Tee-One Topics

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The ramblings of an amateur enthusiast to be shared with others who own, drive, mind or repair Rolls-Royce and Bentley cars, or those who simply love them.

NOSTALGA

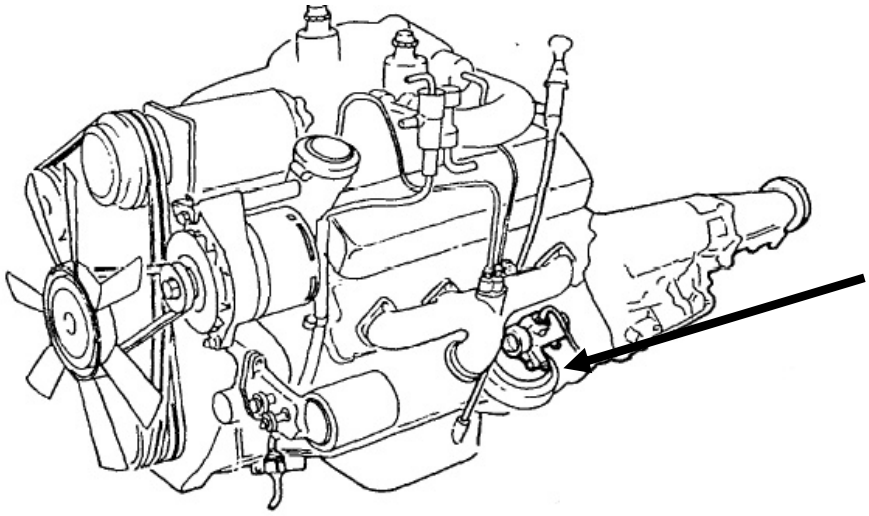
It is a pity we don't have a ready bar to sit back with our pints and recall the good old days. Recently our local Cloud III which is in daily use and has been for quite a few years, needed some tarting up in the door seal department . I was given the welting and asked to fit it. No problem until I removed the steel loom cover seen lying nonchalantly on the door step above. Nicely made, enameled and held down by seven self tapping screws it covers minor wiring to the rear compartment. Sigh! I have recently had to do something with the wiring in my Spur and a friend's Spirit and noted that the technique then was to cover any wiring with sticky tape. Probably just as effective certainly lighter and quicker but/……..They don't build 'em etc.!!

But credit where due, the wiring on the old Clouds, where exposed is steadily trying to anonymise itself by shedding its plumage. The latter was coloured waxed cotton, excellent for old eyes but when it dried out in the heat of an engine compartment it sheds like a snake's skin.

CASTANETS IN A T2

A ‘new’ T2 arrived in the neighborhood. Nice looking car and relatively rare in Australia. One mysterious noise however was the apparent clatter of a hydraulic pump. It’s timing was inconsistent with any other function and would never occur while the engine was run up while the car was stationery. The noise could best be heard by the driver and it appeared to be coming from behind the speedometer.

Phil Sproston to the rescue as he had come across a number of cars with the noise and they were all T2’s or Silver Shadow II’s. He had traced the noise to the return line of the number one system accumulator and more particularly the return line from the accumulator valve to the reservoir.



The Shadow 2 engine (chassis numbers 30,000 plus) had the accumulators repositioned to either side of the engine. This is the number 2 accumulator which for some reason does not generate the knocking noise.

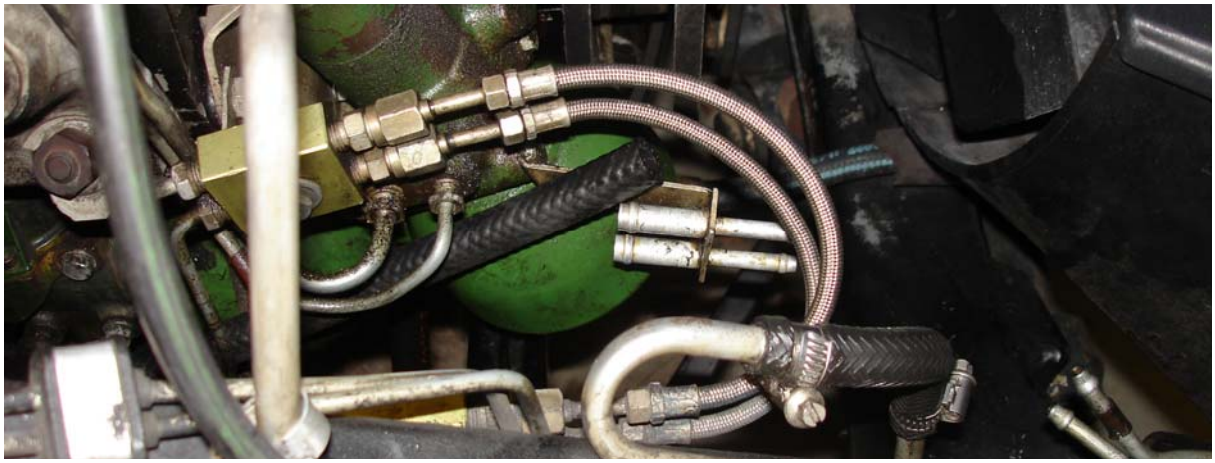
When an accumulator is fully charged the output from the pumps is directed by the accumulator valving back to the reservoir.

