FORD 5R110W-TORQSHIFT TRANSMISSION
SETTING DIAGNOSTIC TROUBLE CODE P0657
LOSS OF ACTUATOR SUPPLY VOLTAGE

COMPLAINT: Ford Motor Company vehicles equipped with the 5R110W-Torqshift transmission either before or after overhaul with the complaint of having 5th gear and reverse only, and displaying DTC P0657: ***Loss of Actuator Supply Voltage.***

EXPLANATION: On 5R110W-Torqshift equipped vehicles, when the ignition is switched to the on position, the Powertrain Control Module sends battery voltage to the transmission from the PCM "B" connector, terminal 7 (See Figure 1). This voltage is sent to the transmission solenoids at terminals 7-20, and 24 at the Transmission Harness Connector (See Figure 4). The voltage is used to power the transmission solenoids. Upon sending voltage to the transmission solenoids, the PCM looks for a voltage return from all of the transmission solenoids to check the integrity of the solenoid circuits. If a no voltage return is detected on several, or all transmission solenoids, the PCM will log DTC P0657, and shut off the voltage supply to the transmission, resulting in the transmission having 5th gear and reverse only.

CAUSE: The cause may be:

(1) The PCM connectors are tightly bundled in the engine compartment, and sometimes will cause the Actuator Supply Voltage wire at PCM connector "B," terminal number 7 to be pulled loose from the connector and cause it to lose the proper connection (See Figures 1-2).
(2) Due to high engine compartment temperatures, the wiring harness may become damaged and require replacement.
(3) The internal transmission harness may be damaged .

CORRECTION: Check for key on battery voltage at pins 7-20, and 24 on the Vehicle Harness side of the Transmission Connector side. (See Figure 4) Wire identification is shown in Figure 3. ***Note: Example given is for a 2004 E450 6.0 Diesel*** Check for continuity to the PCM (See Figure 3). Ohm check internal transmission components. Information for ohm checking internal transmission components has been provided in Figure 5. Refer to Figure 6 for a wire schematic from the PCM. Repair or replace as necessary.

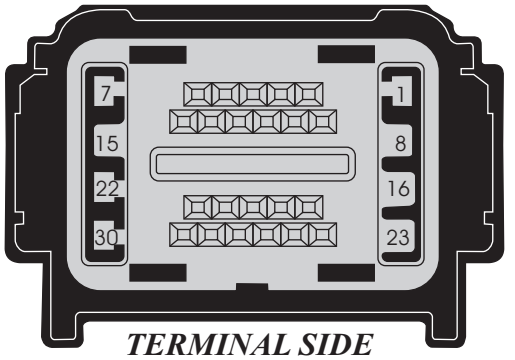
SERVICE INFORMATION:

UPPER WIRING HARNESS (E series only).....4C2Z-7Z078-AA
INTERNAL WIRING HARNESS..... 4C3Z-7G276-AA

Special thanks to Dino at Lee Miles

2004 E450 PCM CONNECTOR "B" PIN IDENTIFICATION AND FUNCTIONS AND PCM LOCATION

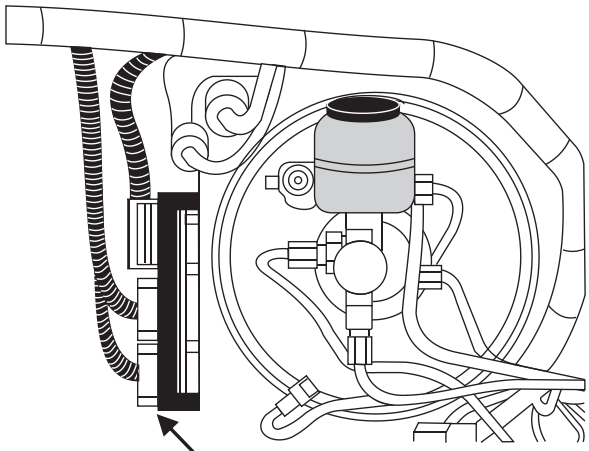
PCM CONNECTOR "B"



