TEE-ONE TOPICS

Number 74 April, 2008

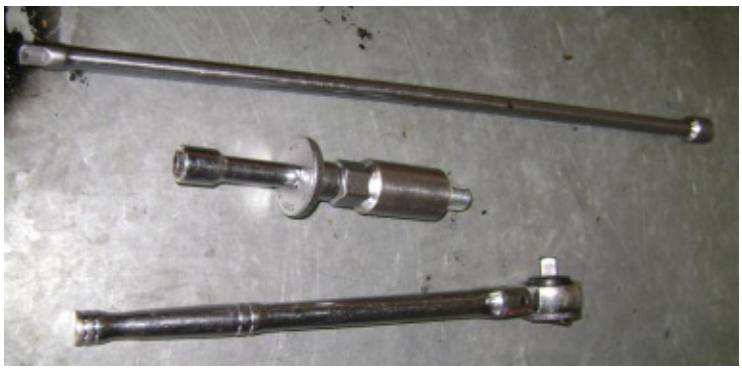
THE SIMPLE JOB OF CHANGING SPARK PLUGS

Many years ago I was told that there were then over 10,000 patents taken out on the design and manufacture of spark plugs, God knows how many there are now. They are a favourite component for the spin merchants to get their teeth into bedazzling the enthusiast with tales of longevity reliability fuel economy and better performance. Needless to say all these qualities come at a price. And for price the sky seems to be the limit especially for plugs for high performance engines. Personally I stick to the manufacturer's recommendation and use 'hotter' plugs when through worn engines; there is a problem of fouling. As to brand the only two freely available plugs that I find are NGK and Champion and since my 'auto shops always seem to have a good range of the former it is those that I buy. The choice is yours.

A typical example of fouled plugs through cold running and frequent starts and stops, The carbon build up simply shorts out the central electrode and the charge never gets to jump the gap at the and to create the spark. The end of the unglazed spark plug can just be seen on the new plug to the right.

Of course you know that the fundamental purpose of the structure of the plug is to get high voltage current from the outer terminal to the other end of that conductor without current leak. That is achieved by encasing the electrode in a high precision porcelain insulator which

is the pretty white thing that stands out when you look at the installation. This same insulator once it get through the metal mounting collar with its sealing washer and thread, the insulator no longer carries a glazed outer surface. Presumably this makes for better insulation in the combustion inferno.



Nothing much new here except the centre collection. The very long extension is essential for the rear plugs on the 'B' bank of carburetted Shadows. With a little dexterity and patience the extension can be threaded down under the brake fluid reservoir and inserted into the plug tube spanner which is placed on the plug beforehand.

It is this last bit of insulation that usually causes problems since it is apparently porous. This shows up in body shops, the nowadays casualty department for bent cars. There are few shops where a car can sit in one place for the weeks or months while it is repaired. Instead the car is started up cold and moved to the other side of the shop so that another car can be moved past it or perhaps moved to alternate equipment or for painting, it matters not. Each time the engine starts cold, a fine mist of petrol soaks the inner porcelain which then burns, leaving carbon. Carbon as you will remember is a conductor. The high voltage charge can then short out through the damaged central insulator and pass to earth and you have a 'missing' plug.

When you get a plug spanner ensure that it has a rubber insert in it as shown here. This grips the plug around the white insulator and stops it dropping on the ground, breaking and then forcing you to use language best reserved for more deserving occasions.

This is the chasing tool to clean up damaged threads in the head. The hexagon waist fits perfectly in the plug spanner and the length is sufficient to get a grip with the fingers and ease it into the damaged area. The 'O' ring in the centre holds the device in the plug spanner.

This is the 'special' tool that I use. It simply allows you to get a better grip on the assembly of socket spanner and plug, gives a little more leverage when starting the plug and speeds up the screwing in of the unit. When the plug is home, your ratchet bar can be inserted into the back of the fitting.

Cleaning spark plugs went out with red flannel draws unless you are desperate but it is seldom of any help. Getting some of the plugs out of Rolls-Royce vee eight engines can be a challenge even for ET. Some would hold that the pre Shadow cars were the worst involving removal of the front wheels and valance panels! But the SY cars were front runners up particularly with the plugs at the rear of the left hand or 'B' bank of the engine. Here we are indebted to Louis Braille since the plugs usually cannot be seen but can be felt. Plug spanners can be inserted into the bowels of the engine compartment and felt onto the plugs then amazingly long extensions connected for undoing.

