

F150 with an EPC Code that Won't Go Away



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The Ford F150 may be one of the most popular trucks of all time. Most shops see them in their bays on a regular basis. The truck pictured (figure 1) is an Extended Cab 4WD with a 4.6L gas engine.

This truck came into the shop with the OD light at the end of the shifter handle flashing (figure 2). This truck came to us from a local transmission shop, specifically for this article.

Our first step in the diagnosis was to connect a scan tool. The truck had two codes in memory:

- P1747 — Pressure control solenoid short circuit
- P1760 — Pressure control solenoid A short circuit

The battery had been disconnected recently, so we also had P0603 (Internal control module KAM error code).

We cleared the codes three or four times; each time the solenoid codes come back as soon as we fired up the engine.

Diagnosing the Codes

First we needed to check the wires from the controller to the EPC solenoid. The battery box on this F-150 comes out faster than we can raise the truck up in the air. Removing the battery box provides easy access to the controller for testing.

We unplugged the 104-pin controller connector and the transmission case connector. We then probed pin 81 on the 104-pin connector with our meter's



Figure 1

positive lead and connected the negative lead to ground. The reading should be zero ohms. Anything other than zero ohms indicates a short to ground and the wire must be repaired (figure 3).

The wires from the computer to the transmission read zero ohms, which verified that there were no shorts to ground in the wiring between the controller and the transmission.

Now the thought of a bad controller came to mind. We know these are expensive units; list price for this one is close to \$650.

A simple, effective way to test the controller is to wire a solenoid directly into it. In this case we used a known good EPC solenoid and a couple jumper wires. One of the jumper wires was



Figure 2

fused: We were going to be working with system voltage, and a fuse would keep us safe from arc welding or catching anything on fire.

We located the EPC wire and cut it close to the controller, but left enough wire so it'd be easy to repair once we were finished testing (figure 4).

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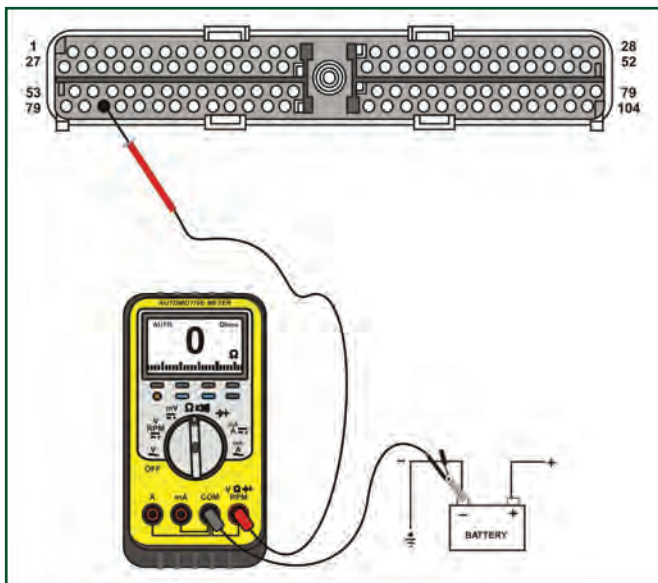


Figure 3

Next we use a jumper to connect the solenoid to the cut wire on the controller side, and the fused wire from the other solenoid terminal to the positive battery cable (figure 5). This wired the test solenoid into the solenoid control circuit.

We used the scan tool to clear codes and see which codes, if any, would return. The codes reset almost immediately after clearing them (figure 6). That meant the problem could only be:

- the 3 inches of wire

between the controller and the test solenoid.

- the 104-pin connector going into the controller.
- the controller itself.

If the codes hadn't returned with the test solenoid wired into the circuit, it would've meant the problem was in the EPC circuit, somewhere between where we cut the wire and the transmission.

A quick inspection of the connector and the wire revealed no problems, so the controller had to be the root cause of the codes. We took this information to the boss and explained with confidence that this truck needed a new controller. Once the testing was complete, we soldered the cut EPC wires back together and covered the repair with heat shrink tubing to protect the wire from the elements (figure 7).

Installing and Programming the New Controller

The new controller comes from the Ford dealer with no programming. The controller is basically an empty box. We need to fill that box using the reprogramming software we have on our laptop or desktop PC.

In the April 2009 edition of *GEARS*, I wrote about what it takes to get started reprogramming. Check it out on line at www.atra.com.