TERMINAL SIDE

Figure 1

PCM LOCATION



PCM CONNECTOR "B" LOCATION

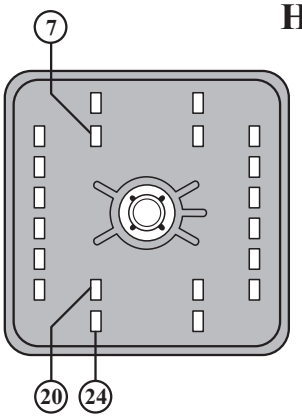
Figure 2

2004 E450 6.0 DIESEL

Pin	Wire Color	Circuit Function	Pin	Wire Color	Circuit Function
1	Green/yellow	12V Reference Voltage, Speed Sensors and TRP	16		"Not Used"
2	Violet/Yellow	PC-A Pressure Control Solenoid Ground	17		"Not Used"
3	DkGrn/Yellow	Reverse Lamp Relay, Control	18		"Not Used"
4		Not Used	19		"Not Used"
5	White/Lt Green	TCIL, Control (Tow/Haul)	20		"Not Used"
6		"Not Used"	21		"Not Used"
7	Red/Yellow	12V Power to Solenoids	22	Tan/Lt Green	Transmission Range Sensor Ground
8		"Not Used"	23		"Not Used"
9	Orange/Yellow	SSPC-A Shift Solenoid Pressure Control A Ground	24		"Not Used"
10	Violet/Orange	SSPC-B Shift Solenoid Pressure Control B Ground	25	Lt Blue/Yellow	TR-P Transmission Range Sensor Signal
11	Pink/Black	SSPC-C Shift Solenoid Pressure Control C Ground	26	Orange/Black	TFT Transmission Fluid Temp Sensor Signal
12	Black/Lt Green	SSPC-D Shift Solenoid Pressure Control D Ground	27	Gray/Orange	ISS Intermediate Shaft Speed Sensor Signal
13	Dk Blue/White	SSPC-E Shift Solenoid Pressure Control E Ground	28	Dk Blue/Yellow	OSS Output Shaft Speed Sensor Signal
14	Brown/Orange	TCC Torque Converter Clutch Solenoid Ground	29	DkGreen/White	TSS Turbine Shaft Speed Sensor Signal
15		"Not Used"	30	Brown/Pink	TFT Sensor Ground

Figure 3

HARNESS CONNECTOR CHECK



View Looking Into Face Side Of Vehicle Harness Connector

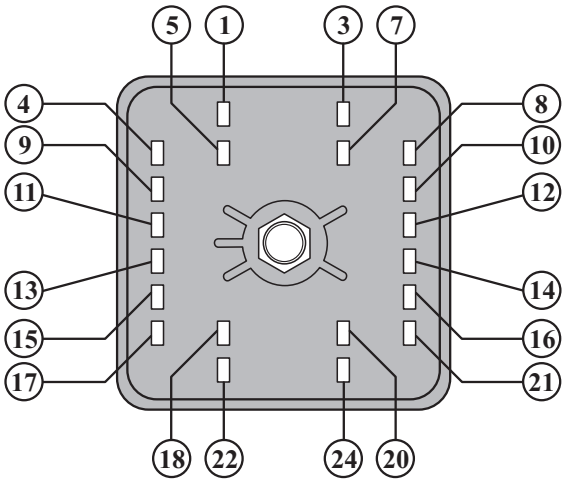
BATTERY VOLTAGE TO TERMINALS 7-20 AND 24 KEY ON

Figure 4

INTERNAL COMPONENT RESISTANCE CHART

INTERNAL COMPONENT	CASE CONNECTOR PIN NUMBERS	OHMS RESISTANCE	** Internal Wire Colors At Component Connector
SSPC-A Soleniod	*12 and 20*	*4.1 to 4.7 @ 72° F*	*Purple and Orange*
SSPC-B Soleniod	*3 and 20*	*4.1 to 4.7 @ 72° F*	*Red and Tan*
SSPC-C Soleniod	*5 and 24*	*4.1 to 4.7 @ 72° F*	*Orange and Purple*
SSPC-D Soleniod	*4 and 24*	*4.1 to 4.7 @ 72° F*	*Tan and Pink*
SSPC-E Soleniod	*1 and 24*	*4.1 to 4.7 @ 72° F*	*Tan and Purple*
PC-A Solenoid (Late)	*7 and 10*	*5.1 to 5.8 @ 72° F*	*Gray and Purple*
TCC Solenoid	*7 and 8*	*4.1 to 4.7 @ 72° F*	

