

TEE-ONE TOPICS

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OIL FILTERS

It seems that even the most automotively ignorant driver these days is aware that their car's engine enjoys an oil filter. They may not be aware of what this is but they do know that when the engine oil is changed, the filter is also. The concept of a filter seems well accepted, from our nose complete with its hairs and mucous, to intakes on the home air conditioner, filters to hold the strange body exudations given off by our bodies in the spa and almost universally in most Western households, the simple installation of screens to keep the flies out of our living area. Filters are so often ignored if we don't actually have to see them or touch them. Many commercial enterprises have been set up simply to attend to these, our shortcomings!

The idea of filtering the engine oil seemed to have surfaced in the early twenties of the last century. It was a brave venture since filtration materials appeared to not present themselves. Remember that these had to not only extract the muck in the oil but they had to not restrict the oil flow in the process. Nor could they disintegrate under the prevailing conditions of pressure, fluid velocity and temperature.



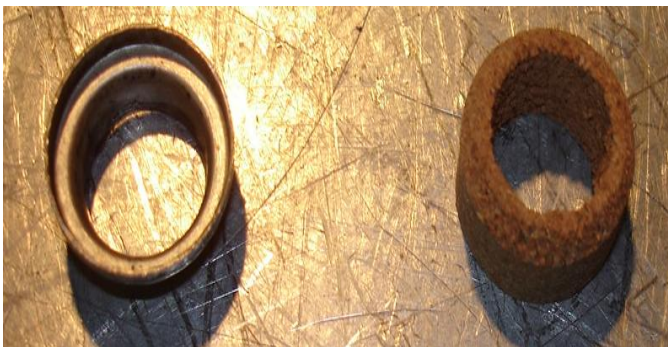
The engines on the immediate post-war cars up until the arrival of the Silver Shadow used propriety filter assemblies strapped on the side of the engines under the induction manifolds and connected to the main engine oil galleries by large pipes. Full-flow spin on filters were nowhere in sight, filters were inserts carefully jammed in their adapted casing. One feature that did appear was a by-pass valve which opened in the case of the cartridge becoming blocked. It was not until the advent of the Shadow II that spin-on filters were finally installed.

It was not until the immediate post-war period that efficient safe and reliable filters became available to the automotive industry although even then manufacturers were not game enough to force all the oil in their engines through the one filter for fear that if it blocked or collapsed, the engine would be destroyed. In 1946 with the birth of the Mark VI Bentley and a little later the Silver Wraith, the Factory finally summoned up courage to fit a by-pass filter to the lubrication system as standard equipment. It was really a gesture since less than 40% of the oil got to be filtered.



Despite clear instructions on how to look after the cartridge filters fitted to early Shadows, and Silver Clouds II and III, mistakes are made in assembly which could well spell the destruction of one of these engines. Above is the complete assembly laid out in sequence. The bolt is perfectly standard but before it is inserted in the casing, the Dowty washer seen also beside the spare bolt at left must be fitted. The Dowty washer has a bonded neoprene seal fitted into its inner diameter preventing any oil that may get down the shaft of the bolt under pressure from leaking. Once inside the canister there is a plain rubber washer with a plain steel washer on top. A spring forces the latter washer hard against the lower rubber washer sealing the lower part of the canister. Sitting on top of the spring is a cup which holds a conical cork seal which sits neatly into the bottom of the actual filter cartridge. When the assembly is bolted up to the filter head the cartridge is forced down, compressing the spring, helping to seal the bottom of the cartridge and the base of the canister. It is the cup and cork washer that seems to foil would be filter changers.

Immediate post-war Australia not only enjoyed the wool boom which facilitated quite a few orders for Rolls-Royce and Bentley vehicles, but with the eventual de-rationing of fuel supplies lots of these cars were ploughing through our legendary bulldust. Dusty conditions clearly dictate more frequent oil changes. Unfortunately this escaped the notice of many drivers of our cars the latter of course then running on by-pass filters.

