



by Pete Huscher

# 4x4 Low Range *will not Engage* at Times

In the last installment of *Keep Those Trannys Rolling*, we looked at a 1999 Ford Explorer with a “chatter or shudder” sensation on acceleration while turning (*GEARS*, October 2007). While diagnosing the BW4405 automatic four-wheel drive system, we found codes P1837 (rear driveshaft speed sensor), B1322 and B1574 (door ajar circuits) in the GEM (generic electronic module) system.

A faulty rear driveshaft speed sensor was causing the automatic four-wheel drive system to engage intermittently, causing a chatter or shudder sensation on acceleration while turning. Replacing the rear driveshaft speed sensor seemed to eliminate the problem. But before we were ready to deliver the vehicle, we had to recheck the GEM system to see if code P1837 returned.

## Back at the Shop:

After returning to the shop, we connected a scan tool and checked the GEM system for codes. P1837 wasn't present, but codes B1322 (drivers door ajar circuit) and B1574 (left rear door ajar circuit) were.

While performing the final checks on the four-wheel drive system, we noticed the Gem system wouldn't allow a commanded shift to 4x4 low range at times. After verifying all parameters were within range to allow for a commanded shift to 4x4 low, we cleared the door ajar codes and rechecked the 4x4 system operation. With the door ajar codes cleared, the GEM system would now allow a commanded shift to 4x4 low range.

As we continued to check the 4x4 system operation, we discovered

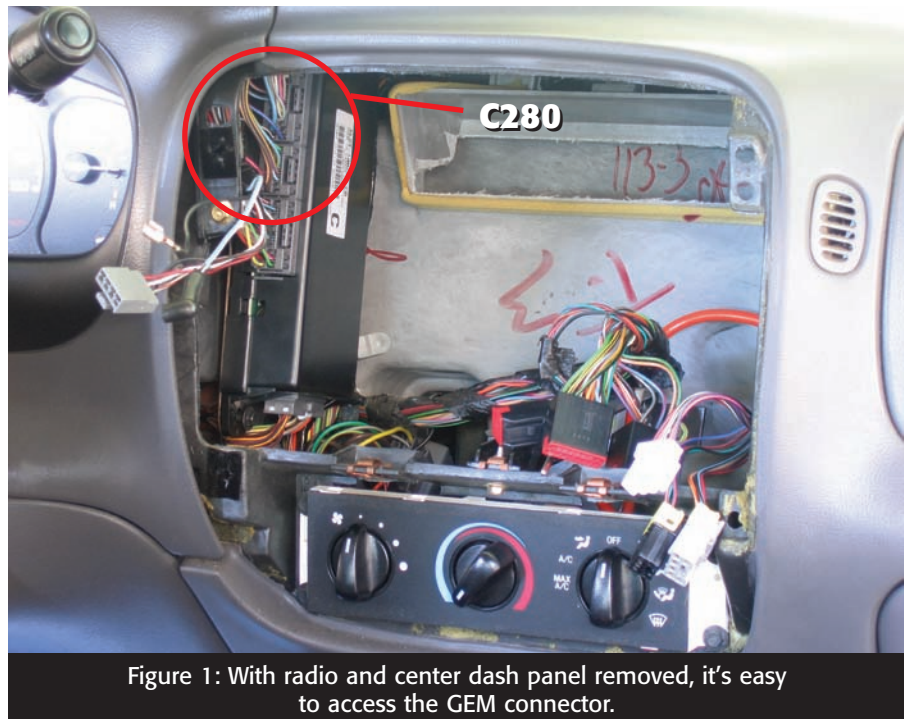


Figure 1: With radio and center dash panel removed, it's easy to access the GEM connector.

that each time the driver's door was opened and closed, code B1322 (drivers door ajar circuit) would reset, disabling the command for 4x4 low range. Apparently the door ajar code was interfering with the engagement to 4x4 low. It became obvious that, to repair the “no engagement into 4x4 low” problem, we were going to have to fix the door ajar circuits.

## Checking the Door Ajar Circuits

We reconnected our scan tool, and monitored the driver's door ajar system. Each time we opened and closed the driver's door, the scan tool would show the driver's door open and close intermittently. Sometimes the scan tool would indicate the driver's door was

open when it was actually closed.

Next, we removed the radio, center dash panel and the mounting screw securing the GEM module to the dash frame, to access to GEM module connector C280 (figure 1). While back-probing the GEM module C280 connector, terminal #8 (yellow/black wire; figure 2) we were able to monitor the driver's door ajar signal.

When the driver's door is closed, the driver's door ajar circuit is grounded through the driver's door latch assembly; when the door is open, the ground circuit is interrupted.

While monitoring the circuit, we could see the circuit go to ground some times; other times it wouldn't. After verifying that the Gem module was getting an intermittent ground from the

