

B Clutch

Symptom Chart

B Clutch

For B clutch operation,
REFER to: [B Clutch](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80,
Description and Operation).

B Clutch

Condition	Possible Sources	Action
B clutch does not apply	SSB is mechanically stuck OFF	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
	B Clutch regulator valve stuck OFF	DISASSEMBLE, CLEAN and INSPECT the regulator valve. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

	PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
B CL CONTR, hydraulic circuit blocked/leaking	DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
B clutch hub	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
B clutch friction plates	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
B clutch piston seals	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

B clutch always applied	SSB mechanically stuck	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
	B Clutch regulator valve or CL B latch valve stuck ON	DISASSEMBLE, CLEAN and INSPECT the regulator valve. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
	B CL CONTR, hydraulic circuit cross leaks	DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

	B clutch hub, clutch and planetary carrier, No. 4 ring gear	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	B clutch friction plates	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	B clutch piston seals	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
B clutch delayed/soft/slipping apply	Incorrect transmission strategy programmed into PCM/ TCM.	PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
	Low line pressure	PERFORM line pressure test. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	SSB mechanically sticking	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

B Clutch regulator valve sticking	DISASSEMBLE, CLEAN and INSPECT the valves. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
B CL CONTR, hydraulic circuits blocked/leaking	DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
B clutch friction plates	DISASSEMBLE and INSPECT the transmission passages for debris/blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
B clutch piston seals	DISASSEMBLE and INSPECT the transmission passages for debris/blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

B clutch harsh apply	Incorrect transmission strategy programmed into PCM/ TCM.	PERFORM the Transmission Strategy Download, REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	High line pressure	PERFORM line pressure test. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	SSB mechanically sticking	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
	B Clutch regulator valve sticking	DISASSEMBLE, CLEAN and INSPECT the valves. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

B CL CONTR hydraulic circuit blocked/leaking	DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
B clutch friction plates	DISASSEMBLE and INSPECT the transmission passages for debris/blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
B clutch piston return springs	DISASSEMBLE and INSPECT the transmission passages for debris/blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

Preliminary Inspection

Overview

The preliminary inspection is part of Automatic Transmission Diagnosis. The preliminary inspection is used to find obvious causes for transmission concern.

Underhood Inspection

To correctly diagnose a concern, first understand the customer concern or condition. Customer contact may be required to understand the conditions, including when the concern occurs. For example:

1. Look for missing or damaged air induction components.
2. Inspect the wire harness for proper routing, especially near the rear of the cylinder heads. Make sure the harness is not chafed or pinched.
3. Inspect transmission fluid cooler for proper mounting and check for any missing air deflectors.

Under Vehicle Inspection

1. Place the selector lever in D.
2. With the vehicle in NEUTRAL, position it on a hoist.
REFER to: [Jacking and Lifting - Overview](#) (100-02 Jacking and Lifting, Description and Operation).
3. Inspect transmission case for evidence of leaks.
4. Inspect transmission fluid cooler lines for proper routing, pinches, or kinks.
5. Inspect transmission fluid cooler mounting and check for any missing air deflectors.

6. Adjust the selector lever cable. (If equipped)

REFER to: [Selector Lever Cable Adjustment - 10-Speed Automatic Transmission - 10R80, Vehicles With: Column Shift](#) (307-05 Automatic Transmission External Controls, General Procedures).

REFER to: [Selector Lever Cable Adjustment - 10-Speed Automatic Transmission - 10R80, Vehicles With: Floor Shift](#) (307-05 Automatic Transmission External Controls, General Procedures).

Transmission Fluid Inspection

Transmission fluid condition can provide many clues to the nature of the transmission concern. Proper transmission fluid level can only be determined with the transmission fluid at a specified temperature range. It is not necessary to verify exact transmission fluid level at this time. If the transmission fluid is below operating temperature, it is expected to be low on the transmission fluid level indicator. Transmission fluid temperatures below 30.2°F (-1°C) may not show up on a transmission fluid level indicator.

1. With the vehicle in NEUTRAL, position it on a hoist.

REFER to: [Jacking and Lifting - Overview](#) (100-02 Jacking and Lifting, Description and Operation).

Remove the transmission fluid fill plug and transmission fluid level indicator.

2. Allow the transmission fluid to drip onto a facial tissue or white sheet of paper.
3. Examine the stain.
4. Small black particles are typically burnt friction material.
5. Small shiny metallic particles indicate excessive hard part wear.
6. Foamy pink color indicates either water or engine coolant in the transmission.

Water in Transmission Fluid

To correctly repair an automatic transmission that has had water or coolant introduced into the system, completely disassemble, clean, and replace the following parts:

- All internal and external seals
- All friction material
- Torque converter
- All parts with bonded seals

- All solenoids
- All transmission fluid filters

Prior to installing the transmission, flush and clean the transmission fluid cooler(s) and the transmission fluid cooler tubes and hoses.

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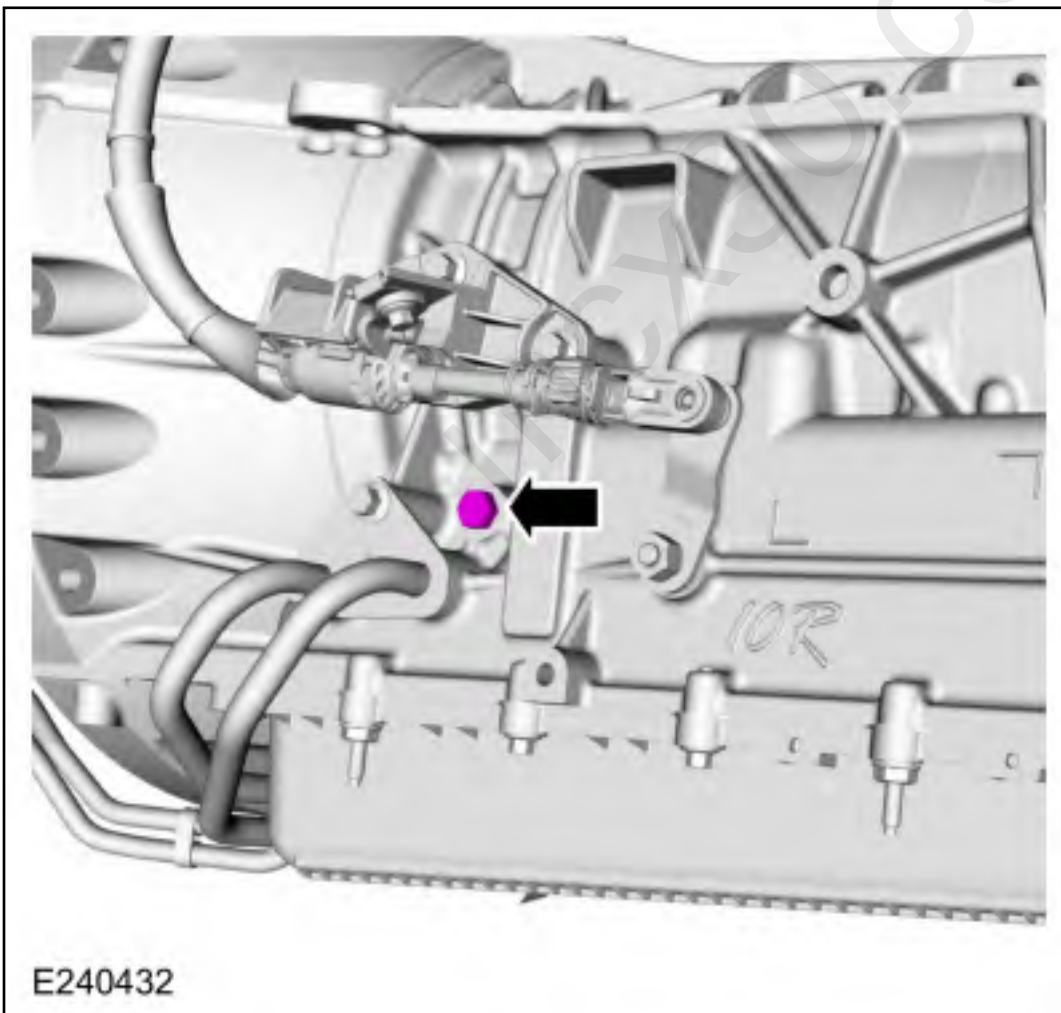
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Special Testing Procedures

Line Pressure Test

NOTE: Carry out the Line Pressure Test prior to carrying out the Stall Speed Test. If the line pressure is low at stall, do not carry out the Stall Speed Test or further transmission damage will occur. Do not maintain Wide Open Throttle (WOT) in any transmission range for more than 5 seconds.

This test verifies that the line pressure is within specification.



1. **NOTE:** The line pressure tap is an M10 X 1.00 thread. Do not use a National Pipe Thread (NPT) fitting when installing a pressure gauge. If a NPT fitting is used, damage to the transmission case will occur.

Connect the Transmission Fluid Pressure Gauge to the line pressure tap using an M10 X 1.00 fitting.

2. Start the engine and check the line pressures. Refer to the Line Pressure Chart to determine if the line pressure is within specification.

Line Pressure Chart

NOTE: Actual and commanded pressures vary based on calibration and transmission adaptive strategies. All pressures listed are approximate.

Gear	Line Pressure — kPa (psi)		Commanded — LPC pressure kPa (psi) a	
	Idle	WOT Stall	Idle	WOT Stall
P, N	619 (90)	-	94 (14)	-
R	619 (90)	1,675 (240)	94 (14)	410 (60)
(D)	619 (90)	1,600 (230)	94 (14)	375 (55)
3	619 (90)	1,230 (180)	94 (14)	275 (40)
2	619 (90)	1,675 (240)	94 (14)	410 (60)
1	619 (90)	1,600 (230)	94 (14)	375 (55)

