



5R110W

ERRATIC SHIFTS AND TFT GAUGE OPERATION

COMPLAINT: A Ford truck equipped with a 5R110W transmission comes to the shop with complaints of erratic shifts, intermittent TFT gauge operation and no Tow/Haul mode function. The MIL may be on and the Tow/Haul indicator lamp may be blinking. (See figure 1) Scan tool data reveals transmission fluid temperature (TFT) readings are fluctuating from normal ranges to -40 degrees (F) coinciding with the erratic display seen on the TFT gauge in the instrument cluster. Code retrieval may indicate fault codes such as P0711-P0712-P0713, or P1711, with no signs of Transmission overheating.

CAUSE: Either the TFT sensor is faulty (Figure 2) or the internal wiring harness is faulty (Figure 3). The transmission fluid temperature (TFT) sensor twist-locks into the solenoid body and is a temperature sensitive device called a thermistor (Figure 2). As the fluid temperature increases, the TFT resistance decreases, as shown in the chart in Figure 4. The PCM uses the TFT signal as an input to determine cold and hot temperature shift scheduling and for TCC apply and release scheduling.

When the transmission is in cold mode operation, below -15°C (5°F), as determined by the TFT sensor, the transmission shifts 1st gear, 2nd gear, 3rd gear, 4th gear (ratio 1.09), 6th gear. When in hot mode the transmission will shift 1st gear, 2nd gear, 3rd gear, 5th gear (ratio 1.00), 6th gear. Either way it is still a five speed unit with six forward gear ratios available, dependant upon cold mode or hot mode operation.

CORRECTION: Unplug the transmission vehicle harness connector and turn the key on with the engine off. Using a Digital Volt Ohm Meter (DVOM) set to DC volts, place the negative meter lead to a **known** good ground. Place the positive meter lead to terminal 18 in the vehicle harness connector and check for approximately 5 volts on the wire coming from the PCM (Figure 5). This is the TFT sensor signal wire. If 5 volts **is not** seen, then the wire is damaged or the PCM may be defective. If approximately 5 volts **is** seen then verify the external sensor ground circuit as follows. Leave the positive meter lead at terminal 18 where approximately 5 volts was previously seen. Remove the negative meter lead from the **known** good ground and place the negative meter lead to terminal 22 in the vehicle harness connector. The meter reading should indicate the same 5 volts as was seen when the negative meter lead was connected to the **known** good ground. If approximately 5 volts **is not** seen at this time then the external ground circuit is faulty and will require repair. (See figure 5 for both front and rear views of the vehicle harness for terminal ID)

Note: Plug in the trans harness connector and the same voltage and ground tests can be performed with the trans pan removed at the 2 terminal connector when unplugged from the TFT sensor as seen in figure 2. This will confirm the complete circuit integrity to the sensor. If this test fails, the internal harness is faulty.

The TFT sensor can be tested externally by unplugging the trans harness connector and measuring the resistance across terminals 18 and 22 at the case pass through connector with a DVOM set to OHMS (See Figure 4).

SERVICE INFORMATION:

Transmission Fluid Temperature Sensor.....3C3Z-7H141-AA

At the time of printing this sensor lists for \$81.40 and wholesales at \$65.12

Internal Wiring Harness Assembly.....4C3Z-7G276-AA

At the time of printing this harness lists for \$98.97 and wholesales at \$79.18

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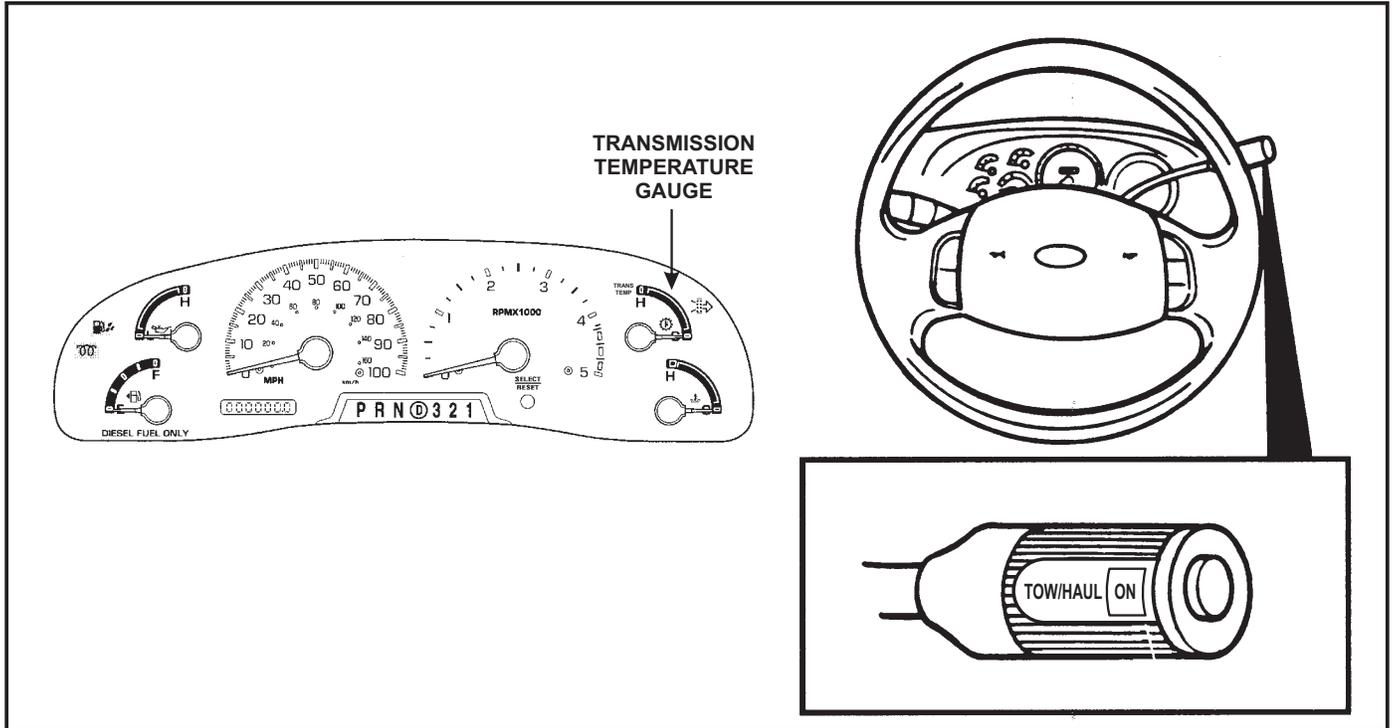
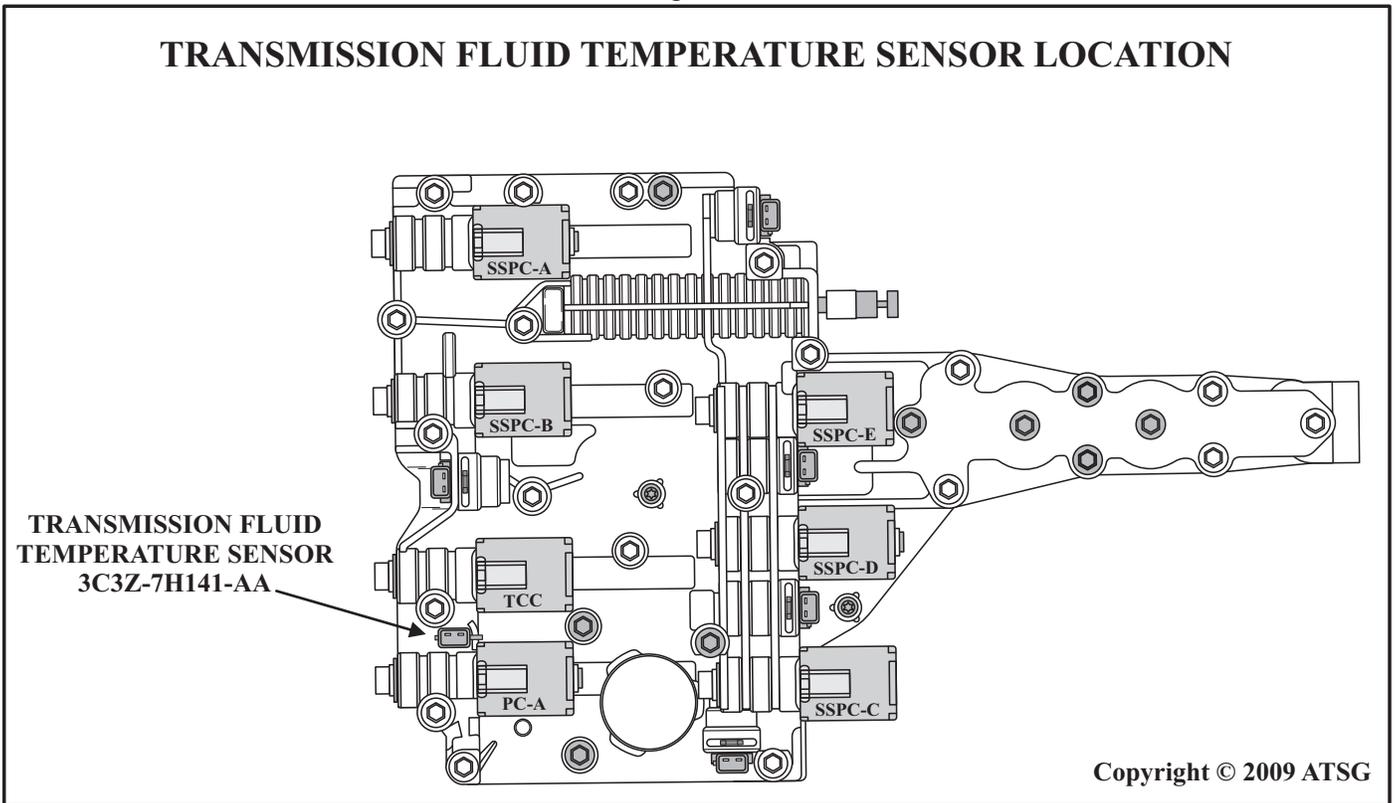


