Over the years, it’s become obvious that the existing troubleshooting procedures won’t solve all of its electrical problems. This article will help you troubleshooting the difficult problems on 2003-and-later Caravans with the 41TE transmission. These vehicles now use the PCM to control the transmission.

Before you dig into the computer system, always start with the basic checks for connections, grounds, and so on.

- The battery must be fully charged; 12.45 minimum rest voltage.
- Some tests require testing with live voltage.
- Some tests require you check the current flow in a circuit.
- Improper testing could damage the vehicle or your meter.

To begin troubleshooting, identify which area the problem falls into.

**Type 1 Problems:**

TCM and TCM Communications

These problems include no codes, no communication, or TCM codes P0604, P0605, P0613, P1652, P1687, P1694 or P1793.

If you can’t communicate with the TCM:

- Erase all trouble codes from other modules.
- Check pin 29 of the C1 connector. (Figure 1)
- Check all grounds and key-on voltage pins at all PCM connectors.
- Verify that the crank (start) signal at pin 30 of the C1 connector works as described in the 41TE Terminal ID and Voltage charts. (Figure 1)

If any terminal is out of range, disconnect the PCM and retest all battery and key-on voltage circuits at the PCM. If the circuits check out okay with the PCM disconnected, the PCM may be at fault. (Figure 2)

Repair any circuits that are out of range. Then reconnect the PCM. If you still can’t communicate with the PCM, try a different scan tool or update your scan tool’s software.

There are 2 types of data signals which TCM data can be requested. One is the Programmable Communication (PCI) BUS, which includes data from the PCM. The other signal is called the Serial Communication (SCI) which is dedicated to TCM data. To check for PCI communication, check for varying voltage at pin 38 of the C1 connector. With scan tool connected and engine running, voltage should be between zero and 7 volts. If data stream activity appears to be present, you can scan tool or software may not be compatible with the PCM.

To check the SCI data stream, connect a scan tool and have the engine running. The voltage at pin 27 of the C1 connector should toggle between zero and 5 volts (Figure 2). If the circuits don’t work as described, the PCM may have a problem. For more information on communication problems, see the 2007 seminar manual.

**Type 2 Problems:**

Input Signals

These problems are input sensor codes, such as TSS, OSS, pressure switches, gear select, crank sensor, TPS and temperature sensor. Test TSS and OSS inputs with a lab scope or AC voltmeter. See the PCM Connector ID and Voltage chart for specifications.

**TSS and OSS Sensors**

To test the sensor’s operation, use a lab scope or multimeter to monitor the circuits directly. Use the PCM Connector ID and Voltage chart to identify sensor terminals at the PCM (Figure 3).

Use a scan tool to watch the TCM

<table>
<thead>
<tr>
<th>Pin</th>
<th>Wire Color</th>
<th>Function</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Black/Brown</td>
<td>Ground</td>
<td>Less Than 0.01V</td>
</tr>
<tr>
<td>11</td>
<td>Pink/Grey</td>
<td>Ignition</td>
<td>12V Ign. ON</td>
</tr>
<tr>
<td>18</td>
<td>Black/Dk. Green</td>
<td>Ground</td>
<td>Less Than 0.01V</td>
</tr>
<tr>
<td>29</td>
<td>Orange/Red</td>
<td>Fused B+</td>
<td>12.45V Min at Rest</td>
</tr>
<tr>
<td>30</td>
<td>Yellow</td>
<td>Start</td>
<td>12V Start 0V Ign. On</td>
</tr>
<tr>
<td>37</td>
<td>Dr. Green/Yellow</td>
<td>SCI Transmit</td>
<td>0V Toggles 0-5 when scantool cont. Requests data</td>
</tr>
<tr>
<td>38</td>
<td>White/Violet</td>
<td>PCI BUS</td>
<td>Toggles 0-7V cont. When Data Present</td>
</tr>
</tbody>
</table>

**Figure 1**

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process the signals:

- In Park, the TSS should read close to engine RPM. The OSS should read zero.
- At a stop in drive, both sensors should read zero, even during a stall test. If the TSS reads more than zero RPM, a clutch is slipping or the TSS circuit is generating a false signal because of EMI or a bad ground.
- Operate the vehicle in 3rd gear with lockup on. Both sensors should read right about engine RPM. Accelerate and decelerate the vehicle. Make sure that both sensor signals vary with engine RPM. If not, either a clutch is slipping or the speed sensor needs further testing.

HINT: Bad grounds, connectors, alternator diodes, and EMI can affect speed sensors. If clutches are good and you can’t find any external problems, suspect a faulty PCM.

L/R, 2-4 and OD Pressure Switches

To troubleshoot the pressure switch circuits:

- Disconnect the PCM.
- Connect a jumper between pin 29 of the C1 PCM connector and pin 56 and 18 of the C4 PCM connector. The ETAX relay should energize the circuits. (Figure 3)
- Move the gear selector to Drive.
- Connect a voltmeter to the L/R pressure switch terminal at PCM C4 connector. See the PCM Connector ID and Voltage chart for the pin number. The voltmeter should display 12V.
- Apply air pressure to the L/R pressure tap. The voltmeter should display 0V.
- Release the air pressure and 12V should reappear.