There are few hazards in plug changing. Apart from fitting the wrong plugs, avoid dropping them – they do not bounce. Note the anti-seize grease on the threads, something you should be using liberally around your car in the interests of preservation! Note also the metal sealing washer and its form. This crushes when you tighten the plug, a process you can feel in the spanner.

Above all do not cross thread them. If you come across a head with damaged threads do not try and force the plug in the hope that you may clean the thread up. The only option is to clean the thread out with a thread chaser, a special tap used for the purpose which is not expensive and readily available. Do always use anti-seize grease on the threads and always start the plugs with your fingers rather than a tommy bar. Ideally you should be able to screw the plug right home with your fingers. Lastly do not over tighten plugs. Usually all that is required is one turn after the plug has bottomed.

Be assured that it is not a nuclear explosion you are containing!

Some cars, in this case a Phantom VI are relatively kind and at least allow you to get at the plugs to change them. The hand tool mentioned can be seen here clearly and illustrates how convenient it is to put the old pinkies down there and feel what is going on at the plug/head interface!!!

AN OUT-OF-BODY EXPERIENCE

Ever since owning the Spur I have been irritated with a ‘bocking’ noise in the front end somewhat reminiscent of old worn shock absorbers. The front shocks (sorry dampers) were changed. Still much bocking. Passengers were reporting odd noises coming from the left front floor which prompted a hoisting and closer examination. I had been aware that despite my best efforts it had taken several attempts to stop the hydraulic reservoirs from leaking. When they leak they make a bee-line for the front sub-frame mounts that hold the former to the floor of the car at the rear of the sub frame. Basically they are a variation of the much used silent bloc bush except that instead of the displacement occurring radially it occurs axially and it would also have to be the biggest bush of its kind I have seen. Anyway the one on the left hand side was rotten and had collapsed so that all the vibration in the sub frame was transmitted to the body of the car. The ruined item can be seen on the right above.

At left is a view of the two mounts inverted. The shoe polish tin is there to give a scale to the picture. The bushes are screwed into apertures at the rear of the sub-frame and locked by a screwed ring from the top side. The Factory method of removal is to disconnect everything and lift the body off the sub frame broadly speaking. My enthusiasm waned at this point so I hied me to my mentor and his hoist.

The body is fastened to the sub frame via these mounts by a large bolt through the centre hole and into the body floor. The head of the bolt which would be some 5” long is stabilised by some light metal horseshoe pressings which all

Here the locking ring on the top side has been removed and the bush is about to be screwed out of the sub-frame – note the anti-rust treatment via the leaking reservoirs. The tool in this case is a genuine factory item.

owners would be familiar with. These are the ones that yokels wack a jack under to change a tyre and finish up crushing them! Step one is to support the body. Step two is the place a jack under the sub frame, you can then remove the horseshoe stays and then undo the large bolt.

At left is the new mount fitted and the boomerang support straightened before re-fitting. The head of the bolt that holds the sub frame to the floor can be seen passing through the boomerang mount.

Most of the weight of the engine and the tension of the coil springs is now resting on the jack. Gingerly lower the jack and the sub frame and the body will part company. The separation will depend on the condition of the mount on the other side. We did one at a time which made life difficult. By undoing both sides (I decided to replace both sides at the same time) there would be more room to work.

What is required is to get a serrated tube spanner over the top of the sub-frame between it and the body and unscrew the top locking ring. The serrations on the locking ring are the same as those on the bush so that when you have these tube spanners made up you will have a pattern for both. The top tube would be no more than say 1 ½" deep and the bottom one can be say 5".

Anyway the finished job transformed the car, removed the noise and improved the handling in the steering department! When I got home I whipped out the front springs and the shock absorbers and tightened the lower shock joints which had loosened with use.

REMOVAL OF THE FRONT SPRINGS TO TIGHTEN SHOCK ABSORBER JOINTS

I am sure I have addressed this task previously. It is largely academic in that most owners are not as mad as I am and would happily leave spring removal to others who have the equipment to do the job. Back on page 1004 we looked at the ball joints the SY and SZ cars used with their composition cushions to minimise wear. These do however wear and the joints become loose. I thought that after the expense of the mounts I would check the joints at the bottom of the front shock absorbers since they carry most of the weight of the car.

What is involved is releasing the tension on the front springs then lifting the shock absorbers out, overhauling the bottom joints including re-greasing them and putting the whole lot back together. The following picks will be of interest.

