

# TEE-ONE TOPICS

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## INFILTRATED FLOATS

In these strange days where people carry pyrotechnics with them to illustrate their beliefs and opinions one hesitates to use the above adjective, but I trust that those who take great personal interest in such matters will excuse my levity. For the few who are wondering what the above objects are, they are floats used in post war carburettors to control the amount of fuel sitting in the supply chamber of each unit. The floats work exactly the same as the cistern in your toilet ( for those living with a one-holer in the country, you will have to pop into the nearest motel or pub to check out cisterns.

The float is an hermetically sealed vessel shaped to fit freely in a chamber and able to float without hindrance. For those old enough to remember old Archimedes and the time he ran down the street naked shouting 'Eureka' he was probably the first person to realise the relationship between the weight of a floated object and the amount of fluid that it displaced. For the immediate discussion we should note that the heavier the object, the lower it floats. In a carburettor the height of the float above the fuel level is a critical dimension and directly relevant to fuel level and subsequently, overall mixture control.

Since Methuselah tuned his first carburettor, manufacturers have used copper sheeting to make their floats since that metal is largely inert, quite malleable and relatively cheap to use. Joints which are unavoidable are soldered. One would think then that these little masterpieces would last forever.

NOT, as modern argot would have it. The copper floats pictured on the previous page came out of an ancient S1 Bentley which staggered up my precipitous drive recently trailing a small stream of fuel. Having confiscated all matches and cigarettes on the property I lifted the bonnet to find fuel running out of the front carburettor from beneath the lid. Ignition off removed the lid and the float chamber was fuller than the family po! The float was however submerged!! First guess before the lid came off was a defective jammed or clogged needle valve. A submerged float however killed that diagnosis.

A couple of dental picks from your local fang farrier are the best tools to draw out the float which usually defies all attempts to grip it! The float out and held to my shell pink ear with a spirited shake and lo the sound of sloshing fuel. The thing had leaked, settled lower and the fuel had to rise that much more before the float could push the needle valve shut. Old hands will tell you they are repairable but if you think about it they are just not worth the trouble. To do it properly you would have to boil the fuel out of the float then weigh it exactly. You can solder the leak hole and then adjust the weight by paring off solder on other joints so that the finished weight is as the original.

Fortunately, I had a couple old floats. To test that they didn't have holes in them I immersed them in boiling water and watched for bubbles caused by the air inside the vessel expanding! No bubbles, popped them in the chambers cleaned the filters in the lids and all was right with the world again. No leaks. The car ran like a spastic nematode and it was very tempting to fiddle with the mixture screws. I didn't. The 'rubber' diaphragms were probably the originals, brittle as glass and any forced movement would have them cracking and leaking!

The other strange contraption is a float the Shadow II's onwards until fuel have obvious benefits yet they can still and was certainly irreparable.



from an HIF carburettor fitted from injection took over. Plastic floats leak. This one was half full of fuel

To finish the topic - a small anecdote.

A fellow some years ago dumped an Aston Martin Lagonda on my doorstep with precise instructions on how to destroy it if I could not fix it. All very new to me, I lifted the huge bonnet to find a 90 degree five and something litre engine with four overhead camshafts all chain driven. At the time the car was the fastest car on the road and one prominent owner was Her Majesties' eldest nipper. But all this did not overcome the problem which was a periodic tendency to flood. It had four double throat Weber carburettors (that is one throat per cylinder) which generated no less that 36 adjustment points to attend to to tune it.

Predictably, the flooding would not occur for me until 'Do I smell petrol?' said my passenger. Seems it was number two instrument from the front. Simple prophylaxis demanded a change of all the needles. That did not stop it. Much dismantling and inspection revealed nothing. Despair was settling in. One o'clock in the morning saw me standing dismayed in my little workshop of the day slightly steeped in carburettor analysis fluid a product produced preferably in the Scottish Highlands! I had the offending carburettor body in my hand idly stroking the inner surfaces of the float chamber. Suddenly as they say in the best epics my finger froze, 'What is that' I heard my slightly anaesthetised voice mumble..... There was, when viewed with a powerful lens a very small stalactite of metal that had 'grown' from the casting. The design of the float chamber allowed very little room around the float and this little projection would sometimes just catch the float and hold it down long enough to flood! Such things are very satisfying to discover but getting there is often in the climbing Everest category!.