Figure 1

TRANSMISSION FLUID TEMPERATURE SENSOR LOCATION



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Figure 2

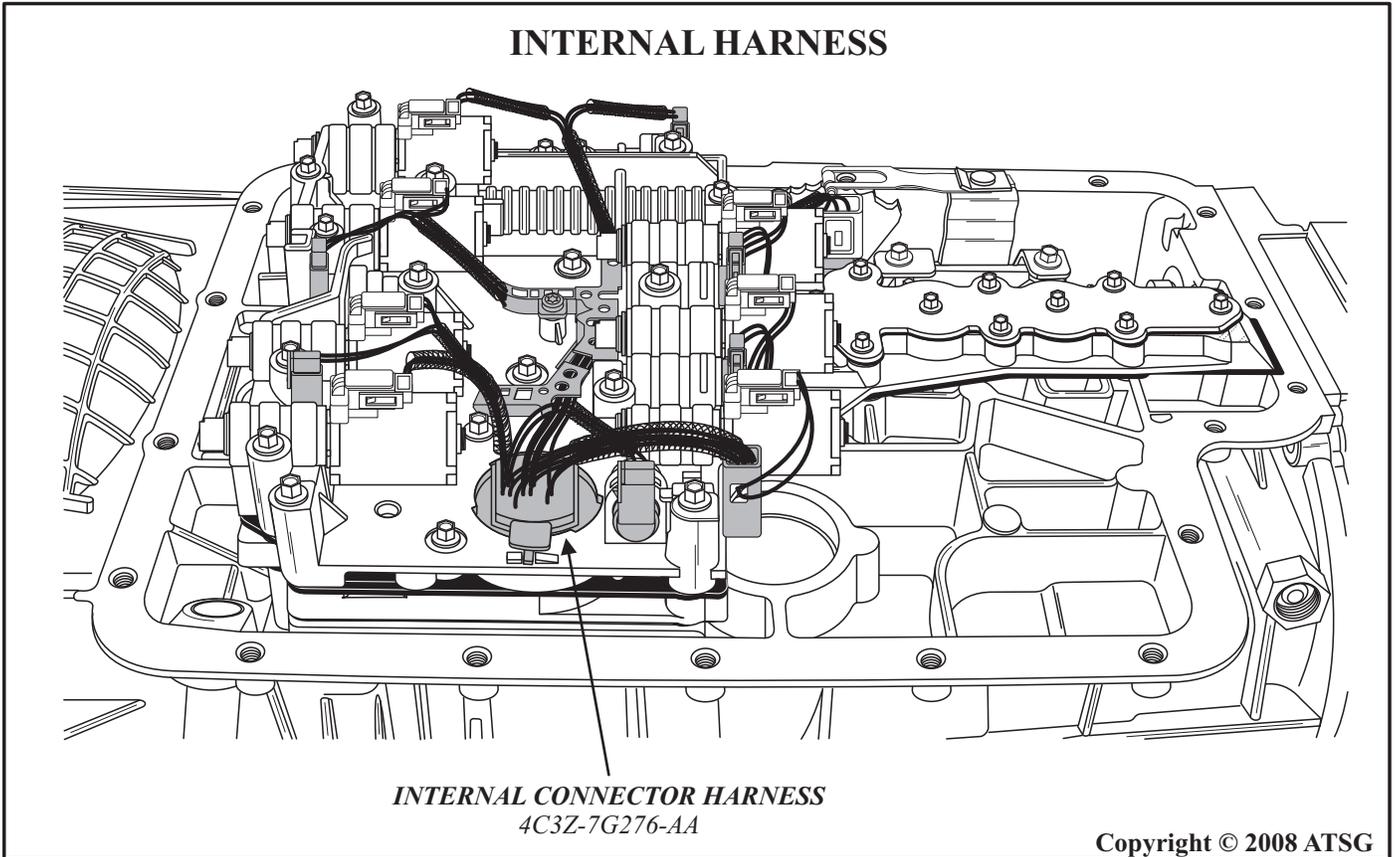


Figure 3

OHM TEST

*View Looking Into
Transmission Case
Connector*

*Ohm Meter at Pins
18 and 22*

<i>Transmission Fluid Temperature (TFT)</i>		
<i>Degrees C</i>	<i>Degrees F</i>	<i>Resistance (Ohms)</i>
<i>-40 to -20</i>	<i>-40 to -4</i>	<i>967k to 284k</i>
<i>-19 to -2</i>	<i>-3 to 31</i>	<i>284k to 100k</i>
<i>0 to 20</i>	<i>32 to 68</i>	<i>100k to 37k</i>
<i>21 to 40</i>	<i>69 to 104</i>	<i>37k to 16k</i>
<i>41 to 70</i>	<i>105 to 158</i>	<i>16k to 5k</i>
