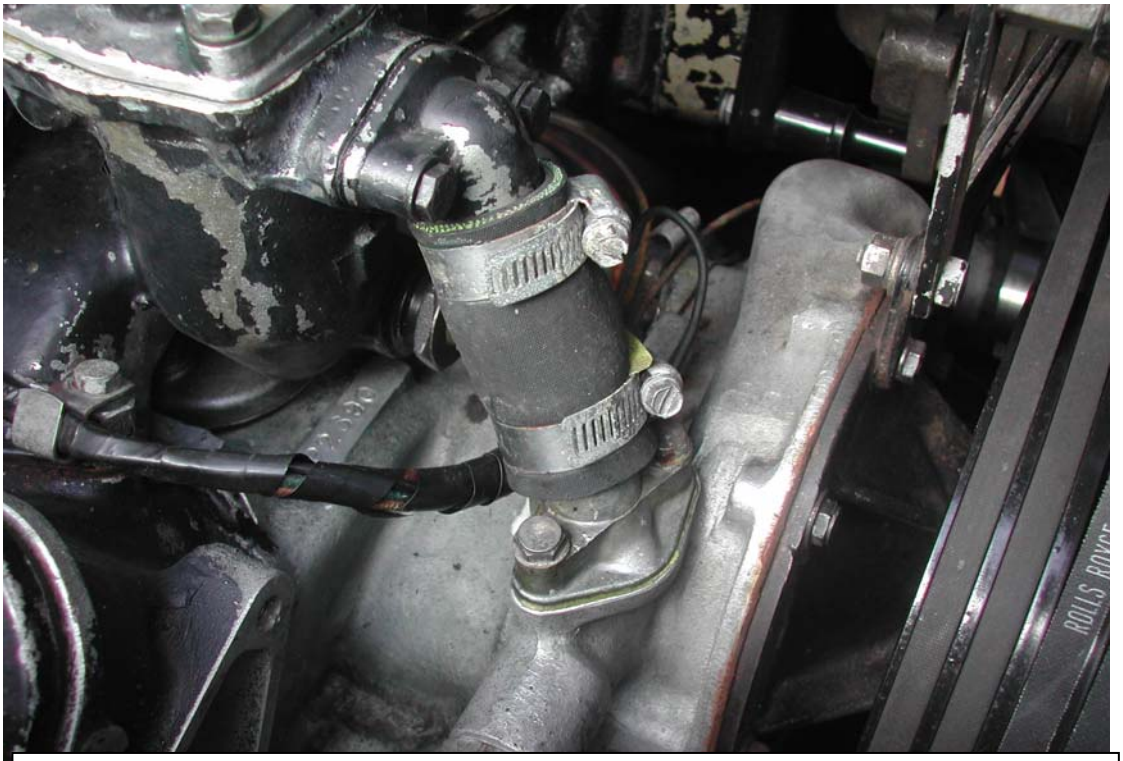
- maximum but controlled flexibility;
- constant ground clearance, i.e. a height corrector;
- continuous shock absorption, remaining proportional at all times.

The Citroën's hydropneumatic suspension possesses all these criteria of the ideal suspension. On account of its permanent and automatic adaptation to circumstances, it achieves this by conciliating an amazing flexibility in a position close to the position of equilibrium, with an ever-efficient shock absorber system. It should be added that the height corrector has been provided with a manual control to enable the driver to increase the clearance at will, on rough ground or to drive over deep snow, for example.

This very convenient device also serves to change a wheel and is an excellent substitute for a jack. (The car is placed in its high position, a crutch is placed on the side of the wheel to be changed to maintain this side

upraised when the car is lowered to its normal position. The wheel is then changed and the car is placed again in high position to remove the crutch.)

In the present state of technical progress, the hydropneumatic suspension is undoubtedly the best. It ensures both the comfort and the complete safety of the passengers. But it has an additional and typically Citroën characteristic: it is better and it is more than a mere suspension: it is a coherent hydraulic network that ensures the overall safety of lD19 and DS19 and is perhaps a pointer to what the car of the future will be.