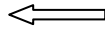


A close-up view of the cup and cork seal. The cork shrinks and should always be replaced when with the cartridge. If you use genuine cartridges the cork seal comes in the kit. Aftermarket cartridges although now no longer available came without the seal. This would be bought genuine separately or else the seal reused. For some reason operators noting the new seal threw the old one away WITH the cup. Realising that the seal was not designed to sit on the narrow edges of the spring they usually popped a plain washer under it for support. But then there was no lateral support and heat and pressure would slowly squash the cork flat!

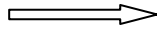
History records that an Australian Mark VI had the first crankshaft failure due to faulty lubrication. It was not until mid 1951 with the introduction of the 4 ½ litre engine in the 'M' series cars that full flow oil filtration was introduced. Modification schemes were offered with parts readily available and many cars with bi-pass filtration were quickly adapted. I was however somewhat horrified to see a Mark VI chassis absolutely over-restored in the UK some years ago by a very reputable concern which specialised in these tasks. To my amazement there was the standard by-pass filter system all beautifully restored, still fitted in the interests of originality. If you run a bi-pass filter in your car I suggest an oil change every 3000 miles or three months!



THIS



Or



THIS



Once upon a time you could buy cartridge filters from Crosland among other filter makers at about a third of the Factory price. Since the last engine that used the cartridge filter (the one on the right was the Shadow I) the population sadly, seems to have dwindled to the point where it is simply not worthwhile for the aftermarket people tooling up to make them. It seems that not only did we miss out but the Factory presumably did also because they had to commission a special run to keep the remaining cars on the road! And so at the time of writing the cartridges are almost \$90 a throw!



One solution I adopt, more for convenience than cost has been to change the filter pedestals. The spin on pedestal is no longer available (fortunately – last price nearly \$1500) but the same unit was used in the SZ cars until they started using oil coolers in late '67. There are wrecked SZ's around! You cannot do this conversion on the Post55 cars as there simply isn't room because the engine on these cars is supported on a mid-engine saddle! The Factory spin on filter is readily available as is the Crosland version the latter at a considerable saving. This is not a recommendation simply an observation. Do note with these units that it is essential that you oil the face of the

rubber seal on the filter and only do it up as tight as you can with your hand! Anymore and doing it dry and things start to distort and leak.

Generally, beware of ultra cheap filters – they are around and usually feature in 'bargain' oil change deals. They can be bad news!

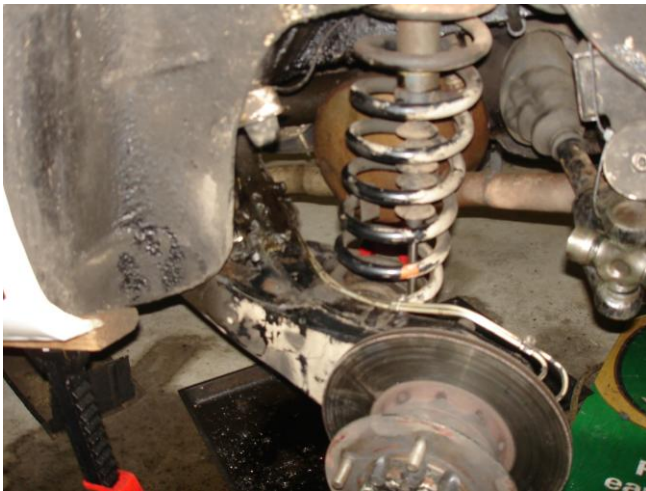


NOTES ON REAR SPRING REMOVAL IN SY CARS

This is one of those chestnuts that come up from time to time. In this case it was a 1972 Shadow that appeared to have had a gentle life and had just passed the magic 100,000 miles. Clearly the tail end was low and before the pundits start quoting me chapter and verse on standing heights, where from to whereto, it seems to be accepted that the ideal level is one where the line of the lower edge of the stainless steel door sill trim strip should pass just below the centre line of the rear hub cap. This is with the car unloaded and about ½ a tank of fuel!