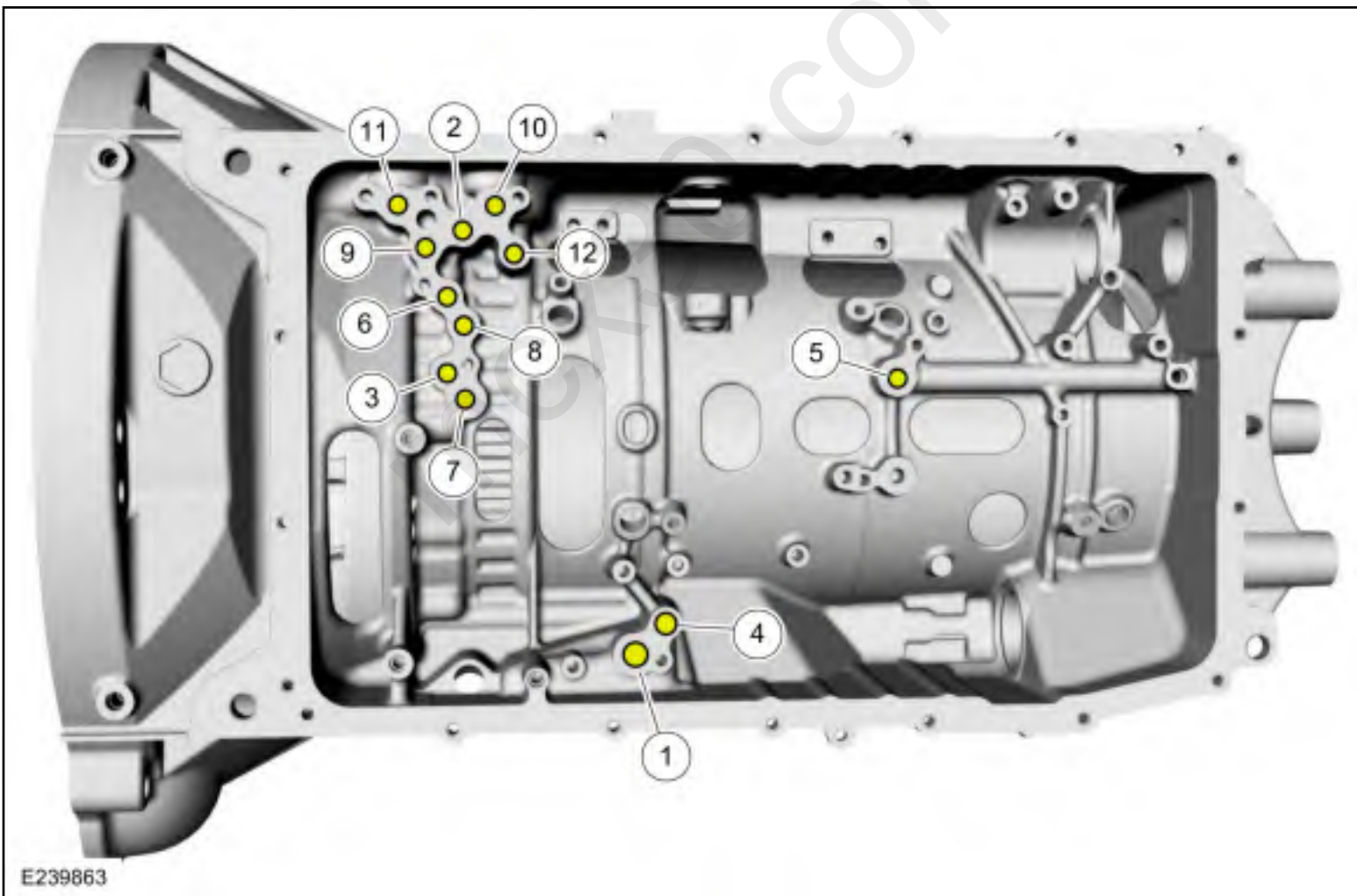
aCommanded pressure as viewed on diagnostic equipment.

3. If the line pressure is not within specification, refer to the Line Pressure Diagnosis Chart.
4. When the pressure tests are complete, install the line pressure tap plug.
1. Tighten to 11 Nm (97 lb-in).

Test Results	Possible Source
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HIGH at IDLE - ALL RANGES	• Wiring harnesses • LPC solenoid • LPC valve
LOW at IDLE - ALL RANGES	• Low fluid level • Fluid inlet filter/seal • Main control • Cross leaks • Gaskets • Pump • Separator plate

Air Pressure Test



10R80 Air Ports

Item	Description
1	A clutch
2	B clutch
3	C clutch
4	D clutch
5	E clutch
6	F clutch
7	TCC apply
8	TCC release
9	Lube
10	To cooler
11	From cooler
12	Line pressure tap

NOTE: When applying air pressure to the clutches using the indicated ports, restrict air pressure to no more than 276 kPa (40psi).

A no-drive condition can exist even with correct transmission fluid pressure because of inoperative clutches. Refer to the Clutch Application Chart to determine which clutch is applied in each gear range. A clutch concern can be located through a series of checks by substituting air pressure for fluid pressure to determine the location of the conce

Stall Speed Test

NOTE: Carry out the Line Pressure Test prior to the Stall Speed Test. If line pressure is low, do not carry out the stall test or additional transmission damage will occur. Do not maintain Wide Open Throttle (WOT) in any gear range for more than 5 seconds.

NOTE: After testing each of the ranges, move the selector lever into the NEUTRAL position and run the engine at 1,000 rpm for about 15 seconds to allow the torque converter to cool off before continuing onto the next range.

NOTE: If the engine speed exceeds maximum specified rpm, release the accelerator pedal immediately.

NOTE: Only perform the stall speed test with the engine and transmission at normal operating

temperatures.

The Stall Speed Test checks the operation of the following items:

- Torque converter clutch stator
- A clutch
- B clutch
- C clutch
- D clutch
- E clutch
- F clutch

1. Connect a scan tool.
2. Press the accelerator pedal to WOT in each range. Record the rpm reached in each range. Stall speeds should be in the appropriate range.

Stall Speed

Engine	Drive	Reverse
3.5L	3478-3845 rpm	3478-3845 rpm

Test Results Possible Source Stall speed high — R only	Possible Source
Stall speed high — R only	• General line pressure concerns • F clutch
Stall speed high — 1st and 3rd gears	• E clutch
Stall speed high — Both 2nd and 3rd gears	• C clutch
Stall speed high — 2nd, 3rd and R gears	• D clutch

Stall speed high — All ranges	• A clutch
Stall speed high — R and 1st, 2nd	• Engine driveability concern • TCC stator

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Diagnosis By Symptom

Symptom Chart(s)

Symptom Chart: Automatic Transmission

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

In most circumstances the PCM/ TCM sets a DTC to help guide with diagnostics. Refer to the DTC Chart before using the Symptom Chart. The Condition column lists the vehicle condition. The Possible Sources column lists a detailed vehicle condition. The Action column lists the action to be performed to determine the cause of the condition. Each action lists the components that can cause the symptom and the individual components in that system. The components are listed in order of disassembly. Use the list of components and the required action to focus on disassembly inspections for the root cause of the concern.

Symptom	Possible Sources	Action
Engagement concerns	No forward	- CHECK A clutch for damage. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). - CHECK E clutch for damage. REFER to: E Clutch (307-01B Automatic

		Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • CHECK the low one way clutch for damage. REFER to: Low One-Way Clutch Assembly (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	• No reverse	• CHECK A clutch for damage. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • CHECK B clutch for damage. REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • CHECK D clutch for damage. REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

	CHECK F clutch for damage. REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
Harsh reverse	- CHECK B clutch for damage. REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). - CHECK F clutch for damage. REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
Harsh forward	- CHECK E clutch for damage. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). - CHECK A clutch for damage. REFER to: A Clutch (307-01B Automatic

	Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Delayed/soft reverse	• CHECK the transmission fluid level. REFER to: Transmission Fluid Level Check (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures). • CHECK line pressure. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • CHECK B clutch for damage. REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • CHECK F clutch for damage. REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic

	Transmission - 10R80, Diagnosis and Testing).
• Delayed soft/forward	• CHECK the transmission fluid level. REFER to: Transmission Fluid Level Check (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures). • CHECK line pressure. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • CHECK E clutch for damage. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

- No forward and no reverse

- CHECK the transmission fluid level.
REFER to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

- INSPECT the filter and filter to pump seal/gasket.
REFER to: [Transmission Fluid Pan, Gasket and Filter - Raptor](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

- INSPECT the pump assembly.
REFER to: [Transmission](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

- INSPECT main pressure regulator valve for damage, scoring, or sticking.
REFER to: [Main Control Valve Body](#)

	(307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul). INSPECT turbine shaft splines on transmission input shaft and in the torque converter turbine. REPLACE damaged components as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
Delayed/soft forward and reverse	- CHECK the transmission fluid level. REFER to: Transmission Fluid Level Check (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures). - CHECK line pressure. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

- INSPECT the filter and filter to pump seal/gasket.

REFER to:

[Transmission Fluid Pan, Gasket and Filter - Raptor](#) (307-01B

Automatic

Transmission - 10-

Speed Automatic

Transmission - 10R80,

Removal and

Installation).

- INSPECT main pressure regulator valve for damage, scoring, or sticking.

REFER to: [Main](#)

[Control Valve Body](#)

(307-01B Automatic

Transmission - 10-

Speed Automatic

Transmission - 10R80,

Overhaul).

- INSPECT the pump assembly.

REFER to:

[Transmission](#) (307-

01B Automatic

Transmission - 10-

Speed Automatic

Transmission - 10R80,

Overhaul).

• Neutral after launch	• The Low One way clutch is not holding on acceleration. REFER to: Low One-Way Clutch Assembly (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Harsh/soft/delayed engagement after stop/start restart.	• CHECK auxilliary transmission oil pump, pick up screen/check ball (If equipped). Pump tube to case O-ring missing or damaged. Pump output tube blocked/restricted LPC valve not returning to center (sticking valve/broken springs). REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Shift concerns	Slip on hard acceleration in 1st or 2nd	One way clutch (sprag type slipping). REFER to: Low One-Way Clutch Assembly (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	No 1-2 shift/harsh/soft/slipping	- C, D clutch may be damaged or worn. See condition C or D clutch does not apply. REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). - The A clutch may be slipping during the shift. See condition A clutch delayed/soft/slipping apply. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). - The E clutch may be seized Stuck on.

	REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• No 2-3 shift/harsh/soft/slipping	• The E clutch may be damaged or worn. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • One Way clutch seized/stuck holding. REFER to: Low One-Way Clutch Assembly (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The A, C, or D clutch may be slipping during the shift. See condition A, C, or D clutch delayed/soft/slipping apply. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic

	Transmission - 10R80, Diagnosis and Testing). REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• No 3-4 shift/harsh/soft/slipping	• The E clutch may be damaged or worn. See condition E clutch does not apply. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The A, C, or D clutch may be slipping during the shift. See condition A, C, or D clutch delayed/soft/slipping apply. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic

	Transmission - 10R80, Diagnosis and Testing). • The E clutch may not be releasing properly. See condition E clutch always applied. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• No 4-5 shift/harsh/soft/slipping	• The E clutch may be damaged or worn. See condition, E clutch does not apply. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The A, C, F clutch may be slipping during the shift. See condition A, C, F clutch delayed/soft/slipping apply. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

REFER to: [F Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).

- The D clutch may not be releasing properly. See condition D clutch always applied.
REFER to: [D Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).

- No 5-6 shift/harsh/
soft/slipping

- The D clutch may be damaged or worn. See condition D clutch does not apply.
REFER to: [D Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).
- The A, E, F clutch may be slipping during the shift. See condition A, E, F clutch delayed/soft/slipping apply.
REFER to: [A Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).
REFER to: [E Clutch](#)
(307-01B Automatic

	Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The C clutch may not be releasing properly. See condition C clutch always applied. REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• No 6-7 shift/harsh/soft/slipping	• The C clutch may be damaged or worn. See condition C clutch does not apply. REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The D, E, F clutch may be slipping during the shift. See condition D, E, F clutch delayed/soft/slipping apply. REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic

	Transmission - 10R80, Diagnosis and Testing). REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The A clutch may not be releasing properly. See condition A clutch always applied. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• No 7-8 shift/harsh/soft/slipping	• CHECK B clutch for damage. REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The D, E, F clutch may be slipping during the shift. See condition D, E, F clutch delayed/soft/slipping apply. REFER to: D Clutch (307-01B Automatic

	Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The C clutch may not be releasing properly. See condition C clutch always applied. REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• No 8-9 shift/harsh/soft/slipping	• The C clutch may be damaged or worn. See condition C clutch does not apply. REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The B, E, F clutch may be slipping during the shift. See condition B,

E, F clutch delayed/
soft/slipping apply.
REFER to: [B Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).
REFER to: [E Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).
REFER to: [F Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).