By that stage the pressure in the system can well be over 2,500 psi and it is oil at this pressure that is belching out and into a 3/16” ‘rubber’ pipe connected to a steel pipe on the body. Apparently, it is thought, the flexible pipe used by the factory is too rigid and the pulsing hydraulic flow causes the knocking. Once one realises what is causing the knock you can imagine the events and the timing that initiates it. It is intermittent because unless the accumulator valve is exhausting there is nothing to knock. Hence a quick brake application, the accumulator re-charges and a short interval later the clatter occurs, the accumulator spitting the now unneeded fluid out to the reservoir. For some reason the same problem does not occur with the number 2 system.

Step one was to make up a new exit pipe from the accumulator. The original was retained in case the scheme did not work

Phil decided that placing a ‘muffler’ into the flexible pipe might let the energy from the pressurised fluid dissipate before it started on its journey back to the reservoir. He did this by fitting small plastic ferrules over the metal outlet pipe and over the end of the metal inlet pipe to the reservoir. This allowed him to fit a larger flexible pipe between the two points giving the required ‘space’ for the high pressure fluid to relieve itself. This works very well.

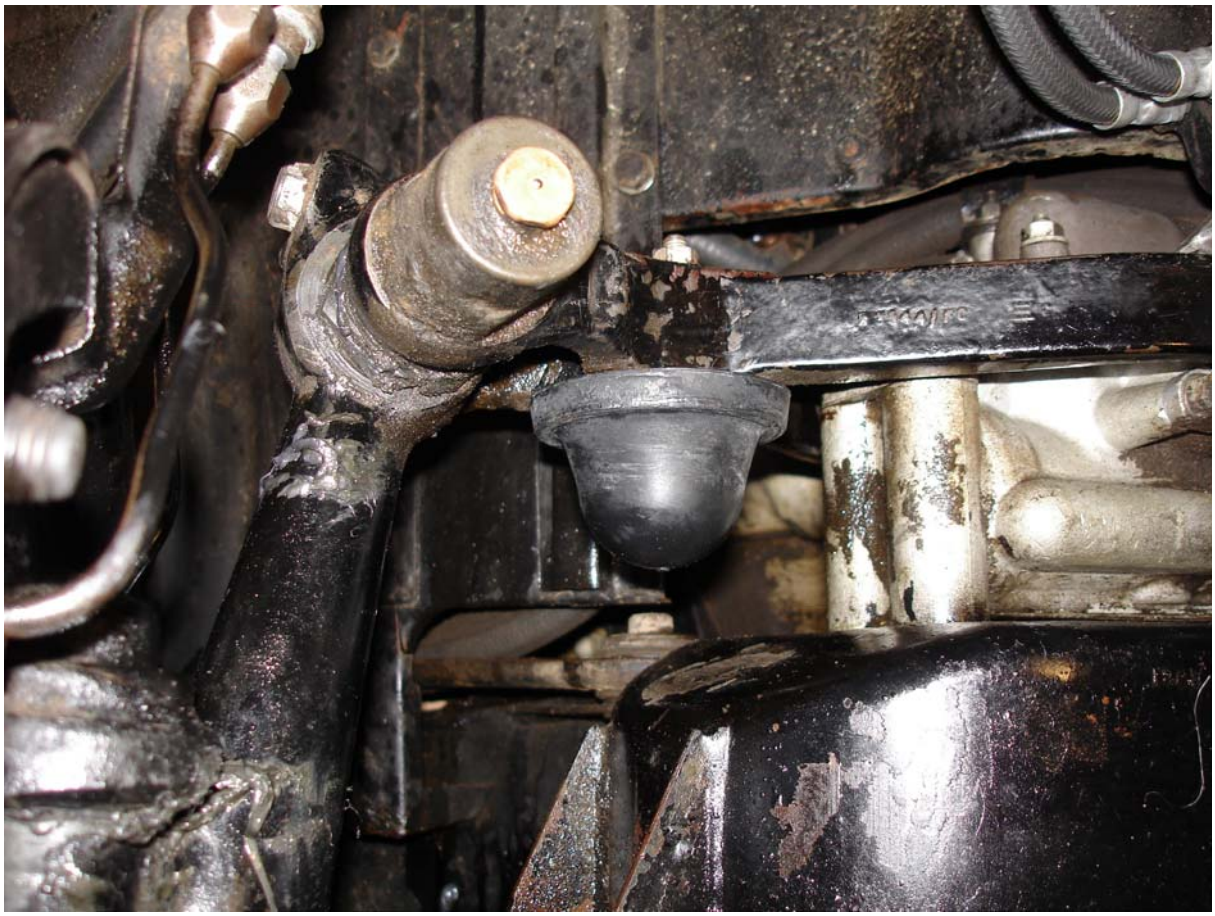
Quite separately I was struggling to change the low pressure hoses on the Silver Spur. As you know these cars use mineral oil and a lot of very different bits to do the job. Nevertheless the task and result are the same so I wondered why there was no knocking in this car. On the SZ cars most of them cluster their accumulators and valves around the front right hand corner of the engine. The valves are very neat little affairs with a nice large outlet on the top of them. Both outlets notably have very liberal lengths of large bore hoses with graceful curves to help align themselves to the chassis return pipe to the reservoir. Both pipes however fasten to a restrictor on the other side of which is a smaller pipe. It is from here that a smaller flexible pipe connects to the chassis return line.