## BE GENTLE WITH YOUR NIPPLES



out as can be just seen in the picture. This is often so bad that the nipple can barely be withdrawn from the receiving assembly. The solution ideally is to make up a new pipe and fit a new nipple. Alternatively a little judicious filing around the swollen perimeter should do the job. As to how tight to do them up I nip them up 'comfortably' knowing that some may drip. With full pressure in the spheres apply the brakes or load the rear as needed and gently tighten leaking joints just enough to stop the leak! ✂

My mate Peter mucked around with his incredibly complicated camera to take the photo at left. What we were trying to show was the flaring of the lower unthreaded portion of the pipe nipple. This system of union is used right through the hydraulics of all post-war models and involved double flaring of the pipe.

The outside of the pipe fits snugly into a conical recess in the base of the nipple and when the latter is screwed into the calliper/wheel cylinder/junction block etc the double flared nipple should fit neatly over an inverted cone shape in the receiving assembly.

The nipple pushes the pipe down firmly and the seal should be made. Unfortunately because the pipe is relatively soft there is no obvious 'tight' point at which you can say that's it! So the ham fisted will tighten and tighten. Indeed if he keeps going he will reduce the double flare to tissue paper thickness and at the first burst of pressure the pipe or what is left of it will simply spring out of the nipple and hose all those in attendance with brake fluid or mineral oil!

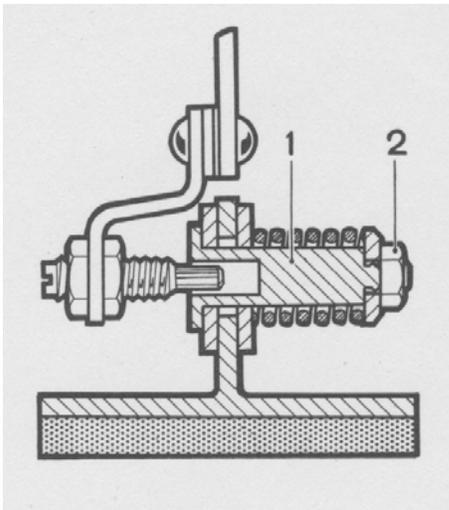
While this unfeeling Mr Hercules was doing his spannering, the nipple was suffering at the same time through the end of it being flared





## SHAKE BACK STOPS

These little gadgets can be pretty much a life and death thing and yet are often thrown together without any check as to their function or performance. They were first used by the Factory when the Cloud appeared on the horizon and were part and parcel of the, by then well tested small fluid volume approach to hydraulics. In effect this requires that the braking units, in this case the shoes, have only a minimal distance to travel to do their job.



Since owners can hardly be trusted to check their brake adjustments each week some sort of automatic adjuster was required. First it should be remembered that when the shoe is no longer forced against the brake drum, the return springs are designed to heave the shoes back just enough to minimise drag. If the car is then used on perfect roads the shoes will probably stay right where the springs pulled them to.

At left is a cross sectional view of the stop showing the spring bearing down on the two washers clamping the shoe web. Note the very small clearance between the adjusting bolt and the sides of the stop hole. It is this distance that the shoe retracts when the brakes are released.

But alas the perfect surface has yet to be adopted for all our roads. So when the wheel hits an almighty bump among other forces being flung around the car, there is bound to be one that will encourage the brake shoes to retract even further. So after several of these events the driver applies the brakes and because the distance the wheel cylinder pistons have to travel, now a relatively considerable distance, the master cylinder pushes all its fluid out before the shoes eventually get to the drum. If they don't make it to the drum or just barely touch it, your pedal will be on the floor and you will be reaching for your prayer book!