- The D clutch may not
be releasing properly.
See condition D clutch
always applied.
REFER to: [D Clutch](#)
(307-01B Automatic
Transmission - 10-
Speed Automatic
Transmission - 10R80,
Diagnosis and Testing).

- No 9-10 shift/harsh/soft/slipping

- CHECK D clutch for damage.
REFER to: [D Clutch](#)
(307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

- The B, C, F clutch may be slipping during the shift. See condition B, C, F clutch delayed/soft/slipping apply.
REFER to: [B Clutch](#)
(307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
REFER to: [C Clutch](#)
(307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
REFER to: [F Clutch](#)
(307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

- The E clutch may not be releasing properly. See condition E clutch always applied.
REFER to: [E Clutch](#)
(307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80,

	Diagnosis and Testing).
• Only gears R, 1, 2, 3, 4, 5, 6 available • Only gears 7, 8, 9, 10 available	• The A clutch may not be releasing properly. See condition A clutch always applied. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The A clutch assembly may be damaged or worn. See condition A clutch does not apply. REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Only gears R, 8, 9, 10, M1, and M2 available • Only gears 1, 2, 3, 4, 5, 6, 7 available	• The B clutch may not be releasing properly. See condition Direct clutch always applied. REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The B clutch assembly may be damaged or worn. See condition Direct clutch does not apply. REFER to: B Clutch

	(307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Only gears 2, 3, 4, 5, 7, 9, 10 available • Only gears R, 1, 6, 8 available	• The C clutch may not be releasing properly. See condition C clutch always applied. REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The C clutch assembly may be damaged or worn. See condition C clutch does not apply. REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Only gears R, 3, 4, 6, 7, 8, 10 available • Only gears 1, 5, 9 available	• The F clutch may not be releasing properly. See condition Low reverse clutch always applied. REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The E clutch assembly

	may be damaged or worn. See condition E clutch does not apply. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Only gears 1, 3, 5, 6, 7, 8, 9, available • Only gears R, 2, 4, 10 available	• The E clutch may not be releasing properly. See condition E clutch always applied. REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The E clutch assembly may be damaged or worn. See condition E clutch does not apply.
• Only gears R, 4, 5, 6, 7, 8, 9, 10 available • Only gears 1, 2, 3 available	• The F clutch may not be releasing properly. See condition F clutch always applied. REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing). • The F clutch assembly may be damaged or worn. See condition F clutch does not apply.

		REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	• No engine braking in M1 or M2	• The B clutch assembly may be damaged or worn. See condition B clutch does not apply. REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Torque converter operation concerns	• No apply	• CHECK for DTCs related to torque converter concerns. • INSPECT the torque converter hydraulic circuits and regulator valve for damage or wear. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul). REFER to: Torque Converter Clutch (TCC) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80,

		Diagnosis and Testing).
	Always applied (engine stalls)	- CHECK for DTCs related to torque converter concerns. - INSPECT the torque converter hydraulic circuits and regulator valve for damage or wear. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul). REFER to: Torque Converter Clutch (TCC) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	Cycling/shutter/chatter	- CHECK for DTCs related to torque converter concerns. - CHECK the transmission fluid level. REFER to: Transmission Fluid Level Check (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80,

		General Procedures). INSPECT the torque converter hydraulic circuits and regulator valve for damage or wear. REFER to: Torque Converter Clutch (TCC) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
Other concerns	Selector lever high effort	Selector lever cable routed wrong, binding or damaged. REFER to: Selector Lever Cable - 10-Speed Automatic Transmission - 10R80, Vehicles With: Column Shift (307-05 Automatic Transmission External Controls, Removal and Installation).

• No start TR indicates R when selector lever is in P	• Selector lever cable routed wrong, binding or damaged. REFER to: Selector Lever Cable - 10-Speed Automatic Transmission - 10R80, Vehicles With: Column Shift (307-05 Automatic Transmission External Controls, Removal and Installation).
• External leaks	• Damaged or worn seals. REFER to: Leakage Inspection (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
• Noise	• Engine drive accessories, suspension, CV joints, REFER to: Noise, Vibration and Harshness (NVH) (100-04 Noise, Vibration and Harshness, Description and Operation).

• Vibration	• Engine drive accessories, suspension, CV joints, transmission fluid cooler tubes, REFER to: Noise, Vibration and Harshness (NVH) (100-04 Noise, Vibration and Harshness, Description and Operation).
• No park range	• INSPECT the selector lever cable for correct adjustment. REFER to: Selector Lever Cable Adjustment - 10-Speed Automatic Transmission - 10R80, Vehicles With: Column Shift (307-05 Automatic Transmission External Controls, General Procedures).
	• INSPECT the manual control lever for damage, wear or correct installation. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

		• INSPECT the park pawl, park pawl actuator, for damage or wear. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	• Overheating	• Transmission fluid cooling system damaged. REFER to: Transmission Cooling (307-02 Transmission Cooling, Diagnosis and Testing).

Diagnostic Trouble Code (DTC) Charts and Pinpoint Tests - 2.7L EcoBoost (238kW/324PS)

Principles of Operation

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.
3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom.
REFER to: [Diagnosis By Symptom](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically OFF. Check for an open, short to ground or the transmission connector disconnected. The PCM disables power to the transmission solenoids when certain transmission DTCs are set.

Solenoid Operation Chart

Selector Lever Position	PCM Commanded Gear	SSA (1, 2, 3, 4, 5, 6, M1, M2, R)	SSB (2, 8, 9, 10, M1, M2, R)	SSC (2, 3, 4, 5, 7, 9, 10, M2)	SSD (2, 3, 4, 6, 7, 8, 10, M2, R)	SSE (1, 3, 5, 6, 7, 8, 9, M1)	SSF (4, 5, 6, 7, 8, 9, 10, R)	TCC Solenoid
P	P	On	On	Off	On	Off	Off	Off
R	R	On	On	Off	On	Off	On	Off
N	N	On	On	Off	On	Off	Off	Off
D	1	On	Off	Off	On ^a	On	Off	Off
	2	On	Off	On	On	Off	Off	On/Off
	3	On	Off	On	On	On	Off	On/Off
	4	On	Off	On	On	Off	On	On/Off
	5	On	Off	On	Off	On	On	On/Off
	6	On	Off	Off	On	On	On	On/Off
	7	Off	Off	On	On	On	On	On/Off
	8	Off	On	Off	On	On	On	On/Off
	9	Off	On	On	Off	On	On	On/Off
	10	Off	On	On	On	Off	On	On/Off
M1	1	On	On	Off	On ^a	On	Off	Off
M2	2	On	On	On	On	Off	Off	Off

- On to reduce frictional losses from a released clutch, but does not contribute to power flow.

DTC Chart: PCM

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

DTC Chart

DTC	Description	Warning Light/DTC Type	Action
P0602	Powertrain Control Module Programming Error	MIL/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0603	Internal Control Module Keep Alive Memory (KAM) Error	MIL/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0604	Internal Control Module Random Access Memory (RAM) Error	MIL, Wrench/Initialization	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0605	Internal Control Module Read Only Memory (ROM) Error	MIL/Initialization	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0607	Control Module Performance	MIL/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).

P060A	Internal Control Module Monitoring Processor Performance	MIL, Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P060B	Internal Control Module A/D Processing Performance	MIL, Wrench	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P060C	Internal Control Module Main Processor Performance	MIL, Wrench	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P060D	Internal Control Module Accelerator Pedal Position Performance	MIL, Wrench	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P060F	Internal Control Module Engine Coolant Temperature Performance	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0610	Control Module Vehicle Options Error	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).

P061A	Internal Control Module Torque Performance	None/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P061B	Internal Control Module Torque Calculation Performance	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P061C	Internal Control Module Engine RPM Performance	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P061D	Internal Control Module Engine Air Mass Performance	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P061E	Internal Control Module Brake Signal Performance	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P062B	Internal Control Module Fuel Injector Control Performance	None/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).

P062C	Internal Control Module Vehicle Speed Performance	None/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0630	VIN Not Programmed or Incompatible - ECM/PCM	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P064F	Unauthorized Software/ Calibration Detected	MIL, Wrench/ Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0657	Actuator Supply Voltage "A" Circuit Open	MIL, Wrench/ Continuous	If the power circuit to the transmission solenoids is interrupted then all solenoids are failed electrically off. CHECK for an open, short to ground or the transmission connector disconnected. REPAIR as required. CLEAR the DTC. GO to Pinpoint Test A
P068A	ECM/PCM Power Relay De- Energized - Too Early	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P06B8	Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error	MIL/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).

P0702	Transmission Control System Electrical	Wrench/Continuous	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. RERUN the KOEO and KOER self-test. If DTC P0702 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing) .
P0706	Transmission Range Sensor "A" Circuit Range/Performance	Wrench/KOEO, Continuous	The TR sensor outputs a duty cycle indicating manual lever position. This DTC sets when the frequency is greater or less than the expected duty cycle by 25Hz or more. Engine may not crank. CLEAR the DTC. If DTC P0706 returns, GO to Pinpoint Test C
P0707	Transmission Range Sensor "A" Circuit Low	Wrench/KOEO, Continuous	Engine may not crank, CLEAR the DTC. If DTC P0707 returns, GO to Pinpoint Test C
P0708	Transmission Range Sensor "A" Circuit High	Wrench/KOEO, Continuous	Engine may not crank, CLEAR the DTC. If DTC P0708 returns, GO to Pinpoint Test C
P0709	Transmission Range Sensor "A" Circuit Intermittent	Wrench/Continuous	The TR sensor outputs a duty cycle indicating manual lever position. This DTC sets when the duty cycle is within range but is in the dead band between the design position, and an in-range but invalid duty cycle. GO to Pinpoint Test C
P0710	Transmission Fluid Temperature Sensor "A" Circuit	Wrench/Continuous	CLEAR the DTC. If DTC P0710 returns, GO to Pinpoint Test B