The twin pipe restrictor seen on the Silver Spur in the middle of the picture is mounted on the front of the accumulator valve. The disconnected hose is the large return pipe from the number 2 accumulator located on the side of the engine block. Using this fitting on the T2 obviously used up only one of these restrictor pipes. To the right can be seen the entry ends of the return pipes to the reservoir.

A not terribly helpful picture of the installation in the T2. The unused 'leg' of the restrictor still has its red blanking plug. The black hose beneath the red cap is the smaller end of the return pipe which is curved around and joins up with the steel chassis pipe seen immediately below it. Unlike the Spur which because of the juxtaposition of the accumulators to the body frame there was not much opportunity to run reasonable lengths of flexible pipe.

With my fingers crossed I bought one of these restrictors and found a bolt under the power steering pump on which to mount it after a little hole enlarging and bracket bending. I had made up a new outlet pipe from the accumulator valve and silver soldered a hose fitting on the end to ensure a good grip. This allowed the fitting of a 3/8" I/D hose normally used for getting the brake fluid from the reservoir to the pumps. This hose fitted the larger side of the restrictor and a smaller hose was hooked up to the other side and thence to the chassis return pipe. And it worked! I now have a look at the odd passing example of this model and note that most treatment seem to involve simply fitting a larger diameter flexible pipe from the accumulator outlet pipe to the chassis return pipe and squashing it down to stop any leaks. Phil's method certainly gives better sealing but I like my system because it was used later on the Spirits. How's that for mechanical idolatry!!!



THINGS THAT GO BUMP

You will all have recognised the upper control arm of a Silver Cloud. The nice aluminium structure to the right is the front shock absorber and holder of the control arm lest the wheel fall over! The stout vertical bit of metal to the left is the stub axle assembly on which the wheel hopefully revolves. The inverted mammary like object under the control arm is a rebound buffer. When the wheel enters a ditch/bump/pothole, the spring forces the control arm down and if the buffer were not present the noise of the control hitting the front cross member would probably promote the idea of the passengers leaping to their freedom!

The bashing of these things is amazing and eventually they break up with age. They cost most of an arm and one finger at last count but the expenditure is well worthwhile. To get them in, the trick is

to remove the wheel and lower the suspension until it is sitting securely on a wooden block. Then jack up the opposite corner at the rear as high as practical which will compress the spring and enable you to unbolt the buffer, slip it out and fit a new one!