This little bit of hose is often ignored by drivers and fixers alike. Prior to Shadows this was the means for the vee eight to get the by-passing coolant from the thermostat back to the pump. The thermostat in the housing seen to the left of the picture, when closed directs the coolant through the side of its body and down to the pump impeller, whence it is pushed back through the cylinder block to repeat the journey. As the coolant warms up it heats the thermostat which gradually opens and gradually closes off the by-pass until all is going through the thermostat and up the top coolant hose to tumble down through the radiator getting rid of its heat then out the bottom hose into the pump and back into the block to carry away some more heat. The little connecting hose seen above seems to last forever but don't count on it. Coolant hoses should be replaced every two years for safety and this little bloke is just one of them.

A BIT OF A BURST ON CITROEN

What are the essential features of safety in a car ? The road holding and the brakes. We have seen the vital influence of the suspension on the road holding. The importance of the brakes is evident. Obviously, the faster the car, the more powerful its brakes must be. This is why manufacturers, the world over, have now adopted the hydraulic brakes that Citroën was one of the first in Europe to install as a standard feature in 1934. It is also the reason why disc brakes - far more reliable and efficient than the drum type - seem to be adopted as a general rule on fast cars. Here too, Citroën set the example, as they were the first to fit disc brakes (at the front) on mass produced cars: the DS19 and ID19.

Finally, this is the reason why improvements have been made on the conventional hydraulic system, the latest of these being the introduction of a servo brake, or its equivalent, in the form of an accumulation of potential energy to replace any effort on the driver's part.

But concern for constantly improving safety conditions leads one to investigate the problem of ground grip and in particular the question of making full use of the weight, the distribution of which (displacement of the centre of gravity) varies as a function of the speed of deceleration - or braking. It therefore appeared desirable, or rather necessary, to control the distribution of the braking effort in proportion to the weight distribution.

We are aware of its influence on the springing, and vice versa the influence of the springing on it. Now on the DS19 or ID19, there was both a hydraulic suspension system and a hydraulic braking system. This resemblance was to enable Citroën engineers to establish the essential connection between the brakes and the suspension. Thus, although other designs for the hydraulic control of the interaction between the brakes and the suspension are conceivable, it is logical to come round to the idea of a centralized hydraulic plant, to the exclusion of any other hydraulic application.

This centralization of two vital functions brings out the superiority of mechanisms, which behave as slaves with brains of their own and replace the driver, to act in his stead with a perfection and speed he could never attain. The DS19 has a double braking circuit: the front and rear braking circuits are independent, each with its own pressure supply. In other words, if one of the circuits fails, the other will still work (and save the passengers' lives). Even today, the DS19 is one of the few cars to comprise this feature though it is unanimously advocated by all safety specialists.

When the driver puts his foot on the brakes, a dispenser, controlled hydraulically by the pressure in the rear suspension spheres, distributes the power between two separate distributors. These distributors, lined up on the high pressure system, route fluid to the brake cylinders with a proportionate force. The dispenser automatically determines the braking force on each axle, on the basis of the load, i.e. the weight on the axle.

Though somewhat lengthy to describe, this action is of course instantaneous. On the ID19 a device based on the same principle achieves the same result. Thus, the Citroën suspension not only coordinates the many parameters which make vehicle suspension problems so complex, but also controls and determines the braking force. This is an additional advantage which gives it the envied position of the safest suspension of our time.

It is also a convincing example of the complete safety and genuine functional simplicity obtainable by reasoned application of hydraulics to car design. At the same time, it is the key to the superiority of Citroën's suspension and the reason why it cannot be compared with any other type. The Air-Oil hydropneumatic system is a brakes and suspension assembly unique in the world.

THE FIRST WINTER SELF HELP DAY

George S.

The Cast and their roles:

Peter Chan	Co-host and owner of Silver Spur H10059
Bill Coburn	Co-host and owner of Silver Spur H10059
Gavin Lillyman	Moral and spiritual overseer.
Ken Glover	Long time participant of Tee-One, owner of Silver Spur H6901
Lorraine Yell	The fairer half of the Yell pair. Sustenance co-ordinator.
Malcolm Yell	Driver, advisor, observor, commentator. Lovely Shadow II.
Sally Wells	Peter's better half. Sustenance co-ordinator too.
Peter Wells	First timer. Getting upclose and personal with his Shadow.
Steve Crocker	New "old hand". Nice Silver Shadow.
Darren Smith	Keeping father off the streets and out of mischief.

