Subject:
Scan tool unable to communicate with PCM

Unit:
4L80-E

Vehicle Applications:
1994 Chevrolet W4 Tiltmaster

Essential Reading:
- [x] Rebuilder
- [ ] Shop Owner
- [ ] Center Manager
- [x] Diagnostician
- [ ] R & R

Authors:
Jesse Zacarias and Roy Delfran

Do You Speak My Language?

Have you ever had something as simple as ordering food in a restaurant complicated by the fact that your waiter doesn't speak your language?

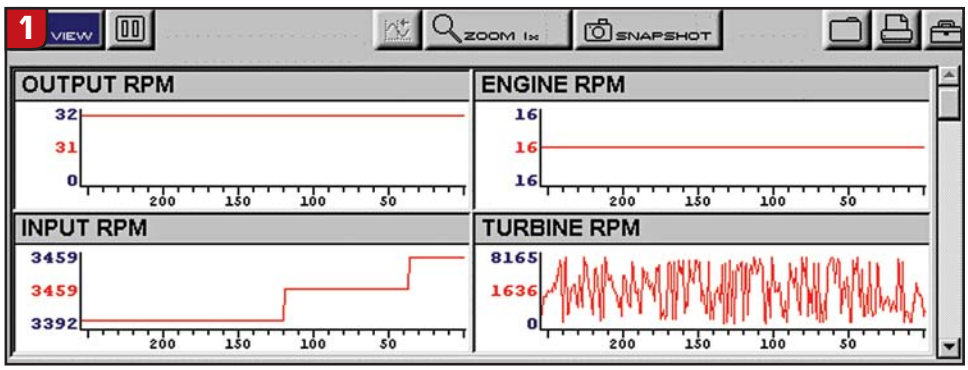
If you've ever been in a foreign country were you don't speak the language, then you know what we are taking about.

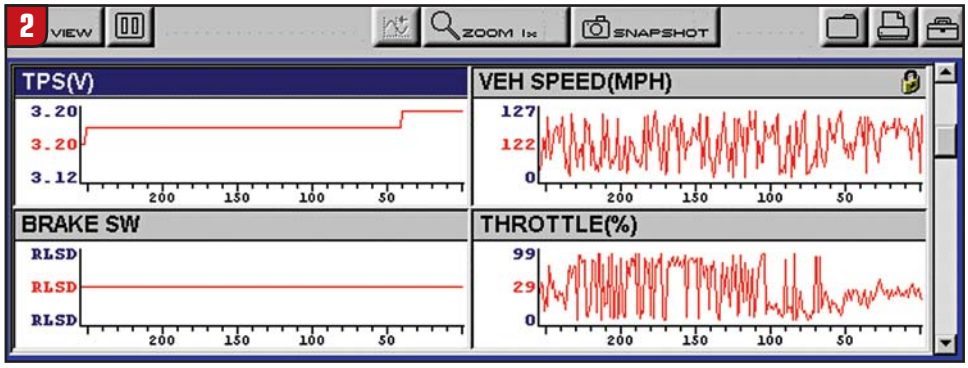
Something similar happened to us with a simple problem on a 4L80-E in a 1994 Chevrolet W4 Tiltmaster with a 5.7-liter engine.

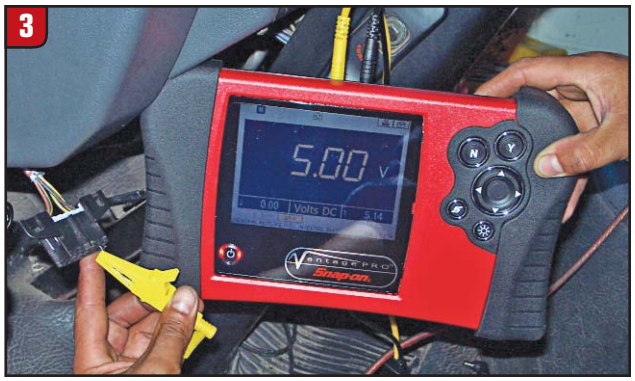
An auto-repair shop sent this vehicle to a nearby transmission shop after replacing the transmission case to repair a cracked case. The shop complained that the transmission would not go into overdrive and the engine would cut off at times.

