Ask Ronny
by Ronny Shaver @ Ronny's Garage
Answering Your Questions About Classic Car Care Service And Restoration

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Why Can't I See My Silver Shadow Brake Fluid Level?

by Ronny Shaver

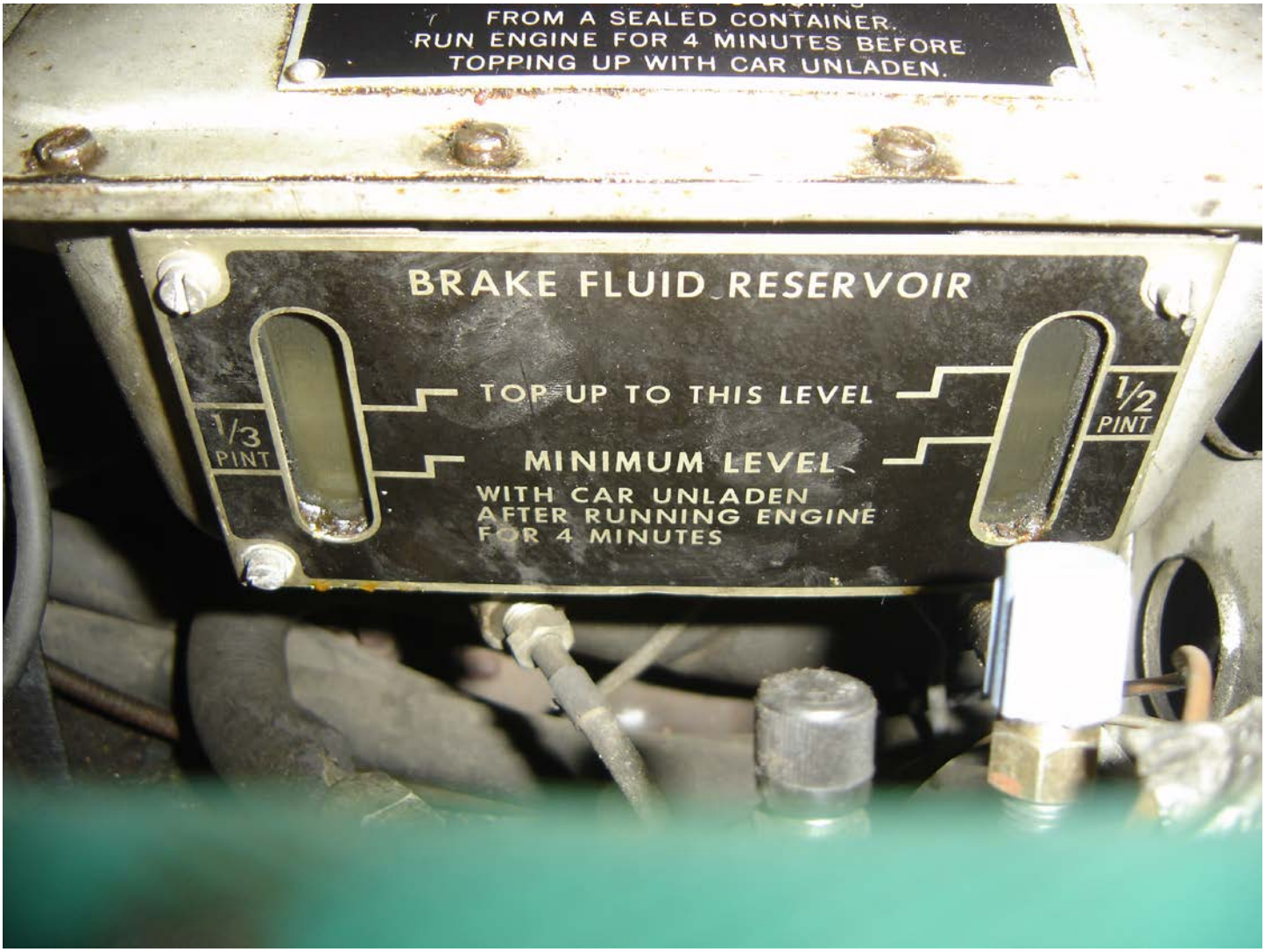
Starting with the Silver Shadow model, Rolls-Royce/Bentley began using a complicated, dual high-pressure braking system licensed by Citroen. The systems have mechanical pumps run off the engine camshaft as described in my last article which in that case a car came to my shop without out any warning lamps displayed but still having one complete system not functioning because of a broken pump pushrod. In this article I will describe a car that did have a warning lamp displayed (#1 system pressure) caused by a different problem.

