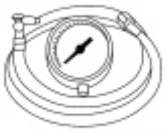
Pinpoint Tests — OSC Equipped Vehicle

Special Tool(s)

 ST1137-A	73 III Automotive Meter 105-R0057 or equivalent
 ST1633-A	Alignment Gauge, TR Sensor 307-351 (T97L-70010-A)
 ST1565-A	Transmission Fluid Pressure Gauge 307-004 (T57L-77820-A)
 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Shift Solenoid Pre-Diagnosis

Any time an electrical connector or solenoid body is disconnected, inspect the connector for terminal condition, corrosion and contamination. Also inspect the connector seal for damage. Clean, repair or install new as necessary.

Use the following shift solenoid operation information when carrying out Pinpoint Test A.

Solenoid Operation Chart

Gearshift Selector Position	PCM Comm- anded Gear	5R55S Solenoid States						
		SSA	SSB	SSC	SSD	PCA	PCB	PCC
P/N	P/N	ON	OFF	OFF	ON	L	H/L	L
R	R	ON	OFF	OFF	ON	L/H	L	H
D	1	ON	OFF	OFF	ON	H	H/L	L
	2	ON	OFF	ON	ON	L/H	H	L
	3	ON	ON	OFF	ON	H	L/H	L
	4	OFF	OFF	OFF	ON	H	H/L	H
	5	OFF	OFF	ON	ON	H	H	H

(D) Cancelled	1	ON	OFF	OFF	ON	H	H/L	L
	2	ON	OFF	ON	ON	L/H	H	L
	3	ON	ON	OFF	ON	H	L/H	L
	4	OFF	OFF	OFF	OFF	L/H	H	H
Manual 3	3	ON	ON	OFF	OFF	H	L	H/L
Manual 2	2	ON	OFF	ON	OFF	H	L	H/L
Manual 1	1	ON	OFF	OFF	OFF	H	L	H/L

H = HIGH

L = LOW

H/L = PCM controlled

Manual = if equipped

Shift Solenoid Failure Mode Chart

Failed ON or OFF due to PCM and/or vehicle wiring concerns, solenoid electrically, mechanically or hydraulically stuck ON or OFF.

Solenoid Failure Mode Chart A

	Actual Gear							
	SSA		**SSB**		**SSC**		**SSD**	
Gear	**ON**	**OFF**	**ON**	**OFF**	**ON**	**OFF**	**ON**	**OFF**
D Position								
1	1	1	3	1	2	1	1	1/M1
2	2	2	2	2	2	1	2	M2
3	3	3	3	1	3	3	3	3/M3
4	1	4	4	4	4/5	4	4	4/M4
5	2	5	5	5	5	4	5	5
D Position — (D) Cancelled								
1M	M1	M1	M3	M1	M2	M1	1	M1
2M	M2	M2	1.1	M2	M2	M1	2	M2
3M	M3	M3	M3	M1	1.1	M3	3	M3
4M	M1	M4	M4	M4	5	M4	4	M4
R	R	R	N	R	R	R	R	R

Slip = Slip due to low line pressure

1.1 = Actual ratio with Forward Clutch, Intermediate and Overdrive (O/D) Band applied.

Solenoid Failure Mode Chart B

	Actual Gear		

	PC A		PC B		PC C	
Gear	**L**	**H**	**L**	**H**	**L**	**H**
D Position						
1/S	1	1	1	1	1	1
2	2	2	1	2	2	2
3	1/S	3	3	3	3	3
4	4	4	4	4	1	4
5	5	5	4	5	2	5
D Position — (D) Cancelled						
1M	1	M1	1	M1	1M	M1
2M	M2	M2	1	M2	2M	M2
3M	1	M3	3	M3	3M	M3
4M	M4	M4	4	M4	1	M4
R	R/S	R	R/S	R	R	R

H = High

L = Low

Slip = Slip due to low line pressure

1.1 = Actual ratio with Forward Clutch, Intermediate and Overdrive (O/D) Band applied.

Pinpoint Tests

Refer to Wiring Diagrams Cell 29 for schematic and connector information.

PINPOINT TEST A: SHIFT AND TORQUE CONVERTER CLUTCH (TCC) SOLENOIDS

NOTE: Refer to the Transmission Vehicle Harness illustration Transmission Connector Layouts in this section.

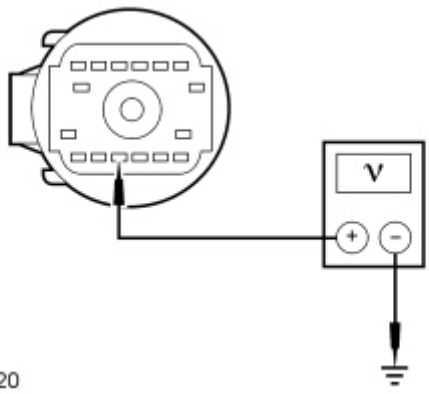
NOTE: Refer to the Transmission Internal Harness illustration Transmission Connector Layouts in this section.

NOTE: Read and record all DTCs. All Transmission Range (TR) sensor and Vehicle Speed Sensor (VSS) DTCs must be repaired before entering output state control.