If the switch circuit tests okay but there’s a code for the pressure switch, look for a hydraulic crossleak or a faulty PCM. If the switch fails the test, check the circuits or replace the solenoid pack. Repeat the test for the 2-4 and OD pressure switch circuits. Reconnect the PCM.

HINT: A pressure switch trouble code may be caused by valve body crossleaks. For example, a 2-4 or a L/R pressure switch code; these problems can be caused by a bad solenoid pack, a sticky solenoid switch valve, or a warped valve body.
Troubleshooting the 604 (41TE)

<table>
<thead>
<tr>
<th>PCM Green Connector C4 ID &amp; Voltage Chart</th>
<th>Terminal</th>
<th>Wire Color</th>
<th>Application</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>Yellow/Grey</td>
<td>OD Solenoid</td>
<td>6.5-7.5 Amps In 3rd &amp; 4th</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>Yellow/Light Blue</td>
<td>UD Solenoid</td>
<td>6.5-7.5 Amps In 1st-3rd</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>Yellow/Dark Blue</td>
<td>2-4 Solenoid</td>
<td>6.5-7.5 Amps In 2nd &amp; 4th</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>Dark/White</td>
<td>L/R Solenoid</td>
<td>6.5-7.5 Amps Commanded On</td>
</tr>
<tr>
<td>13 &amp; 14</td>
<td>14</td>
<td>Black/Light Green</td>
<td>Grounds</td>
<td>Less than 0.01V</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>Dk. Green Light/Blue</td>
<td>PRNDL</td>
<td>12V in P,OD,L 0V in R,N,D</td>
</tr>
<tr>
<td>16</td>
<td>10</td>
<td>Dk. Green/ Dark/Blue</td>
<td>PRNDL</td>
<td>12V in R,N,OD 12V in P,3/2,L</td>
</tr>
<tr>
<td>18</td>
<td>10</td>
<td>Yellow/Brown</td>
<td>Relay Control</td>
<td>12V ign. ON</td>
</tr>
<tr>
<td>19, 28 &amp; 38</td>
<td>10</td>
<td>Yellow/Orange</td>
<td>Relay Output</td>
<td>12.45V Min. Engine Running</td>
</tr>
<tr>
<td>22</td>
<td>10</td>
<td>Dk. Green/Tan</td>
<td>OD psi Switch</td>
<td>12V in 1st/2nd 0V in 3rd &amp; 4th</td>
</tr>
<tr>
<td>27</td>
<td>10</td>
<td>Dk. Green/Green</td>
<td>PRNDL</td>
<td>12V in R, OD, 3/2, L 0V in P, N</td>
</tr>
<tr>
<td>29</td>
<td>10</td>
<td>Yellow/Tan</td>
<td>L/R psi Switch</td>
<td>12V 2.34, 0V 1st, Rev</td>
</tr>
<tr>
<td>30</td>
<td>10</td>
<td>Yellow/Dark Green</td>
<td>2-4 psi Switch</td>
<td>0V in 2nd &amp; 4th 12V All Other Gears</td>
</tr>
<tr>
<td>32</td>
<td>10</td>
<td>Dark Green/Brown</td>
<td>Output Speed Sensor</td>
<td>550-600Hz or 3VAC@30mph</td>
</tr>
<tr>
<td>33</td>
<td>10</td>
<td>Dark Green/ White</td>
<td>Input Speed Sensor</td>
<td>4-6 VAC or 1000Hz @1Idle @9VAC or 3100Hz @ 3000rpm</td>
</tr>
<tr>
<td>34</td>
<td>10</td>
<td>Dark Green/ Violet</td>
<td>Speed Sensor Ground</td>
<td>Less Than 0.01V</td>
</tr>
<tr>
<td>35</td>
<td>10</td>
<td>Dark Green/ Orange</td>
<td>Trans Temp Sensor</td>
<td>1.8V @ 140°F</td>
</tr>
<tr>
<td>37</td>
<td>10</td>
<td>Dark Green/ Yellow</td>
<td>PRNDL</td>
<td>12V in 3/2, OD 0V in P, R, N, L</td>
</tr>
</tbody>
</table>

Figure 3

| Gear Ratio Errors |

- **Type 4 Problems:**

  Gear ratio errors are detected by the PCM calculating signals from the input and output sensors. Make sure both sensors are working. See **Type 2 Problems** for testing procedures. If they’re working, the clutches are slipping, a hub or shell may be stripped, or the solenoid pack is faulty.

  - **TIP:** Code P0944 is usually caused by a clogged filter, warped valve body, or worn pump.

  Codes P01770, P1771 or P1772 (CVI Codes) indicate clutch clearance problems. These codes can also be set by faulty speed sensors, crossleaks, wrong stall converter, temperature too high or too low, or a bad PCM.

  A TCC slip code may be caused by a bad converter or pump, or a warped valve body. Test the TCC operation by monitoring the TCC release pressure tap. With TCC applied, TCC release pressure should be less than 10-15 psi (depending on ECCM command).

  A TCC slip code may be caused by a bad converter or pump, or a warped valve body. Test the TCC operation by monitoring the TCC release pressure tap. With TCC applied, TCC release pressure should be less than 10-15 psi (depending on ECCM command).

Once you’ve verified that all circuits related to the problem or symptom are working properly, the most likely problem is a bad PCM. By performing these tests, you should be able to identify and isolate most electrical problems in any 41TE transaxle.

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