The local transmission shop, in an effort to eliminate a code 68, replaced the input- and output-speed sensors, 2-3 solenoid and the transmission-range pressure switch (later you will

continues page 22







see why). It also replaced the internal harness and external connector because they where "old and fitted loose." When the problem persisted, the local transmission shop sent the vehicle to us.

The first thing we did was to hook up our scan tool to retrieve codes and found code 68 (transmission component slipping). To determine whether 4th gear or TCC was slipping, we erased the codes and road-tested the vehicle in manual third. Code 39 (TCC stuck off) appeared now. That was simple enough to diagnose; we simply brought up data and took a snapshot while checking for TCC percentage and TCC rpm slip.

That's when things got ugly. The data did not make any sense. We were in park, engine at idle, and the data was telling us otherwise. It was not speaking our language.

According to the data (see figures 1 and 2), at times we were exceeding 100 mph but our engine speed never exceeded 16 rpm. Our input and output speeds were definitely wrong. They showed output-shaft movement in park and erratic turbine speed. We can see now why the local transmission shop replaced all those parts. However, when we changed from monitoring transmission data to monitoring engine data, the engine-speed and throttle-percentage readings were correct. We thought, "Maybe it's the scan tool." So we got hold of another scan tool, Genisys, only to find the same readings.

We borrowed a Tech 1A factory scan tool and got yet another result. It gave us a "re-enter VIN" and no data even though it would run the test for code 12 successfully. We tried another scan tool, a Master Tech, but it gave us the identical reading as Tech 1A (same maker).

Since the factory scan tool was not able to obtain data for us, we decided to check for proper voltage at pin M of the data-link connector; this is where the data is fed to the scan tool. The factory manual calls for a 5-volt reading at pin M. We found no problems there (see Figure 3).

Our simple original problem began to take a back seat. We wanted to know why we could not communicate with the PCM. Why it would not speak our language?

We checked the PCM and noticed that it had been replaced with an aftermarket unit (see Figure 4), but was it the correct one?

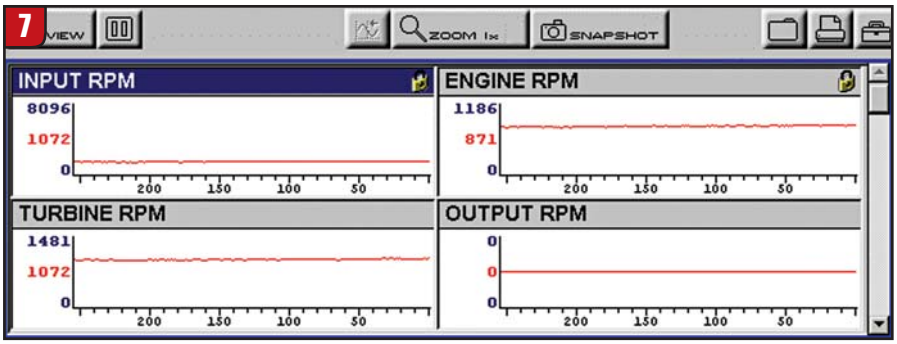
We called the local Isuzu/Chevrolet Tiltmaster dealer and gave them the vehicle identification number and the computer part number. Their answer was, "It's the wrong PCM."

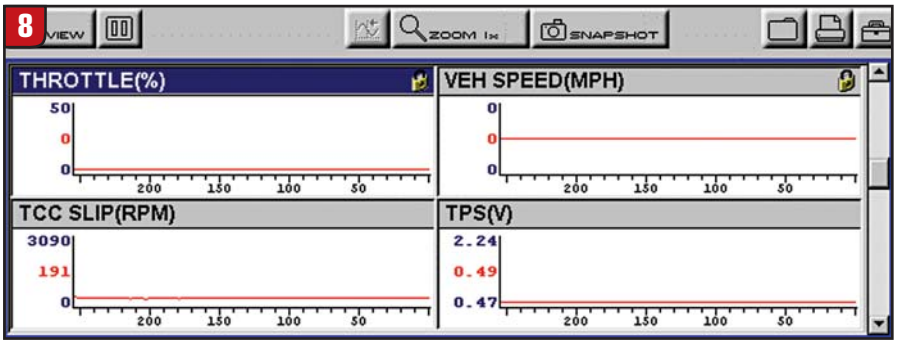
We informed the owner of the vehicle of this, and he decided to get the correct one from the dealer, since he was the one who got this PCM from a "local parts house."