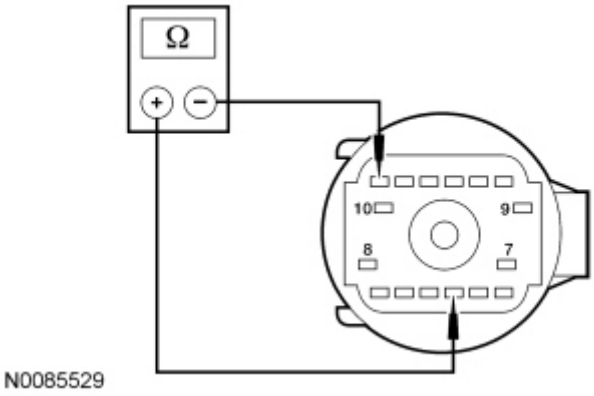
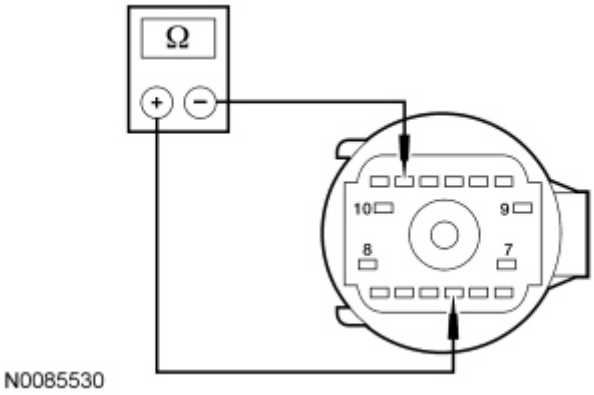
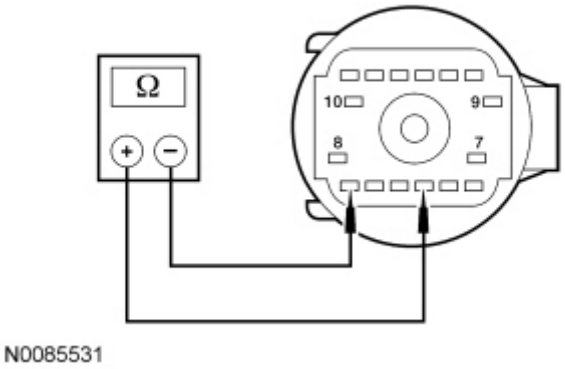
Test Step	Result / Action to Take
A1 ELECTRONIC DIAGNOSTICS • Select PARK. • Ignition OFF. • Check to make sure the transmission harness C175T is fully seated, terminals are fully engaged in the connector and are in good condition before proceeding. • Connect the scan tool. • Ignition ON. • Access the transmission PIDs. • **Is the scan tool able to access the transmission PIDs?**	**Yes** GO to A2. **No** REPEAT procedure to access the transmission PIDs. If the scan tool did not access the transmission PIDs, REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual for diagnosis of PCM.

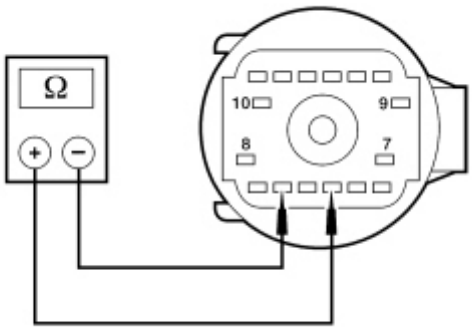
A2 SOLENOID FUNCTIONAL CHECK	

• Select PIDs to be monitored.
  ▪ Shift Solenoid A (SSA)
  ▪ Shift Solenoid B (SSB)
  ▪ Shift Solenoid C (SSC)
  ▪ Shift Solenoid D (SSD)
  ▪ Torque Converter Clutch (TCC)
• Select ON to turn suspect solenoid(s) ON.
• Select OFF to turn solenoid(s) OFF.
• Repeat steps for each solenoid.
• **Does the suspect solenoid turn ON and OFF when commanded?**
	Yes
	GO to A3 .
	
	No
	GO to A4 .

A3 OSC TRANS-DRIVE MODE (GEAR OR TCC)	
• Select GEAR for shift solenoids. • Select TCC for torque converter clutch solenoid. • **Does the transmission upshift and downshift or torque converter engage/disengage when commanded?**	**Yes** CLEAR the DTCs. ROAD TEST to verify if concern is still present. If concern is still present, REFER to Diagnosis By Symptom in this section to diagnose shift or torque converter concern. **No** GO to A4 .
A4 CHECK CIRCUIT 1862 (VT/WH) FOR BATTERY VOLTAGE	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C199. • Visually inspect all wires and connectors for damage. • Ignition ON. • Measure the voltage from the vehicle harness C199-3, circuit 1862 (VT/WH), harness side to ground.  N0052520 • **Is the voltage greater than 10 volts?**	**Yes** GO to A5 . **No** REPAIR circuit 1862 (VT/WH). CLEAR the DTCs. TEST the system for normal operation.
A5 ELECTRICAL SIGNAL CHECK	
• Measure the voltage between the vehicle harness C199-3, circuit 1862 (VT/WH) and vehicle harness C199 signal pin, vehicle harness side. • Access the transmission PIDs and measure the voltage while cycling the solenoids ON and OFF using the following chart.	**Yes** GO to A6 . **No** REPAIR the faulty circuit. CLEAR the DTCs. TEST the system for normal operation.

