

# TEE-ONE TOPICS

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## IT'S ALL TOO MUCH FOR AN OLD BLOKE

'Wear out the old ones', my old Aunt Agatha used to say. Seems the Head Mechanic is Hell bent on doing just that. I will never retire again, it is just too strenuous. Ever mindful of a statistic batted around Canberra years ago to the effect that Public Servants (of which I was one) who retired at 65 (which was then compulsory) of them, 80% were dead within one year. FACT!!! Must keep active became my permanent mantra. So .....among other things, I managed to attend a very pleasant Post 55 Register Meet at Dubbo NSW for a weekend then off to Victoria for some very pleasant social exchanges with Branch members there including their annual Concours for which I brought pleasant weather. The Blue Beast sped to Dubbo with great style ne'er missed a beat and returned some pounds heavier with an entire bug collection glued to the front of the car but most interesting she turned in 18 mpg overall!



The Presidential Phantom VI over-arched the Concours. A nostalgic vehicle consigned to an age when owners were content to show their taste in motor vehicles and craftsmen were able to show off their greatest assets!

The great joy was that all cars known to me proceeded. I like to think that that was due to personal attention to the condition of the vehicles. At Dubbo we had a mild technical session which was an opportunity for me to ramble at large and hopefully further imbue the audience

with more motivation to look after our charges! We did have one challenge. One driver reported an ominous ‘thunk’ from his back end which turned out to be coming from the car. We were in a Northern NSW town that had one garage which was shut and the other handful of residents could do little more than gape at our concern. As so often happens there was a fellow around the corner who not only had a hoist but a fully equipped garage. I weighed in with very carefully worded predictions of destroyed drive shaft universals, inner CV joints or simply a self destroying differential!



This is the trailing end of a very nice Corniche seen at the Victorian Concours. And there is the standard spare tyre lowering nut we are all so familiar with. What is different is the angle the thing presents relative to the floor of the boot. It certainly is not one of those things you undo with your little pinkies but if you put a spanner on it unless it is a very shallow socket, there is simply not enough room to do the job. And one need only look at the damage to the leather trim adjacent to the nut!

Hoisted closer to God, diagnosis became a bit easier. All joints and diffs seemed OK until someone shook the near side wheel. It was loose! Very Loose! So simple. There was a good reason for the looseness given that it had bodgie wheels but there was a lesson there. The points of interest where looseness was supposed to be arrested had worn badly but judicious use of a wheel wrench at appropriate intervals got the car home.

Finally in the hope of some forthcoming sympathy I have been forced into a new computer with a screen so large we keep having people turn up outside with popcorn and kids in their pyjamas. Worse, the new Gates creation of Vista has been thrust on me having almost got used to XP!!! We shall survive if I just know which button to push!





### A COMMON GAPING MAW

Where are we? Even the most resolute anti-mechanical owner is usually taken aback at this sight. The dirty large member near the bottom of the picture is the right hand section of the front sub frame on your everyday pre-30K chassis Shadow. The tapering large assembly in the top left hand corner is the steering box, on this car a right hand drive model. The greasy horrible thing to the right of the box is a constant velocity joint fitted to the bottom of the steering column and connecting the latter to the former. Given that lots of lubrication is needed for the joint and that it is only a matter of inches from the ground a concertina rubber boot covers the whole lot to protect the mechanism from dirt.



This is generally an area requiring little attention but after some thirty odd years the rubber boot hardens and rots and you are greeted with the above spectacle. At left is the end of the job after the boot has been replaced. The fencing wire clips by the way are standard – who am I to criticise and they do work! Here can be seen the steering column to the right which is simply fastened to the CV joint by four bolts. The other end is fastened with two bolts

which can be seen in the top picture.



Here is the joint cleaned up and re-booted. The wire clip retaining the boot is simply that – a bit of wire bent with a hook either end. This in turn forces a moulding on the inside of the boot into a groove on the metal body. Should the wire break I suggest you make a new clip rather than buy one!



This is the business bit inside. Note the ‘buttons’ either side of the cross shaft and just behind them small Belleville washers. These are made of spring steel, are conical in cross section and if squashed spring back to their original position. The object is to keep the button firmly pressed against the outer casing of the joint. Any looseness shows up as slack in the steering wheel.