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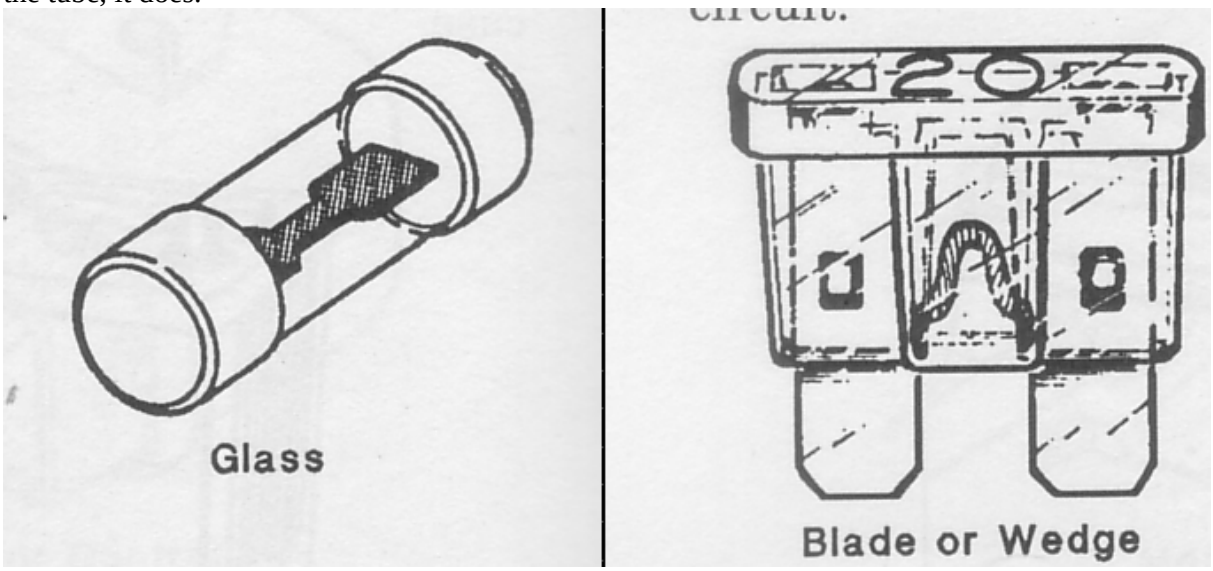
WHY DO FUSES FUSE???

It has long puzzled me how cartridge fuses i.e. the little glass tubes with a bit of wire inside, 'blow' when there is no apparent overload. This mystery was cleared up the other day for me by an old hand in the electricity game. As you know electricity going through a conductor generates heat. OK not much in the case of your flasher unit for the headlights but heat up that little bit of wire in the tube, it does.



Heating metal causes expansion. The metal ends of the glass tube are usually very carefully fitted, so much so that they will not move, despite their expanding little metal connector madly trying to push them apart. Something has to give so the metal 'arches' and when the power goes off and the metal cools it contracts. No problem except after the umpteenth time the metal fractures, breaks the circuit everything cools down and that is the end of the fuse and the operation of your flasher! The point at which it breaks is often inside the cap at either end so you can't see it.

Worse, the break, given the circumstances of its creation is hairline and barely visible to the naked eye so you the hapless owner looks and sees what appears to be a perfectly intact fuse and moves on. A little prophylaxis perhaps; replace your fuses every so often. Better done in the comfort of your garage rather than on the side of a busy highway!!

These fuses replaced the wonderful old fuse holders used for many years that you could rewind a bit of fuse wire into the little frame and you were back in business again. This all ended with the introduction of the SZ cars which had more fuses than the average mother-in-law. To use the old holders took up too much space, they were expensive to make and fit and owners believe it or not in some cases were so useless they couldn't even fit the fuse wire. The glass fuses simply popped in and out – not too much metal stress there but probably a little less reliability. Eventually the Factory caught up and installed the wedge fuse from about 1985. The fuse is easy to check and lo!!! it even caters for expansion and contraction!

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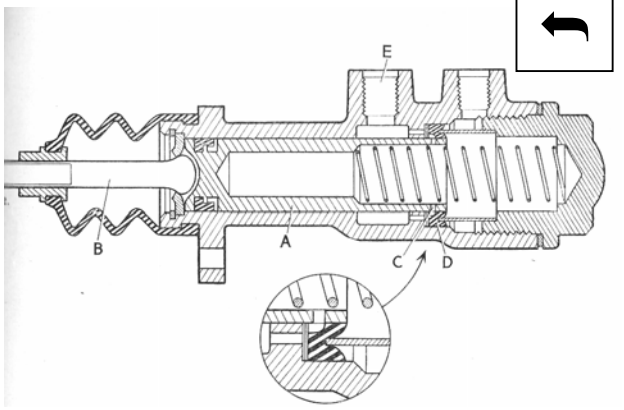
BLEEDING THE MASTER CYLINDER IN AN EARLY SILVER SHADOW.

In the early fifties when Citroen developed the concept of piping stored hydraulic energy to brake pistons they came up against a fundamental point of resistance from their car buyers. The idea of using our foot to stop must go back to creation. How else do we stop – fall over? I've tried that. At some time most of us have been on a trike, bike or Billy cart and the instinctive action when you wanted to stop was stick your foot out and the quicker you wanted to stop the harder you pushed. And even now when you are a passenger and the driver's reactions don't coincide with yours, what is your foot doing – pushing like Hell on the floor.