Connector Pin	Circuit	Connector Signal Pin
C199-3	Circuit 237 (OG/YE)	C199-16
C199-3	Circuit 315 (VT/OG)	C199-15
C199-3	Circuit 971 (PK/BK)	C199-6
C199-3	Circuit 236 (BK/LG)	C199-5
C199-3	Circuit 126 (VT/YE)	C199-14

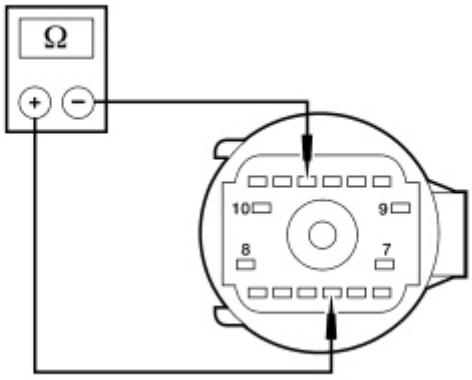
• **Does the voltage change?**	
A6 CHECK THE TRANSMISSION INTERNAL HARNESS/COMPONENT FOR AN OPEN • For SSA , measure the resistance between C199-3 and C199-16, component side.  N0085529 • For SSB , measure the resistance between C199-3 and C199-15, component side.  N0085530 • For SSC , measure the resistance between C199-3 and C199-6, component side.  N0085531 • For SSD , measure the resistance between C199-3 and C199-5, component side.	**Yes** GO to A7 . **No** INSPECT the transmission internal harness for an open. If no open is found, REPLACE the faulty component. CLEAR the DTCs. TEST the system for normal operation.



N0085532

- For TCC , measure the resistance between C199-3 and C199-14, component side.

Component	Resistance
SSA	16-45 ohms
SSB	16-45 ohms
SSC	16-45 ohms
SSD	16-45 ohms
TCC	9-16 ohms



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- **Is the resistance within specification?**

A7 CHECK THE INTERNAL HARNESS FOR A SHORT TO GROUND

- Measure the resistance between the transmission internal harness C199 component side and ground using the following chart.

Transmission Connector	Component	Ground
C199-3	Power feed	Ground
C199-16	SSA	Ground
C199-15	SSB	Ground
C199-6	SSC	Ground
C199-5	SSD	Ground
C199-14	TCC	Ground

- **Is the resistance less than 5 ohms?**

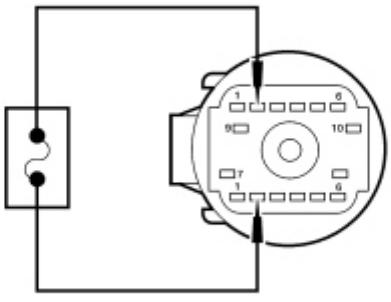
Yes
INSTALL a new transmission internal harness. CLEAR the DTCs. TEST the system for normal operation.

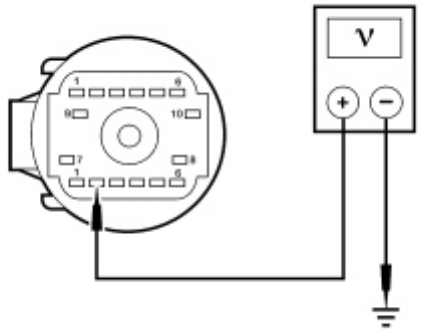
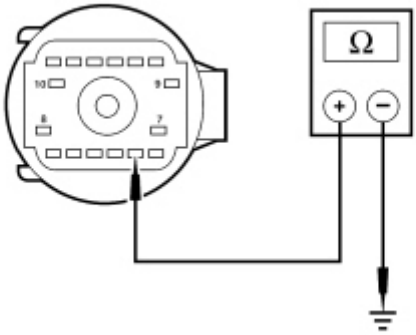
No
REFER to Diagnosis By Symptom in this section for diagnosis of shift or torque converter concerns.

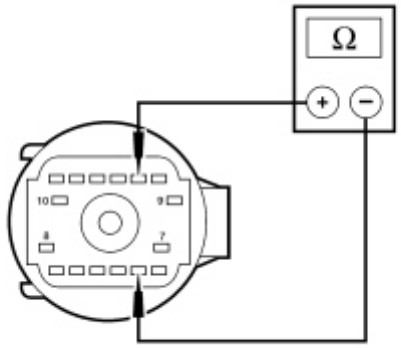
PINPOINT TEST B: TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR

NOTE: Refer to the Transmission Vehicle Harness illustration Transmission Connector Layouts in this section.

NOTE: Refer to the Transmission Internal Harness illustration Transmission Connector Layouts in this section.

Test Step	Result / Action to Take
B1 ELECTRONIC DIAGNOSTICS	
• Select PARK. • Ignition OFF. • Check to make sure the transmission vehicle harness C199 is fully seated, terminals are fully engaged in the connector and are in good condition before proceeding. • Connect the scan tool. • Ignition ON. • Access the transmission PIDs. • **Is the scan tool able to access the transmission PIDs?**	**Yes** GO to B2. **No** REPEAT procedure to access the transmission PIDs. If the scan tool did not access the transmission PIDs, REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual for diagnosis of PCM.
B2 ELECTRICAL SIGNAL CHECK	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C199. • Ignition ON. • Access the TFT PID. • **Does the scan tool display 145°C-151°C (293°F-302°F)?**	**Yes** GO to B3. **No** REPAIR the transmission vehicle harness circuit 923 (OG/BK) for a short to ground. CLEAR the DTCs. TEST the system for normal operation.
B3 CHECK THE VEHICLE HARNESS SIGNAL CIRCUIT	
• Connect a fused jumper between C199-12, circuit 359 (GY/RD), harness side and C199-2, circuit 923 (OG/BK), harness side.  N0085912 • **Does the scan tool display -40°C (-40°F)?**	**Yes** GO to B5. **No** GO to B4.
B4 CHECK THE TFT INPUT CIRCUIT	
• Measure the voltage between C199-2, circuit 923 (OG/BK), harness side and ground.	**Yes** GO to B5. **No** INSPECT the transmission vehicle harness circuit 923 (OG/BK) for an open. If an open circuit is not found, REPLACE the PCM. REFER to Section 303-14. TEST the system for normal