For some years I used to make impressive calculations and send the old springs off for re-setting always adding a bit to allow for settlement. This was not always effective and when this happened I found myself struggling packing rings into the spring pot to get the right height. On one occasion on a late Shadow II the thing finished up emulating a grasshopper. The owner dismissed my embarrassment and quickly borrowed a large sheet of very thick steel which took two strong men to place carefully in the boot under the carpet. This was removed some months later and 25 years later the car's level is still exactly right. There are easier ways to do this.

I believe I have mentioned that R A Chapman in Bayswater Melbourne now supply rear springs for all the SY series cars that in my experience are somewhat superior to those originally fitted. They not only appear to give greater stability on corners but a better ride. The latter may be attributable to the addition of one more coil compared with the original.



Coil springs should always be regarded as being in the same category as grenades with loose safety pins. Unlike the front springs however the residual tension of these springs can be relieved by lowering the suspension arm a further 6" or so. This however will take the universal joints seen here, and the actuating height control levers connected to the suspension arms way beyond their design limits. The joints are released by pulling four bolts. The shaft is then pulled up out of the way as shown. The easiest tie is a large dimension tie strap. The height control levers are a simple small clamp bolt.



One more bit to release is the bottom of the shock absorber shaft. Due to the pressure of the gas in it, when released it will fully extend. Best you unbolt the conical mount that holds the lower end of the shock absorber to the suspension arm holding the shaft up with a jack, then lowering it gently. The conical cover can then be removed.



At left is the rebound strap that limits the travel of the rear suspension arm. It loops over a little (?) crosspiece in the crotch of the suspension arm and is bolted to the floor of the car. The muck around the strap is grease to stop the thing squeaking.

Before releasing the re-bound strap, support the arm on a jack that has plenty of travel. The arm will drop considerably but due to a designed embuggerance it will not drop quite enough to be able to swing the shock absorber shaft out of the way so the spring can be removed. The shaft can be

levered up with a tyre iron or similar strong flat blade or if you are clever, use a small bottle jack and push the shaft up say 4 – 5 inches then tie the shaft so it won't drop. The latter is done by making a loop of clothes hanger wire that will go loosely around the body of the shock absorber so that you finish up with one of those wire loops that you use to blow bubbles with soap solution! About 8 inches further down make a smaller loop that will loosely fit over the shaft. Bend both loops in the same plane so that they are at right angles to the wire.



Pass the large loop over the body of the shock absorber and slide it up until the lower loop goes over the shaft. With the lower end you must leave one of the washers on the shaft otherwise the lower loop will simply slide up the shaft!