To avoid this upholstery damaging situation the Factory fitted shake back stops. These are quite simple in that a steel post is mounted on the stub axle brake mounting plate, which threads in to a hole in the shake back stop. The latter sits astride the brake shoe web and passes through a large

angular hole. The stop itself consists of a large headed bolt with a stout large washer threaded over it. The two are then threaded through the hole in the web and another stout washer placed over the bolt. The web is then sandwiched between the two washers. It remains to top this little setup with a very strong coil spring, a washer to sit on top and a nut to screw down on the washer and spring. The result is that the web is now jammed between the two washers.



At left the elongated hole is where the shake back stop is mounted. Note the crud generated by the lining bonding process has been removed to ensure the correct grip of the washers on the web.

In operation, the pistons in the wheel cylinders push the shoes out to the drums. Given their power, the sandwiched web slides between the two washers. When the brakes are released, the return springs try to pull the shoes back but can't because of the

jamming washers. It gets a bit clever here. The end of the bolt that pokes up into the shake back stop is some thousands of an inch smaller than the hole drilled in the bolt that is the shake back stop. The 'slop' between the bolt and the hole is the distance the springs can pull the shoe back before the clamped stop takes hold and this the 'clearance' designed for the shoes.

It follows that if the 'clamping' force is not strong enough to resist the return springs, there will be too much clearance between the shoes and the drums. Actually the more likely problem is too much clamping as a result of the web of the shoe rusting through lack of use or a build up of brake shoe dust. Actually it is fairly easy to check. Simply lift the wheel off the ground and rotate it. There should be a slight drag. If it runs freely you don't have enough clearance. The wheels on each side of the car should feel roughly the same.