 N0085913 • **Is the voltage between 4.8 and 5.1 volts?**	operation.
B5 CHECK THE RESISTANCE OF THE TRANSMISSION INTERNAL HARNESS	
• Measure the resistance between the transmission internal harness C199-2, component side and ground.  N0085914 • **Is the resistance greater than 10,000 ohms?**	**Yes** GO to B6 . **No** REPLACE the transmission internal harness. CLEAR the DTCs. TEST the system for normal operation.
B6 CHECK RESISTANCE OF THE TRANSMISSION INTERNAL HARNESS/TFT SENSOR	
• Measure the resistance between the transmission internal harness C199-2, and C199-12, component side using the following chart. **TRANSMISSION FLUID TEMPERATURE (TFT)** **℃ / ℉ / Resistance (Ohms)** -40 to -20 / -40 to -4 / 967K-284K -19 to -1 / -3 to 31 / 284K-100K 0-20 / 32-68 / 100K-37K 21-40 / 69-104 / 37K-16K 41-70 / 105-158 / 16K-5K 71-90 / 159-194 / 5K-2.7K 91-110 / 195-230 / 2.7K-1.5K 111-130 / 231-266 / 1.5K-0.8K 131-150 / 267-302 / 0.8K-0.54K	**Yes** REFER to Diagnosis By Symptom in this section to diagnose an overheating concern. **No** REPLACE the TFT sensor. CLEAR the DTCs. TEST the system for normal operation.

 N0085915 • **Is the resistance value correct?**	

PINPOINT TEST C: TRANSMISSION RANGE (TR) SENSOR

NOTE: Refer to the Transmission Range (TR) Sensor illustration in Transmission Connector Layouts in this section.

NOTE: Refer to the TR Sensor Diagnosis Chart Transmission Connector Layouts in this section.

Test Step	Result / Action to Take
C1 VERIFY DTCs	
• Select PARK. • Ignition OFF. • Check to make sure the transmission vehicle harness C199 is fully seated, terminals are fully engaged in the connector and are in good condition before proceeding. • Connect the scan tool. • Ignition ON. • **NOTE:** DTCs P0705 and P0708 cannot be set by an incorrectly adjusted TR sensor. • Retrieve DTCs. • **Are only DTCs P0705, P0708 present?**	**Yes** GO to C4. **No** GO to C2.
C2 VERIFY TR SENSOR ALIGNMENT	
• Select PARK. • Ignition OFF. • Check to make sure the TR sensor C167 is fully seated, terminals are fully engaged in the connector and are in good condition before proceeding. • Apply the parking brake. • Select NEUTRAL. • Disconnect the selector lever cable from the manual control lever. • Verify that the TR Sensor Alignment Gauge fits in the appropriate slots. • **Is the TR sensor correctly adjusted?**	**Yes** GO to C3. **No** ADJUST the TR sensor. REFER to Transmission Range (TR) Sensor Adjustment in this section. PLACE selector lever in PARK. CLEAR the DTCs. TEST the system for normal operation. GO to C3.
C3 VERIFY SELECTOR LEVER CABLE ADJUSTMENT	
• Place the transmission manual lever in the (D) position. • Re-connect the selector lever cable. • Verify that the selector lever cable is adjusted OK. Refer to Section 307-05. • **Is the selector lever cable adjusted OK?**	**Yes** GO to C4. **No** ADJUST the selector lever cable. REFER to Section 307-05.
C4 CHECK ELECTRICAL SIGNAL OPERATION	
• Select PARK.	**Yes** REPAIR as necessary.

- Disconnect: TR Sensor C167.
- ***NOTICE:*** **Do not pry on connector. This will damage the connector and result in a transmission concern.**
- Inspect both ends of C167 for damage or pushed-out terminals, corrosion, loose wires and missing or damaged seals.
- **Is there damage to the connector, terminals or harness?**

CLEAR the DTCs. TEST the system for normal operation.

No
If diagnosing a DTC, GO to C5 .

If diagnosing a starting concern, GO to C10 .

C5 CHECK ELECTRICAL SYSTEM OPERATION (TR AND PCM)

- Connect the scan tool.
- Ignition ON.
- Access the transmission PIDs.
- Move transmission selector lever into each gear position and stop.
- Observe the following PIDs, TR , TR 1, TR 2, TR 3, TR 3_V and TR 4 while wiggling harness, tapping on sensor or driving the vehicle.
- Compare the PIDs to the TR Sensor Diagnosis Chart.
- **Do the PIDs TR , TR 1, TR 2, TR 3, TR 3_V and TR 4 match the TR Sensor Diagnosis chart, and do the PIDs remain steady when the harness is wiggled, the sensor is tapped on or the vehicle driven?**

Yes
The problem is not in the TR sensor system. REFER to Diagnosis By Symptom in this section for further diagnosis.

No
If the PIDs change when wiggling harness, tapping on the sensor or driving the vehicle, the problem may be intermittent. GO to C6 .

C6 CHECK TR SENSOR OPERATION

- Ignition OFF.
- Disconnect: TR Sensor C167.
- ***NOTICE:*** **Do not pry on connector. This will damage the connector and result in a transmission concern.**
- Using the TR Sensor Diagnosis Chart, measure the resistance of the TR sensor with the selector lever in each range position using the following chart. Compare the measurements to the TR Sensor Diagnosis Chart.

TR Sensor

Pin Number	Range Position	Pin Number
2	TR 3	3
2	TR 1	4
2	TR 2	5
2	TR 4	6

- **Do the measurements match the TR Sensor Diagnosis Chart?**

Yes
Concern is not in the TR sensor, GO to C7 .