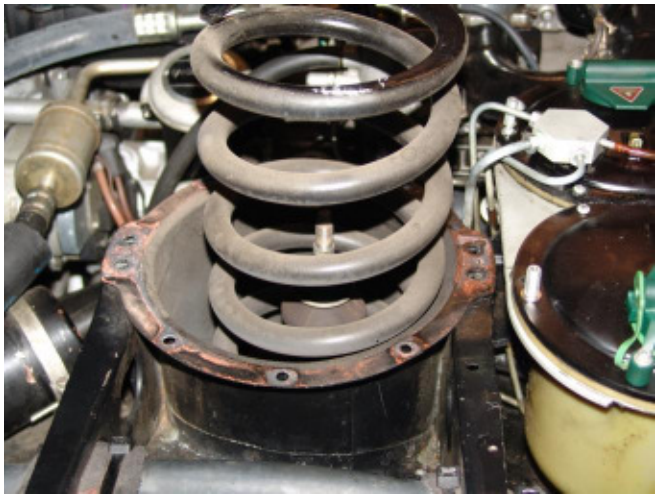
Step one is to remove the front wheels and block the car under the body so that it is down to a reasonable height to work on. Then remove the securing nut and lock nut from the top of the shock absorber together with the large washer and the rubber bush there under. It is the time to check that the distance piece seen here on the top of the shock absorber has not worn through the rubber and 'ovalled' the hole in the top spring plate. If so these can be repaired. Note also the larger bolts at either side of the spring plate these have been removed as have the bolts at 12 o'clock and six o'clock. This leaves four bots containing the spring. Note: where the bolts have been removed the remaining fibre washers which cut down noise transmission to the body. These were introduced early in the SZ series and can be fitted retrospectively to the SY cars.

Here a thick steel mounting plate has been placed on top of the spring retaining plate with a felt cushion beneath. The latter is merely to prevent scratching of the paint on the plate beneath. The raised brackets on the mounting plate are to contain the particular jack used to release the spring tension. Note also the large hole in the

centre to accommodate a centring tool when the spring is recompressed.

Here is the jack fitted to the mounting plate. It is a 2 throw with a third section for adjusting the final height. If I bought another jack it would ideally have three throes!

A heavy cross bar has been placed on the jack and connected to the body of the car with high tensile steel rods. The jack is fully extended and the cross piece tightened down on the jack. The remaining four bolts holding the top spring plate can now be safely removed. The jack is then slowly released allowing the spring to collapse the jack and release its tension.



The removal apparatus has been taken away and the top plate lifted off with its damper washer. The top of the damper can be seen through the spring. It is important that the lower wishbones of the suspension are down as far as possible by removing the wheels. If this is not done the spring has that much further to emerge which cannot be accommodated with the jack.