Peter Smith	Keeping off the streets and out of mischief. Silver Shadow.
Neil Garvey	Tin rattler and general factotem. Silver Shadow.
Eric Hart	Old campaigner. Owns a Concours winner. Shadow II.
Dougie Brown	Eric's navigator this time. Has a silver Silver Shadow.
John Summers	Potential owner. Looking for hints and advice. Will get it here!
Warwick Grigg	Long time member and serious enthusiast.
Wayne Wardman	Video producer and defender of the faith.
Laraine Shores	Conveyor of tools, jacks and stands. Ever loyal.
George Shores	Anti social grumblebum. Loves the cars.
Frank Rodwell	Refugee from Cooma covets an early T1 (sic)
Garry Scorgie	Yass representative with a very nice Shadow.

Winter's chill invaded every nook and cranny on the 1st of June. There is a method in our madness though. Pain can be deferred if skinned knuckles are occasioned when the hands are numbed with cold, so what better time to work on one's car than the first day of winter. Well, that's this group's theory and we are sticking by it.

We had planned and advertised a "nook and cranny" day where owners poked our noses into places where the sun don't shine. Laraine followed me over to Bill and Peter's place to set up for an anticipated handful of zealots. What we got was 'overwhelmed'. Judging from the attendance on such an inhospitable day, it appears that we are hitting the right chord with people. Eric and Doug from Sydney/Caryong(?) beat us there as did the affable Steve Crocker. As we milled around getting coffee and setting out tools, Sally and Peter Wells wheeled into the gradually diminishing hardstand.

Peter Wells having a cigarette over his car and wondering what on earth George Shores' gestures to your author mean.

Eric had complained of an unseemly squeak in his brakes so we decided to look at them first. The car was chocked and jacked in short order and the rear wheels removed. Eric gave the whole assembly a thorough going over to see if he could spot any reason for the noises. He did find a small (match head sized) stone which may(?) have been the culprit wedged in the off side caliper but that was a bit iffy so he proceeded with the removal of the pads. We (i.e. Dougie, Eric and George) had pontificated about the causes and agreed that the pads sometimes were the cause and that the bevelling of the peripheral edges sometimes cured the problem so out they came. Eric removed the spring pin from the retaining pins on the caliper and prised out said pins. Gentle wiggling of the pads eased them from the calipers and Dougie "the rasper" Brown quickly chamfered the edges.

They went back in without any fuss (though sometimes the pistons need to be eased back into their sleeves) and were pinned and clipped, the wheels refitted and the car tested. The noise failed to make an appearance so we proclaimed the exercise a success.

Meanwhile, Neil Garvey and Wayne Wardman had arrived and were getting about the business of "Tee-One" ing. Neil had some difficulty with a recalcitrant washer motor and had enlisted the help of Steve Crocker in giving it a hurry up. Whatever they did was effective because they fixed the fault in short order. In turn, I gathered the clan around Peter Wells newly acquired Silver Shadow and launched into a "how to" removal of the driver's door trim with the intention of showing how the window lifts should be lubricated. Crashing on the reef of my own ignorance, I couldn't get the door handle off. Steve Crocker, flushed from the victory over Neil's faulty washer motor, casually remarked that it probably would be easy if I removed the set screw in the underside of the handle. With a face bright enough to be a fire hazard, I quickly did so and the rest was easy. Anyway, we saw that the internals of Peter's door were in good condition and having greased the window lift chain, on went the trim and door handle. There are no tricks to the front trims although the rear of the later Shadows and Shadow II 's are a bit fiddly and you will need a 5/16th spanner to get the arm rest off.
As that job finished, Wayne took the group and showed them how the stone guard was removed from the underside of his front wheel well. His aerial had packed it in and when he accessed it by removing the stone guard, he noticed some grunge and rust trying to get a hold in the rear quarter of the front mudguard. It occurred to him that there was a definite "need to know" about his little discovery so he proposed to broadcast it at our next get together. So now we do. Thank you, Wayne.

Wayne Wardman (obscured) demonstrating removing the underwear from his Shadow II while a striped Neil Garvey supervises. Eric Hart on the right contemplates, Garry Scorgie to the left of Neil looks on in amazement and Sally Wells wonders what the Hell she has let herself in for!