No
INSTALL a new TR sensor. CLEAR the DTCs. TEST the system for normal operation.

C7 CHECK TRANSMISSION VEHICLE HARNESS CIRCUITS FOR OPENS

- Disconnect: PCM C175T.
- ***NOTICE:*** **Do not pry the connector. This will damage the connector and result in a transmission concern.**
-
- Measure the resistance between TR C167 and PCM C175T, harness side using the following chart.

TR Connector	Circuit	PCM
C167-3	1268 (RD/BK)	C175T-27
C167-4	1144 (YE/BK)	C175T-16
C167-5	1145 (LB/BK)	C175T-17
C167-6	1143 (WH/BK)	C175T-28

- **Are the resistances less than 5 ohms?**

Yes
GO to C8 .

No
REPAIR the vehicle transmission harness circuit which is open. CLEAR the DTCs. TEST the system for normal operation

C8 CHECK TRANSMISSION VEHICLE HARNESS CIRCUITS FOR

SHORT TO GROUND

- Measure the resistance between the TR C167, harness side and ground using the following chart.

TR Connector	Circuit	Ground
C167-3	1268 (RD/BK)	Ground
C167-4	1144 (YE/BK)	Ground
C167-5	1145 (LB/BK)	Ground
C167-6	1143 (WH/BK)	Ground

- **Are the resistances greater than 10,000 ohms?**

Yes
GO to C9.

No
REPAIR the vehicle transmission harness circuit shorted to ground. CLEAR the DTCs. TEST the system for normal operation.

C9 CHECK FOR SHORT BETWEEN TR AND PCM INPUT SIGNAL CIRCUITS

- Measure the resistance between the TR sensor C167 pins, harness side using the following chart.

TR Sensor Pin	Circuit	TR Sensor Pins
2	359 (GY/RD)	3, 4, 5, 6
3	1268 (RD/BK)	4, 5, 6
4	1144 (YE/BK)	5, 6
5	1145 (LB/BK)	6

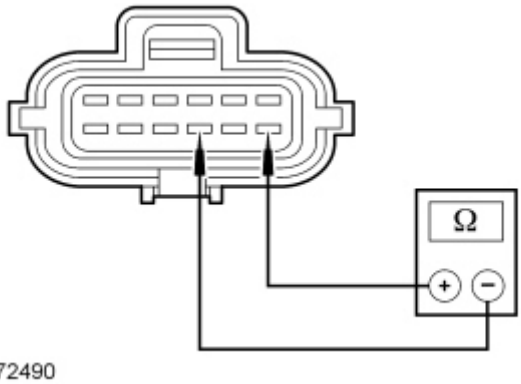
- **Are the resistances greater than 10,000 ohms?**

Yes
REPLACE the PCM. REFER to Section 303-14. RECONNECT all components. CLEAR the DTCs. TEST the system for normal operation.

No
REPAIR circuits having less than 10,000 ohms between other TR /PCM input signal circuits that are shorted together. RECONNECT all components. CLEAR the DTCs. TEST the system for normal operation.

C10 CHECK TR SENSOR OPERATION

- Disconnect: TR Sensor C167.
- ***NOTICE:*** **Do not pry on connector. This will damage the connector and result in a transmission concern.**
- Measure the resistance between TR sensor C167-10 and C167-12, component side, with the selector lever in PARK and then NEUTRAL.



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- **Are all the resistances less than 5 ohms?**

Yes
Concern is not in the TR sensor. REFER to Section 303-06.

No
INSTALL a new TR sensor. CLEAR the DTCs. TEST the system for normal operation.

PINPOINT TEST D: PRESSURE CONTROL SOLENOIDS

NOTE: Refer to the Transmission Vehicle Harness illustration Transmission Connector Layouts in this section.

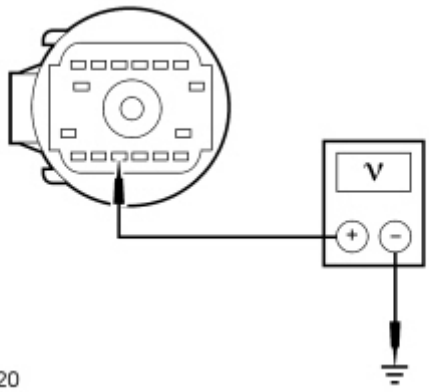
NOTE: Refer to the Transmission Internal Harness illustration Transmission Connector Layouts in this section.

NOTE: Read and record all DTCs. All Transmission Range (TR) sensor and Vehicle Speed Sensor (VSS) DTCs must be repaired before entering output state control.

<table>
<tr><th>Test Step</th><th>Result / Action to Take</th></tr>
<tr><td>D1 ELECTRONIC DIAGNOSTICS</td><td rowspan="2">Yes
GO to D2 .

No
REPEAT procedure to access the transmission PIDs. If the scan tool did not access the transmission PIDs, REFER to Powertrain Control/Emissions Diagnosis (PC/ED) manual for diagnosis of PCM.</td></tr>
<tr><td>• Select PARK.
• Ignition OFF.
• Check to make sure the transmission harness C199 is fully seated, the terminals are fully engaged in the connector and are in good condition before proceeding.
• Install pressure gauges into the Line and Pressure Control Solenoid C (PCC) tap.
• Connect the scan tool.
• Ignition ON.
• Access the transmission PIDs.
• Is the scan tool able to access the transmission PIDs?</td></tr>
<tr><td>D2 SOLENOID FUNCTIONAL TEST</td><td rowspan="2">Yes
REFER to Diagnosis By Symptom in this section for diagnosis of pressure concerns. TEST the system for normal operation.