P0711	Transmission Fluid Temperature Sensor "A" Circuit Range/Performance	MIL/Continuous	CLEAR the DTC. Road test the vehicle at least 5 minutes. If DTC P0711 returns, GO to Pinpoint Test B
P0712	Transmission Fluid Temperature Sensor "A" Circuit Low	MIL/KOEO, Continuous	DTC P0710 may set. CLEAR the DTC. If DTC P0712 returns, GO to Pinpoint Test B
P0713	Transmission Fluid Temperature Sensor "A" Circuit High	MIL/KOEO, Continuous	DTC P0710 may set. CLEAR the DTC. If DTC P0713 returns, GO to Pinpoint Test B
P0715	TSS Sensor "A" Circuit	MIL/KOEO, Continuous	CLEAR DTC. If DTC P0715 returns during KOEO, GO to Pinpoint Test D
P0716	TSS Sensor "A" Circuit Range/Performance	MIL/Continuous	The PCM detected TSS sensor drop out, noise spike, or TSS not corresponding to other speed sensor inputs for current gear. REPAIR all clutch faults first. INSPECT TSS sensor for proper mounting. INSPECT TSS tone wheel (part of No. 2 planetary carrier) for damage.
P0717	TSS Sensor "A" Circuit No Signal	Wrench/Continuous	P0717 illuminates the wrench light in conjunction with P0715, P07BF, and/or P07C0. Service the more specific DTC first. GO to Pinpoint Test D
P0718	TSS Sensor "A" Circuit Intermittent	MIL/Continuous	The PCM detected TSS sensor fault, but the fault did not last long enough for the PCM to set a more specific TSS sensor DTC. Inspect TSS sensor wiring and connectors for damage.
P0720	Output Shaft Speed Sensor Circuit	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P0720 returns during KOEO, GO to Pinpoint Test D

P0721	Output Shaft Speed Sensor Circuit Range/Performance	MIL/Continuous	The PCM detected OSS sensor drop out, noise spike, or OSS sensor not corresponding to other speed sensor inputs for current gear. REPAIR all clutch faults first. INSPECT OSS sensor for proper mounting. INSPECT OSS sensor tone wheel (part of planetary carrier No. 4 output shaft) for damage.
P0722	Output Shaft Speed Sensor Circuit No Signal	Wrench/Continuous	DTC P0722 illuminates the wrench light in conjunction with P0720, P077C, and/or P077D. Service the more specific DTC first. GO to Pinpoint Test D
P0723	Output Shaft Speed Sensor Circuit Intermittent	MIL/Continuous	The PCM detected OSS sensor fault, but the fault did not last long enough for the PCM to set a more specific OSS sensor DTC. Inspect OSS sensor wiring and connectors for damage.
P0729	Gear 6 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio errors either in or while shifting to 6th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0731	Gear 1 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 1st gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0732	Gear 2 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 2nd gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0733	Gear 3 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 3rd gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0734	Gear 4 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio errors either in or while shifting to 4th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0735	Gear 5 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio errors either in or while shifting to 5th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0736	Reverse Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to Reverse. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0740	Torque Converter Clutch Solenoid Circuit/Open	Wrench/KOEO, Continuous	CLEAR DTC. If DTC P0740 returns during KOER, GO to Pinpoint Test G
P0741	Torque Converter Clutch Solenoid Circuit Performance/Stuck Off	Wrench/Continuous	DTC P0741 is a non-electrical failure that caused the TCC to fail to apply. For TCC Does Not Apply Symptom, REFER to: Torque Converter Clutch (TCC) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0743	Torque Converter Clutch Solenoid Circuit Electrical	Wrench/KOEO, Continuous	DTC P0743 illuminates the wrench light in conjunction with P0740, P2769, and/or P2770. Service the more specific DTC first. GO to Pinpoint Test G
P0748	Pressure Control Solenoid Electrical	Wrench/KOEO, Continuous	DTC P0748 illuminates the wrench light in conjunction with P0960, P0962, and/or P0963. Service the more specific DTC first. GO to Pinpoint Test G
P0751	Shift Solenoid "A" Performance/Stuck Off	MIL/KOEO, Continuous	DTC P0751 is a non-electrical failure indicating the A clutch failed to apply. For A clutch Does Not Apply symptom, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0752	Shift Solenoid "A" Stuck On	MIL/Continuous	DTC P0752 is a non-electrical failure indicating the A clutch stayed applied when SSA was de-energized. For A clutch Always Applied symptom, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0753	Shift Solenoid "A" Electrical	Wrench/KOEO, Continuous	DTC P0753 illuminates the wrench light in conjunction with P0973, P0974, and/or P097A. Service the more specific DTC first. GO to Pinpoint Test A
P0754	Shift Solenoid "A" Intermittent	MIL/Continuous	The PCM detected a SSA fault, but the fault did not last long enough for the PCM to set a more specific SSA DTC. Inspect SSA wiring and connectors for damage.
P0756	Shift Solenoid "B" Performance/Stuck Off	MIL/Continuous	DTC P0756 is a non-electrical failure indicating the B clutch failed to apply. For B clutch Does Not Apply symptom, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0757	Shift Solenoid "B" Stuck On	MIL/Continuous	DTC P0757 is a non-electrical failure indicating B clutch stayed applied when SSB was de-energized. For B clutch Always Applied symptom, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0758	Shift Solenoid "B" Electrical	Wrench, KOEO, Continuous	DTC P0758 illuminates the wrench light in conjunction with P0976, P0977, and/or P097B. Service the more specific DTC first. GO to Pinpoint Test A

P0759	Shift Solenoid "B" Intermittent	MIL/Continuous	The PCM detected SSB fault, but the fault did not last long enough for the PCM to set a more specific SSB DTC. Inspect SSB wiring and connectors for damage.
P0761	Shift Solenoid "C" Performance/Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating the C clutch failed to apply. For C clutch Does Not Apply symptom, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0762	Shift Solenoid "C" Stuck On	MIL/Continuous	DTC P0762 is a non-electrical failure indicating the C clutch stayed applied when SSC was de-energized. For C clutch Always Applied symptom, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0763	Shift Solenoid "C" Electrical	Wrench, KOEO, Continuous	DTC P0763 illuminates the wrench light in conjunction with P0779, P097C, and/or P0980. Service the more specific DTC first. GO to Pinpoint Test A
P0764	Shift Solenoid "C" Intermittent	MIL/Continuous	The PCM detected SSC fault, but the fault did not last long enough for the PCM to set a more specific SSC DTC. Inspect SSC wiring and connectors for damage.
P0766	Shift Solenoid "D" Performance/Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating D clutch failed to apply. For D clutch Does Not Apply symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0767	Shift Solenoid "D" Stuck On	MIL/Continuous	DTC P0757 is a non-electrical failure indicating the D clutch stayed applied when SSD was de-energized. For D clutch Always Applied symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0768	Shift Solenoid "D" Electrical	Wrench, KOEO, Continuous	DTC P0768 illuminates the wrench light in conjunction with P097D, P0982, P0982 illuminates the Wrench light. Service the more specific DTC first. GO to Pinpoint Test A
P0769	Shift Solenoid "D" Intermittent	MIL/Continuous	The PCM detected SSD fault, but the fault did not last long enough for the PCM to set a more specific SSD DTC. Inspect SSD wiring and connectors for damage.
P076F	Gear 7 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 7th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0771	Shift Solenoid "E" Performance/Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating the E clutch failed to apply. For E clutch Does Not Apply symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0772	Shift Solenoid "E" Stuck On	MIL/Continuous	DTC P0772 is a non-electrical failure indicating the E clutch stayed applied when SSE was de-energized. For E clutch Always Applied symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0773	Shift Solenoid "E" Electrical	Wrench/Continuous	DTC P0773 illuminates the wrench light in conjunction with P097E, P0985, P0986. Service the more specific DTC first. GO to Pinpoint Test A
P0774	Shift Solenoid "E" Intermittent	MIL/Continuous	The PCM detected SSE fault, but the fault did not last long enough for the PCM to set a more specific SSE DTC. Inspect SSE wiring and connectors for damage.
P077D	Output Shaft Speed Sensor Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D
P0791	Intermediate Shaft Speed Sensor "A" Circuit	MIL/Continuous	GO to Pinpoint Test D
P0792	Intermediate Shaft Speed Sensor "A" Circuit Range/Performance	MIL/Continuous	GO to Pinpoint Test D
P0793	Intermediate Shaft Speed Sensor "A" Circuit No Signal	Wrench	GO to Pinpoint Test D
P0794	Intermediate Shaft Speed Sensor "A" Circuit Intermittent	MIL/Continuous	GO to Pinpoint Test D

P07A9	Transmission Friction Element "D" Stuck On	None/Continuous	The PCM detected that D clutch failed to release multiple times and determined the SSD is not stuck on. For D clutch Always Applied symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07AB	Transmission Friction Element "E" Stuck On	None/Continuous	The PCM detected that E clutch failed to release multiple times and determined the SSE is not stuck on. For E clutch Always Applied symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07AD	Transmission Friction Element "F" Stuck On	None/Continuous	The PCM detected that F clutch failed to release multiple times and determined the SSF is not stuck on. For F clutch Always Applied symptom, REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07C0	TSS Sensor "A" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D
P07C6	Intermediate Shaft Speed Sensor "A" Circuit High	MIL/Continuous	GO to Pinpoint Test D
P07C8	Intermediate Shaft Speed Sensor "B" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D

P07D9	Gear 8 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 8th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07F6	Gear 9 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 9th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07F7	Gear 10 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 10th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0868	Transmission Fluid Pressure Low	Wrench/Continuous	CLEAR the DTC. Road test vehicle, if DTC P0868 returns, or if DTCs P0751, P0756, P0761, P0766, P0771 or P2707 are set, TEST for low pump pressure or fluid contamination. PERFORM the line pressure test. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0882	TCM Power Input Signal Low	MIL/KOEO, Continuous	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. If DTC P0882 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
P0883	TCM Power Input Signal High	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P0883 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
P0884	TCM Power Input Signal Intermittent	MIL/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P0960	Pressure Control Solenoid Control Circuit/Open	MIL/KOEO, Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G
P0961	Pressure Control Solenoid Control Circuit Range/Performance	MIL/Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G

P0962	Pressure Control Solenoid Control Circuit Low	MIL/KOEO, Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G
P0963	Pressure Control Solenoid Control Circuit High	MIL/KOEO, Continuous	The LPC solenoid failed to high current which is maximum pressure indicating short to ground, wiring or solenoid issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G
P0973	Shift Solenoid "A" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSA electrical. Since SSA shorted to ground causes SSA to be failed to high current (maximum pressure since SSA is directly proportional). A clutch is failed on. GO to Pinpoint Test A
P0974	Shift Solenoid "A" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSA electrical. Since SSA shorted to power causes SSA to be failed to low current (minimum pressure since SSA is directly proportional). A clutch is failed off. GO to Pinpoint Test A
P0976	Shift Solenoid "B" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSB electrical. Since SSB shorted to ground causes SSB to be failed to high current (maximum pressure since SSB is directly proportional). B clutch is failed on. GO to Pinpoint Test A

P0977	Shift Solenoid "B" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSB electrical. Since SSB shorted to power causes SSB to be failed to low current (minimum pressure since SSB is directly proportional). B clutch is failed off. GO to Pinpoint Test A
P0979	Shift Solenoid "C" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSC electrical. Since SSC shorted to ground causes SSC to be failed to high current (maximum pressure since SSC is directly proportional). C clutch is failed on. GO to Pinpoint Test A
P097A	Shift Solenoid "A" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSA electrical. Since SSA shorted to power causes SSA to be failed to low current (minimum pressure since SSA is directly proportional). A clutch is failed off. GO to Pinpoint Test A
P097B	Shift Solenoid "B" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates an open circuit in the SSB electrical. Since SSB shorted to power causes SSB to be failed to low current (minimum pressure since SSB is directly proportional). B clutch is failed off. GO to Pinpoint Test A
P097C	Shift Solenoid "C" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSC electrical. Since SSC shorted to power causes SSC to be failed to low current (minimum pressure since SSC is directly proportional). C clutch is failed off. GO to Pinpoint Test A