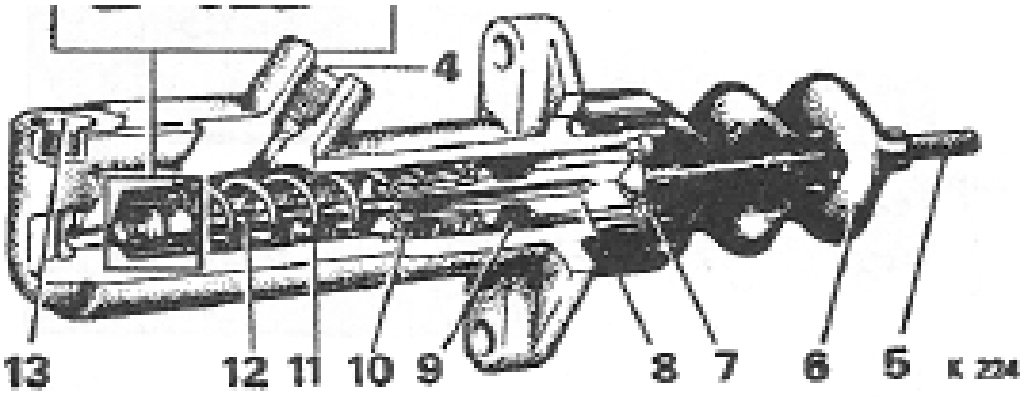
The **Loughead** brothers Allan and Malcolm pioneered with aircraft during the 1910s. But the Loughead company had to close down in 1921. Malcolm quit the aviation business and became successful with a hydraulic brake system for motor cars. Malcolm changed his name into **Lockheed** and baptised his new company the *Lockheed Hydraulic Brake Company*. Allan, together with Jack Northrop, got back to airplanes when both created the Lockheed Aircraft Corporation. 'Lockheed' to ride on the fame of the brake company.

So many owners do not appreciate the very different mechanisms between the old system of pushing brake fluid down a line with a piston operated by your foot and the system used on the Shadow and later cars. With the latter all the operator has to do is open a tap and let the stored highly pressurised brake fluid in the reservoirs get into the brake lines and apply the brakes. When Citroen introduced this system they simply replaced the conventional brake pedal with a round knob on the floor not unlike a dipper switch. It had only token resistance to the pressure from the driver's foot but the harder you pushed the more pressurised brake fluid was admitted to the calipers and the faster the car stopped. I have never driven one of these cars but it must have felt odd to the experienced driver. Citroen had to alter the design and fit their cars with a conventional brake pedal.



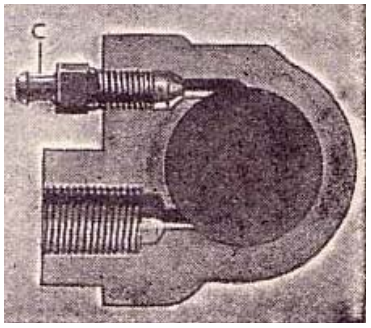
Always on the lookout for some illustration, at left is a crossection of the single master cylinder used on the 1952 Rover 75. It is Lockheed in manufacture and design and almost identical to that fitted to the Silver Clouds. They of course used two of them to avoid putting all the eggs in one basket. As an aside unlike the Mark VI which used a Girling system there is relatively little movement of fluid in the Lockheed setup. The shoes/pads were always lightly rubbing the braking surfaces be they rotor or drum so a little push from the piston 'A' at left gave enough movement to the shoes at the other end. Below is a cross section of the actual cylinder fitted – similar but a bit different.

But even with the pedal there was nothing to push against so it had to be given feel. And that is where the little master cylinder comes in. It is apparently straight out of a Morris Minor of the day and as conventional as you can get. It has of course a very small bore and connects to four fairly



large caliper pistons on the rear wheels. Fortunately with disc brakes only a very small amount of fluid is needed to move these pistons and our Morris unit is only just capable of doing that. The Factory spin merchants in those days actually promoted this little system as a 'third' braking system but can I suggest that if you want to try out that facility by switching the engine off, exhausting both accumulators and then lay into the brake pedal, that you choose a reasonably level deserted road!

In short, the little master cylinder is there for pedal feel. Nevertheless the system has to have integrity, healthy seals, good clean fluid, no scores in the cylinder itself and finally and most importantly no air in the lines. So that means bleeding. There is no mystery in this, even if you have never used a hypodermic, you know that having filled the syringe you hold it needle up and any bubbles will rise to the top of the liquid. A little push on the plunger and the air is expelled through the needle – i.e. it is now bled.



The picture at left is a cross section of a wheel cylinder in a conventional brake shoe and drum system. What it shows is the function of the bleed screw which is always placed at the top of any fluid receptacle including disc brake calipers. Air bubbles will rise to the top and if the screw (C) is loosened the pressure of fluid will push out the air out. The lower screwed port is of course the entry point for the fluid.