Commercial break. If any of you do a job on your own cars that may be helpful to other enthusiasts, please speak up. Shared knowledge.....very powerful tool.

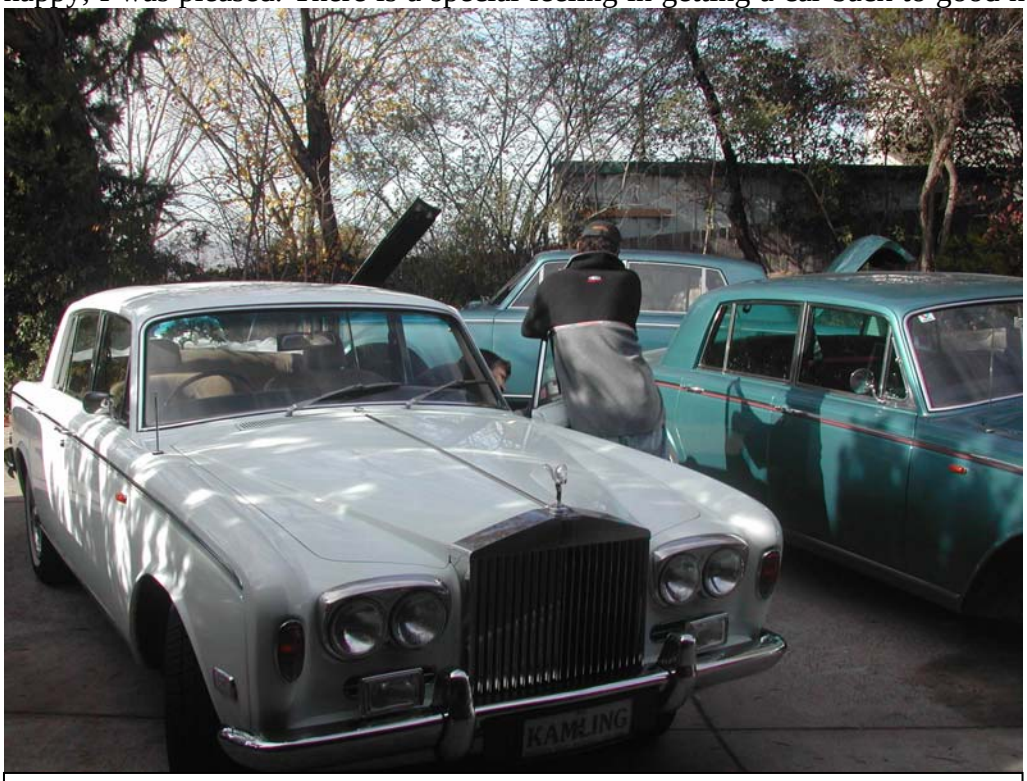
Soon after Peter and Darren Smith arrived, they were accosted by me because at our last get together, Peter had mentioned that the back of his car was sitting low in spite of the heavy duty springs we had fitted. Peter's car was converted to gas as well as petrol and the extra weight of a full tank of gas was depressing! So we agreed that if spacers were fitted to the spring assemblies, the back of the car would be uplifted to an acceptable height. I had removed two 1 cm spacers from my Shadow II some years ago and thought that they would be just the thing to cure Pete's problem.

We removed the R/H spring only to find that the diameter of the collar was smaller in the Shadow II than the Shadow. Darren helped a very disappointed George reassemble Peter's car. By the way, I have since found some appropriate collars and we will fit them soon.

The tape worms began to announce their displeasure at being neglected so we moved into the kitchen where Sally and Marjorie were bravely handling the hungry horde. We all appreciate your hard work ladies. As to the food, Bill had spent a great deal of time and money showing off his cullinary skills (in fact, he stayed up cooking so long the night before that he had no energy left to supervise me).

On a serious note though, we all greatly appreciate Bill's efforts and none more than Eric Hart who claims that it is the food that lures him to Canberra. One must not forget Peter Chan's generosity while I'm at it. His house is perfect for our group though it is with delight that I observe that it is becoming a little crowded!

