

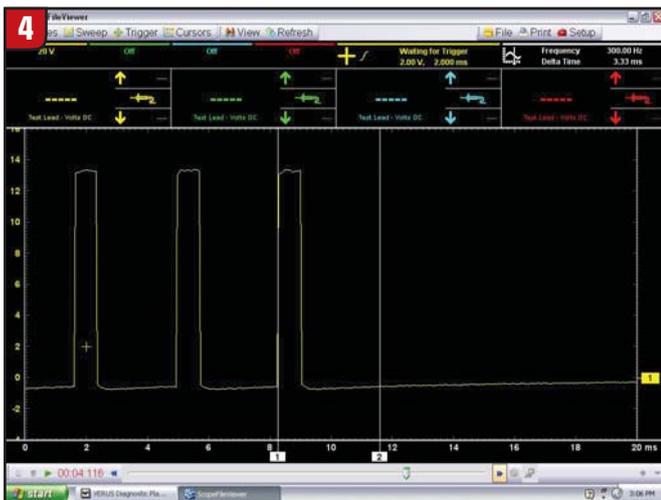
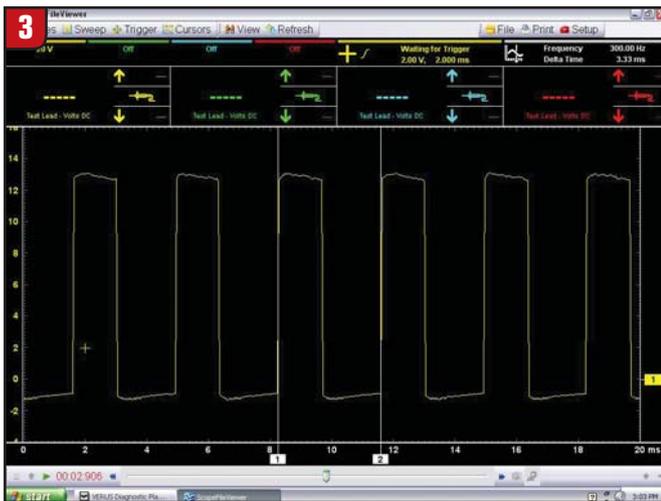
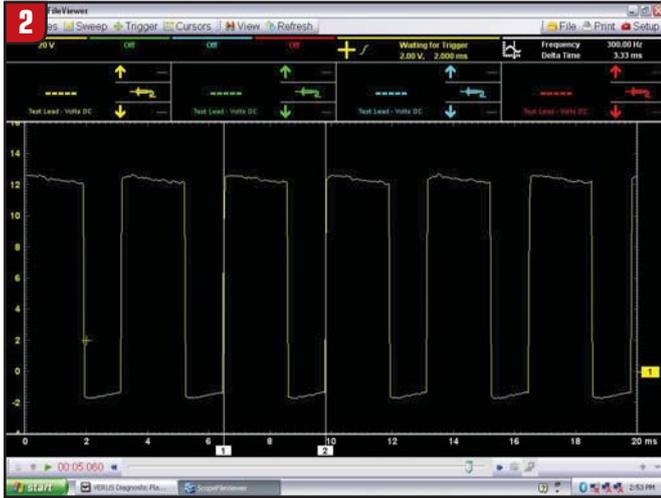


continued from page 32  
input from the right-front wheel-speed sensor to calculate the vehicle speed and then sends this information to the rest of the modules via the controller area net-

work (CAN) and to the instrument panel.

The electronic control for fifth gear is not very complicated, either (see **Figure 1** for the following explanation). The wiring diagram

shows that the transmission control module (N 15/1) modulates the Y2 valve in the valve body. It actually does this at 300 Hz and at about 66% duty cycle when the transmission is in first through



fourth gears (**Figure 2**).

If the TCM receives a voltage signal (switch close) from the transmission-range D contact switch (S 16/9) requesting fifth gear at pin 28, then at the proper speed and throttle opening the TCM will stop modulating the Y2 valve. It does so gradually, changing the modulation on time until it is fully off (**figures 3 and 4**).

The base module (N 16/1) provides the voltage for many of the electrical devices of the vehicle, but we concentrated only on the transmission-range D contact switch, the TCM and also the ABS module.

The base module can have up to four external fuses (this one has only two) for protection. The fuses are named F1, F2, F3 and F4 (**Figure 5**). We found that these fuses were not shown in any of the aftermarket wiring diagrams that we looked at, only in the factory wiring diagrams.

Failure of any of these four fuses can cause the base module not to provide voltage to the transmission-range D contact switch, kickdown switch (S 16/6), TCM and ABS module.

The base module also provides voltage to pins 2 and 8 of the round data-link connector (X 11/4). Most scan tools make use of this voltage, which is the reason we were not able to communicate with some modules.

The best way to verify the integrity of the fuses is by checking for voltage at pins 2 and 8 of the 32-pin data-link-connector socket with the engine running; you should see battery voltage (**figures 6 and 7**).

In this particular case, the F1 fuse was blown, affecting the circuit to the ABS module, which in turn did not allow the vehicle-speed signal to be sent to the TCM. Therefore, the Y2 valve never stopped modulating and the instrument panel showed 0 mph all the time. After spending some time to find a reason for the blown

fuse, possibly a short, we asked the customer what had been done to the vehicle prior to the problem. He informed us that his battery had drained so he had the vehicle jump-started – a simple thing but with dire consequences, which reminds us of the importance of disconnecting the battery when charging it.

Remember, taking the time to analyze the wiring diagrams can help us to better approach electri-

cal problems. **TD**

*Jesse Zacarias is the owner of Elec-Tran Diagnostics in Gilroy, Calif. Roy Delfran is with Snap-on Diagnostics "Ask-a-Tech Web Services" (<http://askatech.snapon.com>).*

### **The Bottom Line:**

**Tell us your opinion of this article:**

Circle the corresponding number on the free information card.

- 93 Useful information.
- 94 Not useful information.
- 95 We need more information.