After we installed the "correct factory PCM" (see Figure 5) we had the same problem (head scratching now).

We decided to borrow a 1994

continues page 26



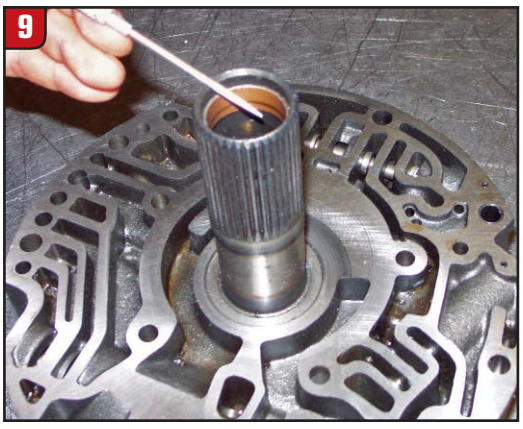


GMC Tiltmaster from a local construction company for which we do a lot of work. When we connected each of our previous scan tools to this GMC, we had communication with all four of them. Now what? (more head scratching)

When we looked at the PCM in the GMC we borrowed, we noticed it was different. Just as the factory wiring harness showed, it contained two 32-pin connectors, but ours had one 32- and one 24-pin connector (see Figure 6).

According to our research this PCM was used only up to 1992. So we identified the vehicle as a 1992 instead of a 1994 and our communication problems disappeared. We had communication. The PCM finally spoke our language.

As you can see, our vehicle-speed reading was correct as well as our readings for the input- and output-speed sensors, throttle-position sensor and throttle percentage (see figures 7 and 8).



By using the snapshot ability of the Snap-on SOLUS, we would now be able to check for TCC slip. We noticed that when TCC percentage was at 98% (which is too high), the TCC slip was 285 rpm (this should not exceed 100 rpm).

Since we confirmed that the PCM was trying to compensate for the slip by increasing TCC percentage, we knew that we were not dealing with a PCM or electrical problem. So we decided to remove the transmission to see what was causing the torque-converter slippage.

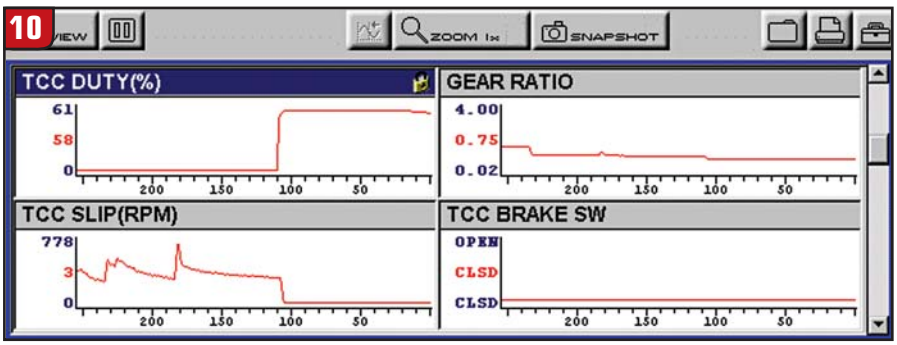
Everything seemed to be in order inside the transmission, but we noticed excessive wear at the stator bushing (see Figure 9).

We replaced the bushing and road-tested the vehicle, and the problem was corrected. TCC duty percentage was in the low 60s (as it should be) with practically no TCC slippage (see Figure 10).

It certainly is better when we speak the same language, even if you are just a computer.

As for that pesky problem of the engine turning off, it turned out to be a bad ignition module. TD

Jesse Zacarias is the owner of Elec-Tran Diagnostics in Gilroy, Calif. Roy Delfran is with Snap-on Diagnostics' Ask A Tech Community Web Forums (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.