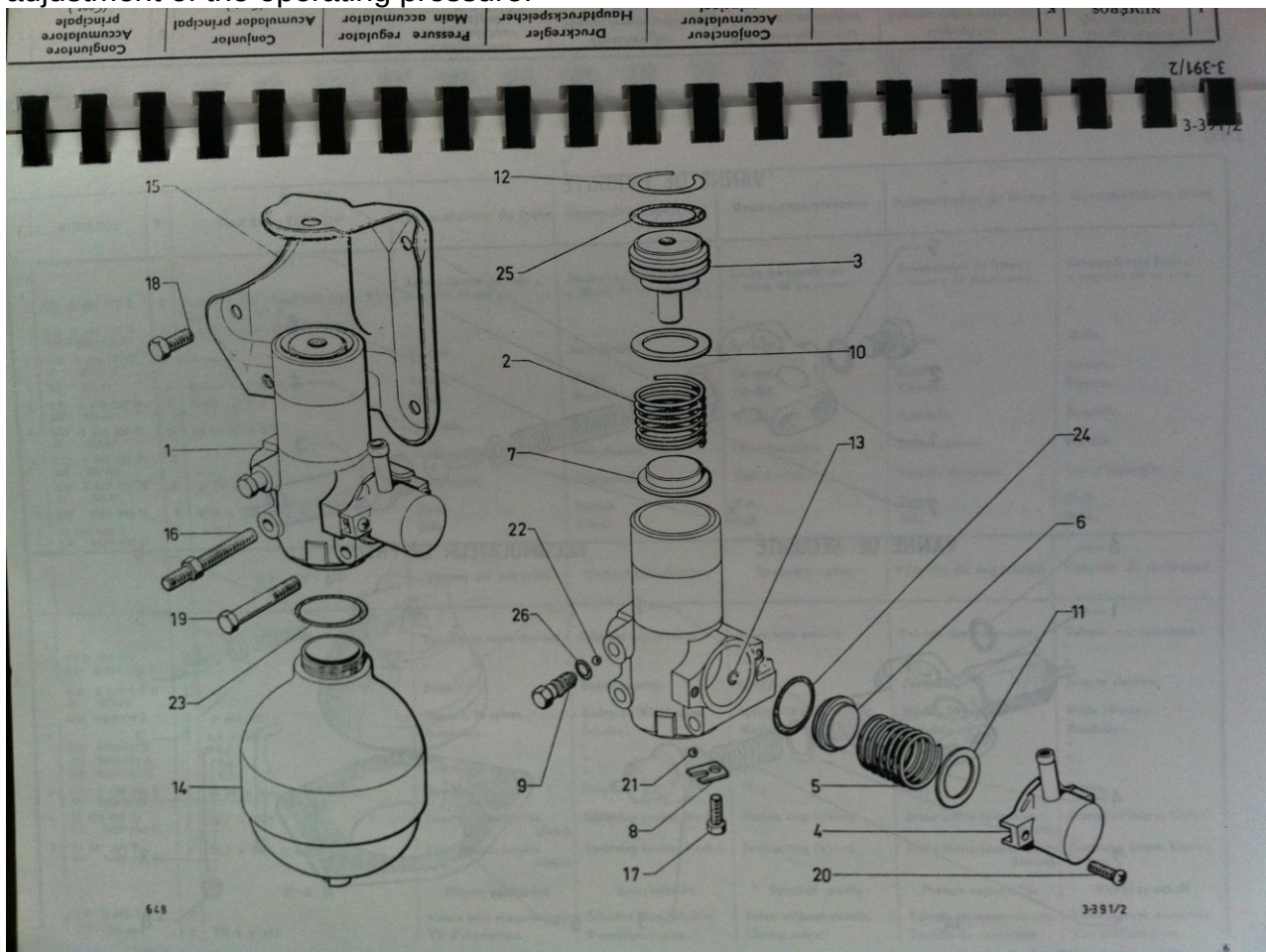


Changing Seals and Shims on a Pressure Regulator

A pressure regulator that leaks LHM slowly (small patch on the ground after being parked overnight) can be the result of a leaking seal. I've never had this low pressure leak problem with older Citroens in all the years I've been driving them, but the dreaded slow drip has been there for a while now on my daily driver XM 2.5. This note sums up the replacement of two seals (items 24 and 25 in Fig. 1) which cured this problem and the adjustment of the operating pressure.