The car in question came to my shop by flatbed tow truck for a "stalling issue" with no mention of braking issues. Even the tow truck driver was hesitant to drive the car down from the flat bed because in his words "the pedal goes all the way to the floor". He said the #1 pressure lamp was on and the owner was standing right there and offered to back the car down, but the driver went ahead and let it down slowly and safely. As we wrote up a service order the customer stated the car would stall on the freeway but never mentioned any braking issues and left the car. I knew better.

I took the car for a quick run around the block after letting it run a few minutes and noted the #1 pressure lamp never extinguished so pulled out gingerly. When I tried to slow the car for the first turn (about 50 yards and 25mph) I applied the brakes and experienced that uneasy feeling I like to call a "sphincter check", the car barely slowed enough to make the turn and I slowly limped the car back to the shop. So why would someone not mention this problem?

I put the car on a lift and tried to pressure bleed the system to quickly check pressures. The more accurate way to check pressures is to tap into the systems with pressure gauges and monitor starting pressures, build up time and final pressures but after 35 years working on these cars I can get a pretty good sense of pressures by bleeding them. When I opened the bleeder on the #1 system, nothing came out, this means at the very least the pump is not working. When I opened the #2 bleeder a dribble came out then some bits of rubber and debris then some flow but not with the speed and volume that a good system would. I looked at the calipers/hoses/rotors and noticed that all of the calipers appeared rebuilt and a couple of the rear caliper hoses had been replaced at some time. Original hoses have a "cross-hatched" covering. The front rotors also had some deep grooves and looked like they had been machined. So this told me that another shop had worked on the car in the not so recent past.

I looked at the reservoir sight glasses to check fluid levels and found a common condition on these cars due to lack of proper maintenance:

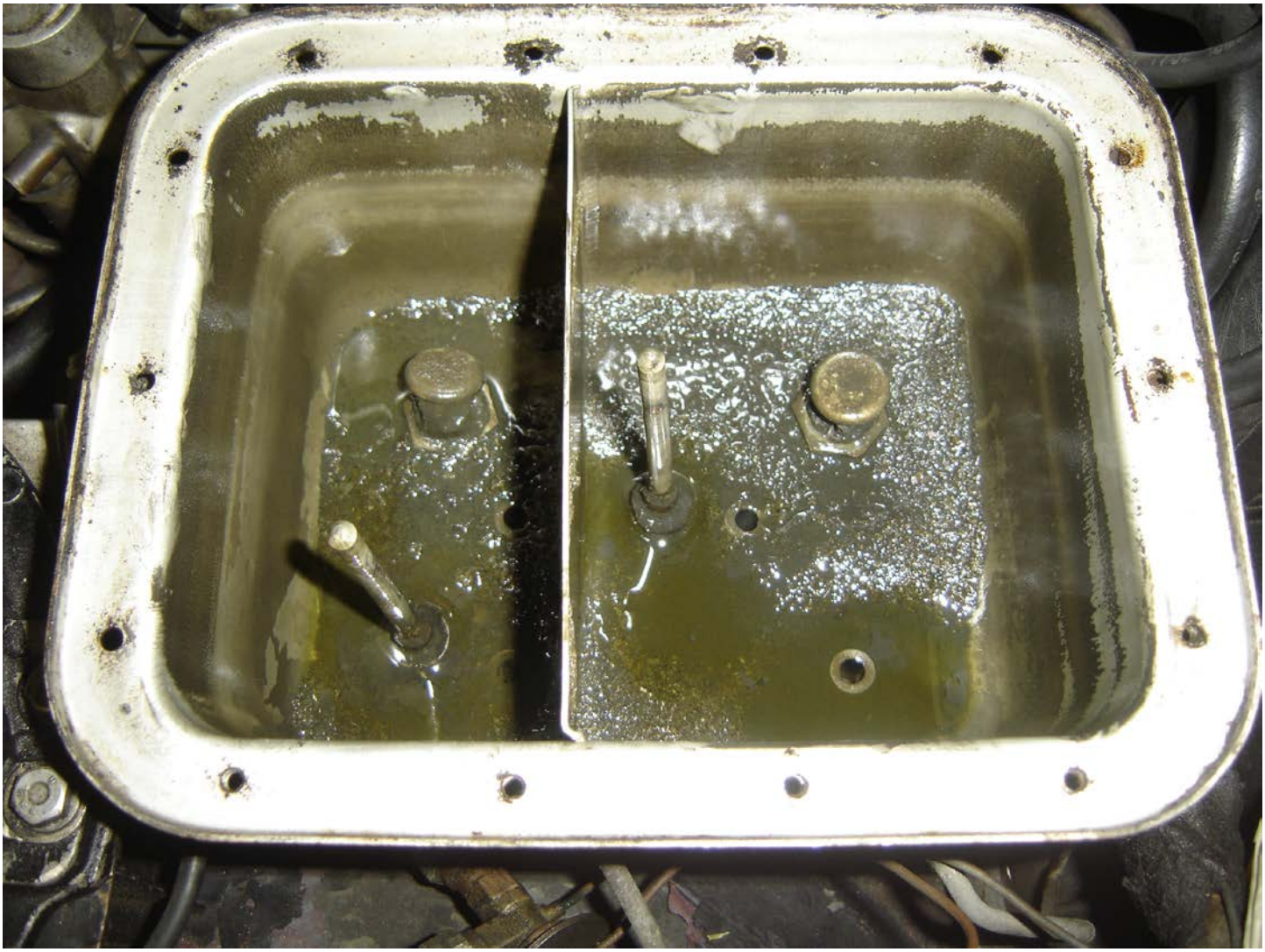


What are the levels? I couldn't really tell even with a powerful flashlight. Normal maintenance recommends cleaning the reservoir at least every two years, this looks like it hasn't been cleaned in 20 years.

My next step was to remove the #1 brake pump to inspect the pushrod and all looked well there but I did notice that no fluid came out of the #1 feed hose so I filled the reservoir until it ran out of the filler hole. Still no fluid, hmmm.

Next I removed the reservoir top and found this:

Here one can see the lumpy residue on the deflector plate, note that the front reservoir is smaller than the rear section. The front one operates four caliper piston pairs and the rear also works four caliper piston pairs in addition to the self-leveling system that requires a larger volume of fluid. Note the two cylinder shaped parts with tubes projecting through the center, these are the level sensors and the tubes prevent warning lamp flashing due to fluid sloshing around turns and bumps. After removing the deflector plate here is what I found:



Look closely at the thick sediment which is about ¼" deep and had a gritty rubbery texture to touch. Also note the two cylindrical parts with hex heads at the bottom. These are the reservoir outlet screens that feed the brake pumps and the high pressure accumulators. They screw onto the floor of the reservoir and are made with a super fine screen mesh to prevent even the smallest debris from exiting the reservoir. The one on the right had a large hole in the side which helps explain the chunks of rubber exiting while bleeding the #2 system. The front one was intact but so plugged that fluid would not pass at all. The three other small holes in the bottom of the reservoir are where fluid returns from accumulators/brakes/leveling system during different modes.

The source of this gritty rubbery debris is usually the combination of incorrect fluid use and or deterioration of brake hoses. One important thing to note is that the feed hoses from the reservoir to pumps were just 3/8" fuel hose which will not hold up to brake fluid.

Back to the customer, after I checked out the system and determined we needed to service this reservoir, overhaul the #1 brake pump and both accumulators and finally replace all 10 of the caliper brake hoses and the front sub-frame brake hoses. Of course this was expensive and when I told him he said that "brake warning light had been on since he bought the car 15 years ago" and that this kind of cost just wasn't in his budget right now so just fix the stalling problem fixed for now (fuel pump problem)!!!!!!!!!!!!!!!!!!

I told him to tow the car out of my shop immediately and that I didn't want to have anything to do with this. in my words, "death trap". I know this seems harsh but it is my opinion and I am much more concerned for the innocent other drivers on the road around this owner. Miraculously "his budget" adjusted to the situation and we will make this car safe to drive after all these years.

So to close, regular cleaning of the brake reservoir along with normal servicing is essential to keep these complicated PMCs performing correctly and safely.

One more burning question, how did the other repair facility that completed the caliper work bleed the car? The customer stated the #1 brake pressure light has been on since he bought the car. Perhaps they were un-qualified and un-familiar with these cars. Be careful about who works on your PMC, it is one thing to have the oil and filter changed, it is another thing to have the complex brake system worked by un-qualified people. Don't forget, the car only weighs over 3 tons, more than many trucks!

Thank you for the questions and keep them coming. Please send your questions to Ronny at ronnyshaver@ronnysgarage.com.

Happy Motoring!
Ronny