So you need to bleed the little master cylinder on your early Shadow. Step one is clearly to stand the car on its front bumper. Open the bleed nipple on the rear caliper and wait for the air to rise to the top of the system. Then a quick pump on the pedal and all air will be gone. This method you will have deduced has a few drawbacks. Conventional brakes are bled by pumping up pressure in the master cylinder with the brake pedal, holding the pedal down firmly and have an assistant quickly open a bleed screw on the system. The fluid under pressure will rush out carrying any entrapped air bubbles in the lines with it. The bleed screw is quickly shut and the process repeated. It is best to jam a clear plastic tube over the bleed screw and hang the other into a clear container with a bit of brake fluid in. This is to avoid air getting sucked back into the system if the operator is a bit slow in shutting the bleeder off. The clear tube and container also allow you to see the joyous little bubbles of air descending and getting out of your life forever!!

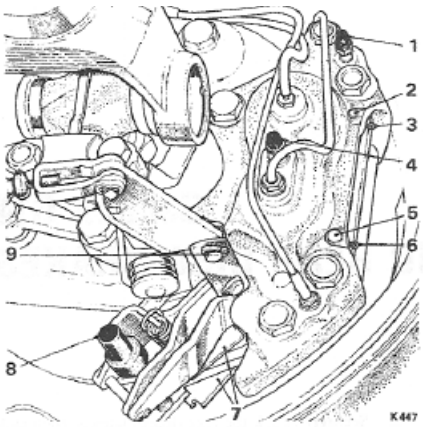


FIG. G44 REAR BRAKE CALIPERS (EARLY CARS)

1 Master cylinder circuit bleed screw
2 Pad locating pin
3 Securing clip
4 Power brake circuit bleed screw
5 Pad locating pin
6 Securing clip
7 Hand brake pads
8 Adjusting ratchet seal
9 Disconnecting point

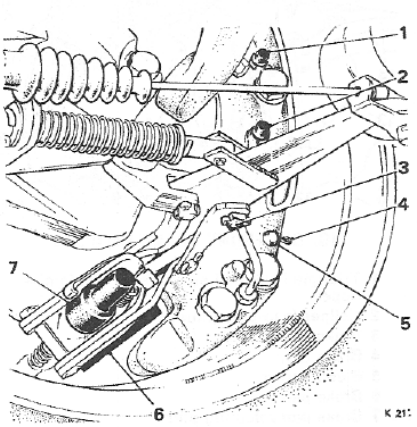


FIG. G45 REAR BRAKE CALIPERS (LATE CARS)

1 Power brake circuit bleed screw
2 Master cylinder circuit bleed screw
4 Securing clip
5 Locating pin
6 Hand brake pads
7 Pad adjusting

The above drawings pinched straight out of the manual show how the juxtaposition of the bleed screws changed at about the early 1800 chassis. Sadly I wonder how many of these cars are still with us!

One other point about bleeding. Do not open the bleed screw wide. The rush of the fluid through the bleeder creates a suction believe it or not at the 'interface' between the threads on the bleeder screw and the cylinder into which it screws. Opening the screw wide lets air in via the threads and into the fluid stream going through the bleeder screw and down the tube. After pumping a small mortgage worth of RR363 through the system and still having bubbles going down the tube you will remember this advice. In short 'just' open the screw to let a reasonable flow through.

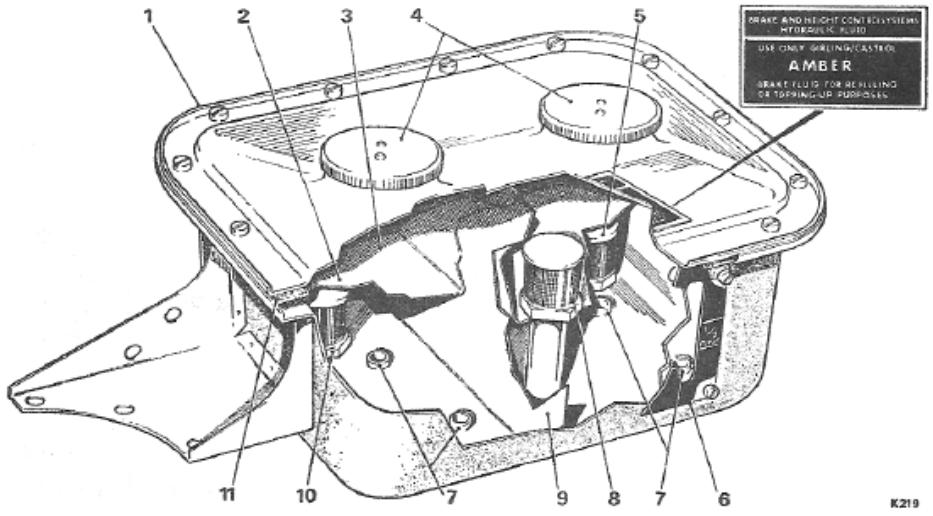
So now you know all about bleeding. The only other funny of course is having to manually operate the master cylinders under the car when you are dealing with a mechanical servo.