P097D	Shift Solenoid "D" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSD electrical. Since SSD shorted to power causes SSD to be failed to low current (minimum pressure since SSD is directly proportional). D clutch is failed off. GO to Pinpoint Test A
P097E	Shift Solenoid "E" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSE electrical. Since SSE shorted to power causes SSE to be failed to low current (minimum pressure since SSE is directly proportional). E clutch is failed off. GO to Pinpoint Test A
P097F	Shift Solenoid "F" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSF electrical. Since SSF shorted to power causes SSF to be failed to low current (minimum pressure since SSF is directly proportional). F clutch is failed off. GO to Pinpoint Test A
P0980	Shift Solenoid "C" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSC electrical. Since SSC shorted to power causes SSC to be failed to low current (minimum pressure since SSC is directly proportional). C clutch is failed off. GO to Pinpoint Test A
P0982	Shift Solenoid "D" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSD electrical. Since SSD shorted to ground causes SSD to be failed to high current (maximum pressure since SSD is directly proportional). D clutch is failed on. GO to Pinpoint Test A

P0983	Shift Solenoid "D" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSD electrical. Since SSD shorted to power causes SSD to be failed to low current (minimum pressure since SSD is directly proportional). D clutch is failed off. GO to Pinpoint Test A
P0985	Shift Solenoid "E" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSE electrical. Since SSE shorted to ground causes SSE to be failed to high current (maximum pressure since SSE is directly proportional). E clutch is failed on. GO to Pinpoint Test A
P0986	Shift Solenoid "E" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSE electrical. Since SSE shorted to power causes SSE to be failed to low current (minimum pressure since SSE is directly proportional). E clutch is failed off. GO to Pinpoint Test A
P0998	Shift Solenoid "F" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSF electrical. Since SSF shorted to ground causes SSF to be failed to high current (maximum pressure since SSE is directly proportional). F clutch is failed on. GO to Pinpoint Test A
P0999	Shift Solenoid "F" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSF electrical. Since SSF shorted to power causes SSF to be failed to low current (minimum pressure since SSF is directly proportional). E clutch is failed off. GO to Pinpoint Test A

P0B0D	Electric Transmission Fluid Pump Motor Control Module	None/Continuous	CLEAR the DTC. If the DTC returns, INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
P0C27	Electric Transmission Fluid Pump Motor Current Low	None/Continuous	This DTC applies to auto-start-stop vehicles only. This DTC sets when the PCM detects low current (10% to 15% duty cycle). Auto-Start-Stop unavailable and the engine will only stop when the operator turns the ignition off. The engine may restart unexpectedly when the vehicle is stopped. CLEAR the DTC. If the DTC returns, GO to Pinpoint Test F
P0C28	Electric Transmission Fluid Pump Motor Current Low	None/Continuous	GO to Pinpoint Test F
P0C29	Electric Transmission Fluid Pump Motor Current High	None/Continuous	GO to Pinpoint Test F
P0C2A	Electric Transmission Fluid Pump Motor Stalled	None/Continuous	GO to Pinpoint Test E
P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/Performance	Wrench/Continuous	GO to Pinpoint Test E
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	Wrench/Continuous	GO to Pinpoint Test E
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	Wrench/Continuous	GO to Pinpoint Test E

P1001	The KOER Not Able to Complete, KOER Aborted	None/KOER	RETRIEVE and RECORD all DTCs. REPAIR any self-test or CMDTCs first. CLEAR the DTC. RERUN the KOER self-test. If the DTC returns, REPROGRAM the PCM to the latest software. RERUN the KOER self-test. If the DTC returns, INSTALL a new PCM REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). After installing the new PCM PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P1397	System Voltage Out Of Self Test Range	None/KOEO	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. RUN the KOEO self-test. If DTC P1397 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
P1501	Vehicle Speed Sensor Out Of Self Test Range	None/KOEO	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).

P160A	Control Module Vehicle Options Reconfiguration Error	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P162D	Internal Control Module Cruise Control Performance	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P162E	Internal Control Module PTO Control Performance	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P1636	Inductive Signature Chip Communication Error	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P1636 returns, INSTALL a new . PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). After installing the new PCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P1639	Vehicle ID Block Corrupted Not Programmed	KOEO, KOER, Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P163E	Transmission Control Module Programming Error	MIL/KOEO, Continuous	CLEAR the DTC. REPROGRAM the original PCM with the latest software. If DTC P163E returns, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). After installing the new PCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P163F	Transmission ID Block Corrupted, Not Programmed	MIL/KOEO, Continuous	CLEAR the DTC. REPROGRAM the original PCM with the latest software. If DTC P163F returns, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). After installing the new PCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General

			Procedures).
P164C	Internal control Module Start Stop Performance	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P1674	Control Module Software Corrupted	MIL, Wrench/KOEO, Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P1705	Transmission Range Circuit Not Indicating Park/Neutral During Self Test	None/KOEO	CLEAR the DTC. RERUN the KOEO and KOER self-test. If DTC P1705 returns, GO to Pinpoint Test C
P1711	Transmission Fluid Temperature Sensor Out Of Self Test Range	None/KOEO	CLEAR the DTC and RERUN the KOEO and KOER self-test. IF the DTC returns, GO to Pinpoint Test B
P1744	Torque Converter Clutch Solenoid Circuit Performance	Wrench/Continuous	DTC P1744 is a non-electrical DTC. CLEAR the DTC. If DTC P1744 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	None/Continuous	The temperature sensor in the electric transmission fluid pump detected an overheat condition. CLEAR the DTC and road test the vehicle. If the DTC returns, INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

P1783	Transmission Over Temperature Condition	Wrench/Continuous	CLEAR the DTC. If DTC P1783 returns, determine if this DTC was set in conjunction with any TFT sensor circuit DTCs and RESOLVE them first, otherwise REFER to: Transmission Cooling (307-02 Transmission Cooling) .
P1A02	Transmission One Way Clutch Performance	Wrench/Continuous	This DTC sets when the PCM detects 3 failures of the one-way clutch to lock in 1st or 2nd gear allowing sun gear 1 to rotate backwards. CLEAR the DTC, road test the vehicle. If DTC P1A02 returns, it may indicate a one way clutch failure. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
P2531	Ignition Switch Run Position Circuit Low	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P2532	Ignition Switch Run Position Circuit High	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P264F	Engine Serial Number Not Programmed Or Incompatible	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P2669	Actuator Supply Voltage "B" Circuit/Open	MIL/Continuous	GO to Pinpoint Test A

P26C3	Internal Control Module Transmission Range Sensor Performance	MIL, Wrench/KOEO, Continuous	CLEAR the DTC. If DTC P26C3 returns, TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
P26C4	Internal Control Module Transmission Range Sensor Performance	None	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
P2700	Transmission Friction Element "A" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0751 (A clutch stuck off) and P0752 (A clutch stuck on), service the more specific DTC first. See DTCs P0751 and P0752 for potential causes. If P0751 and P0752 are not set refer to the associated symptoms, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2701	Transmission Friction Element "B" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0756 (B clutch stuck off) and P0757 (B clutch stuck on), service the more specific DTC first. See DTCs P0756 and P0757 for potential causes. If these DTCs are not set refer to the associated symptoms, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P2702	Transmission Friction Element "C" Apply Time Range/Performance	Wrench/Continuous	This DTC set with either P0761 (C clutch stuck off) and P0762 (C clutch stuck on) - service the more specific DTC first (if present). See P0761 and P0762 for potential causes first. If these DTCs are not set refer to the associated symptoms, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2703	Transmission Friction Element "D" Apply Time Range/Performance	Wrench/Continuous	This DTC set with either P0766 (D clutch stuck off) and P0767 (D clutch stuck on) service the more specific DTC first (if present). See P0766 and P0767 for potential causes first. If these DTCs are not set, refer to the associated symptoms, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2704	Transmission Friction Element "E" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0771 (E clutch stuck off) and P0772 (E clutch stuck on) service the more specific DTC first (if present). See P0771 and P0772 for potential causes. If these DTCs are not set, refer to the associated symptoms, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P2705	Transmission Friction Element "F" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P2707 (clutch F stuck off) and P2708 (clutch F stuck on), service the more specific DTC first. See DTCs P2707 and P2708 for potential causes. If these DTCs are not set, refer to the associated symptoms, REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2707	Shift Solenoid "F" Performance/Stuck Off	MIL/Continuous	F clutch stuck off due to a non-electrical fault. Multiple attempts to apply F clutch failed. GO to Pinpoint Test A
P2708	Shift Solenoid "F" Stuck On	MIL/Continuous	F clutch stuck on due to a non-electrical fault. Multiple attempts to apply F clutch failed. GO to Pinpoint Test A
P2709	Shift Solenoid "F" Electrical	MIL/KOEO, Continuous	SSF (controls F clutch) VFS circuit failure non-MIL "sister" DTCs of P097F, P0998, P0999 used to illuminate the Wrench Light. If one of the more specific circuit codes is set, follow repair procedures for that code. GO to Pinpoint Test A
P2710	Shift Solenoid "F" Intermittent	MIL/Continuous	The PCM detected SSF fault, but the fault did not last long enough for the PCM to set a more specific SSF DTC. Inspect SSF wiring and connectors for damage.
P2745	Intermediate Shaft Speed Sensor "B" Circuit	MIL/KOEO, Continuous	An open circuit fault was detected by the PCM smart driver. GO to Pinpoint Test D
P2746	Intermediate Shaft Speed Sensor "B" Circuit Range/Performance	MIL/Continuous	GO to Pinpoint Test D

P2747	Intermediate Shaft Speed Sensor "B" Circuit No Signal	Wrench/Continuous	GO to Pinpoint Test D
P2748	Intermediate Shaft Speed Sensor "B" Circuit Intermittent	MIL/Continuous	GO to Pinpoint Test D
P2758	Torque Converter Clutch Pressure Control Solenoid Stuck On	MIL/Continuous	TCC stuck on when commanded off due to non-electrical failure. CLEAR the DTC. If DTC P2758 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2760	Torque Converter Clutch Pressure Control Solenoid Intermittent	MIL/Continuous	The PCM detected TCC fault, but the fault did not last long enough for the PCM to set a more specific TCC DTC. Inspect TCC solenoid wiring and connectors for damage.
P2769	Torque Converter Clutch Circuit Low	MIL/Continuous	This DTC indicates a short to ground in the TCC electrical. Since TCC shorted to ground causes TCC to be failed to high current (maximum pressure since TCC is directly proportional). TCC is failed on. GO to Pinpoint Test G
P2770	Torque Converter Clutch Circuit High	MIL/Continuous	This DTC indicates a short to power in the TCC electrical. Since TCC shorted to power causes TCC to be failed to low current (minimum pressure since TCC is directly proportional). TCC is failed off. CLEAR the DTC. If DTC P2783 returns, INSPECT TCC control valve for sticking. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

P2783	Torque Converter Temperature Too High	None/Continuous	The TCC control valve is stuck in a position that provides no flow when the TCC is commanded off. The TCC pumps down when commanded off, causing loss of torque multiplication through the TCC.
P2796	Electric Transmission Fluid Pump Control Circuit	None/Continuous	This DTC sets when the transmission electric fluid pump reports to the PCM that it is not receiving a PWM from the PCM. CLEAR the DTC. If the DTC returns, GO to Pinpoint Test E
P27B4	Internal Control Module Transmission Gear Direction Control Performance	None/Continuous	May be caused by clutch faults that cause R in forward range or a forward gear in R, or a speed sensor error, CLEAR the DTC. If DTC P27B4 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P27B5	Internal Control Module Transmission Gear Ratio Control Performance	None/Continuous	CLEAR the DTC. If DTC P27B5 returns or if any TR DTCs are set RESOLVE them first. If DTC P27B5 returns, PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P27B6	Internal Control Module Transmission Speed Sensor Performance	MIL, Wrench/ Continuous	CLEAR the DTC. Road test the vehicle. If any speed sensor DTCs are set, RESOLVE them first. If DTC P27B6 returns, PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P2801	Transmission Range Sensor "B" Circuit Range/ Performance	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2802	Transmission Range Sensor "B" Circuit Low	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2803	Transmission Range Sensor "B" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2804	Transmission Range Sensor "B" Circuit Intermittent	Wrench/KOEO, Continuous	GO to Pinpoint Test C
P2805	Transmission Range Sensor "A"/"B" Correlation	MIL/KOEO, Continuous	GO to Pinpoint Test C
U0028	Vehicle Communication Bus "A"	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).