No
GO to D3 .</td></tr>
<tr><td>• Monitor the pressure gauges.
• NOTE: Make sure that the solenoids not being tested are off or at zero.
• With the engine running, command the Pressure Control Solenoid A (PCA), Pressure Control Solenoid B (PCB) and PCC solenoids to change the pressure.
• For PCA and PCB : Does the pressure reading for PCA or PCB follow the commanded pressure (actual PCA and PCB pressures will be higher than the commanded pressure)? For PCC : Does the pressure reading match the commanded pressure?</td></tr>
<tr><td>D3 CHECK FOR BATTERY VOLTAGE</td><td rowspan="2">Yes
GO to D4 .

No
REPAIR circuit 1862 (VT/WH). CLEAR the DTCs. TEST the system for normal operation.</td></tr>
<tr><td>• Ignition OFF.
• Disconnect: Transmission Vehicle Harness C199.
• Ignition ON.
• Measure the voltage between C199-3, circuit 1862 (VT/WH), harness side and ground.
 
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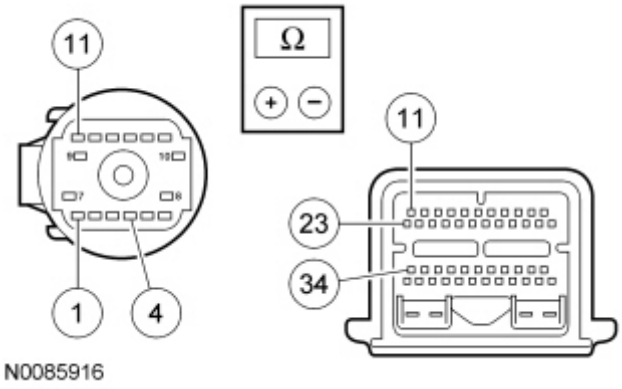
• Is the voltage greater than 10 volts?</td></tr>
<tr><td>D4 ELECTRICAL SIGNAL CHECK</td><td rowspan="2">Yes
GO to D5 .

No
CHECK the transmission vehicle harness circuit which has high resistance for an open. CLEAR the DTCs. TEST the system for normal operation.</td></tr>
<tr><td>• Ignition OFF.
• Disconnect: PCM C175T.
• Measure the resistance between PCM C175T, harness side and transmission vehicle harness C199, harness side using the following chart.
<table><tr><th>PCM Connector</th><th>Circuit</th><th>Transmission Connector</th></tr><tr><td>C175T-11</td><td>925 (WH/YE)</td><td>C199-11</td></tr></table></td></tr>
</table>

C175T-23	966 (LB/PK)	C199-1
C175T-34	923 OG/BK)	C199-4



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- **Is the resistance less than 5 ohms?**

D5 CHECK SOLENOID RESISTANCE AT SOLENOID

- Measure the resistance between the transmission vehicle harness C199, component side power and C199, component side control using the following chart.

Transmission Connector	Component	Transmission Connector
C199-3	PCA	C199-11
C199-3	PCB	C199-1
C199-3	PCC	C199-4

- **Is the resistance within 3.3 ohms and 7.5 ohms?**

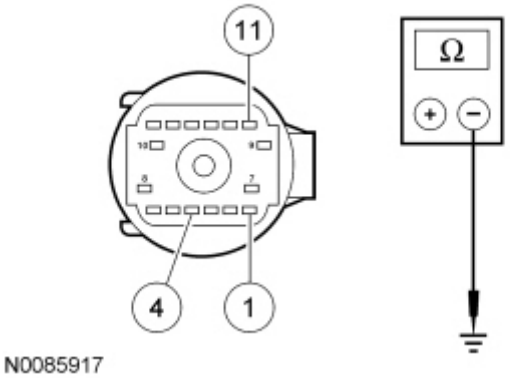
Yes
GO to D6 .

No
REPLACE the transmission internal harness for an open. If no open is found, REPLACE the appropriate solenoid. CLEAR the DTCs. TEST the system for normal operation.

D6 CHECK TRANSMISSION INTERNAL HARNESS/SOLENOID FOR SHORT TO GROUND

- Measure the resistance between the transmission vehicle harness C199, component side and ground using the following chart.

Transmission Connector	Component	Ground
C199-11	PCA	Ground
C199-1	PCB	Ground
C199-4	PCC	Ground



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Yes
REPLACE the transmission internal harness for a short to ground. If no short to ground is found, REPLACE the appropriate solenoid. CLEAR the DTCs. TEST the system for normal operation.

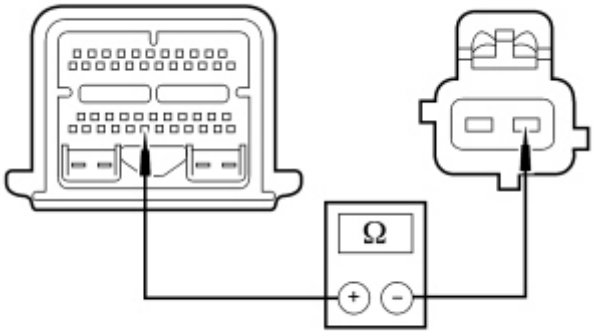
No
REPLACE the PCM. REFER to Section 303-14 . TEST the system for normal operation.

• **Is the resistance less than 10,000 ohms?**	

PINPOINT TEST E: TURBINE SHAFT SPEED (TSS), INTERMEDIATE SHAFT SPEED AND OUTPUT SHAFT SPEED (OSS) SENSORS

NOTE: Refer to the Turbine Shaft Speed (TSS), Intermediate Shaft Speed and Output Shaft Speed (OSS) Sensor illustrations Transmission Connector Layouts in this section.