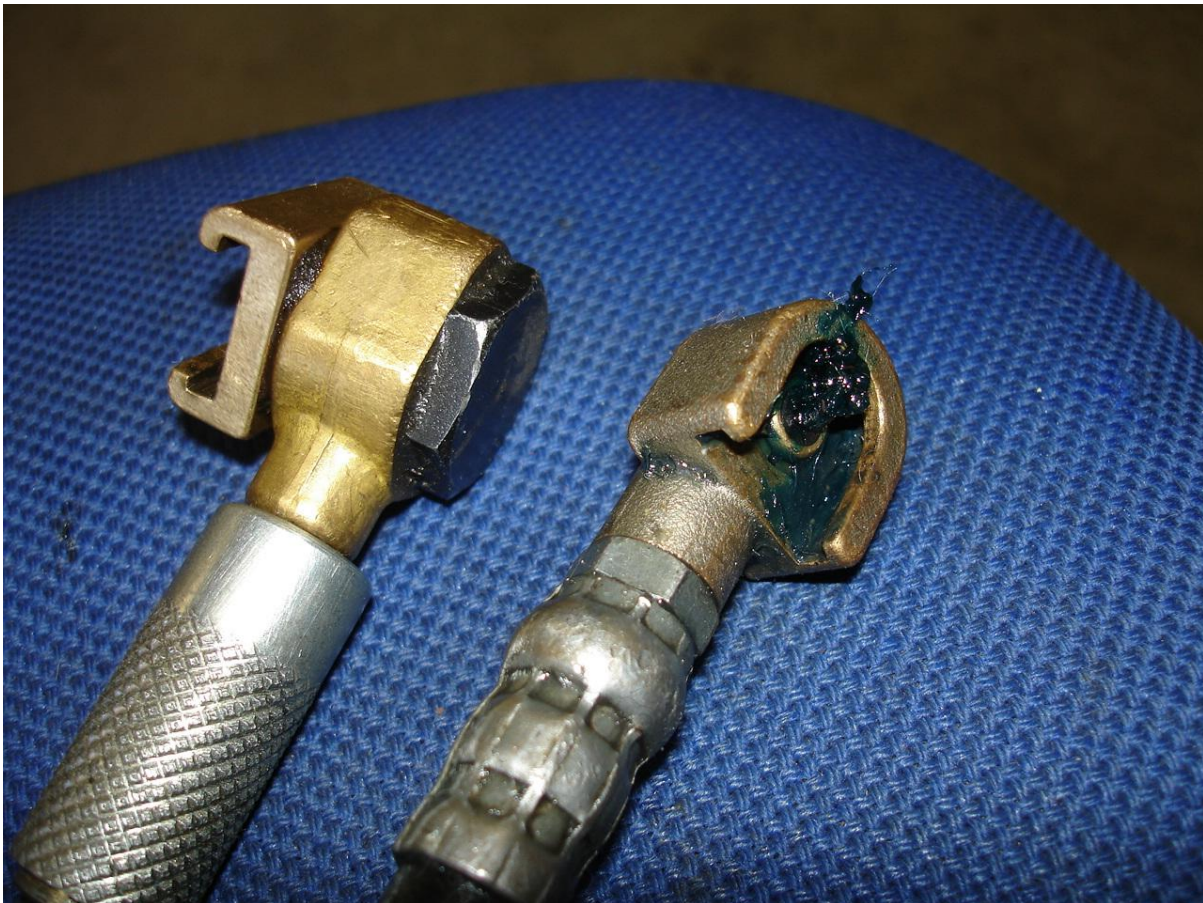
Carefully jack the shaft up sliding the large loop up the body of the shock absorber until the bottom of the shaft is well clear of the lower spring support cup. Releasing the jack slowly will cause the upper loop to jam on the body and hold the lower loop where it is maintaining the shaft clear of the spring cup. The spring can then be swung to the rear and pulled out.



In the lower picture the hub assembly has been removed. This is quite unnecessary but the initial task was to remove the rear callipers. With them out there were only two bolts retaining the hub so removing them facilitated cleaning and access. Although not usually a problem with Australian delivered cars the pot holding the lower end of the spring seen here can rust out. There are replacements available which can be fitted and the arm brought back to original.



All back together with a new spring. Always remove the packing pieces used with the old spring. Check the height before connecting everything up!



GREASE GUN FITTINGS

From time to time I get pleas as to how to get grease into those funny flat nipples. Greasing finally died out with the SZ cars and of course it started with the Clouds when the one shot system finally got shot. The nipples used on these cars are mostly found on industrial machinery. Tecalemit the leaders in this field describe them as Industrial TAT nipples. They have no particular virtue, are spring loaded so that muck can't get in and seem to block no more than the standard item. For some reason the Factory used brass versions which after 20-30 years tend to weld themselves to the car. They are hexagon in shape and usually any use of ring spanners or multi point sockets results in their destruction. The solution is to find a six point socket that the replacements can be steel and are a fraction of the brass ones. Do not confuse them with button nipples the have won't fit.



fits exactly. In any case asking price for the grease gun fitting you



The grease gun fittings are two shown cater for whether

various usually available from machinery shops. The you want to screw the fitting on the gun each time you use it or have an adapter to slip over the end of the gun when you want to grease! The bottom line is don't throw the nipples out for standard ones. They look soooo out of place. Get an adapter and carry it in the boot for the odd occasion that the car is serviced away from home!

THE ANATOMY OF A PUMP

For those who haven't seen one here is the 'heart' of your braking system. From the Shadow on if these things don't work you can't stop. Have I got your attention?