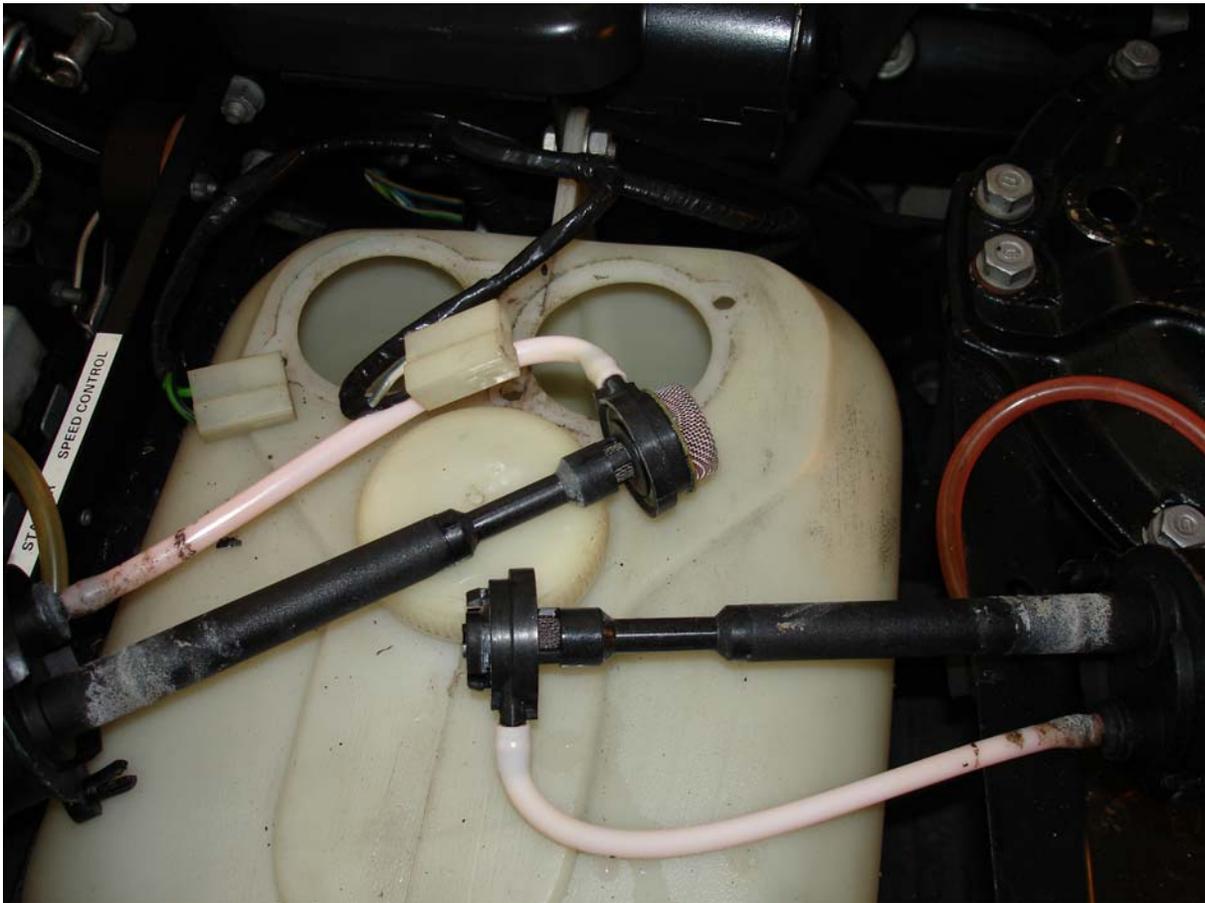


Relining of shoes however has brought to light a new problem. Originally the linings were riveted to the shoes. This procedure today is reserved for trucks and virtually all car linings are now bonded to the shoes.

The length of the spring and the thickness of the top washer are so designed that there is just no thread to start the nut. This is one way to do it – very gently ensuring that the nut threads on cleanly!

There are divided opinions on this method but it seems that it is largely a matter of preference. If however the linings are bonded and of course the shake back stops and pivots would be removed for the process, the various materials used in the bonding finish up covering the whole shoe including the hole through which the shake back stop passes! So when the shoe is reassembled and the friction washers clamped the grip between the washers and the web is very much greater than designed. The result is dragging brakes. The solution is simple, clean the bonding muck off the web where the washers will be working and all will be well. The drag should then be checked with a spring balance as detailed in the workshop manual.





## WASHERS AND SQUIRTERS

This little luxury first appeared on the Mark VI Bentley about 1950 as I recall using American Trico fittings seen on the Buicks and Packards of the day. Miniature pump motors were still in their infancy so a vacuum operated diaphragm pump was used which simply sucked up a mouthful and dribbled it onto the windscreen. The jets were beautifully made and could easily be opened for cleaning and were simple to aim.

The Clouds were the first to enjoy a little electric pump that had the capacity to give a mouse a gentle enema. The jets were still Trico but if you were smacked in the face with a great dob of mud from a passing truck at 60 mph your best recourse was often to stick your head out the window to see where you were going.

The Shadows had a very different engine compartment with everybody in the design department trying to get their bit of equipment in there and unfortunately the Washer Guru got the short straw. The system was improved with much more squirt but unfortunately the plastic bottle that the washer fluid was stored in had difficulty coping with the raging heat of one of the exhaust manifolds nestled beneath it! The sight of an owner flinging open the bonnet on his pretty new Shadow to put water in the washer bottle only to find the latter reduced to stalactites of deformed plastic was well worthwhile capturing with your camera!

The Shadow II complete with its 2008 advertised modifications conceded defeat and rather cleverly popped its capacious reservoir behind the left hand front wheel. But then some clever frock coat decided that headlight washing was essential to the well being of the community which brought yet

another dimension to the scene. This involved fitting two pumps into the reservoir and screwing on another set of wipers on the headlights.

With the larger engine compartment on the Spirits, the reservoir was back in with the rest of the working bits complete with two pumps. About 1985, the wipers were scrapped and a couple of water canons were installed in the front bumper bar which were not only capable of flushing any amount of mud off the lenses but also giving any close-standing pedestrian a friendly splash should they be hovering in the vicinity of the grille! The latter system used a separate reservoir under the right hand front mudguard since the amount of water required for the sluicing is considerable.