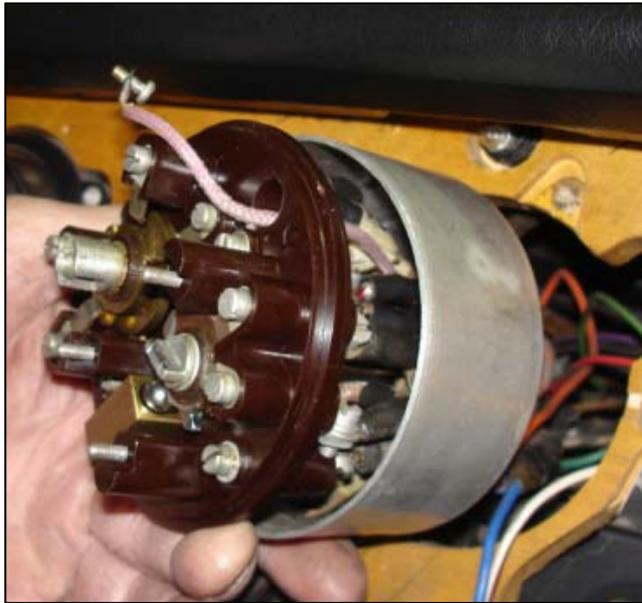


Here is the joint assembled awaiting a mouthfull of grease. This end bolts to the plate on the end of the steering column, the other end is as seen above a solid plate. CV joints of this design have been used by the Factory for many years in propeller shafts and half shafts on the Shadows and early Spirits. They are expensive to manufacture very expensive to repair and where they operate at high speed such as in the drive train they need to have the cross shaft and buttons absolutely dead centre to avoid vibration. In this application it is merely a matter of eliminating any

sideways play.



This circlip is fitted to prevent the joint pulling apart in the event of a collision and must be removed to dismantle it.



## SWITCHBOX SURGERY

This is but one of the many maladies befalling our cars through age. The symptoms are the ignition switch lock jamming. The immediate solution is to jiggle the key until you can turn it! If ignored, eventually one cold morning the thing simply will not turn and in temper you manage to break the key off in the lock.

The reason for the problem is that the tumblers in the lock have worn badly and tend to jam in their bores preventing the

barrel of the lock turning. The cause of the wear is usually owners habitually hanging all their keys including the ignition key on the one ring then poking the key into the lock. The natural movement of the car shakes the heavy bunch of keys around causing wear to the lock internals.

The cure is not rocket science. The switch boxes consist of a centre 'bakelite' casting on which is mounted most of the mechanism. The rear terminals etc are covered by a metal cap and the front by the cover that you look at every time you start the car. The latter is held on by a few screws. Once these are removed the cover comes off complete with the lock mechanism. This can then be taken to any competent locksmith who will repair the barrel and tumblers.



## CLEANSING YOUR CALIPERS

As you know there are two of these babies stopping each rotor on your Shadow or Spirit. Apart from normal pad wear and replacement they give little trouble and on brake fluid cars seldom leak. On mineral oil cars for some inexplicable reason they do leak from time to time. This calliper was removed from an early

Shadow which had been fairly well maintained with reasonably frequent fluid changes. The dust covers on the pistons had however perished, water had got in and all the calliper pistons were pitted to varying extents with corrosion. It should be noted in the service booklet in the car that inspection of these seals is a requirement. If they are damaged they can if considered appropriate be changed in situ although awkward but by the time the seals give trouble it is wise to whip the callipers off clean them out and re-kit them. All parts are quite standard.



This is the usual sight when the calliper is opened. Notice the sludge in the calliper and the disintegrated dust seal. The internal piston seal has yet to be removed.

The corroded pistons are inexpensive and unless perfect on their seal surfaces should be replaced.



The Factory manual clearly states that callipers should NOT be split. Most repairers would agree that cleaning the things of brake dust and rust, while the two halves are bolted together is however quite impractical. The small special intra-calliper seal can be seen at the lower end of the left hand half of the assembly. All bolts including the ones mounting the callipers to the stub axle need to be torque tightened.



The groove in the calliper body that carries the piston seal has to be immaculate before the new seal is fitted. After many years some of the rubber from the back of the old seal welds itself to the back of the groove. If the groove is not clean and the new seal cocks it will leak. The mirror was used to ensure the cleanliness of this unit. The best tool for cleaning I have found is a dental pick.