*** Wire colors may vary.**

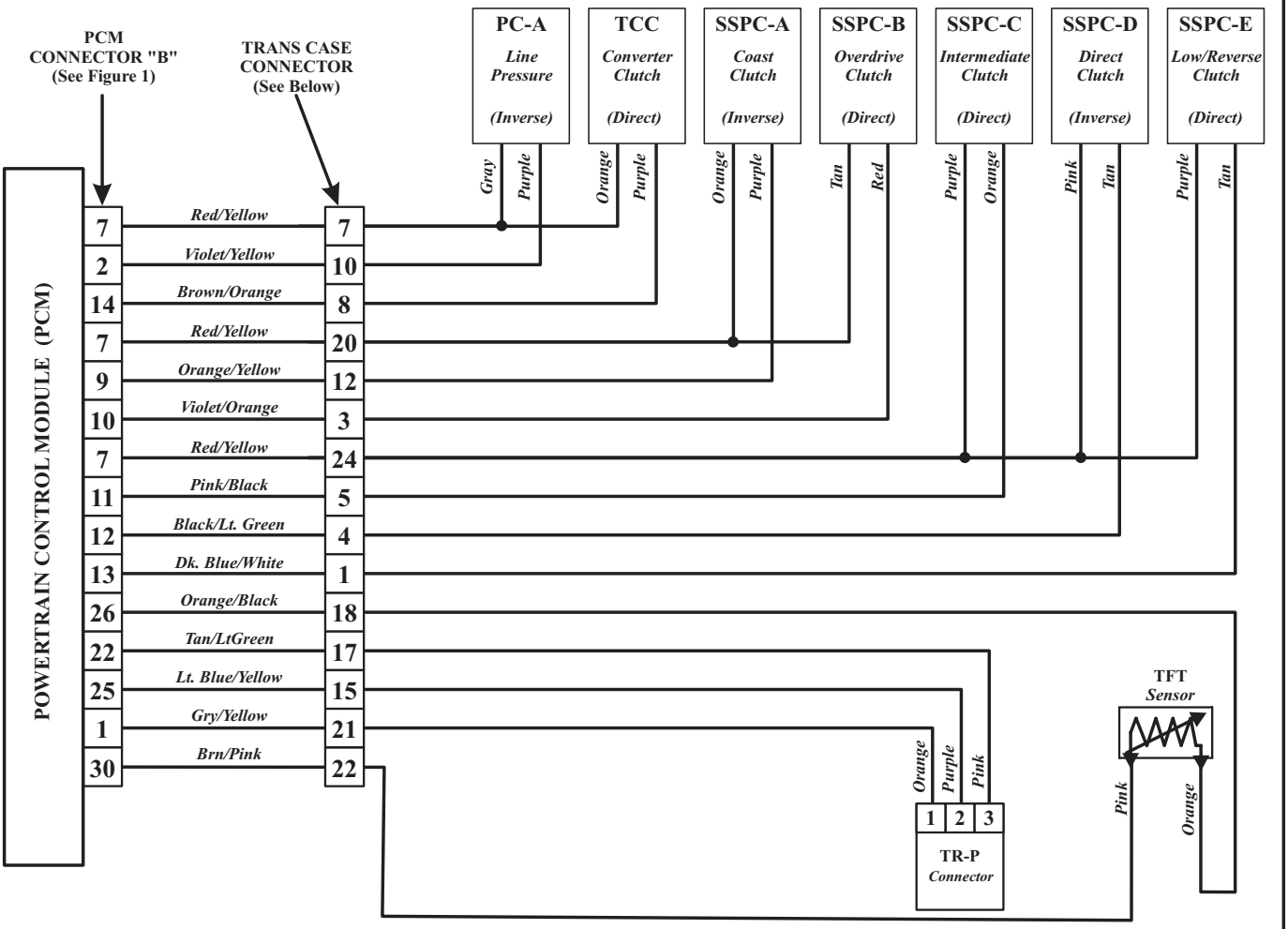


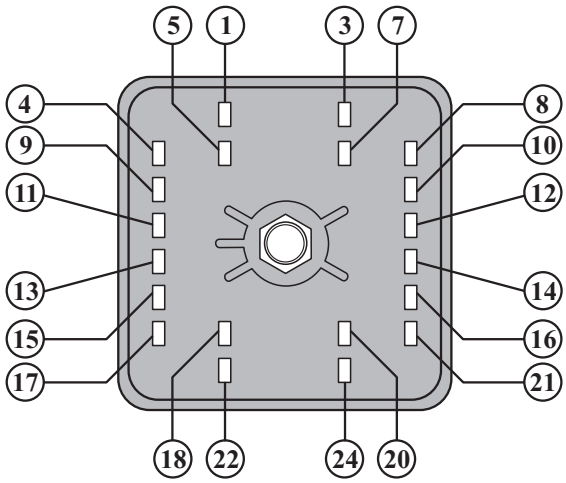
View Looking Into Transmission Case Connector

Transmission Fluid Temperature (TOT)		
Degrees C	*Degrees F*	*Resistance (Ohms)*
-40 to -20	*-40 to -4*	*967k to 284k*
-19 to -2	*-3 to 31*	*284k to 100k*
0 to 20	*32 to 68*	*100k to 37k*
21 to 40	*69 to 104*	*37k to 16k*
41 to 70	*105 to 158*	*16k to 5k*
71 to 90	*159 to 194*	*5k to 2.7k*
91 to110	*195 to 230*	*2.7k to 1.5k*
111 to130	*231 to 266*	*1.5k to 0.8k*
131 to150	*267 to 302*	*0.8k to 0.54k*

Figure 5

5R110W INTERNAL WIRE SCHEMATIC





View Looking Into Transmission Case Connector

Figure 6