<i>71 to 90</i>	<i>159 to 194</i>	<i>5k to 2.7k</i>
<i>91 to 110</i>	<i>195 to 230</i>	<i>2.7k to 1.5k</i>
<i>111 to 130</i>	<i>231 to 266</i>	<i>1.5k to 0.8k</i>
<i>131 to 150</i>	<i>267 to 302</i>	<i>0.8k to 0.54k</i>

The TFT sensor resistance in relation to temperature can be checked with a DVOM set to OHMS. Place the meter leads across pin terminals 18 and 22 in the case connector as shown above.

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Figure 4

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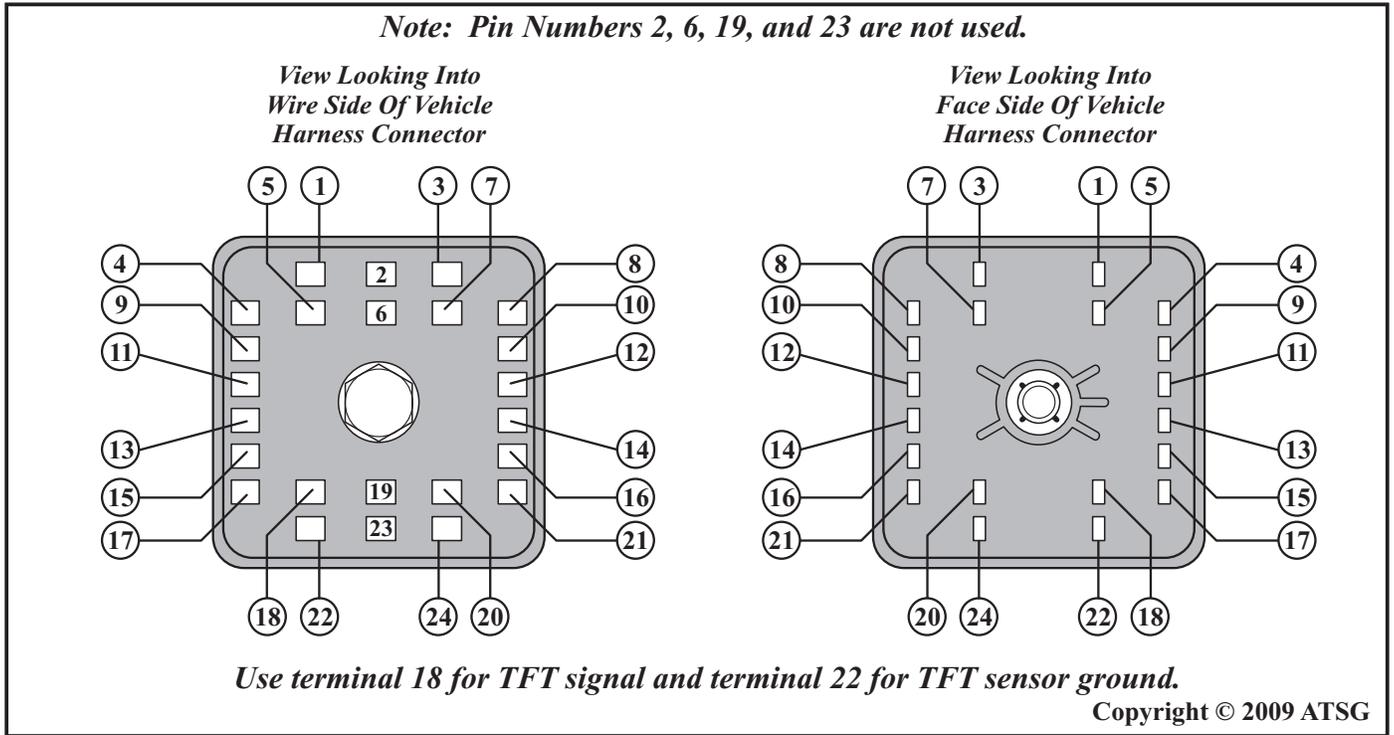


Figure 5

Many thanks to Mark Glasser of X-PERT Transmissions in Philadelphia Pa.