

sonnax Technical Bulletin

LET THE PRESSURE GET TO YOU

Don't let the pressure get to you is a common expression. It's also great advice and a good thing for us all to remember. For automatic transmissions, however, the opposite is true. Pressure is everything.

Pressure is what makes the whole system work. Where it goes, when it goes and how much pressure gets delivered are all critical elements. Where it goes is the difference between applying the right component or the wrong component. When it goes can mean applying or releasing the right component at the wrong time. Failing to control how much pressure is delivered – and this is the case far too often may have you trying to apply a

component without the correct pressure required for the situation. Loss of pressure control results in delayed or soft application and harsh or damaging application of components.

Loss of pressure control plagues a wide variety of transmissions. In the case of the Saturn TAAT units, maintaining pressure control is not only a constant battle but is likely to be attacked by three possible issues within the same valve train.

Let's look at the basic pressure control system in Figure 2.

In this case we see the Type 2 or 2nd design line pressure control system. As in most designs, we have a PR

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PRODUCT SPOTLIGHT

Once the pump bushing goes in the 40 & 50 series of pumps, you no longer have proper sealing and lubrication. Even worse, these pumps are difficult to reassemble properly once you've replaced the bushing because there are no pins or mating features to ensure proper alignment of the pump halves.

Sonnax offers a replacement pump bushing 41005-01 that restores operational clearances for proper sealing and lubrication. This precision steel-backed, ball-indented bushing is a direct OEM

PUMP BUSHING & ALIGNMENT TOOL PART NO. 41005-01 & 41005-TL

FIX THESE COMMON COMPLAINTS

- Front seal leakage
- Delayed engagement
- Converter shudder & slip



replacement and allows you to salvage the pump.

Sonnax also offers pump alignment tool 41005-TL, which allows you to align the pump halves correctly during reassembly.

41005-01
1 Pump Bushing

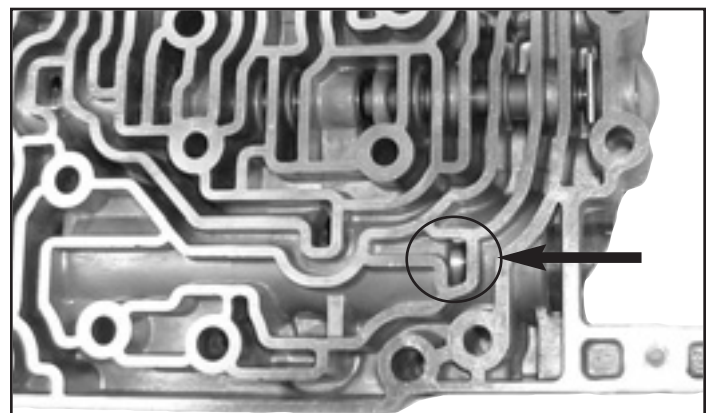
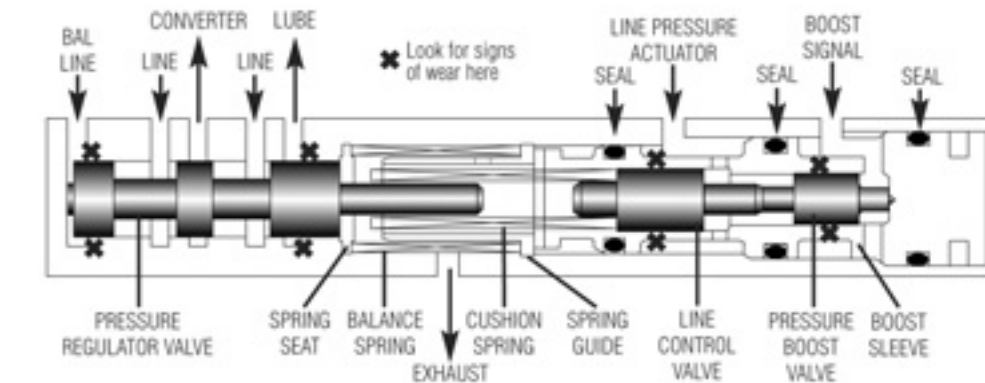
41005-TL
1 Pump Alignment
Tool

valve with a large balance spring. A spring seat on the left end and a spring guide on the right hold the spring under compression. As line pressure begins to build, pressure entering the balance circuit begins to build and stroke the valve against the spring. Unlike many systems where the PR valve strokes to open an exhaust port as a means of regulating pressure, this system regulates line by “exhausting” it to the lube and converter circuits. The lube circuit has a blow-off valve further downstream that allows some pressure to be maintained in the lube circuit but limits any excess by allowing it to blow off.

In this case the lube circuit is performing the function you would see done by a direct exhaust off the PR valve. This part of the system is similar in both the 1st and 2nd designs. The additional line pressure control needed to raise or lower line for the various demands is the main difference between the two systems.

In the Type 2, shown in Figure 2, signal from the line pressure control solenoid surrounds the sleeve and enters at the right-hand end of the line pressure control plunger or boost valve. As this valve moves left, the small cushion spring becomes compressed between the two valves. Pressure on the boost valve helps the balance spring pressure keep the PR valve away from the point of regulation until a higher line pressure is reached. In the 1st design, shown in Figure 1, the boost sleeve had two feed passages and two valves. The line pressure control plunger, closer to the PR valve, was fed the same pressure control signal and worked in the same manner as the single valve in the 2nd design. The smaller line boost valve was fed line pressure off the manual valve in the Manual second position to stroke over and provide additional force and increased line rise.

Figure 1



Type 1 valve bodies have an additional circuit here.

So where do things start to go wrong? One of the first problems to crop up was broken cushion springs. This problem can be found in both Type 1 and Type 2 units. The function of the spring is to help stabilize the valves and cushion the meeting of the PR and line pressure control valves as they are being driven together by opposing pressures. In reality, this spring spends most of its life under full compression and the spring material is not up to the task. Broken sections of spring get hung up inside the spring guide and can restrict the line control or boost valve from stroking the PR valve toward higher line pressure. Low line pressure is the result, causing delays, soft shifts and premature clutch failures. The Sonnax spring [95200-01](#) uses upgraded material to reduce stress breakage.