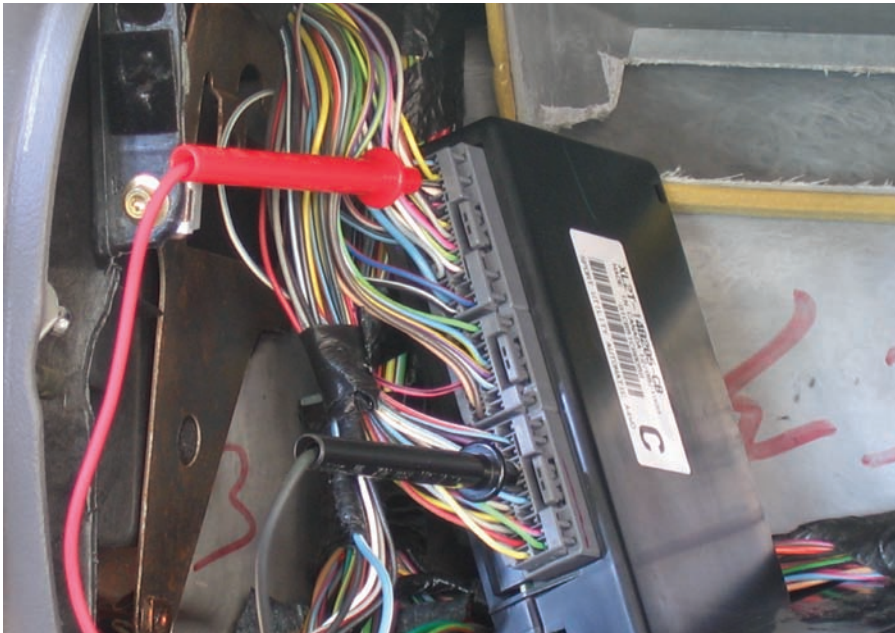


Figure 2: Backprobing the C280 connector lets us verify the problem is in the circuit, not the GEM.

driver's door ajar circuit, we knew there had to be either a wiring problem to the driver's door latch or the driver's door latch assembly was faulty.

### Checking the Door Ajar System

Removing the driver's door panel

and vapor liner revealed the driver's door latch assembly, located behind the driver's rear window track. We removed the rear window track assembly to access to the door latch assembly (figure 3).

The driver's door lock system seemed to have a problem: We could

open the door easily from inside the vehicle, but it was difficult or impossible at times to open it from outside. Further inspection revealed that the driver's power door lock would stick intermittently in the locked position, and wouldn't allow the door to open from the outside. While opening the door from the inside, the latch assembly would override the lock mechanism and allow the door to open.

We disconnected the driver's power door lock actuator from the latch assembly, and the door seemed to open and close properly. Then we rechecked the door ajar circuit operation through the scan tool. This time the door ajar system worked properly. Each time the door closed, the circuit went to ground. Each time the door opened, the ground circuit opened. The door latch assembly seemed to be doing its job; the power door lock actuator must have been interfering with the latch operation.

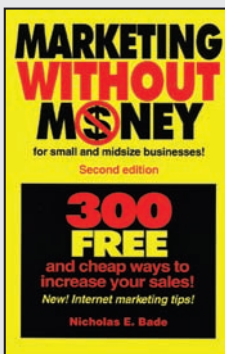
### Not a Unique Problem

Next, we called the local Ford dealership and purchased a new door lock actuator. It quickly became obvious that the new actuator was different from the



## BOOKSTORE

Your Source For Technical And Management Publications



### Marketing Without Money - Second Edition

This management book will show you cheap and easy ways to boost sales, networking tips, ways to increase sales, and many other useful tips to help your business.

**\$16.95**

To order, Email the Bookstore at [bookstore@atra.com](mailto:bookstore@atra.com) or call Shaun or Ron at 1-800-428-8489.

ATRA Bookstore, 2400 Latigo Avenue, Oxnard, CA 93030 • [www.atraonline.com](http://www.atraonline.com)



## PowerPusher™

*If It Rolls...We Can Move It.*



Nu\*Star 1425 Stagecoach Rd. Shakopee, MN 55379  
Phone - (800)800-9274 [www.powerpusher.com](http://www.powerpusher.com)

## 4x4 Won't Engage Occasionally When the Trans Is in Low Range

original. Turns out, Ford's been having problems with the original door lock actuators and redesigned them. This was the updated replacement part.

We installed the new power lock actuator and rechecked the system. With the new power lock actuator installed, the system seemed to work perfectly. We reinstalled the rear window track and rechecked the driver's door latch operation. Each time the driver's door opened, the door ajar ground circuit opened; each time the driver's door closed, the door ajar circuit went to ground. It looked like the door ajar system was repaired.

Before installing the driver's door vapor lining and door panel, we checked the 4x4 system operation. Each time we requested engagement to 4x4 low range, the Gem module complied and engaged 4x4 low range. We reinstalled the driver's door vapor lining and door panel, then installed the Gem module mounting screw, center dash panel and radio (figure 4), and prepared for the final test drive.

We stopped several times during the test drive and tried 4x4 low range; it engaged every time. We also opened and closed the driver's door and then tried 4x4 low range; once again, it worked fine every time.

We drove back to the shop, reconnected the scan tool, and checked the Gem system for codes. None present. At this point we were confident the vehicle was fixed, and ready to be delivered.

So the next time you're working on a transmission problem or a 4x4 system problem and you just can't seem to find the cause, remember: Engine performance, GEM system or body control system codes may interfere with the transmission or 4x4 system operation.

Sometimes all you need to do is step back and take another look at what you're doing. Maybe the problem is being caused by an unrelated system: In this case, the power door lock system interfered with the door ajar system, which, in turn, interfered with the 4x4 system operation. But with a little bit of patience and a better understanding of how each system interacts with one another, you, too, can *keep those trans rolling*.



Figure 3: With the rear window track removed, you can get a good look at the driver's door latch assembly and power door lock actuator.



Figure 4: Once we corrected the source of the problem, we reinstalled the GEM, radio and center dash panel, and prepared for a final road test.

# DO THE JOB RIGHT ... RIGHT OUT OF THE BOX.



## Mopar® Transmission, Transaxle and Differential Rebuild Kits Feature Authentic Mopar Components.

The same O.E. parts used to make transmissions, transaxles and differentials for Chrysler, Jeep® and Dodge vehicles are used in Mopar® Transmission, Transaxle and Differential Rebuild Kits. Each kit comes with everything you need for a complete rebuild job. There's no need to order additional parts. Give your customers authentic Mopar quality with each and every rebuild job.

See your Chrysler, Jeep or Dodge dealer today for more information and application listings.