The problem with bleeding the early Shadow master cylinder is that the displacement of fluid by the master cylinder is so small and the lines and the wheel cylinders are comparatively so large. The object is to get brake fluid into the system via the master cylinder until the whole system is full and free from air. Pumping the system up conventionally is so laborious and usually non-effective that operators give up and leave the system unbled. Three things need to be done before you start this job.

The first is to jack the rear of the car up as high as practical ensuring that it is secure on good jack stands and if necessary sturdy blocks of wood. No cinder blocks, bricks, rocks or other crushable supports. I want you to be able to come back and tell me how successful you were with the bleeding not receive notification of your funeral! I mentioned keeping the fluid level in the rear reservoir compartment high to avoid the possibility of air getting down into the system.

The second is to get a suitable soft faced screwdriver in between the rear brake pads and the brake rotor and lever them back as far apart as possible before you open the relevant bleeder screw. This should push the pistons right to the bottom of their cylinders. I even wedge small pieces of wood in the resultant gap between the pads and the rotors to keep the pistons hard back. Doing this minimises the 'empty spaces' in the system where air can lurk.

The third is to have plenty (5-8 litres) of RR363 on hand in sealed bottles and somewhere to ditch the used fluid. Never re-use fluid no matter how clean it looks! Then when bleeding the master cylinder the fluid level in the rear compartment must not be allowed to drop below the 'full' mark. In other words overfill it to start with. In the cutaway below can be seen the outlet for the master cylinder (8).



The last specific which of course you will be aware of is the chassis number where the Factory changed the master cylinder caliper pistons with the number 2 system pressure

system. Up to the very early 1800's (chassis number) the master cylinder operated the upper caliper pistons in the rear rotors after that they switched the master cylinder to the lower pistons.

So having followed these instructions to a Tee you still find the pedal goes to the floor and you start eying the jerrican of petrol and the matches always kept for emergencies. The problem is that there is a bubble caught somewhere in the lines which will not be budged by the piddling oil flow you are able to generate. My solution is to buy a suction bleeding kit. This does need a compressor. The kit is actually a specialised spray gun. If you have used one of the latter you know that simple spray guns have an air supply squirting over the end of a pipe that is immersed in paint. The squirting air creates a low pressure over paint pie and effectively sucks the stuff up. It mixes with the squirting air and lo you are a born painter!

The bleed device is similar but the 'sucking pipe' is actually connected to the bleed nipple which is opened and the suction actually pulls the fluid through the system and into a reservoir. When I was even poorer than I am now I improvised and used a kerosene gun. I removed the fluid canister connected a clear hose from the canister pipe to the bleed nipple which was opened and pulled the trigger. But the stuff being sucked would come out of the normal kerosene gun squirting nozzle and being brake fluid could float around and land on your beautiful paint job. My solution was to jam a couple of chaff bags into a dustbin jam the nozzle of the gun into the bags and fire. The issuing brake fluid was caught up in the bags and the paint work was saved.

It used to be a delight seeing the odd little bubble extracted up that clear plastic tube and eventually when the line ran clear and the nipple was closed you finished up with a very firm pedal. Again don't open the nipple too far or you will suck air around the nipple and encounter bankruptcy!!

AN EXPENSIVE LITTLE WRIGGLER

A friend walked in and spotted this picture and decided during the absence of glasses that it was a 'Joe Blake' hence the title. This is the well known 'Question Mark' hose that carries the returning oil from your power steering rack and cooler, back to the reservoir at the back and top of the pump.

Fairly obviously it does not need kinks since any starvation of the pump of its constituent fluids is a good way to empty the coffers. Some very clever people use fuel hose and attempt to bend it gently but it either perishes quickly or kinks and the results are not good. They are readily available, easily fitted and usually last for years. Check yours.

ENTERTAINMENT

One of my pleasures in life is music. I am not about to fit myself with one of those plug-in-your-head things that seem to detach the wearers from humanity and probably reality. I just settle for a decent music box in my car. My dear old 1984 Spur still had her antiquated Blaupunkt instrument minus the volume knob which some previous owner seemed to have knocked off and four elaborate speaker which could well have been used as dustbin lids had the bins been small enough!