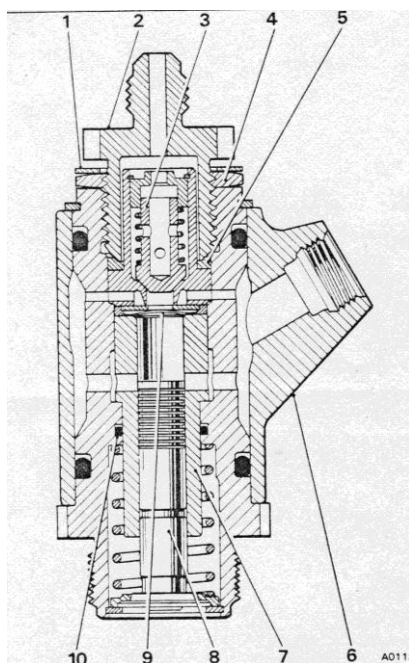


Fig. G6-5 Hydraulic pump

- 1 Identification disc
- 2 Adapter - high pressure outlet
- 3 Non-return valve
- 4 Lock-nut
- 5 Chamfered ring
- 6 Outer housing
- 7 Pump barrel
- 8 Plunger
- 9 Inlet valve
- 10 Sealing ring

You have seen the diagram a thousand times and have worked out that the 'real thing' at far left is undressed. The outer casing is simply the reservoir for the brake fluid which is fed to it by gravity. An added joy here is that having had all this to pieces and connected

it all up again; you can't get the thing to pump. This is usually because there is an air lock. In this case loosen the inlet to the pump until fluid starts to ooze out, retighten and hopefully you will have let the air out and the fluid in. The two very obvious rings in the picture keep the fluid in – well most of the time. With heat and use, the rings shrink and fluid starts to slowly seep!

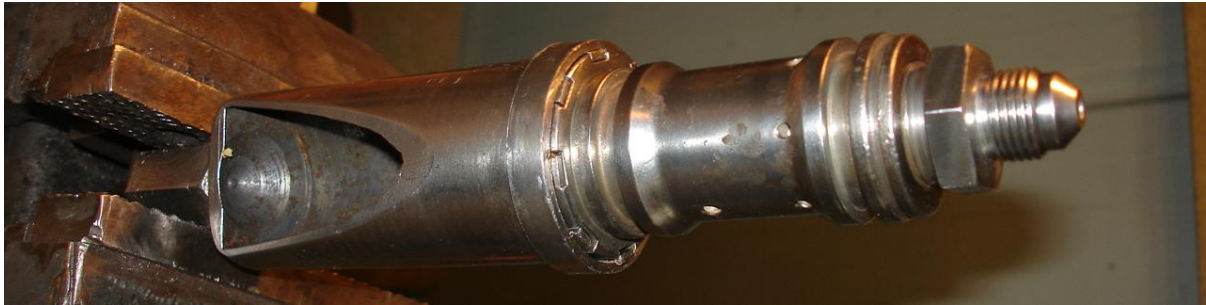


The cure is simple of course you have exhausted the system pressure by pumping the brake pedal or loosening the relevant accumulator bleed screw, disconnect the outlet pipe on the top of the pump and tie it a little bit out of the way, remove the large circlip at the top of the pump and disconnect the feed pipe. In theory the outer casing should just slide off. In practice it helps to swivel the casing around the pump a bit then devise a lever to get under the inlet projection and prise it upwards. You are not likely to damage anything unless you get violent.

The 'O' rings are fiddly to get off. Best ask your dentist for a dental pick. With this you can skewer the thing out and cut it. Clean around the carcass of the pump, wet up the new 'O' rings and roll them down the body. The top one goes in first and the bottom one just rolls over it. (OK OK that is obvious but I have seen people struggle the first one in and out of grooves to get to the bottom one). Wet up the inside of the casing and push it firmly down over the pump until you can fit the large circlip. Top outlet pipe back on then with a new 'O' ring in the inlet opening fit that pipe.