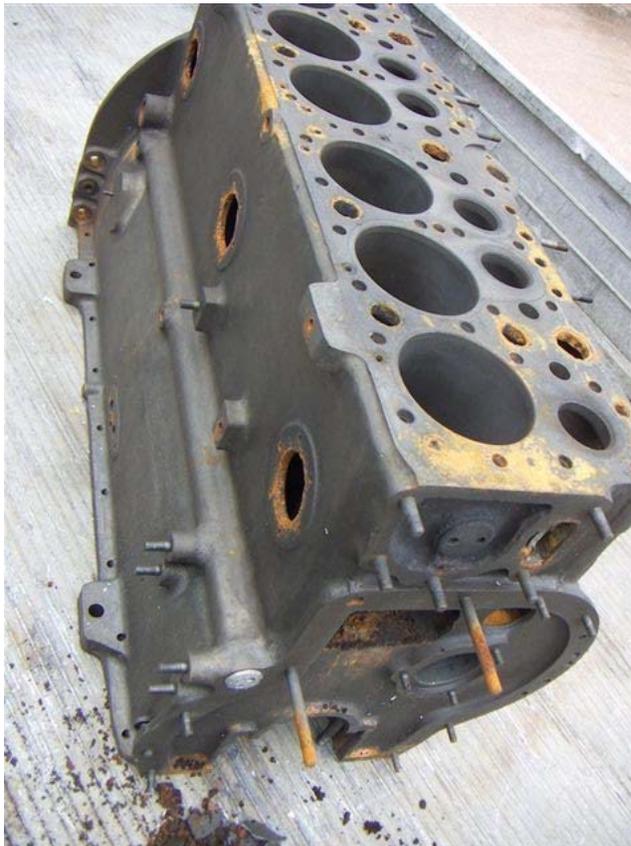
So there is the history. At the time of writing the only original electric pumps still available were those fitted to the Spirits. They should give long service but unfortunately their intakes clog up with the deposits of time and carelessness and eventually the motors burn out! Pulling them out periodically for a good clean and rinsing out the reservoir will pay dividends.

Note that should you have to resort to adapting other pump motors to the systems, that there are two types – blowing and sucking. Obviously the pushing type needs to have a good level of fluid above it to work. This is particularly important with the Shadow II!



## THE RAVAGES OF TIME

I have noticed of late that I am getting a little fragile around the edges but it seems I am not the only sufferer. A friend decided to clean a 1949 Mark VI cylinder block using the services of Redi-Strip in Sydney.



<http://www.redistrip.com.au/>. They did an excellent job it seems guaranteeing that no original metal would be removed or damaged by their process. All rust however departs .

My friend, idly tapping around the block in the manner of the old railway fettler who used to tap railway wheels, noticed a rather dull response from the front of the block – normally covered by the timing case cover. There was a slight crack in the area evidenced by some residual cleaning solution leaching out . A bit harder tapping produced the following.



He actually broke open the hole you see in the picture which revealed that the casting thickness had been reduced by corrosion to 1-2 mm! Originally they would have been 4-5mm of metal.

The other matter of interest was the amount of casting sand which had remained in the block after 57 years!



## A TUBAL INVESTIGATION



In another place I have been pointing out the likely limited life of the numerous rubber hose connections used on the SZ cars. These cars as you know have a re-circulating system requiring two pipes between the engine and the tank.

To simplify the reticulation, rubber hose is used to join the straighter lengths of pipe. This also provides a barrier to noise transmission from the pump and to some extent the engine itself.

With age this hosing becomes brittle and common sense would suggest that it be changed periodically with the best quality hose available.

The pictures give some idea of where these rubbers sections are. In replacing them always use new hose clips.