In the good old days when your Rolls-Royce passed the 100,000 miles, if you wished you could drop your car off at Hythe Road and they would virtually rebuild it! One of the first items for extraction and disposal was the radio since even in those days not sooner had you bought or had fitted the 'latest' instrument, there was a new one for sale. Sort of the modern version of the computer blight which seems have afflicted most of us!!!

For the moment I am only talking SZ cars and even 20 years ago it seems they must have standardised the size and general layout of these instruments. Rule one is surely keep everything as original as possible. I opted for an Eclipse ESN E5 High Power CD/MS Receiver with MP3/ATRAC3 Decoder and Remote! It is put together by the Fujitsu Corporation. I also got four very nice speakers that fitted just where the old ones came out.

My real concern and the reason for writing this is unless you know precisely how your installer will go about the task, it is best that YOU prepare your car for HIM! The door linings for instance are not common in their fixings and having an apprentice of today gouging your veneers as he attempts to remove the dash is discombobulating to say the least. My installation did not require an amplifier, the unit slipped in very easily and the all-up cost was $1500. The speakers were $1000. The finished result is pictured above and I can tell you it is superb! It did however take me two days of careful work to remove and re-install all the body bits!

HOW GREEN WAS MY VALLEY

Richard Treacy

There are two words in sequence which terrify most SY and SZ owners, and they are Fluid and Leaks. Oh dear. Mentioning the two in a single conversation will often bring on fainting, followed by a nervous call to the bank manager. Mention a leaky hydraulic pump, and your mate will turn lifetime enemy. But think again: the hydraulics' complexity and cost of maintenance are seriously overstated on these cars.

I dread Malcolm Yell seeing this display by Richard. Malcolm has been hitting me around the head for some years about not providing a complete equipment listing for each job I write about. I also have to confess not having seen packs of Citroen fluid before.

Off I drove last weekend on a 700 km round-trip, and returned home safely. Next evening, I went to check the fluids as prudence dictates, and noticed a horrible green puddle on the valley cover. A quick call to the UK, and three days later I had a pair of hydraulic pump seal kits for my '87 Turbo R in my letterbox, costing $50 each all-in. I could have skimped and used generic o-rings, but why risk it ? 5 litres of LHM, $ 60 from Mr Citroen (Total), and the kit was complete.

The green gunge that lodges in the valley. The front pump on Richard's Turbo can be seen peeping out at top of the pic in the middle.

I elected not to remove the pumps to replace the third critical o-ring, but to do an in-situ replacement of the outer housing o-rings on both pumps. Being an SZ with LHM hydraulic fluid, the barrel-to-body o-rings are very long-lived, and indeed the leak I suffered is very unusual in cars with LHM. On an SY, it is all more common.

The front pump revealed. Notice the strange 'clover leaf adapter on the top of the pump which requires a special tool to remove it. The circlip retaining the outer casing can be seen clearly underneath

Let the show begin. After lazily delaying the inevitable until this evening, I finally started the job. Instead of blocking off the return hoses, I elected to change all the fluid for good measure. Two oil pans underneath, and the LHM was all out. Next, that rotten oil union on the front pump low pressure pipe had to come off. Like all things Crewe, it is possible to undo, but only just, with a 5/8"

open-ended spanner in this case and 10 minutes of bad language. Then, I undid the top high-pressure pipe union with a ½" open-ender, and bingo: off came the outer housing, rather freely I may say.

The outer casing of the front pump removed.

Now came the tricky bits: removing the old o-rings with instrument screwdrivers. The upper one was straightforward, but the lower one rather tricky because of all the pipe work around it. Using the smallest instrument screwdriver you have, the top o-ring is easy to remove, but it was best to break the lower o-ring whilst in its groove. Wrapping some thin shiny cardboard around the pump housing, the new o-rings, pre-lubricated with LHM, slide safely into their grooves, and the cleaned-out housing is pushed firmly but safely home over the o-rings. Reconnect the low- and high-pressure unions (fiddly), and finally refit the circlip: fit the circlip last so you cannot lose it, and it helps with aligning the low-pressure union as well.

Repeating all this on the rear pump was far simpler as access if not so limited. So far, one hour. The next hour was spent bleeding the entire system and putting everything away.

So my message is this: don't be too daunted by the hydraulics on these cars. If you carry out the correct maintenance according to the schedules, the surprises are infrequent an not catastrophic. Surely, a cost of $160 plus two hours' labour for a surprise repair to two pumps and a complete fluid change is not exactly a major expense. Had I done a full overhaul of the pumps, it would have taken another hour, and the parts were in the repair kits anyhow. Love these cars.

The old 'O' ring removed at left and the new one. Note the flattened outer surface of the old ring where it seals against the outer casing.