While you are at it, have a good look at the low pressure hose from the reservoir to the pump. Do NOT use fuel hose, oil hose or garden hose here, it will rot. Use either the genuine pipes or go to a

trusted brake supply house and get hosing designed to withstand brake fluid. Watch for the glib idiot behind the counter with expressions like ‘Yeah mate that’ll be OK’ or ‘Well that’s what we use etc’, the correct hose is very expensive – about \$45 a metre!



You will certainly have found the pumps by now and wondered how to remove them. The original instruction was to remove the entire induction system including the inlet manifold and you would then find the two pumps sitting up on the valley cover. You could then remove them with the aid of a ‘C’ spanner (or of course as I have seen with a cold chisel and hammer!!!) Ideally you can borrow and have copied or just use a homemade serrated tube spanner seen here clamped in a vice. Not only can you get the pumps out with this tool you can hold the pump in it while unscrewing the very tight adapter at the top of the pump.

A word on the outer pump casings, for some reason these are starting to leak even with new ‘O’ rings. The solution is to have them sleeved as you would with a master cylinder! In practice the professionals tell me they now have them re-sleeved as a matter of course.



So you have got the pump out, washed the detritus off and removed the top outlet adapter. Wedged into the top is the non-return valve seen here sitting upside down on the edge of the pump body so you can see it.

At right is the non-return valve in pieces for cleaning. Look for pitting on mating surfaces.



This is where leaks will occur and in this system it means the accumulator will leak back through this valve to the reservoir. If the valve seems stiff gently lever it from side to side to loosen it. It will actually be jammed down by the sealing washer the outlet adapter engages.



Two pictures ago you will have seen this little trio, the inlet valve, sitting under the non-return valve. The ring at left simply centralises the assembly and the Bellville washer at centre lifts the valve at right to admit new fluid.

Here is the bottom of the pump ready to lose its plunger after the circlip is removed. It has to be remembered that there are no seals between the pump barrel and the plunger. They are machined to very tight limits and form a natural seal.

With the plunger removed, the barrel can be pushed out of the body. This allows the internal 'O' ring to be replaced.



finish however has to be absolutely flat and extremely fine. The finest carborundum

This pump would barely function. It was noted that on the top surface of the pump barrel and the corresponding surface on the inlet valve disc were slightly pitted. This is enough to allow heaps of fluid to escape back to the reservoir rather than be pumped into the waiting accumulators.



The solution is to reface the pitted surfaces. The



would leave tramlines on the surfaces so we have resorted to good old Brasso on glass. The finished surface was like a mirror. And I pass on a tip, when the pump is fully assembled fill it with brake fluid, rig up something to push the pump plunger down onto, put your finger over the top and press down. You should have an immediate lock up if your refacing has been successful. Apart from gross corrosion and/or plunger/barrel wear there really isn't much else to go wrong.

Detailed instructions are in the workshop manual.



STOVE PIPES

Introcara in London now market stove pipes for all our cars. They are not as the originals because when our cars were made asbestos was not a dirty word. The covering of these pipes was not as many owners explain, to stop you burning your little pinkies but to ensure that the heated air piped

