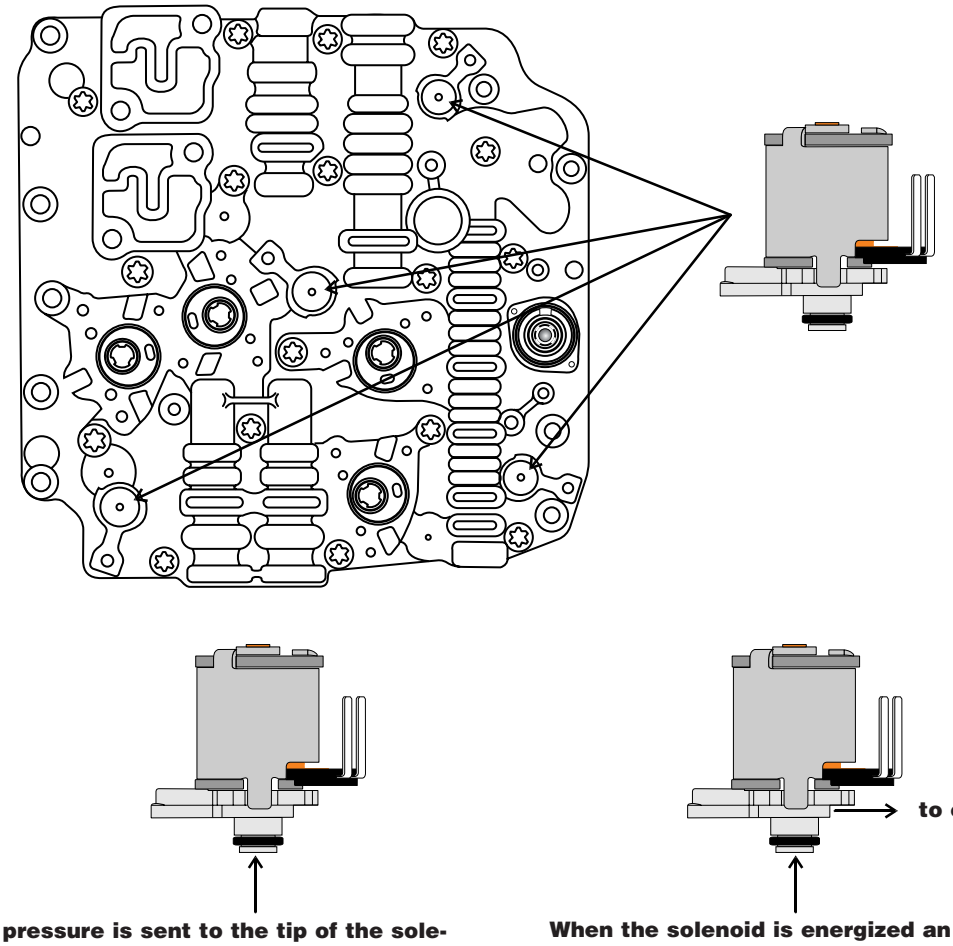
Figure 8

Figure 9

Figure 10

Figure 11

Only an O-ring is fitted to the tip of pressure-control solenoids N217, N218, N233 and N371.



Oil pressure is sent to the tip of the solenoid and blocked from passing through when the solenoid is turned off.

When the solenoid is energized an internal plunger lifts off its seat and the pressure is exhausted.

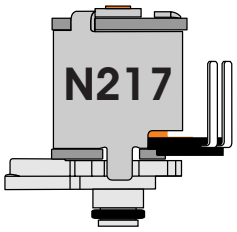
text continued from page 8
small five-coil spring and two O-rings under each of them (see figures 4 through 10 on pages 10, 12, and 18).

Pressure is supplied to these solenoids from the spring pocket pushing the ball up against the ball seat on the solenoid. When the solenoid is energized, a pushrod in the solenoid extends outward, pushing the ball off its seat. This allows the feed pressure to run around the ball to the back side of the seat and out of its slotted side openings (see Figure 4 on page 10), where it is then directed to the multiplexer valve and on to its respective gear actuator.

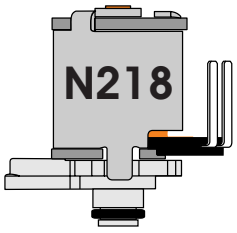
By looking at the operation of this solenoid you can see the importance of the ball seat's being installed correctly and of having properly sealing O-rings, for they keep the supply and apply circuits separated. It will be interesting to see what could happen when the smaller O-ring leaks, allowing supply pressure into the gear-actuator

continues page 22

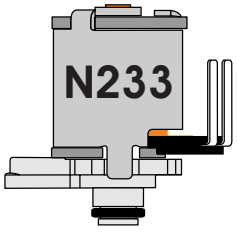
Figure 12



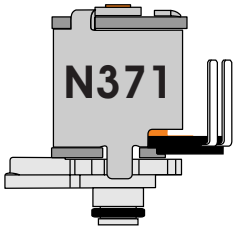
Pressure-control solenoid # 3 (N217) is a normally applied solenoid that measures about 4 to 6 ohms. This solenoid regulates main line pressure. Engine temperature and speed are used to correct main line pressure. In the event of a failure, the solenoid shuts off and the system works under maximum line pressure.



Pressure-control solenoid # 4 (N218) is a normally applied solenoid that measures about 4 to 6 ohms. This solenoid regulates the volume of oil used to cool the K1 and K2 clutches. The multi-plate-clutch oil-temperature sender G509 influences the operation of this solenoid greatly. If this solenoid fails so there is minimal cooling fluid, the clutches will overheat. If the solenoid fails so that it delivers the maximum volume of cooling fluid, gear change becomes difficult at cold ambient temperatures and the driver may notice a loss of fuel economy.



Pressure-control solenoid # 5 (N233) is a normally applied solenoid that measures about 4 to 6 ohms. This is a safety solenoid that can isolate hydraulic pressure to its associated section of the gearbox, known as section 1. When this solenoid fails, gears no longer can be selected from section 1. Only 2nd gear will be available.



Pressure-control solenoid # 6 (N371) is a normally applied solenoid that measures about 4 to 6 ohms. This is a safety solenoid that can isolate hydraulic pressure to its associated section of the gearbox, known as section 2. When this solenoid fails, gears no longer can be selected from section 2. Only 1st and 3rd gears will be available.

Figure 13

N371 safety-control solenoid

Figure 14

N218 pressure-control solenoid (K1/K2-clutch cooling pressure)

Figure 15

apply circuit to the multiplexer valve when it should not be there.

The second grouping consists of six pressure-control solenoids. The four being discussed in this article are N217, N218, N233 and N371 (see figures 11 through 15). N217 is used to control main line pressure, N218 is used to control cooling pressure to the K1 and K2 clutches, and N233 and N371 are safety-control solenoids.

When you look at figures 13 and 14, you will notice that the safety-control solenoid is constructed slightly differently from the pressure-control solenoid, yet they all measure 4 to 6 ohms, they all are normally closed and only one O-ring is fitted to the snout of each (see Figure 15).

Pressure is supplied to the tip of each of these solenoids, and their respective circuits are charged with pressure when the solenoid is off. When the solenoid becomes energized, fluid passes through the solenoid to an exhaust, dropping pressure in their respective circuits (see Figure 11). For a more-detailed explanation of each of these solenoids read the operating details provided in Figure 12. We will finish looking at the remaining solenoids and some helpful box information in part 4 next month. TD

The Bottom Line:

Tell us your opinion of this article:

Circle the corresponding number on the free information card.

96 Useful information.
97 Not useful information.
98 We need more information.