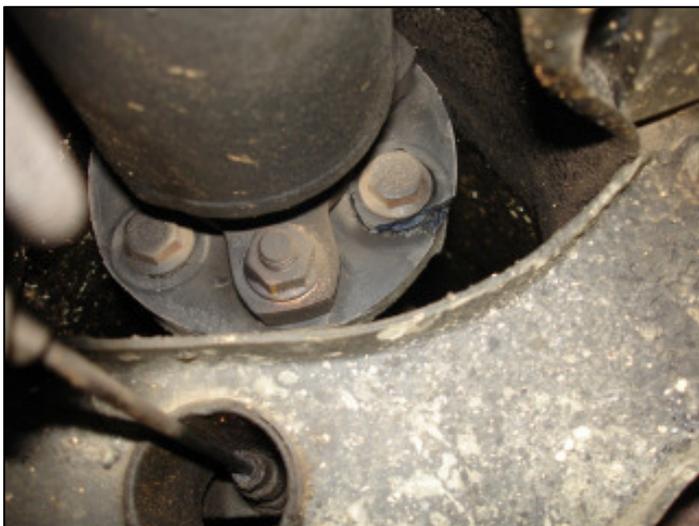
A spot frequently forgotten. The dinky little drillings in the bodies of the calliper connect both sides up to the fluid supply. Brake fluid apart from absorbing water and depositing various deposits around the place can also produce a scale-like deposit which gathers in all sorts of places. These little drillings are typical.

The removal is done with a rat-tail file (available from small rats) which is smartly thrust in and out of these lines. Your keen eye will spot the muck that already has been knocked out of this half calliper!



## THE EROTIC EXTRAS IN EARLY RANGE SILVER SPIRITS

One of my more elderly friends quietly confided that his '85 Spirit had developed a vibration that was becoming quite stimulating – if you get his drift. The frequency varied with the speed of the car and the amplitude definitely increased when the engine was under load. While he appreciated the rejuvenating aspects of this problem he did worry about its origin



and future! The answer of course lay in the picture at left. The Factory was plagued with the problem of noisy differentials. The noise echoed up the hollow propeller shaft so they filled it with Styrofoam but then decided that the conventional steel universal joints were a good transmitting medium for noise and hit on the idea of replacing the joints with flexible drive pads seen in the picture. They last well – probably 150,000K are not too difficult to replace and should not break the bank. Be sure to replace both front

and rear couplings at the same time. For diagnosis the picture tells it all although these joints have failed without such obvious indicators. The clue is the vibration which is very obvious on acceleration. For the nervous owner, if the joint failed completely there is a spigot

connecting the driving and driven members that is intended to stop the propeller shaft dropping off! By that time however the vibrations would be far past the erotic level!

Propeller shafts can be lethal devices but fortunately not on our cars. By now you would be under your car checking out the couplings and will notice that not only does the forward end of the shaft sit significantly over the rear of the front sub frame but that the thing passes



through a dismountable tunnel halfway down the car. In the event of everything breaking the whole shaft would just rattle around in the available space. Lesser cars have been known to break the front joint, the shaft then drops to the ground digs in and acts as a vaulting pole propelling the rear of the car up and over the front in a very neat end for end capsize.

The only disaster I have heard about RR tail shafts was the seizure of the centre bearing on the two piece system used on pre Shadow cars. This caused the flexible mount in the centre of the chassis to fail and the shaft then assumed the posture of a skipping rope which at high speed would be quite spectacular to any worm on the roadway. The flailing assembly apparently literally ripped the centre cruciform of the chassis to pieces and generally put the car in 'to be wrecked' category. I shouldn't think the upholstery would be recoverable either!



### A PLUG THAT IS OFTEN FORGOTTEN

Further to the detail on the CV joint on the steering column, this is a grown up version of the same joint. The joint allows the drive shaft to the wheel to swivel up and down as the wheel passes over the road surface. Again these joints give little trouble and wear well despite the hammering they get from the road surface and the demands of the drive train! But they do require lubrication which is afforded by the injection of rear axle oil into them via the plug

seen in the picture. An easy approach is to use a plastic hypodermic sans needle fill it with oil and pump in about 30 cc's. If the joint is turned to about the position shown above and the unit filled until it runs out that will be sufficient. Always inspect the rubber boot seen in the picture they are prone to crack in the folds and lose their oil!

