



CHRYSLER SOLENOID ELECTRICAL CODES

THE INDUCTIVE SPIKE

COMPLAINT: Changing a solenoid pack, wiring and computer does not resolve a solenoid electrical code with any Dodge, Chrysler or Jeep vehicle using a 41TE, 42RLE, 45RFE, 545RFE or a 68RFE family of transmissions.

CAUSE: Performing just a resistance check of the solenoids may not always find the problem. The cause can still be with either a solenoid pack, wiring or computer which will require a more thorough diagnostic procedure to help pin point the problem area.

One test that has been used to check the integrity of the electrical system is to unplug the TCM/PCM and supply battery voltage to the terminal for the EATX relay's feed back circuit (or the Automatic Shutdown Relay - ASD). This will allow the ability to conduct an amperage check of each of the solenoid's entire electrical circuit.

Explanation: When the TCM/PCM activates the relay, it supplies voltage to the solenoids. This same voltage goes to the TCM/PCM for it to know that the relay closed and the proper voltage level is being supplied to the solenoids. With the TCM/PCM unplugged and a voltage supply is provided to that terminal, it is also providing the solenoids with that same voltage. This voltage then runs through each of the solenoids and returns to the TCM/PCM at their assigned terminals. The test is to then set your meter up to read amperage. With the negative lead to ground, by probing each terminal with the positive lead you get the amperage of each of the solenoid's complete electrical circuit.

Not the best approach: The problem with this approach is that if it is not performed correctly, it will damage the circuit. Most of these solenoids measure approximately 1.5 ohms. With each of these solenoids being supplied with approximately 12 volts from the battery, the amperage will be as high as 8 amps. Even though this does confirm a good circuit when under a load, if you stay there too long, it will all go up in smoke.

CORRECTION: A safer and more efficient way to check these solenoid circuits is with an amp clamp and a scope. The TCM/PCM monitors the integrity of the solenoid circuit not by amps, but by an inductive pulse when the solenoid turns off. The amp clamp will however give you operational amperage which will typically range from 0.1 amp to 1.0 amps. Watching the amp curve can reveal a bad solenoid coil should it fail. Looking at the inductive spike (or kick) allows you to see what the computer is monitoring.

Figure 1 is a screen capture of a scope hooked up to a 2011 Jeep Wrangler with a 42RLE transmission. Notice that when just the ignition is turned on, shortly thereafter the computer turns all the solenoids on and then off to check each circuit for the proper inductive spike.

Figure 2 reveals that each of the four solenoids produced a 42 volt inductive spike when the coil collapsed. If this type of signal is observed yet the TCM/PCM produces a solenoid electrical code, the problem is with the computer as it is not reading the spikes correctly.



Technical Service Information

CORRECTION: If one of the solenoid circuits did not produce this spike and its the same solenoid the TCM/PCM sets a code for, then wiring, the solenoid, or terminal contact is still the problem.

Note: Earlier models will produce a 40 volt spike while later models will be around 42 to 46 volts. The change took place around 2000 to 2002 due to changes in computer type.

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Figure 1

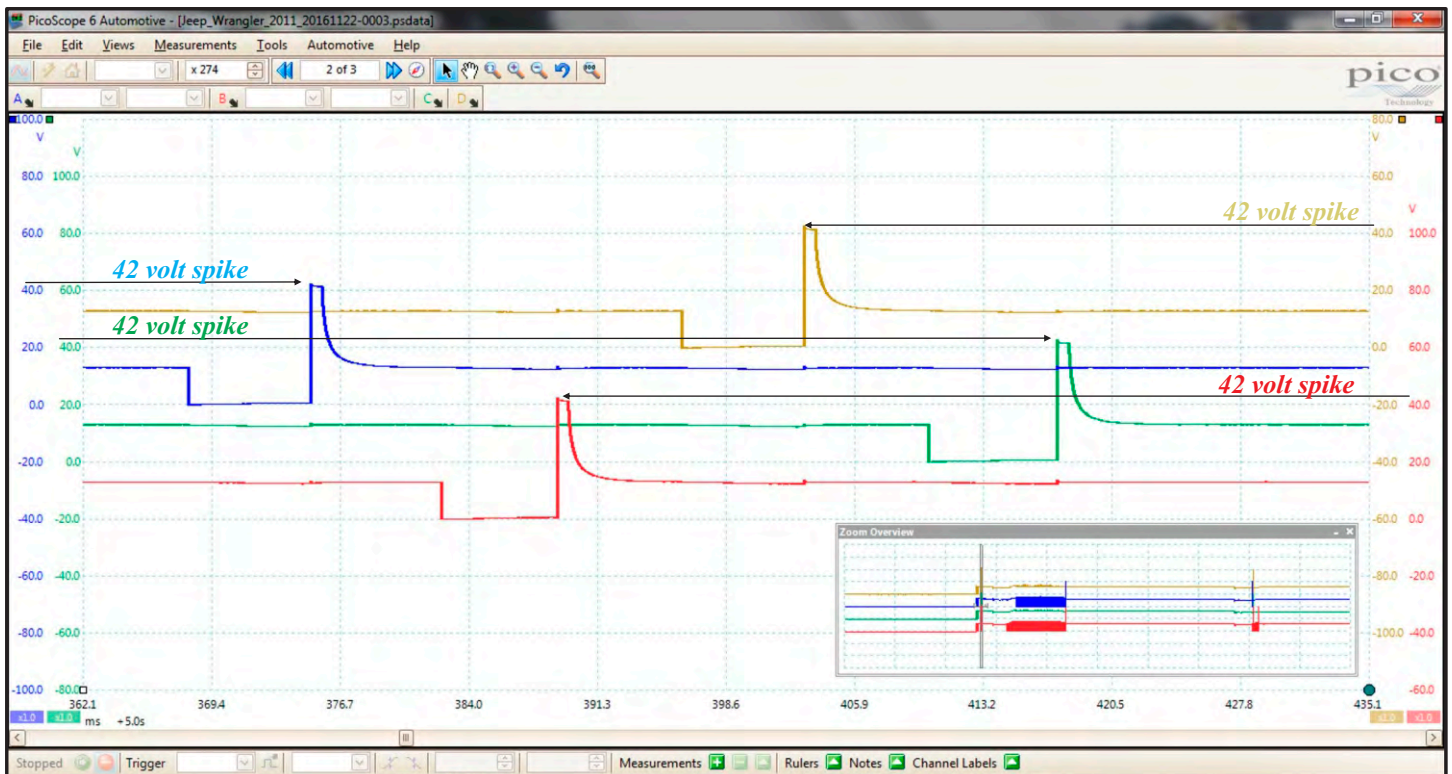


Figure 2