After the wonderful lunch, Neil and I squeezed our rotundas under his car and replaced the filter and gasket on his automatic gearbox. A simple procedure, as described in a previous Tee-One Topics. He was happy, I was pleased. There is a special feeling in getting a car back to good health. It may not have gone better, but I guarantee it felt better. Didn't it Neil????



Peter Smith investigating the internals of his door while his son Darren ensures that the whole assembly won't fall off.

As the days are shorter in winter, most drifted off at about 3.00 pm. The 'die hards' stayed on to give their engine bays a clean up with kerosene and compressed air. Wayne removed unwanted grime from his engine bay and helped Neil do the same. Steve Crocker (there from the beginning to the end, must have liked it!) intended to do his car but the thought of doing it by feel (the sun had gone home by then) did not appeal. When Neil had completed his engine bay wash, Steve said good night. Fine effort man. Great group spirit.

It was a great day, and to reward ourselves, apart from attending the Chevie Bowtie Charity Day (Sunday,22nd of June at the Hospital Carpark on Yamba Drive (9.00 am to 1.00 pm), we will be gathering to drive and compare each others cars in July. Date to be advised. Cheers, and as Jeff Fenech once espoused, 'I love youse all'.

GETTING THE DOOR LININGS OFF A SPIRIT

The recent invasion of the doors of a Cloud pointed up the need to have some idea of where to go for the various fasteners to avoid damaging the finished product. The Silver Spirit is another variation. Here we see the two screws under the armrest on the rear door that allows the lower half to be removed and the courtesy light threaded out of it.

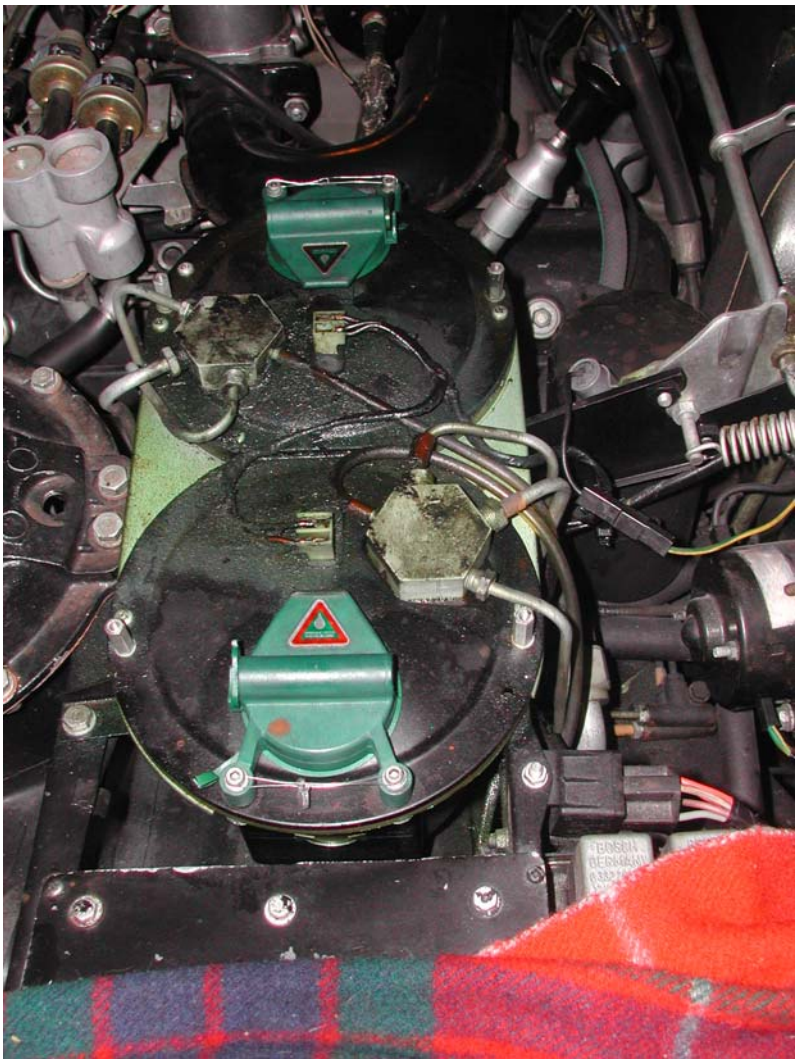
The armrest having been removed, the bottom panel is held on by clips and the speaker cover and surround bt screwed clips. The door handle and switches are pure Shadow.