Pressure regulators on all LHM Citroens are virtually identical and operate on the same principle. They pass fluid from the hydraulic pump to all hydraulic circuits on the car at the correct pressure, returning the supply to the reservoir when the upper pressure limit is reached and then pressurising it again as soon as the pressure drops below the cut in pressure. The PR is supplied by a 6.35mm pipe from the hydraulic pump, a 4.5mm pipe then takes fluid at the correct pressure from to all circuits, and a rubber hose returns the fluid supply to the reservoir (when the pressure lies between the cut in and cut out values).

If you have a pressure gauge its worth removing the 4.5mm pipe from the PR and connecting a gauge to see what the cut in and out pressures are on the car. Shim washers (items 10 and 11 in Fig. 1) can easily be added to adjust the pressure limits upwards if necessary. Cut out is the max pressure (it should lie in the range 162-175 bar), cut in is the pressure at which the needle starts to rise again after opening the bleed screw (item 9) slightly (it should be 140-147 bar).

The PR is held onto the car by three bolts, 2 on the side and one on the end, and an accumulator sphere screws into it. First step is to take it off the car. Dead easy to remove on an SM and GS, just open the bonnet and set to; a bit awkward on an XM, needs to be on axle stands or ramps; difficult on a manual DS as it's low down on the inlet manifold side of the engine; afraid I can't remember how easy it is on a CX or Xantia. Once off, give it a clean externally. There are two sections that need to be dismantled, both have strong springs inside that will fly out so care is needed when dismantling - holding it in a vice or clamp is essential. Needless to say when it's apart cleaning everything and keeping it clean is important.

First take the side unit off, which connects to the return hose (item 4 in Photo 1: its plastic on XMs and Xantia, aluminium on older Citroens). This involves undoing two crosshead or Allen key M5 bolts gradually – it needs to be held on to stop the spring causing things to fly off as the bolts come away. At one end of the spring are shim washers and at the other is an O ring seal sitting in the PR body. If the pressure reading was low extra shims can be added. They seem to be in thicknesses of 0.3, 0.6 and 0.9mm; adding a 0.3mm thick one will increase the pressure by 2-3 bar so it's easy to get the pressure in the recommended range. They measure 28mm OD and 21mm ID.



The O ring measures 33.2 x 37.0 x 1.9mm (ID, OD, thickness). It may be possible to source some that are exactly this size, but if not a supplier can provide some that are dimensionally very close indeed. The new seal just needs to be placed where the old one was, the spring positioned, the shims added and the side unit cover placed over then put back in place. Again when doing up the two retaining bolts care is needed to stop the

spring from pushing things off.



Second step is to remove the unit inside the end of the PR. This needs to be pressed in by several mm to enable a simple circlip to be removed. I use a big balljoint separator with a long central screw to depress the end against the spring force and reveal the circlip. Now if you're persistent the circlip can be removed with a couple of small screwdrivers and a hammer to get underneath it, but it can be fiddly and frustrating. An easier option is to drill a hole say 3-4mm in the side of the PR level with the circlip so that a small screwdriver or similar can be poked through it to push the circlip out. Once out, I unwound the screw of the balljoint separator and the spring pushes the assembly out.



On the top of the spring is a thick end cap with a peripheral seal. The O ring is smaller and fatter than the other one - it measures 29 x 34.4 x 2.7mm. Between the end cap and the spring are washer shims - they measure 32mm OD and 24.5mm ID. Again the seal is easy to replace and the shims can be adjusted as before. Reassembly is the reverse process, just need to be careful to ensure the assembly enters the hole centrally as it's depressed, pop the circlip back in and release.



Changing the seals and shims is a 20 min job, getting the PR off and putting it back on the car can take a lot longer than that depending on which model it is! But this is an easy DIY job really and a good way to get the system pressure right. My XM is now cutting out at 172 bar and cutting in at 147 bar, which seems to me to have sharpened the brakes a little and smoothed the ride a shade too!