U0037	Vehicle Communication Bus "B"	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
U0073	Control Module Communication Bus "A" Off	MIL/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).
U0074	Control Module Communication Bus "B" Off	MIL/Continuous	REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Diagnosis and Testing).

Pinpoint Tests

Power is routed through the transmission solenoid power control (inside the PCM) to all transmission solenoids. If the power circuit to the transmission solenoids or the transmission solenoid power control fails open, all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The transmission solenoid power control disables power to the transmission solenoids when certain transmission DTCs are set.

- Carry out KOEO and KOER procedures.
- Retrieve and record all DTCs.
- Repair all non-transmission DTCs first.
- Repair all transmission DTCs second.
- Clear all CMDTCs and attempt to repeat them.
- Repair all CMDTCs.
- If only pass codes are obtained,
REFER to: [Diagnosis By Symptom](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

Transmission Control Solenoids

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The 10R80 utilizes 6 shift (A through F) solenoids that are linear force solenoids. Unlike previous shift solenoids they are mechanical in nature meaning no transmission fluid passes through them. CIDASs use an armature pin assembly that moves a control valve in the main control valve body to control and apply hydraulic fluid pressure. Each clutch (A through F) has a corresponding shift solenoid (A through F) that is directly proportional in that zero current equals zero pressure and maximum current equals maximum pressure. Since there is no pressure with zero current, none of the clutch packs are able to engage if the power is interrupted to the shift solenoids .

PINPOINT TEST A : TRANSMISSION CONTROL SOLENOIDS

A1 CHECK THE SOLENOID POWER CIRCUIT FOR VOLTAGE	
NOTE: <i>Read and record all DTCs.</i>	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C168A. • Ignition ON.	
Is the voltage greater than 11 volts?	
Yes	GO to A4
No	GO to A2
A2 CHECK THE SOLENOID POWER CIRCUIT FOR AN OPEN	

- Ignition OFF.
- Disconnect: PCM C1232T
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms?

Yes	GO to A3
No	REPAIR transmission vehicle harness circuit for an open.

A3 CHECK THE SOLENOID POWER CIRCUIT FOR A SHORT TO GROUND

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Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C1232T-2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

A4 CHECK SOLENOID CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect: PCM C1232T
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A5
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

A5 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms on the suspect circuit?

Yes	GO to A6
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

A6 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO POWER

Is any voltage detected?

Yes	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.
No	GO to A7

A7 CHECK MAIN CONTROL WIRING HARNESS SOLENOID POWER CIRCUIT FOR AN OPEN CIRCUIT

- Drain the transmission fluid and remove the transmission fluid pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Disconnect Shift Solenoid Connectors (A through F).
- Disconnect Main Control Wiring Harness C177.
- Measure resistance of the suspect solenoid power circuit of the main control wiring harness, using the table below:

Positive Lead	Measurement / Action	Negative Lead
C177-5	Ω	SSA C1843-1
C177-5		SSB C1844-1
C177-5		SSC C1845-1
C177-5		SSD C1846-1
C177-5		SSE C1847-1

C177-5		SSF C1848-1
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Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A8 CHECK MAIN CONTROL WIRING HARNESS SOLENOID POWER CIRCUIT FOR A SHORT TO GROUND

- INSPECT main control wiring harness for chafes or bare wires.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C177-5	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to A9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A9 CHECK MAIN CONTROL WIRING HARNESS SOLENOID CONTROL CIRCUIT FOR AN OPEN CIRCUIT

- Measure resistance of the suspect solenoid control circuit of the main control wiring harness, using the table below:

Positive Lead	Measurement / Action	Negative Lead
C177-8	Ω	SSA C1843-2
C177-9		SSB C1844-2
C177-10		SSC C1845-2
C177-11		SSD C1846-2
C177-3		SSE C1847-2
C177-4		SSF C1848-2

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A11
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A10 CHECK MAIN CONTROL WIRING HARNESS SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

- Disconnect Shift Solenoid Connectors (A through F) (if not disconnected already).
- Measure:

Positive Lead	Measurement / Action	Negative Lead
SSA C1843-2	Ω	Ground
SSB C1844-2		Ground
SSC C1845-2		Ground
SSD C1846-2		Ground
SSE C1847-2		Ground

SSF C1848-2		Ground
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Is the resistance greater than 10,000 ohms?

Yes	GO to A11
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A11 CHECK SOLENOID RESISTANCE

- Disconnect the suspect solenoid connector and remove the suspect shift solenoid.
REFER to: [Shift Solenoids \(SS\)](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Measure and record the resistance of the suspected solenoid.

Is the shift solenoid resistance between 4.8 and 5.4 ohms?

Yes	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new solenoid for the solenoid that failed the resistance check. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TFT sensor is a temperature dependent resistor that is in contact with transmission fluid in the transmission sump area. The PCM monitors the voltage across the TFT sensor, which changes as transmission fluid temperature varies. The PCM uses the TFT sensor signal as an input for its strategy for shifting and TCC operation. The PCM also uses the TFT sensor signal for transmission fault detection and diagnostics.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals
- TFT sensor
- Transmission internal wiring harness frame
- PCM

PINPOINT TEST B : TFT (TRANSMISSION FLUID TEMPERATURE) SENSOR

B1 CHECK TFT INPUT SIGNAL	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C168A. • Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals. • Connect the diagnostic tool. • Ignition ON. • Enter the following mode on the diagnostic scan tool: Datalogger. Monitor the following TFT PIDs, TFT and TFTV.	
Does the TFT PID display -40°C (-40°F) and the TFTV PID display 4.96 to 5.10 volts?	
Yes	GO to B2
No	REPAIR the circuit.

B2 CHECK TFT SIGNAL INPUT CIRCUIT FOR VOLTAGE

Is the voltage between 4.8 and 5.1 volts?

Yes	GO to B3
No	INSPECT and REPAIR the open circuit. If an open circuit is not found, INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

B3 CHECK TFT SIGNAL RETURN CIRCUIT

Does the TFT PID display 190°-195°C (374°-383°F) and the TFTV PID display 0 volts?

Yes	GO to B4
No	INSPECT and REPAIR the open circuit. If an open circuit is not found, INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

B4 CHECK INTERNAL WIRING HARNESS FOR AN OPEN

- Ignition OFF.
- Disconnect TFT Sensor C1842.
- Disconnect TR Sensor C167.

Are the resistances less than 3 ohms?

Yes	GO to B5
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

B5 CHECK INTERNAL WIRING HARNESS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	INSPECT and CLEAN the TFT sensor for metallic contamination. INSTALL a new TFT sensor. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). CLEAR the DTCs.
No	GO to B6

B6 CHECK TFT SENSOR RESISTANCE

- Connect TFT sensor C1842.

Does the temperature to resistance specification match?

Yes	To diagnose an overheating concern, REFER to: Transmission Cooling (307-02 Transmission Cooling, Diagnosis and Testing).
No	INSTALL a new TFT. REFER to: Transmission Fluid Temperature (TFT) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

TR Sensor

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TR sensor is comprised of a dual set of TR sensors. The manual shifter engages and disengages Park and the shifter position is detected by reading TR sensors A and B. There is no manual valve, the PCM provides forward or reverse based on the dual TR sensor inputs. The 10R80 transmission uses dual PWM output (at 125 Hz) TR sensors where: TR sensor A increases as the shifter is moved from Park to Sport and TR sensor B decreases as the shifter is moved from Park to Sport, together the sum of the two signals should add up to 100%. The 10R80 transmission mechanical shifter variant is range by wire with mechanical Park. The dual TR sensor's signals determine customer selected range (P, R, N, D, S). PIDs, TR_A_DC and TR_B_DC may be utilized to monitor the TR sensor duty cycles.

Typical TR Sensors PWM Output

	Transmission Range Sensor A		Transmission Range Sensor B	
Gear	Min	Max	Min	Max
P	8.00	18.96	81.04	92.00

R	35.50	47.90	52.10	64.50
N	51.75	61.75	38.25	48.25
D	67.45	77.45	22.55	32.55
Sport	81.12	92.00	8.00	18.88

PINPOINT TEST C : TR SENSOR

C1 VERIFY DTCS

NOTE: Read and record all DTCs.

- Ignition OFF.
- Select PARK.
- Connect the diagnostic tool.
- Carry out the KOEO then the KOER test.

Are TR sensor DTCs present?

Yes	GO to C2
No	If no DTCs are present, and to diagnose any symptoms that may be present, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

C2 CHECK TR SENSOR ELECTRICAL OPERATION

- Ignition ON.
- Enter the following diagnostic mode on the scan tool: TR PID: TR_A_DC and TR_B_DC.
- Move the selector lever into each range and stop.
- Observe the PIDs: TR_A_DC and TR_B_DC while wiggling the harness or driving the vehicle.
- Compare the duty cycles shown by the PIDs TR_A_DC and TR_B_DC to the selector lever position duty cycle, using the following chart.

Typical TR Sensor(s) PWM Output

Gear	Transmission Range Sensor A		Transmission Range Sensor B	
	Min	Max	Min	Max
P	8.00	18.96	81.04	92.00
R	35.50	47.90	52.10	64.50
N	51.75	61.75	38.25	48.25
D	67.45	77.45	22.55	32.55
Sport	81.12	92.00	8.00	18.88

Are the TR_A_DC and TR_B_DC duty cycles within range?

Yes	The problem is not in the TR sensor. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
No	GO to C3

C3 CHECK TR SENSOR CIRCUITS FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Are the voltages approximately 5 volts?

Yes	GO to C4
No	GO to C5

C4 CHECK TR SENSOR VOLTAGE CIRCUIT FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is the voltage approximately 9 volts?

