

Rear Brake Proportioning Valve Rebuild. By Mark Hooper, July 2002

Important Notes.

The braking system of any car can seriously affect your health, not only from the obvious affects of finding that you haven't got any, but also the affects of the asbestos that can be found in some types of brake pad.

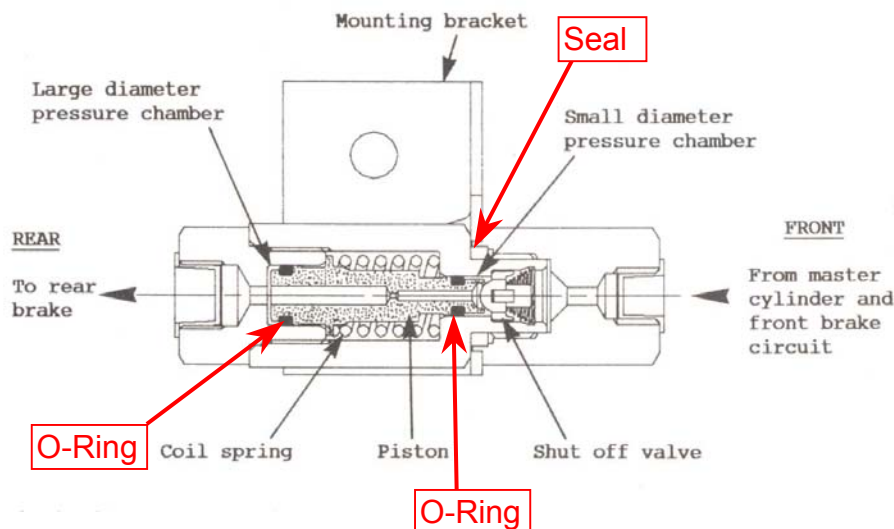
If in any doubt you should seek professional help.

Obtaining the Parts and Parts Required.

Parts availability, the rear brake-proportioning valve is currently NLA. Although after talking (email) to the factory, Lotus is in the process of trying to source a new supplier for these (the original French company having gone bankrupt).

Operation.

The main purpose of these valves is to prevent the rear wheels locking under heavy braking, they achieve this by using a small piston that has two chambers, one low pressure (Small) and one high pressure (Large). When pressure is applied it is initially allowed to pass through the valve, as the pressure increases so the piston starts to move forward, slowly closing the shut off valve to the rear until it is completely closed.



The problem with these valves is that they start to leak brake fluid, caused by failure of the O-rings. This not only causes problems when braking but also in the UK is an MOT failure.

I did get offered some used valves, but at £300 each with no guarantee I decided not to go down that road (Genuine parts are listed at £66 each). What to do...one solution was to purchase some adjustable brake bias valves as used on race and rally cars. This seemed like a good option if all else failed, they seemed to be reasonable priced (approx £80 - £150 each) given the cost of the used genuine items. But (always got to be a but) I wasn't happy that I could set them up to operate at the correct pressure without specialist equipment.

Repair.

Although the workshop manual states that "**No servicing of the pressure limiting or proportioning valves is permitted**" I felt that I had nothing to lose from trying.

At this point I'll apologise for the poor quality of the pictures, I have since invested in a digital camera.



First step, dismantling...the valve is made up of three main hexagonal sections (D, E & H), these all simply screw together. Separating the two larger sections (E & D) will release the mounting bracket and reveal the large sealing ring (A). This seal is normally serviceable as it is not a moving part.



Separating the two remaining sections (E & H) will allow you to remove the piston (G) and its return spring (F) there isn't any great pressure to be released from the spring. Expect to be surprised by the amount of dirt and muck that covers the inside of this assembly including the spring and piston. The chamber where the spring lives should be free from brake fluid, that's the purpose of the two small O-rings on either end of the piston (G). However, these O-rings are what normally fail, whether from wear and tear or simply old age, it doesn't really matter. On closer inspection of these O-rings I could see that they had lost most of their flexibility and also had a noticeable flat on their outer circumference. Further checks showed that no wear or damage was visible on either of the internal surface of sections E & H where the O-rings sit, therefore simple replacement of these O-rings would restore the operation of the valve. I was able to source new O-rings from a local specialist.



Once the O-rings had been replaced the motion of the piston (at least on the work bench) was much smoother than when first dismantled.

The shut off valve consists of two main components, a spring (C) and the valve itself (B), you will find these in the end of section (E), the valve being retained by the spring that is located in a groove. Easing out the spring will allow you to remove the valve for cleaning and inspection, you shouldn't have any problems with this assembly.

After cleaning and replacing the components of the valve you can reassemble it, make sure that you assemble the valve correctly, paying attention to the direction of the mounting bracket. Also make sure that when you replace the valve on your car that you mounted it the correct way around, the small section (H) should be to the rear of the car.

After refitting to the car bleed the brakes as normal and check for leaks, after servicing the valves on my car I noticed that the 'feel' of the brake pedal was improved and a clicking noise from the rear that I could hear when applying the brakes (engine off) had gone.