The article contains information about:

- What a J2534 connector is and where to find them.
- OEM web site addresses for the update programs and recalibration software.
- The types of computers that are best for reprogramming.

Many of us have been reprogramming for some time now. If you haven't reprogrammed a Ford controller for, oh, say a couple of weeks or more, you may be in for a surprise when you log into the subscription area of www.motorscraftservice.com and attempt to reprogram a controller. If you haven't updated your Ford Module Program (FMP) recently, the reprogramming won't work.

Just like your laptop or desktop PC needs occasional updates, so does the FMP. For those who haven't

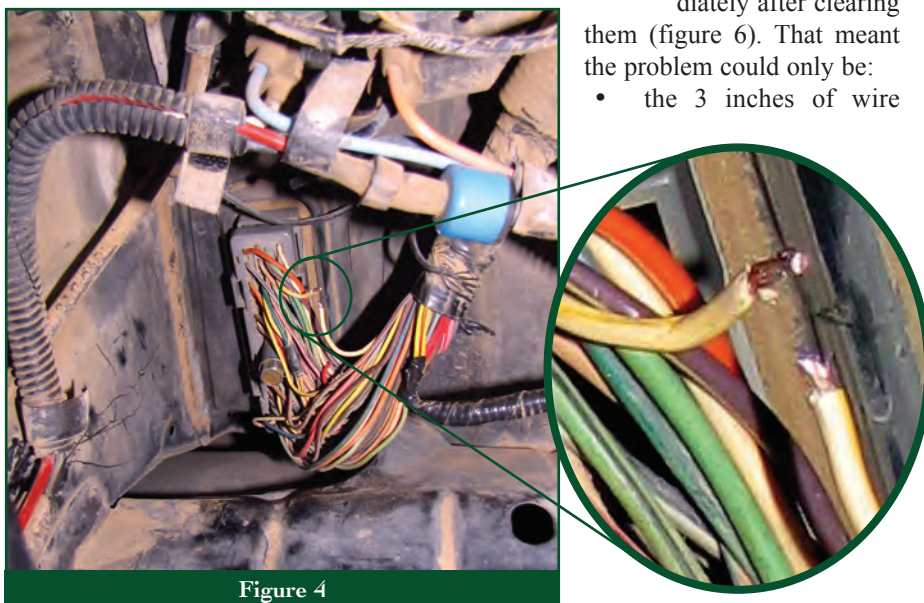


Figure 4

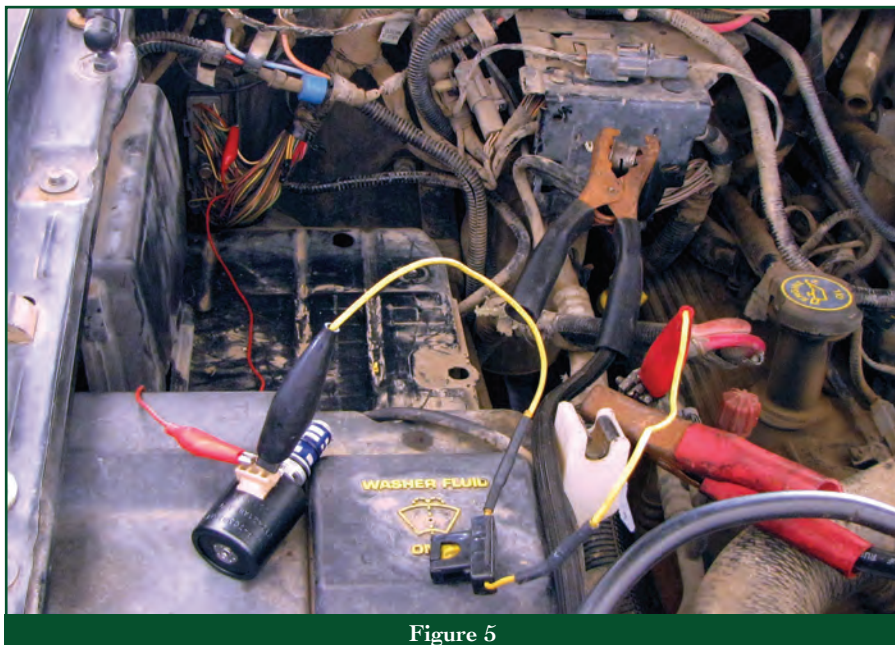


Figure 5

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reprogrammed controllers or are considering it, the FMP is the software downloaded from the Ford web site. This program installs on your computer to work with the factory web site to reprogram Ford controllers.