Yes	GO to C7
No	GO to C5

C5 CHECK TR SENSOR VOLTAGE CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	GO to C6
No	REPAIR the circuit.

C6 CHECK TR SENSOR VOLTAGE CIRCUIT FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

C7 CHECK TR SENSOR GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	INSTALL a new TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	REPAIR the circuit.

C8 CHECK TR SENSOR TRP1, TRP2, CIRCUITS FOR POWER

- Drain the transmission fluid and remove the transmission fluid pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Connect Transmission Vehicle Harness C168A.
- Disconnect TR sensor C167.
- Ignition ON.

Are the voltages approximately 5 volts?

Yes	GO to C9
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

C9 CHECK TR SENSOR VREF CIRCUIT FOR POWER

- Connect Transmission Vehicle Harness C168A.
- Disconnect TR sensor C167.
- Ignition ON.

Is the voltage approximately 9 volts?

Yes	GO to C10
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

C10 CHECK TRANSMISSION INTERNAL WIRING HARNESS FOR AN OPEN CIRCUIT

- Ignition OFF.

Are the resistances less than 3 ohms?

Yes	INSTALL a new TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

OSS, TSS Sensor, ISSA and ISSB

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation TSS Sensor

The TSS sensor is a Hall-effect type sensor that provides a signal to the PCM that changes in frequency as the rotating speed of the planetary carrier No. 2 varies. The PCM compares the TSS sensor signal with the engine speed information to determine the amount of slip occurring in the torque converter. The PCM also compares the TSS sensor signal with the OSS sensor signal to determine the gear ratio provided by the planetary carrier No. 4. The PCM uses the TSS sensor signal as an input for its strategies for shifts and TCC operation. The PCM also uses the TSS sensor signal for transmission fault detection and diagnostics.

Normal Operation OSS Sensor

The OSS sensor is a Hall-effect type sensor that provides a signal to the PCM that changes in frequency as the rotating speed of the rear planetary carrier No. 4 varies. The PCM also compares the OSS sensor signal with the TSS sensor signal to determine the gear ratio provided by the rear planetary gearset. The PCM uses the OSS sensor signal as an input for its strategies for shifts and TCC operation. The PCM also uses the OSS sensor signal for transmission fault detection and diagnostics.

Normal Operation Intermediate Speed Sensors A and B

The Intermediate Speed Sensors A (ISSA) and B (ISSB) are Hall-effect type sensors that provide a signal to the PCM that changes in frequency as the rotating speed of the component being monitored changes. ISSA monitors the speed and rotational direction of ring gear 1 and ISSB monitors the speed and rotational direction of planetary carrier-1/ring gear 4. The Intermediate speed sensors are used to monitor clutch states for transmission fault detection and diagnostics.

TSS Sensor DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0715	TSS Sensor Circuit	This DTC sets if the PCM detects an open or short to ground in the TSS sensor circuitry.
P0716	TSS Sensor Circuit Range/Performance	This DTC sets if the PCM detects too large of a sensor air gap, a TSS sensor fault or an undetected clutch fault.
P0717	TSS Sensor Circuit No Signal	This DTC sets relationally if the DTCs P0715, P07BF, P07C0 are set, RESOLVE these DTCs first.
P0718	TSS Sensor Circuit Intermittent	This DTC sets if the PCM detects an intermittent circuit fault in the TSS circuit.
P07BF	ITSS Sensor Circuit Low	This DTC sets if the PCM detects an open or short to ground in the TSS sensor circuitry.
P07C0	TSS Sensor Circuit High	This DTC sets if the PCM detects an open circuit in the TSS sensor circuitry.

Intermediate Sensor A (ISSA) DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0791	Intermediate Shaft Speed Sensor "A" Circuit	This DTC sets if the PCM detects an open or short to ground in the ISSA sensor circuitry.

P07C6	Intermediate Shaft Speed Sensor "A" Circuit High	This DTC sets relationally if the DTCs P0715, P07BF, P07C0 are set, RESOLVE these DTCs first.
P0792	Intermediate Shaft Speed Sensor "A" Circuit Range/Performance	This DTC sets if the PCM detects an intermittent circuit fault in the ISSA sensor circuit.
P0793	Intermediate Shaft Speed Sensor "A" Circuit No Signal	This DTC sets if the PCM detects an open or short to ground in the ISSA sensor circuitry.
P0794	Intermediate Shaft Speed Sensor "A" Circuit Intermittent	This DTC sets if the PCM detects an open circuit in the ISSA sensor circuitry.

Intermediate Sensor B (ISSB) DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P2745	Intermediate Shaft Speed Sensor "B" Circuit	This DTC sets if the PCM detects an open or short to ground in the ISSB sensor circuitry.
P2746	Intermediate Shaft Speed Sensor "B" Circuit Range/Performance	This DTC sets if the PCM detects an intermittent circuit fault in the ISSB sensor circuit..
P2747	Intermediate Shaft Speed Sensor "B" Circuit No Signal	This DTC sets if the PCM detects an open or short to ground in the ISSB sensor circuitry.
P2748	Intermediate Shaft Speed Sensor "B" Circuit Intermittent	This DTC sets if the PCM detects an open circuit in the ISSB sensor circuitry.

OSS Sensor DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions

P0720	OSS Sensor Circuit	This DTC sets if the PCM detects an open or short to ground in the OSS sensor circuitry.
P0721	OSS Sensor Circuit Range Performance	This DTC sets if the PCM detects too large of a sensor air gap, a TSS sensor fault or an undetected clutch fault.
P0722	OSS Sensor Circuit No Signal	This DTC sets relationally if the DTCs P0720, P077C or P077D are set, RESOLVE these DTCs first.
P0793	OSS Sensor "A" Circuit No Signal	This DTC sets if the PCM detects an open or short to ground in the OSS sensor circuitry.
P077D	OSS Sensor Circuit High	This DTC sets relationally if the DTCs P0720, P0721, P0793 are set, RESOLVE these DTCs first.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires or ground and missing or damaged seals
- TSS sensor
- OSS sensor
- Intermediate Speed Sensor A (ISSA)
- Intermediate Speed Sensor B (ISSB)

PINPOINT TEST D : OSS (OUTPUT SHAFT SPEED) , TSS (TURBINE SHAFT SPEED) SENSORS, INTERMEDIATE SPEED SENSORS A AND B

D1 CHECK SENSOR POWER CIRCUIT FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is the voltage on the suspect circuit 8.8 to 9.2 volts?

Yes	GO to D5
No	GO to D2

D2 CHECK THE SENSOR POWER CIRCUIT FOR A SHORT TO GROUND

- Disconnect: PCM C1232T.
- Ignition OFF.

Is the resistance on the suspect circuit greater than 10,000 ohms?

Yes	GO to D3
No	INSPECT and REPAIR transmission vehicle harness sensor power circuit for a short to ground.

D3 CHECK THE SENSOR POWER CIRCUIT FOR AN OPEN

- Ignition ON.

Is the resistance on the suspect circuit less than 3 ohms?

Yes	INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

D4 CHECK THE SENSOR SIGNAL CIRCUIT FOR A SHORT TO POWER

- Ignition OFF.
- Disconnect: PCM C1232T.
- Disconnect: Transmission Vehicle Harness C168A (If not already disconnected).
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to D5

D5 CHECK THE SENSOR RETURN CIRCUIT FOR AN OPEN

- Ignition OFF.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to D6
No	REPAIR the transmission vehicle harness signal return circuit for an open.

D6 CHECK THE SENSOR RETURN CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.

Is the resistance greater than 10,000 ohms?

Yes	GO to D7
No	REPAIR the circuit.

D7 CHECK THE SENSOR RETURN INTERNAL HARNESS CIRCUITS FOR A SHORT TO POWER

- Disconnect for OSS sensor C1107.
- Disconnect for TSS sensor C3106.
- Disconnect for ISSA sensor C1836.
- Disconnect for ISSB sensor C1837.
- Ignition ON.

Is any voltage detected on the suspect circuit?

Yes	GO to D8
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

D8 CHECK THE SENSOR INTERNAL HARNESS POWER CIRCUITS FOR AN OPEN

- Disconnect Suspect sensor connector .
- Ignition ON.

Is the resistance greater than 10,000 ohms?

Yes	GO to D9
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

D9 CHECK THE SENSOR INTERNAL HARNESS CIRCUITS FOR A SHORT TO GROUND

- Ignition ON.

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new sensor as necessary. REFER to: Output Shaft Speed (OSS) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Turbine Shaft Speed (TSS) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Intermediate Speed Sensor A (ISSA) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Intermediate Speed Sensor B (ISSB) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

DTCS P0C2A, P0C2C, P0C2D, P0C2E, P2796

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation and Fault Conditions

The electric transmission fluid pump keeps the transmission engaged when the engine is stopped and the transmission is in drive. The electric transmission fluid pump has an internal microprocessor and communicates with the PCM over a PWM circuit with a frequency of 150 Hz with a duty cycle range of 10% to 90%.

DTC	Duty Cycle Range	Condition
P0C2D	Less than 10%	Out of range Low
P0C27	10% to 15%	Pump current too Low, Speed OK
P0C28	20% to 25%	Pump Current Too High, Speed OK
P175A	30% to 34%	Pump Over Temperature
P0C2A	35% to 40%	Pump Stalled
NONE	44% to 50%	Normal Value Of Signal
P0B0D	55% to 60%	Pump Over Speed – current OK
P0B0D	65% to 70%	Pump Under Speed – current OK
P0C29	75% to 80%	Both Current and Speed out of range
P2796	85% to 90%	No Command received from Control Module
P0C2E	Greater than 90%	Duty Cycle Out of range HI - undefined
P0C2C	Any other value (between)	Invalid duty cycle or invalid frequency. This could include no signal.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0B0D	Electric Transmission Fluid Pump Motor Control Module	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz and a valid duty cycle was detected (55% to 60% or 65% to 70%). The electric transmission fluid pump has detected a pump over or under speed condition. The current flow through the pump was within specification.
P0C27	Electric Transmission Fluid Pump Motor Control Module	Possible causes are loss of pump prime or low transmission fluid level. This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (10% to 15% duty cycle).
P0C28	Electric Transmission Fluid Pump Motor Current Low	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (20% to 25% duty cycle).
P0C29	Electric Transmission Fluid Pump Motor Current High	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a high current is detected.
P0C2A	Electric Transmission Fluid Pump Motor Stalled	This DTC sets if the PCM commands the electric transmission fluid pump motor on and does not detect a corresponding increase in pump speed, indicating a stalled pump motor.
P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/ Performance	This DTC sets if the E-Pump frequency is between 125 and 175Hz but has an invalid duty cycle or the frequency is outside of the 125-175Hz range. This can be caused by a loss of power to the E-Pump.
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	This DTC sets if the duty cycle is less than 10%.
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	This DTC sets if the duty cycle is greater than 90%.
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but an over temperature condition is detected (30% to 34% duty cycle). This DTC can be caused by high transmission fluid temperatures

P2796	Electric Transmission Fluid Pump Control Circuit	This DTC sets when the electric transmission fluid pump reports to the PCM that it is not receiving a PWM from the PCM.
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Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires or ground and missing or damaged seals
- BJB fuse 98 (15A)
- Electric transmission fluid pump
- PCM

PINPOINT TEST E : DTCS P0C2A, P0C2C, P0C2D, P0C2E, P2796

E1 RETRIEVE AND RECORD ALL DTCS	
• Using the diagnostic scan tool, retrieve all DTCs.	
Are DTCs P0C2A, P0C2C, P0C2D, P0C2E, P2796 present?	
Yes	For DTC P2796, GO to E7 For all other DTCs, GO to E2
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or terminal issues.
E2 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP POWER CIRCUITS	

- Ignition OFF.
- Disconnect Transmission Vehicle Harness C168A.
- Ignition ON.