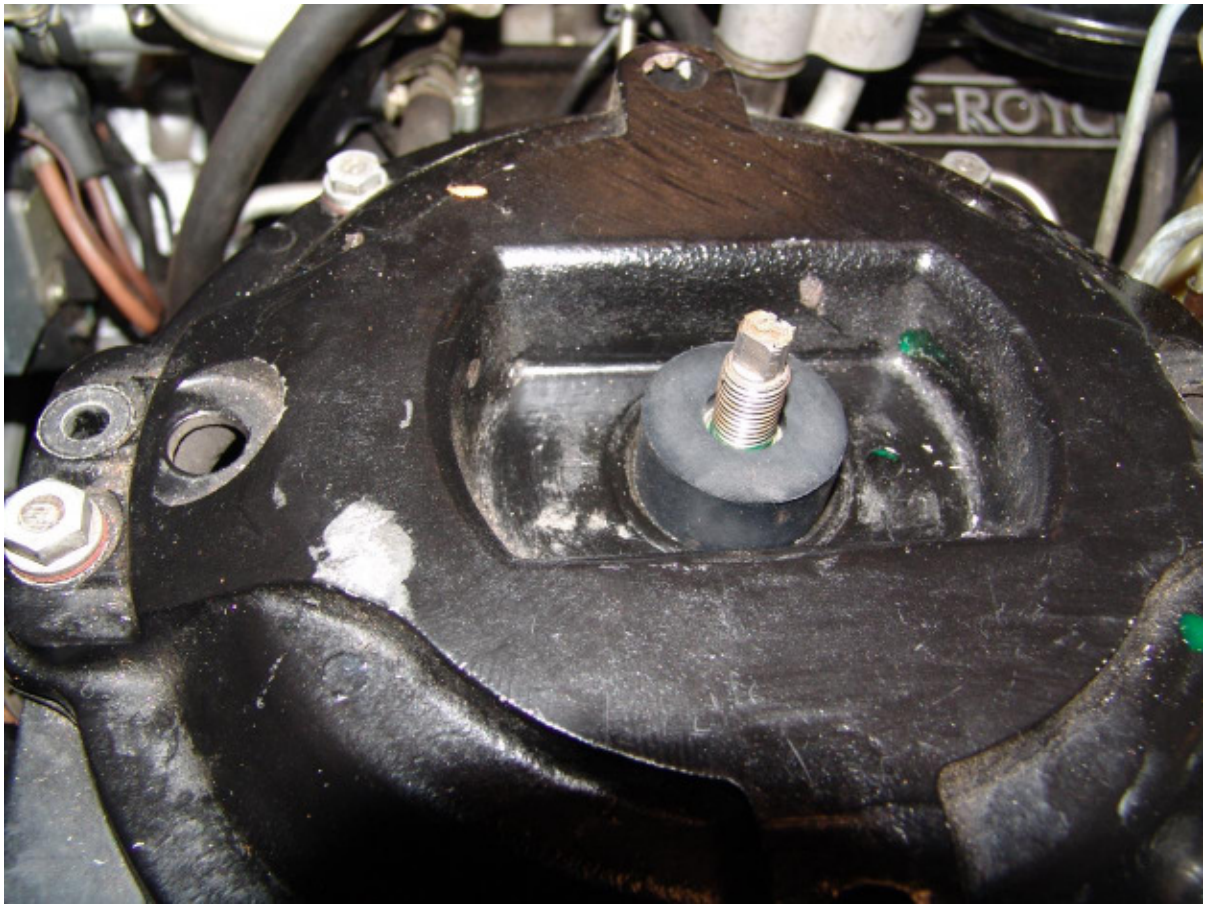
A bird's eye view of the suspension with the spring removed. The round object at the bottom is where the lower end of the shock absorber is housed and bolted in place. The clevis and rod disappearing to the right is the left hand caster rod that controls the fore and aft movement of that wheel.

And here among all the mess on my bench is the shock absorbed plucked from the car after removal of the spring. The spring sits on the round collar seen halfway up the shock absorber. At the bottom of the latter is the joint we are aiming to tighten.

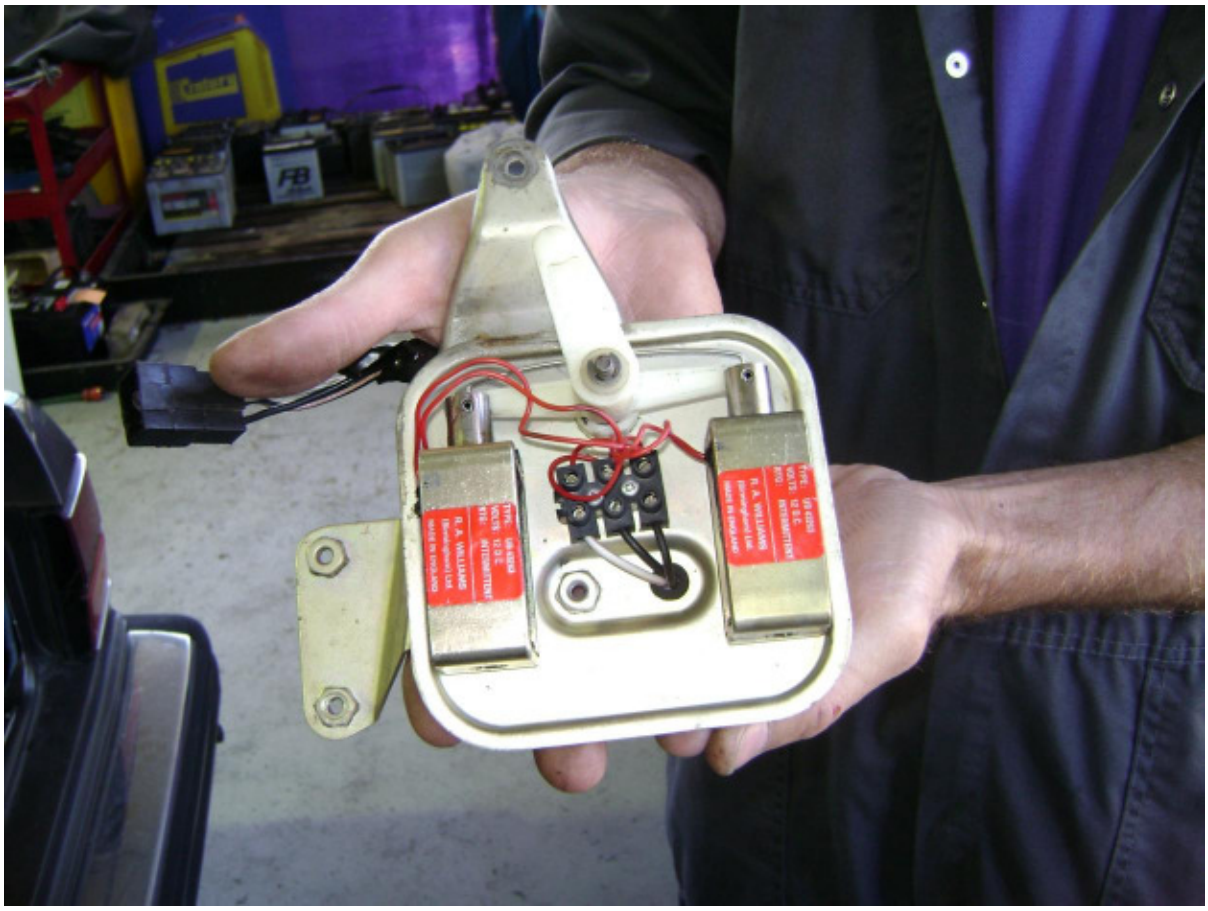
Removing the joint from the bottom of the shock absorber.