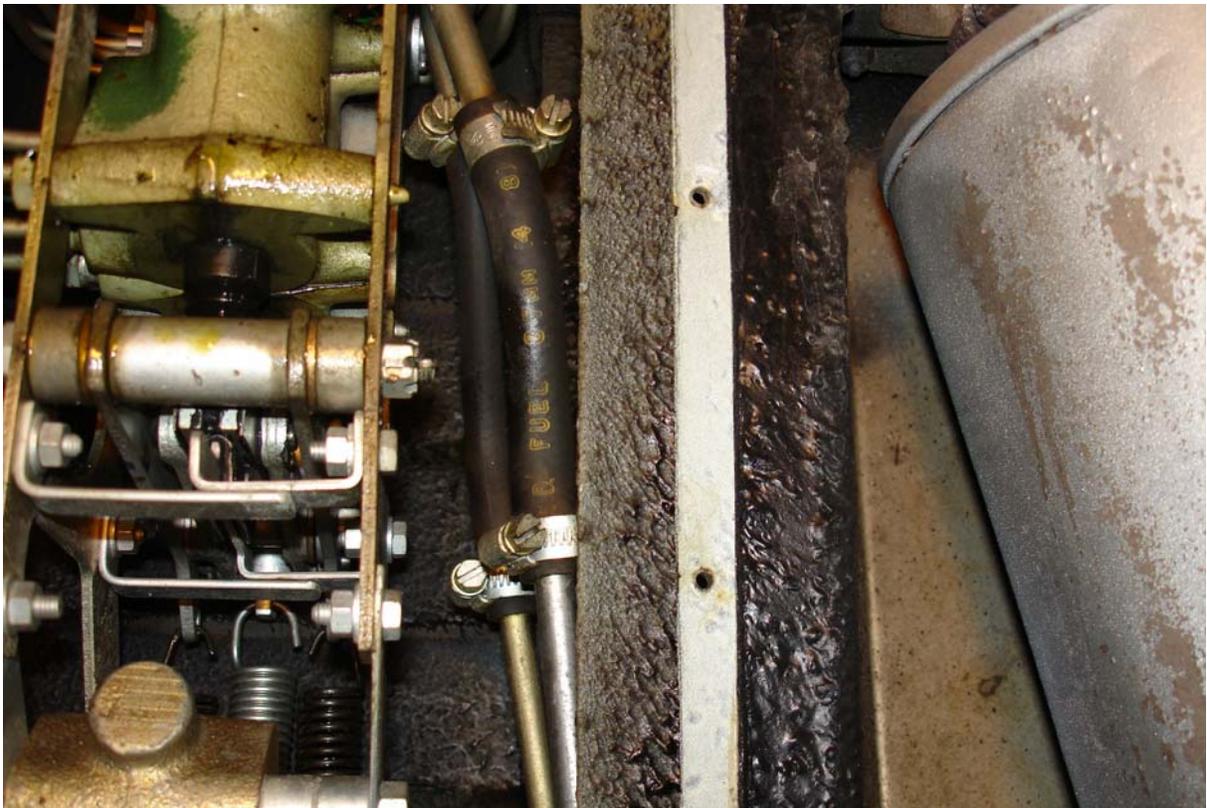
The primary filter below is often forgotten until the fuel pump gives up

trying to push fuel through a gravel pit!









## THE TECHNICAL LIBRARY

I have just had the great pleasure of working in a professional operator's garage with automotive patients ranging from early 1930's to the end of the century and all drawn from both the Bentley and Rolls-Royce stables. I confess to being rather delighted when recourse was had to our Technical Library to clear up some doubts about procedures, the juxtaposition of various parts and assemblies and simple basic data.

What, I enquired did these people do before the library? We are getting about 900 hits a month through the Club Web Site so I suspect a fairly wide spectrum of users are availing themselves of the facility. And our American friend who carefully downloads out stuff, puts it on a CD and flogs them through eBay is doing quite nicely methinks! The latter poaching is I think generated by an inherent embuggerance in the system. This was brought home to me during my recent sabbatical when we needed to fathom how the boot lock mechanism went together on a post-nineties Bentley.

Despite our scanners painstakingly splitting the section of the workshop manual dealing with the body, I still had to download a very considerable file to get the little bit of information I wanted! If I had been drawing on a CD on my computer the extraction would be much quicker. If the whole file had been on my hard disc it would have been very very much quicker! So the method would seem to be download the entire manual and install it on your hard drive if you have a reasonable use for it otherwise pop it on a CD and have it beside you to draw on as required.

Meanwhile I will try and break down the files into smaller parcels. It is a time consuming job however and with these 24 hour days /..... I am also aware that aesthetically and practically the location of the Library is not ideal. The software was not designed for the task but we are fortunate to have access to it and will make the best of what is available.