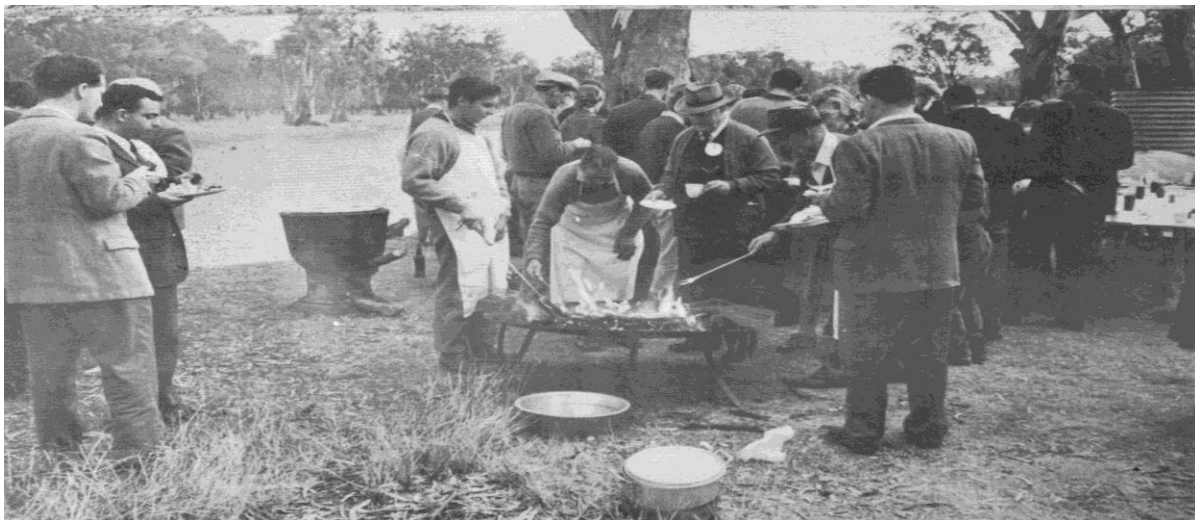
through them was not chilled before it got to the choke coils. This was a real problem with the early Clouds tearing across the Tundra at 90 mph in a minus thirty degree blizzard. The chill factor was so great that it cooled the stovepipes to the point where the choke would close due to cold coils.

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SELF HELP GROUPS

Elsewhere I have written about this growing phenomenon. I like to think it was largely through the efforts of George Shores a former member of the ACT Branch in getting the scheme rolling but I am told that he was not the first however. Fifty years ago it was a very blokey fixit function that would attract members.



Fifty years later it still goes on. George commandeered a disused service station in Canberra, cars were produced and pulled apart and a lot of owners gained a lot of experience. Sydney got back in the act with the Shadow Register under the leadership of the then registrar John Begg and several very instructive meetings were held at various venues.

Some years later Robert Wort in Victoria attracted a group of owners who under the aegis of the then State President were given every encouragement to get in and learn how to maintain their cars by practical experience and communal support.

This last month the ACT Branch organised a seminal self help day and a dozen members got together for some very basic instruction. I prepared some notes on some topics we covered and include them here for the record and possible interest to others.

NOTES ON JACKING

- Get a decent jack -\$250.00
- Four (4) heavy duty jack stands – must be four legged.
- 1” thick rubber pad on jack head.
- Decent road wheel chocks
- Sufficient room and level surface.
- With SZ cars remember the rear suspension sags when the engine is running. Drive the rear wheels on to thick blocks to allow the jack to get under the car.
- Never get under a car sitting on a jack.
- Allow for car movement generated by jack.
- Having placed jack stands lower car partially onto them then check stands are engaging body where intended and stands are not tilting.
- When lowering car try to keep a hand on the body of the car to be aware of the direction of its movement.
- Keep in mind what is holding the car – the wheels or the jack
- Ensure surface on car which jack is pushing on is level
- Support car by the appropriate members.
- When jacking do not twist the car.

TIGHTENING WHEEL NUTS

- Wheels are more than adequately secured with studs and full brass nuts.
- On some cars the studs are held onto the hubs by half nuts i.e. the Phantom VI and post55 cars.
- Studs from the SY cars on were a splined press fit high tensile headed bolt.
- The nominal torsion recommended for these nuts is 50 foot pounds.
- The socket and Tommy bar supplied with the car for the tightening of wheel nuts limits the amount of torque by virtue of their size.
- Because the nuts are a brass alloy, their self centring cones are relatively soft and over-tightening them will actually crush them. The most likely source of this damage are tyre company changers and rattle guns.
- SY and SZ cars have had their wheels tightened so much they have torn the centring holes out of the wheels.
- The best story was at an over sea dealer where the wheels on a new Continental were inadvertently tightened to 150 foot pounds necessitating replacement of not only the wheels and nuts but the hubs as well.
- Wheel studs should be oiled not greased.
- Bright spots on the hubs or drums should be greased prior to the wheels being fitted.