This is the lower joint opened for inspection cleaning and reassembly. The joint was quite loose. The adjustment for tightness is achieved by removing or adding shims between the upper cones seen at left and the body of the joint.

Reassembly is the reverse of dismantling. A small brass pilot cone was machined to screw on the top of the shock absorber to guide it through the spring plate. The spring compressor was re fitted and the jack extended allowing the bolts to be reinserted. It is important to note that of the two rubber bushes fitted to the top of the shock absorber the one with the extended lip is fitted under the spring plate. The edge of the 'lip' can be seen surrounding the spacer on the stock absorber stem in the picture.



It remains to fit the top rubber bush and bolt down the top washer to the spacer.



THAT REASSURING CLUNK

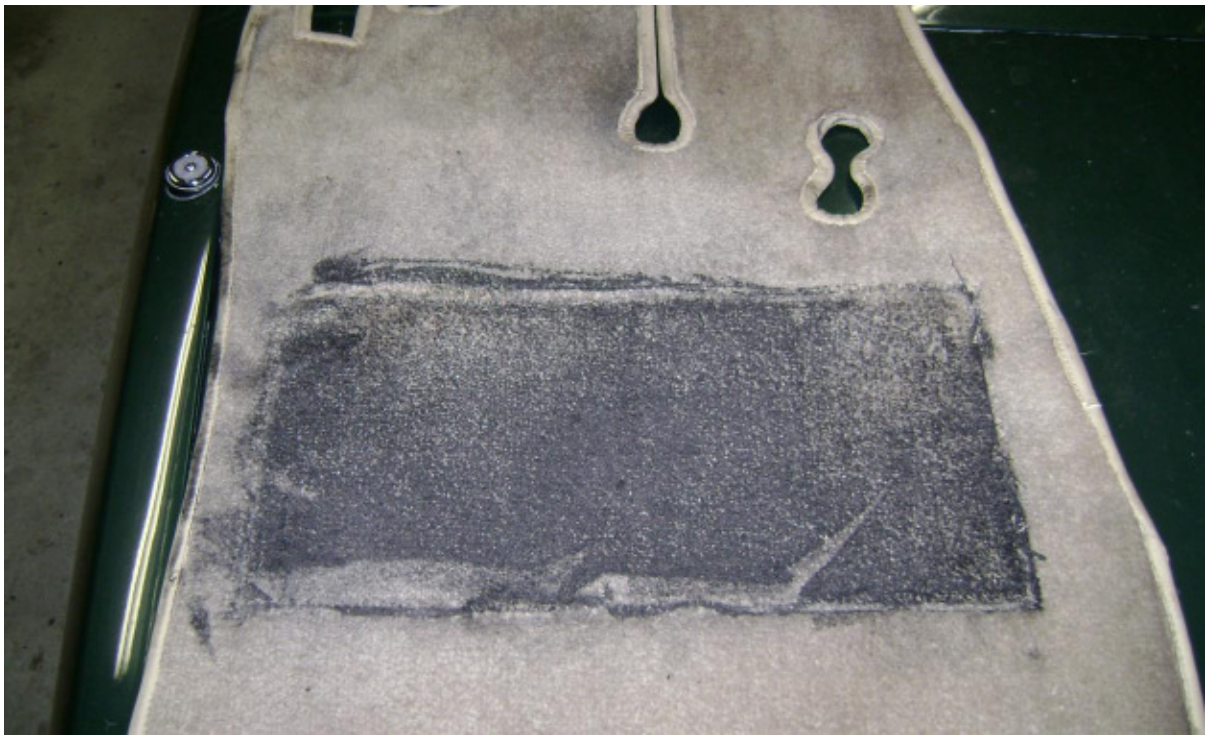
No NOT the one from the rear axle, rather the one inside the doors when you lock them. It seems that most owners that don't have keyless locking systems lock their cars by pushing down the waist rail locking button and holding the outer door button in when they slam the door. Whether you do this or insert a key in the door lock and turn it is up to you but the clonk you hear as the waist rail button goes down is from the solenoids in the doors doing their job.