WHERE THERE'S A WILL ..

One of our self helpers sought help with trying to read the sight glass on his early Shadow reservoir. Given the crud that can build up in these systems it was not an unusual problem but this one resisted all attempts to read the level with the brightest of lights. So the top came off, the fluid was syringed out and voila the problem was relieved. The two screws have been inserted into the holes that feed the sight glass – see them on the other side of the reservoir partition. The sight glasses are simply a shaped piece of glass held in place by a rectangular metal frame with the whole arrangement sealed by a thick neoprene 'O' ring. The frames are behind the instruction plate seen on the outside of the reservoir. The problem occurs in trying to get the screws out that hold the frame to the reservoir since they tend to corrode. The solution is to remove the reservoir to a good bench and sort out the problem there. Someone has discovered this with the above car, found they are unable to get the screws out and fixed a leaking sight glass by blocking the holes.

ACCUMULATORS AND GAS SPRINGS

Noting that the dash board lit up like Luna Park whenever I planted my foot on the brake I decided that a change of accumulators was warranted. The Spirit and all cars using mineral oil sytems use sealed accumulators which are ostensibly not rechargeable. They are cheaper to maintain that the old dismountable units and much easier to maintain. So I call up my friendly dealer man and ask for a pair of accumulators. They arrive and one of them is seen to the right of the picture above. As I have had little experience in this field I happily screwed on the first unit and found there was simply no room for the second. I immediately decided that someone had modified the car to take smaller spheres (accumulators). The enquiry that followed rivalled any Royal Commission but the answer was simple, the Factory had packed gas springs in accumulator boxes. Lest you have the same problem I share the above photo with you. At left is an old gas spring I dug out of the garbage, in the centre is the correct accumulator and the right hand unit was another new gas spring that arrived in the right box!!!



THE MINERAL OIL EXPERIENCE

Without doubt the change from RR 363 was the best thing that ever happened to RR hydraulics. The stuff being hygroscopic, running at very hot temperatures and in such a volume made it a sitting duck for degradation. Mineral oil should also be changed every 20,000 miles but the reservoir seen here never get as cruddy as those with RR363! One of the few problems was someone putting RR363 into the system which was disasterous. About the only bit you didn't have to replace was the rear vision mirror!

Anyway to avoid this happening by accident the green filler caps were initially wired in place, then new caps seen here were screwed in place and sealed with lead seals and wire. To get oil into these containers required a special filler device that came with the container of mineral oil.

To make it even more difficult the caps came with a spring loaded plunger that made it mandatory to use the correct filler and container. The warning plate that covers most of the reservoir covers has been removed in the picture. Note the oil and muck – a product of careless filling.

John Grannall Memorial Charity Day Car Show.

Sunday the 22nd of June 2003.

This worthwhile charity day is being organised by the Chevie Bowtie Club in support of "A Simple Wish - Adults with Cancer.". This will be the fifth such event and will be held in conjunction with the Canberra Hospital Markets in the **Hospital's carpark on Yamba Drive in Woden starting at 9.oo am on Sunday the 22nd of June 2003.**

All those intending to display their cars please contact George on **62553366** and please leave a message. Room will be limited and we already have some 8 or 9 cars promised and I need to let the organisers know how much space we need so do phone me.

The cost to participants is $5.00 per car, which is okay considering the good cause and that a sausage or steak sanger and a drink will be provided. Food will be on sale so we have been asked not to bring barbeques/picnic baskets. Anyway, the event is due to finish at 1.00 pm. There are a couple of trophies for People's choice and best club presentation.

Bill Coburn and I will be giving a short talk on the differences between the hydraulic systems on the Shadow series and the Spirit series of cars. We shall also have our cars up on ramps so those who wish to see as well as hear can do so. Then, for those still awake, I will try to demystify the effects of galvanic reactions and electrolysis in our cooling systems. Wish me luck.

I believe that we can only further our cause by participating in such events. The public and other clubs will see that we do have a human side even though our cars are much better than theirs are (tongue in cheek, of course!). They are great days and we get to meet lots of interesting people.

Hope to hear from you by Wednesday 18th. George Shores.

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

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