You may want to take this into consideration when estimating the time it will take to reprogram your next controller. The updates to the FMP are slow and may take up to an hour to perform. After the updates are installed, you'll need to reboot your computer.

Once you've updated the FMP, the program will operate as designed when you're logged in to the Ford web site.

After you've completed the new controller programming, you'll need to introduce the Passive Anti-Theft System (PATS) to the new controller. The FMP will do the introductions, but this means you'll also have to reprogram the ignition keys to the vehicle.

Programming the keys isn't much of an issue *as long as you follow the procedure to the letter*. This means that when the instructions say leave the ignition key on for 20 seconds, leave it on for 20 seconds; no more, no less.

Then the instructions for programming a key says to insert the next key into ignition within five seconds of removing the previous key. If it takes longer than five seconds, the key won't program and you'll have to restart the process. Lay the keys out on the front seat to make the process smooth and trouble free (figure 8).

It's always a bit intimidating to change a computer on a car or truck. As technicians we like to be able to see and touch the broken part. When a faulty component doesn't look or feel broken, we sometimes have a hard time replacing it, especially if it costs hundreds of dollars.

But by using sound testing techniques, you can be sure your repair decisions are correct, and can feel confident with your recommendations. And with the latest software, you can reprogram on-board computers efficiently.

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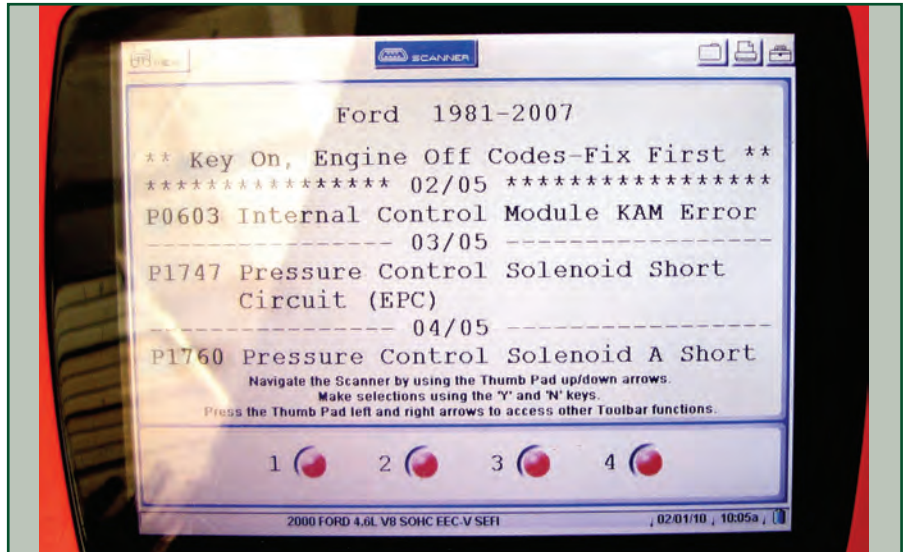


