

along with the pressure reading for each application clutch, amperage reading at linear solenoids A and B, and voltage readings from each shift solenoid and the third and fourth pressure switches. I even monitored the duty cycles of linear solenoids A and B during upshifts and downshifts.

I looked for any pressure lost in the third-clutch circuit while the transmission was hot, and as **Figure 3** shows, third-gear oil pressure was within the 10-psi difference allowed between apply pressure and main line pressure. In this case it was equal to main line pressure, proving no pressure lost in circuit 30, which leads to the third-clutch pack. This is interesting, because as we mentioned at the beginning we did not replace the bushings in the countershaft or mainshaft, and by this time they had 134,000 miles of wear.

After obtaining all this data, I sat down for hours analyzing it. I noticed something peculiar when looking at the recordings of the pressure readings taken during upshift and coast downshift. On the third clutch, pressure was present during a forced 4-2 downshift but not as much during the 5-2 downshift (**figures 4 and 5**).

When I looked at the recordings made with the third pressure switch connected to the scope, I noticed that the pressure present was enough to close the third pressure switch (**Figure 6**).

This third-clutch pressure was present from when fourth pressure was connected to CPC A pressure (Channel 3), through 2nd gear (Channel 1) and until third gear was fully applied (Channel 2), for a total of about 2 seconds and reaching at times 50 psi. This third-clutch pressure reaches its highest when second-clutch pressure is fully applied at 125-130 psi. That could not be good for the third-gear clutches, but was it a cross leak? It was not present during all the upshifts or coast downshifts and not even during the 5-2 forced

downshift. So that almost ruled out a cross leak, but how was this oil pressure getting into the third-clutch circuit on a 4-2 downshift?

To eliminate the possibility of a software update that might solve this problem, I had the PCM re-
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