Test Step	Result / Action to Take
E1 ELECTRONIC DIAGNOSTICS	
• Select PARK. • Ignition OFF. • Check to make sure the transmission vehicle harness C199, TSS C143, intermediate shaft speed sensor C164 and OSS C193 are fully seated, the terminals are fully engaged in connector and are in good condition before proceeding. • Connect the scan tool. • Ignition ON. • Access the transmission PIDs. • **Is the scan tool able to access the transmission PIDs?**	**Yes** GO to E2. **No** REPEAT procedure to access the transmission PIDs. If the scan tool did not access the transmission PIDs, REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual for diagnosis of PCM.
E2 DRIVE CYCLE TEST	
• While monitoring the appropriate sensor PID, drive the vehicle so that the transmission upshifts and downshifts through all gears. • **Does the TSS, intermediate shaft speed or OSS PID rpm increase and decrease with engine and vehicle speed?**	**Yes** GO to E3. **No** If the TSS, intermediate shaft speed or OSS PID rpm does not increase and decrease with engine and vehicle speed, GO to E4.
E3 DRIVE CYCLE TEST ERRATIC	
• While monitoring the appropriate sensor PID, drive the vehicle so that the transmission upshifts and downshifts through all gears. • **Is the TSS, intermediate shaft speed or OSS PID rpm signal erratic (drop to zero or near zero and return to normal operation)?**	**Yes** If the sensor signal is erratic, INSPECT for intermittent concern in the harness, sensor or connector. GO to E4. **No** CLEAR the DTCs. TEST the system for normal operation.
E4 CHECK TRANSMISSION VEHICLE HARNESS CIRCUITS FOR OPENS	
• Ignition OFF. • Disconnect: PCM C175T. • Inspect for damaged or pushed-out pins, corrosion or loose wires. • Lower the rear of the transmission to gain access to the sensors. • Disconnect: TSS Sensor C143. • Disconnect: Intermediate Shaft Speed Sensor C164. • Disconnect: OSS Sensor C193. • For OSS, measure the resistance between PCM C175T-41, circuit 359 (GY/RD), harness side and the OSS sensor C193-2, circuit 359 (GY/RD), harness side.	**Yes** GO to E5. **No** REPAIR circuits having more than 5 ohms. CLEAR the DTCs. TEST the system for normal operation.



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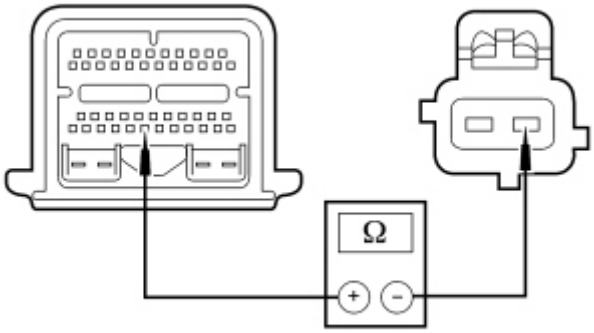
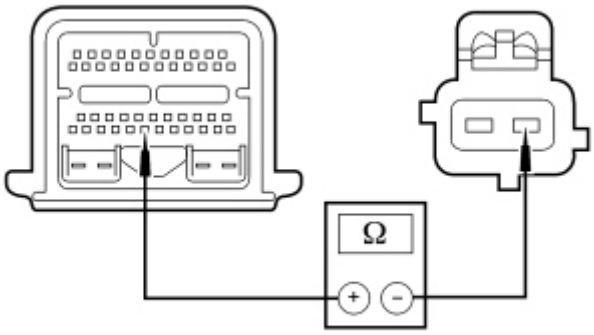
- For intermediate shaft speed, measure the resistance between PCM C175T-41, circuit 359 (GY/RD), harness side and the intermediate shaft speed sensor C164-2, circuit 359 (GY/RD), harness side.



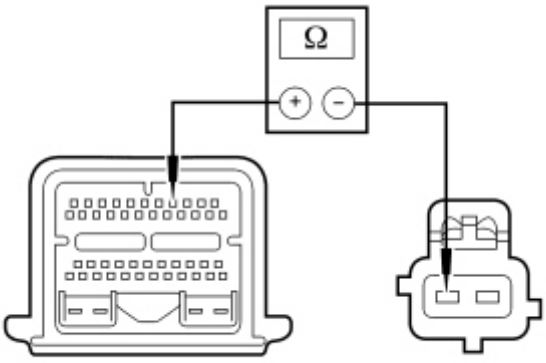
N0052544

- For TSS , measure the resistance between PCM C175T-41, circuit 359 (GY/RD), harness side and the TSS sensor C143-2, circuit 359 (GY/RD), harness side.



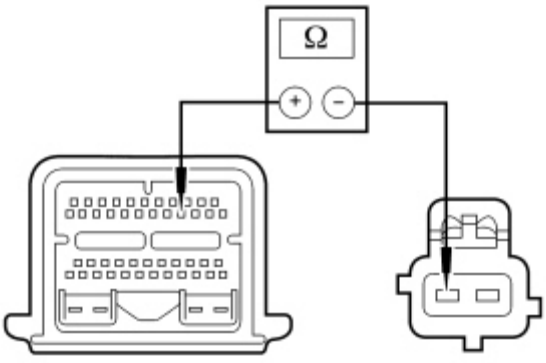
N0052544

- For intermediate shaft speed, measure the resistance between PCM C175T-4, circuit 134 (GY/OG), harness side and the intermediate shaft speed sensor C164-1, circuit 134 (GY/OG), harness side.