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## THE G VALVE

And here it is nestling right at the back of the rattrap above the little master cylinder. In case you have forgotten the juxtaposition of all these bits here is the whole contraption again





produced below. The overall design really did not significantly change apart from the deletion of the master cylinder right up to the end of production.

The valve extracted from the rattrap. The inlet is at the left hand end as seen in the picture the the outlet the upper of the two holes seen at the bottom right hand lower end of the picture. The bleed valve seen on the top side is the first bleed point for the whole system after the accumulators. But in practice it is ignored unless the whole system has been drained since it is awkward to get at necessitating removal of the rattrap cover.

The sole function of the valve is to limit the braking pressures applied to the rear callipers

when the car is making a sudden stop. Very heavy braking, most of which is done on the front wheels, tends to 'rotate' the whole car around the front axle. This is largely a function



of the suspension. This 'rotation' lifts the rear end of the car significantly reducing the weight on the back wheels. If those wheels receive the normal amount of braking pressure it is highly likely they will skid.

The valve opened. The hexagon headed plug at left has the inlet port. The heavy ball can be seen and the grooved retainer to its left keeps the ball from blocking the inlet during normal operation. With a heavy flow of fluid through the centre port of the retainer there is enough force to propel the ball up the valve body. Most importantly at the bottom of the valve can be seen the orifice leading to the valve outlet, around the orifice is a rubber cushion to help with the sealing and cushion the action of the ball.

A skidding wheel has virtually no directional influence and if the car happens to be at an angle to the direction the front wheels are talking it, it is highly likely the rear end will swing around clouting anything that happens to get in the way.

This is not a Rolls-Royce foible, all cars do it. The solution is to minimise the braking effort at the rear wheels during panic stops!



At left is the rotten cushion that gets eaten by the system. Beside it is the new replacement and still in its plastic bag the rivet than holds the seal in position. Left, the rotted seals have been known to be forced down the brake line to the rear callipers cutting off all rear wheel braking!

Notice that the angle of the body of the G valve is canted upwards towards the front of the car. Inside the valve there

is a large heavy steel ball that normally sits at the lower end of the valve held there by gravity. In normal operation application of the brakes applies fluid



Removal of the seal retaining rivet is done with a small drill or Ezi Out.

through the lower end of the body of the valve and out the pipe leading from the side of the valve and thence to the callipers. If there is a sudden rush of brake fluid, the ball will be pushed up the slope of the valve until it strikes the outlet, effectively closing it and preventing any more fluid going to the callipers.



The new seal with the rivet fitted. The pair are simply tapped into the out let at the bottom of the valve.

In the situation where the brakes are applied gently and then progressively applied very hard the inertia of the heavy ball will run it up the valve and cut off the fluid. A simple but very effective system.



You will notice from the picture the crud in the valve particularly the minor ravages of rust. This was from a 1972 car that had been well maintained however cleaning out the G valve is neither on any maintenance schedule and given its relative inaccessability, is not likely to be serviced.

The valve cleaned up and the ball polished and placed in the bore after the rivet and seal have been inserted.

Frequent changes of brake fluid will go a long way to keeping the valve in good condition. What can't be prevented is the deterioration of the rubber cushion around the outlet at the end of the valve. This simply rots and bits of cushion break away and find their way through the number 2 system particularly the solenoid valve and the restrictors.



The ball retainer dropped in. The ball can just be seen through the inlet aperture in the retainer. It is important to remember when bleeding the rear brakes, not to open the valve suddenly otherwise the rush of fluid will jam the ball against the rubber seal in the outlet and no further bleeding will occur. If this does happen release the brake pedal, pause, then reapply, then open the bleed valve slowly!

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## THOSE LITTLE FILTERS

These little attachments to my eyes scream out 'maintain maintain' but it is amazing how many times cars develop extraordinary starvation problems simply because these little last bastion filters are blocked. And they are so easy to change. They are readily available from the SU agents in Australia, Midel and are not expensive so why ignore them. They are of course an accessory to the HIF SU carburettor (Horizontal Internal Float) fitted to all carburetted cars from the Shadow II onwards.

And a reminder, for those with post '55 cars, have you changed your fuel hoses? The life of any 'rubber' hose is 10 years. Sure, your hoses for fuel and brakes look good but perhaps you need a more graphic reminder which I am pleased to supply!