The picture above which you have seen before shows the solenoid assembly. The little metal boxes house a solenoid each.

At left is a good solenoid. The waist rail button linkage is connected to the door lock linkage and the switching for the solenoids is done

inside the box in the picture. The solenoids in this installation pull, they are identical and as you can see by the linkage energising either solenoid will determine which way the locking mechanism is moved.

At left is a crook solenoid with burnt out wiring. They are still available but if this is not the case for you they can be rewound. In this context, the boot locking system as you know also has solenoids. During a recent installation of a keyless locking system it was noticed that the unlocking solenoid while intact and working did not really have that much oomph so my electrical genius had the solenoid re-wound with a few extra turns and now the mechanism slams back and forth like a demented pile driver.



WHO DID THIS?

Actually it was Old Father Time. This was the front driver's side carpet from a 1990 Turbo. The outline is that of a moulded rubber heel mat. In time the rubber simply perished and some of the softened muck that remained simply glued itself to the carpet tufting. Step one was to remove the black thread stitching. For those very macho owners who were never allowed to use their Mother's sewing machine, they can recover that bit of missing knowledge. Sewing machines use two threads, one below and one above the material being sewn. The threads used on these mats were originally designed to moor R.M.S Titanic judging by their strength. The object is to cut the threads and not the carpet.

Put on dark glasses, go into a sewing shop and buy a picker which is a very strong fine prong set in a strong plastic handle. Not only are they great for unpicking threads but they also double as aimers for the windscreen washer jets, various minute poking tasks and picking the top off the odd pimple! The object is to pry up a stitch then cut the resulting loop. Do the same an inch or so further down the row and pull out the thread between. Patience is required. When you have all the threads out you can if you live in Australia buy a product by Preen for cleaning the rubber off the carpet. Follow the instructions. This stuff will get the spots off leopards.

The next step is to take the carpet to your friendly automotive upholsterer who will sell new vinyl mats to replace the rubber one you have just removed. He will even stitch it onto the carpet for you!

SAVING THE LADIES!

There are few things more mortifying than returning to your car to find the lady has been pinched. The only positive factor occurs if the grill has not been damaged with the extraction. The Shadow was the first model to fit a flexible mascot mainly to lessen the filleting effect on passing pedestrians. Prior to this, mascots were very securely bolted to the top of the grill during the Cloud era and before that they reposed on the top of dummy filler caps which could be easily removed. Clouds had no such facility and most atrocities were committed by sawing the lady off at the ankles! There was a case also many years ago where

some very strong cretin managed to literally tear the whole assembly out of the top of the grille! Students of the spare parts manual for these cars would be aware that the grille on a Cloud and the sister Bentley could be fitted with a dummy filler neck and a screw on cap with or without mascot applied. I have never seen one.

So what to do? The answer for the 'flexible' mounted lady is to carry a parking cap or probably more correctly a parking button. These are still available and if you can borrow one have one made. If you do this the problem is to find a spring that fits under it otherwise when you want to remove it you have to turn the car upside down and shake it out. An alternative method is to use a suction cup from your kids' bow and arrow set. This also applies to the SZ cars provided you don't have a drop-down mascot. For them apparently there is a lockable plate that can be placed over the dear thing after you put her to bed. I have yet to find one of these.






One picture saves a thousand words etc. Note the spring under the plug to aid withdrawal. Cars delivered new to Switzerland wore these caps and the lady was placed in the glove box. The hex key should be found in the tool kit and is a perfectly standard item!