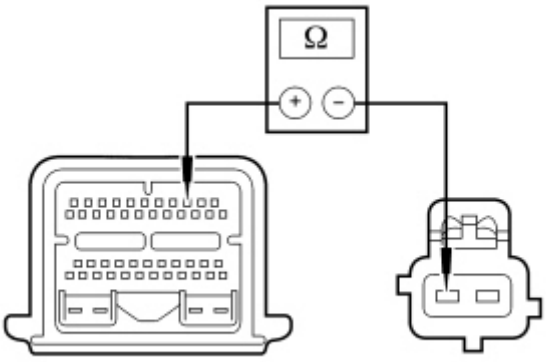
N0052545

- For TSS , measure the resistance between PCM C175T-15, circuit 970 (DG/WH), harness side and the TSS sensor C143-1, circuit 970 (DS/WH), harness side.



N0052546

- For OSS , measure the resistance between PCM C175T-3, circuit 136 (DB/YE), harness side and the OSS sensor C193-1, circuit 136 (DB/YE), harness side.



N0052547

- **Are all resistances less than 5 ohms?**

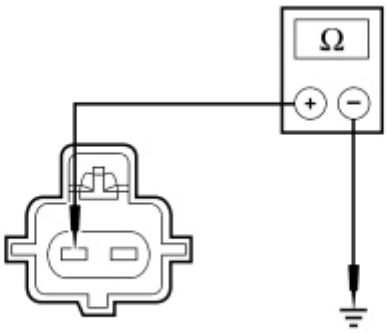
E5 CHECK TRANSMISSION VEHICLE HARNESS CIRCUITS FOR SHORT TO GROUND

- For the TSS , intermediate shaft speed and OSS measure the resistance between the component connector harness side and ground using the following chart.

Connector Number	Circuit Number	Ground
C143-1	970 (DG/WH)	Ground
C164-1	134 (GY/OG)	Ground
C193-1	136 (DB/YE)	Ground

Yes
GO to E6 .

No
REPAIR circuits having less than 10,000 ohms. CLEAR the DTCs. TEST the system for normal operation.



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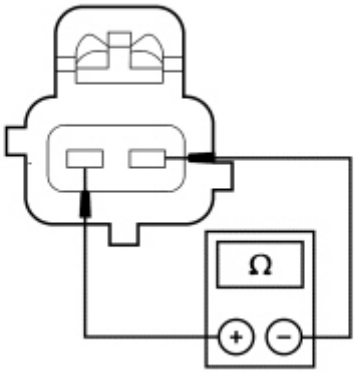
- **Are the resistances greater than 10,000 ohms?**

E6 CHECK RESISTANCE OF TSS , INTERMEDIATE SHAFT SPEED OR OSS SENSOR

- Measure the resistance between terminal 1 and terminal 2 of the speed sensor using the following chart.

Resistance (ohms)	Temperature
266-390	-20℃ (4℉)
325-485	21℃ (70℉)
492-738	150℃ (302℉)



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- **Is the resistance within specification?**

Yes
GO to E7 .

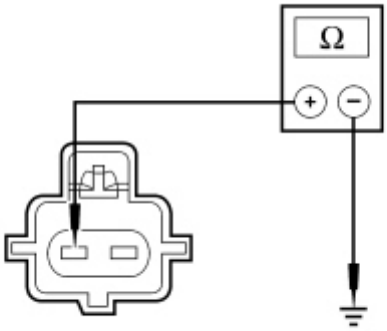
No
INSTALL a new sensor.

E7 CHECK SENSORS FOR SHORT TO GROUND

- Measure the resistance between terminal 1, component side and ground.

Yes
INSTALL a new sensor.

No
REFER to Diagnosis By Symptom in this section for diagnosis of shift or torque converter concerns.

 N0085932 • **Is the resistance less than 10,000 ohms?**	

PINPOINT TEST F: SOLENOID MECHANICAL FAILURE

NOTE: Repair all other DTCs before repairing the following DTCs: P1714, P1715, P1716, P1717 and P1740.

Test Step	Result / Action to Take
F1 ELECTRONIC DIAGNOSIS • Select PARK. • Connect the scan tool. • Ignition ON. • Carry out Key ON Engine OFF (KOEO) test until DTCs are displayed. • If any of the following DTCs are present, P1714, P1715, P1716, P1717 and P1740, continue with this test. • **Are other DTCs present for Transmission Fluid Temperature (TFT) or shift solenoids?**	**Yes** REPAIR the DTCs for TFT or shift solenoids first. CLEAR the DTCs and CARRY OUT transmission Drive Cycle test. RERUN Key ON Engine OFF (KOEO) test. **No** INSTALL a new solenoid and/or body. REFER to the Diagnostic Trouble Code (DTC) Charts in this section for code description. GO to F2.
F2 TRANSMISSION DRIVE CYCLE TEST • Carry out Transmission Drive Cycle Test. Refer to Transmission Drive Cycle Test in this section. • **Does the vehicle upshift and downshift OK?**	**Yes** GO to F3. **No** REFER to Diagnosis By Symptom in this section to diagnose shift concerns.
F3 RETRIEVE DTCs • Connect the scan tool. • Select PARK. • Ignition ON. • Carry out KOEO test until DTCs are displayed. • **Are DTCs P1714, P1715, P1716, P1717 and P1740 still present?**	**Yes** INSTALL a new PCM. ROAD TEST the vehicle. RERUN the Key ON Engine OFF (KOEO) test. **No** Testing completed. If a concern still exists, REFER to Diagnosis By Symptom in this section.