Looking inside the Volkswagen 09G 6-Speed; PART 3

In past issues we looked at the design and operation of the VW 6-speed transmission. We covered the theory and operation of the solenoids, the computer, and the clutches used to create six forward speeds and one reverse.

We also looked inside the unit: We took the gear train and clutch assemblies apart, identified them, and put them back together. This time we’ll focus on the areas that control the clutches, including the solenoids and valve body.

First let’s make sure we have a decent set of clutches for the valve body and solenoids to control. The unit has several taps to check pressures. The tap under the inhibitor switch is the K1 clutch; the one under the oil fill tube is the B1 clutch (figure 1). There are several more taps on the back side, but the two most important ones are the K2 and B2 clutches (figure 2).

Typical clutch pressure in forward range at idle is 28-90 and 125-199 PSI at WOT. Reverse pressure at the B2 or K3 clutch tap should be 57-115 at idle and 150-270 PSI WOT. In manual low, the B2 clutch pressure should be 85-115 at idle and 140-199 PSI at WOT. These pressure readings are based on the computer reacting to the load conditions of the vehicle. Pressures may vary depending on the adaptive strategies and the particular load at that time of testing.

The next clutch test is to remove the valve body and air check the clutches. To do that you’ll need to remove a lot of wiring. Figure 3 shows the wiring connectors, brackets and sensor positions for when you’re ready to put it back together.

With the valve body removed, use figure 4 as a guide for air checking the clutches through the case feed holes. These clutches must all air check really well, or no amount of repair to the valve body or solenoids is going to get the car out the door.

If you find a leaking clutch, you’ll need to go inside and check the sealing...
rings, supports, molded pistons and drums. This unit is actually very simple: As we saw in the last issue of GEARS, there are only five clutch packs, and no hidden clips or bolts to mess with you.

**Solenoids**

This unit has several solenoids to control the shifts, clutch apply, line pressure and TCC. Before you remove the solenoids, mark them or take a picture with the part number visible. The only solenoids that work the same way are 88 and 89. Both of these are simple on-off solenoids. The other six solenoids are modulating solenoids. These are linear solenoids and they

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aren’t all the same. Installing them in the wrong location can cause shifting or pressure problems. As an example, the EPC solenoid 93 is normally open; it provides maximum oil flow when it’s off. The other solenoids are normally closed; they provide minimum or no oil when turned off. Remember that each solenoid has a unique pressure curve, so make sure you reinstall them in their original locations.

**Internal Valve Body**

The valve body is the last thing on the agenda… and the item that’s overlooked most often. When disassembling the valve bodies (figures 5-16), there are small pins that will fall out without you noticing, so pay close attention to where they belong.
Cool Under Pressure

The new Sonnax Pressure Regulator Valve kit with an oversized hard-anodized valve and recalibrated springs salvages worn Mercedes 722.6 valve bodies.

**Complaint**
Loss of 2-3 shift, 4-3 neutral on downshift, soft shifts under acceleration

**Secondary Complaints**
- Code issues due to slip
- Delayed engagements
- Loss of lockup

**Cause**
The pressure regulator bore and/or valve is worn.

**Correction**
This Sonnax kit salvages the worn valve body by restoring the hydraulic integrity of the pressure regulator circuit.

**Pressure Regulator Valve Kit**

68942-07K
1 Pressure Regulator Valve
1 Inner Spring
1 Outer Spring

F-68942-TL7
1 Guide Pin
1 Reamer Jig
1 Reamer

**Note:** This sleeve will fit Chrysler 300 & 300C, '05-'07; Chrysler Aspen, '07; Chrysler Crossfire, '04-'07; Dodge Charger SRT, '06-'07; Dodge Magnum R/T, SXT, SRT-8, '05-'07; Dodge Nitro, '07; Dodge Sprinter Van, Diesel 2500-3500, '04-'07; Jeep Commander, '06-'07; and Jeep Grand Cherokee, Laredo and STR-8, '05-'07.

Excessive valve-to-bore clearance at the modulating pressure area allows modulated solenoid feed pressure to exhaust, reducing line pressure and creating shift-related complaints. Bore wear at the inner spool results in high line pressure conditions. The Sonnax kit 68942-07K, salvages the valve body with recalibrated springs and an oversized hard-anodized valve to prevent excessive wear.

- Outer spool has extended length for better support.
- Aluminum valve has been hard-anodized to prevent excessive wear.
- Valve spools have annular grooves to prevent wear due to side loading.
Looking inside the Volkswagen 09G 6-Speed; Part 3

You noticing, so pay close attention to where they belong. Notice the locations of the checkballs and relief valve, and pay attention to when to insert the main pressure regulator retainer pin. Our example was in the middle of the 5 steps (figure 12).

Figure 9: Main Valve Body Relief Valves & Springs

Figure 10: Main Valve Body Shift Valves & Springs

Figure 11: Upper (Top) Valve Body Shift Valves & Springs

Figure 12: Upper (Bottom) Valve Body Valves Springs
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There are no factory exploded views of the valve body. We labeled the valves that are most likely to create pressure problems, erratic shifting, and TCC problems. For now, no hard parts are available: The aftermarket is working on an overhaul kit, but they haven’t issued a release date for it yet.

Bottom line, this transmission is an easy unit to overhaul, as long as you use care with the solenoids and wiring. Even if you only work on domestic cars, don’t assume you’ll never see this transmission… because, with the new trend in the transmission world… these units will be used in other manufacturers’ vehicles.
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