Figure 6

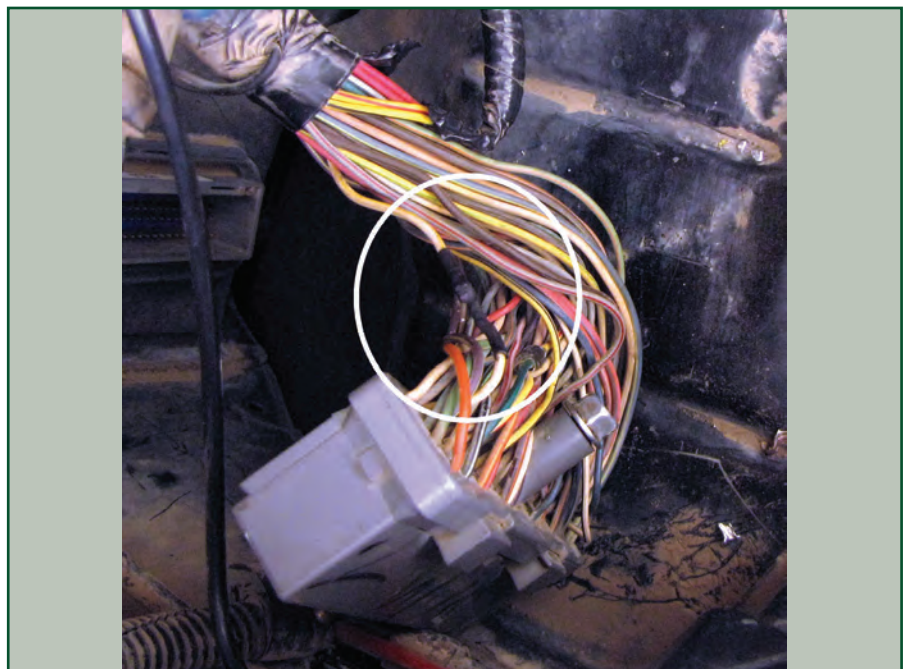
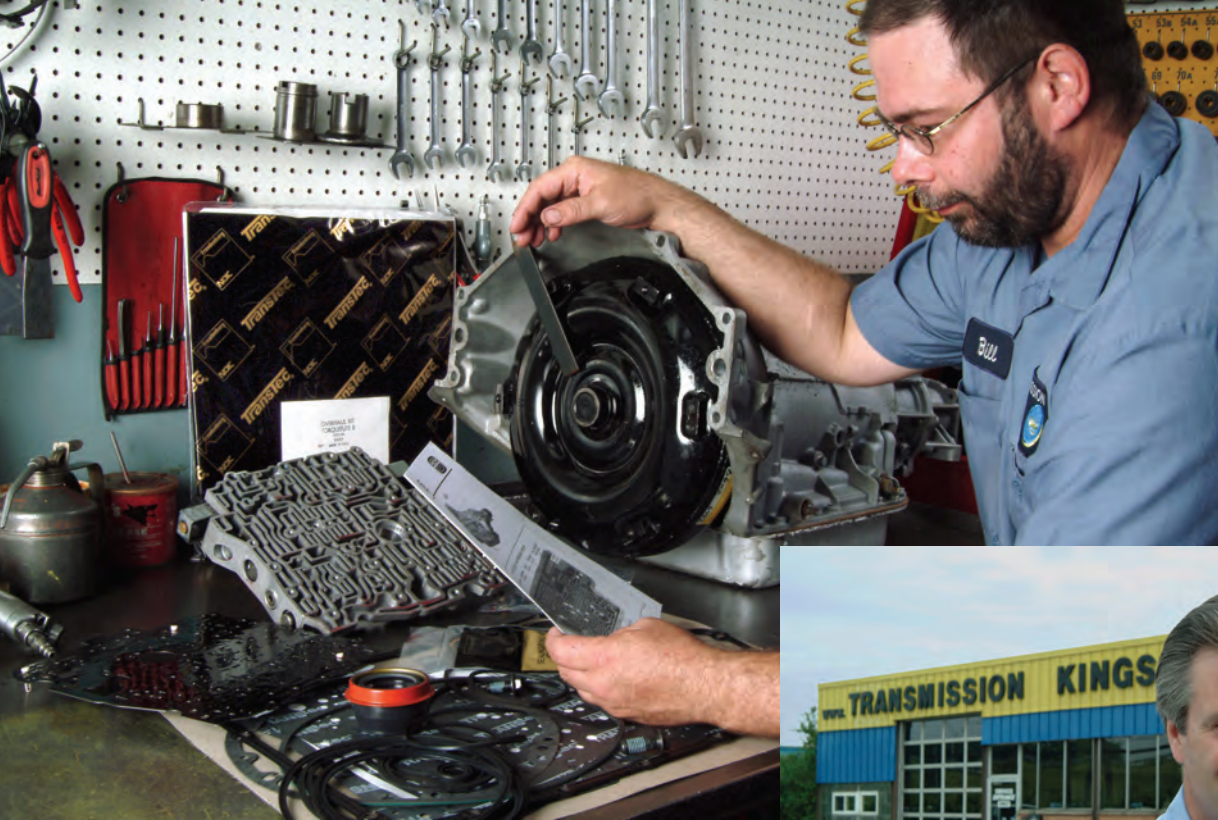


Figure 7



Figure 8



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