Is the voltage greater than 11 volts?

Yes	GO to E3
No	VERIFY the BJB 98 (15A) is OK. If the fuse is OK, REPAIR the suspect circuit for an open. If the fuse is not OK, REFER to the Wiring Diagrams manual to identify the cause of the affected circuit shorted to ground.

E3 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP GROUND CIRCUIT FOR AN OPEN

- **NOTE:** *Confirm that the ground eyelet is clean and tightly secured to the ground point.*

Is the resistance less than 3 ohms?

Yes	For DTC P0C2A, GO to Pinpoint Test F For all other DTCs, GO to E4
No	REPAIR the circuit

E4 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK / MONITOR CIRCUIT FOR OPEN

- Ignition OFF.
- Disconnect PCM C1232T.
- Ignition ON.

Is the resistance less than 3 ohms?

Yes	GO to E5
No	REPAIR the circuit.

E5 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK / MONITOR CIRCUIT FOR SHORT TO GROUND

- Ignition OFF.

Is the resistance greater than 10,000 ohms?

Yes	GO to E6
No	REPAIR the circuit

E6 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK / MONITOR CIRCUIT FOR SHORT TO POWER

- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E7

E7 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR SHORT TO POWER

- Ignition OFF.
- Disconnect PCM C1232T (If not already disconnected) .
- Disconnect Transmission Harness Connector C168A.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E8

E8 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR OPEN

Is the resistance less than 3 ohms?

Yes	GO to E9
No	REPAIR the circuit

E9 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP VEHICLE WIRING HARNESS COMMAND CIRCUITS FOR AN OPEN

Is the resistance greater than 10,000 ohms?

Yes	GO to E10
No	REPAIR the circuit

E10 CHECK ELECTRIC TRANSMISSION FLUID PUMP TRANSMISSION VEHICLE HARNESS FEEDBACK / MONITOR CIRCUIT FOR SHORT TO POWER

- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E11

E11 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND/MONITOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect PCM C1232T (If not already disconnected) .

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E12

E12 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP INTERNAL WIRING HARNESS POWER CIRCUIT FOR AN OPEN

- REMOVE the transmission pan.
REFER to: [Transmission Fluid Drain and Refill](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
- Ignition ON.

Are the resistances less than 3 ohms?

Yes	GO to E13
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E13 CHECK THE TRANSMISSION INTERNAL WIRING HARNESS GROUND CIRCUIT

- Ignition OFF.

Is the resistance less than 3 ohms?

Yes	GO to E14
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E14 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP INTERNAL WIRING HARNESS CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect Transmission Vehicle Harness C168A (If not already disconnected) .

Is the resistance greater than 10,000 ohms?

Yes	GO to E15
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E15 CHECK TRANSMISSION INTERNAL WIRING HARNESS FLUID PUMP CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect Transmission Vehicle Harness C168A (If not already disconnected) .

Are the resistances less than 3 ohms?

Yes	GO to E16
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E16 CHECK THE TRANSMISSION FLUID PUMP DUTY CYCLE OPERATION

- Connect PCM C1232T.
- Connect Transmission Vehicle Harness C168A.
- Connect Electric Transmission Fluid Pump C1792.
- Connect the diagnostic tool.
- Ignition ON.
- Using a diagnostic scan tool, COMMAND the transmission fluid pump ON using, TRANS_PMP_CMD and set to a duty cycle of 70%.
- MONITOR the PIDs, TRANS_PMP_MEAS.

Does TRANS_PMP_MEAS quickly return to 44% to 50% after the command percentage changes?

Yes	The electric transmission fluid pump is operating correctly at this time.
No	INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

DTCs P0B0D, P0C27, P0C28, P0C29, P0C2A, P175A

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation and Fault Conditions

The electric transmission fluid pump keeps the transmission fluid circulating during extended drive times without engine charging. The electric transmission fluid pump has an internal microprocessor and communicates with the C1232E over a PWM circuit with a frequency of 150 Hz with a duty cycle range of 10% to 90%. If the transmission fluid level is low or overfilled or there are any restrictions in the transmission lines, hoses (if vehicle is equipped with external lines or hoses) or cooler it may affect the electric transmission fluid pump operation.

DTC	Duty Cycle Range	Condition
P0C2D	Less than 10%	Out of range Low
P0C27	10% to 15%	Pump current too Low, Speed OK
P0C28	20% to 25%	Pump Current Too High, Speed OK
P175A	30% to 34%	Pump Over Temperature
P0C2A	35% to 40%	Pump Stalled
NONE	44% to 50%	Normal Value Of Signal
P0B0D	55% to 60%	Pump Over Speed – current OK
P0B0D	65% to 70%	Pump Under Speed – current OK
P0C29	75% to 80%	Both Current and Speed out of range
P2796	85% to 90%	No Command received from Control Module
P0C2E	Greater than 90%	Duty Cycle Out of range HI - undefined
P0C2C	Any other value (between)	Invalid duty cycle or invalid frequency. This could include no signal.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0B0D	Electric Transmission Fluid Pump Motor Control Module	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz and a valid duty cycle was detected (55% to 60% or 65% to 70%). The electric transmission fluid pump has detected a pump over or under speed condition. The current flow through the pump was within specification.
P0C27	Electric Transmission Fluid Pump Motor Control Module	Possible causes are loss of pump prime or low transmission fluid level. This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (10% to 15% duty cycle).
P0C28	Electric Transmission Fluid Pump Motor Current Low	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (20% to 25% duty cycle).
P0C29	Electric Transmission Fluid Pump Motor Current High	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a high current is detected.
P0C2A	Electric Transmission Fluid Pump Motor Stalled	This DTC sets if the PCM commands the electric transmission fluid pump motor on and does not detect a corresponding increase in pump speed, indicating a stalled pump motor.
P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/Performance	This DTC sets if the E-Pump frequency is between 125 and 175Hz but has an invalid duty cycle or the frequency is outside of the 125-175Hz range. This can be caused by a loss of power to the E-Pump.
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	This DTC sets if the duty cycle is less than 10%.
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	This DTC sets if the duty cycle is greater than 90%.

P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but an over temperature condition is detected (30% to 34% duty cycle). This DTC can be caused by high transmission fluid temperatures
P2796	Electric Transmission Fluid Pump Control Circuit	This DTC sets when the electric transmission fluid pump reports to the PCM that it is not receiving a PWM from the PCM.

PINPOINT TEST F : DTCS P0B0D, P0C27, P0C28,P0C29, P0C2A, P175A

F1 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP POWER CIRCUITS

- Ignition OFF.
- Disconnect Transmission Harness Connector C168A.
- Ignition ON.

Is the voltage greater than 11 volts?

Yes	GO to F2
No	VERIFY the BJB fuse 98 (15A) is OK. If fuses are OK, REPAIR the affected circuit for an open. If fuses are not OK, REFER to the Wiring Diagrams manual to identify the cause of the affected circuit shorted to ground.

F2 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	GO to F3
No	REPAIR the circuit

F3 CHECK THE TRANSMISSION FLUID LEVEL

- Ignition OFF.
- Check the transmission fluid level.
REFER to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

Is the transmission fluid level correct?

Yes	GO to F4
No	CORRECT the transmission fluid to the proper level.

F4 CHECK THE ELECTRIC SUMP SEALS

- Ignition OFF.
- Drain the transmission fluid and remove the transmission pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Remove the electric transmission fluid pump and sump and inspect the seals.

Are the electric transmission fluid pump seals OK?

Yes	INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL new seals on the electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

When the electrical connector or solenoid is disconnected, inspect the connector for terminal condition, corrosion and contamination and the connector seal for damage. Also inspect the connector seal for damage. Clean, repair or install new components as required. If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The TCC is controlled by a directly proportional solenoid. Like the shift solenoids the TCC solenoid is controlled by a “smart driver” capable of detecting open, short to ground and short to power faults. In the event of an open circuit or short to power fault the TCC circuit is failed open. The TCC and LPC solenoids share a high side driver. Anytime power is removed the transmission defaults to MAX line pressure with open TCC. LPC is controlled by an inversely proportional solenoid (0 current = max pressure, max current = min line pressure). The LPC solenoid is controlled by a “smart driver” capable of detecting open, short to ground or short to power faults.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals
- TCC and LPC solenoid(s)
- Main control wiring harness
- Transmission internal wiring harness
- PCM

PINPOINT TEST G : TCC, LPC SOLENOIDS

G1 CHECK THE SOLENOID POWER CIRCUIT TSPC2 FOR VOLTAGE	
• Ignition OFF. • Disconnect: Transmission Harness C168A. • Ignition ON.	
Is the maximum recorded voltage greater than 11 volts?	
Yes	GO to G4
No	GO to G2

G2 CHECK THE SOLENOID POWER CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect: PCM C1232T.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms?

Yes	GO to G3
No	REPAIR the transmission vehicle harness circuit for an open. CLEAR the DTCs. If DTC P0657 returns, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14A Electronic Engine Controls - 2.7L EcoBoost (238kW/324PS), Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

G3 CHECK THE SOLENOID POWER CIRCUIT FOR SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	GO to G4
No	REPAIR the transmission vehicle harness circuit short to ground.

G4 CHECK VEHICLE HARNESS SOLENOID CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect: PCM C1232T
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to G5
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

G5 CHECK VEHICLE HARNESS SOLENOID CONTROL CIRCUITS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms on the suspect circuit?

Yes	GO to G6
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

G6 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO POWER

Is any voltage detected on the suspect circuit?

Yes	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.
No	GO to G7

G7 CHECK MAIN CONTROL WIRING HARNESS FOR AN OPEN CIRCUIT

Are the resistances less than 3 ohms?

Yes	GO to G9
No	INSTALL a new main control wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

G8 CHECK MAIN CONTROL WIRING HARNESS FOR A SHORT TO GROUND

Are the resistances greater than 10,000 ohms?

Yes	GO to G9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

G9 CHECK SOLENOID RESISTANCE

- Measure and record the resistance of the suspected solenoid.
REFER to: [Shift Solenoids \(SS\)](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
Compare the recorded value with the chart below:

Solenoid	Ohms
LPC solenoid	4.6 to 5.2
TCC solenoid	4.6 to 5.2

Is the solenoid resistance within specification?

Yes	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new solenoid for the solenoid that failed the resistance check. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Diagnostic Trouble Code (DTC) Charts and Pinpoint Tests - 5.0L 32V Ti-VCT

Principles of Operation

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.
3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom.
REFER to: [Diagnosis By Symptom](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically OFF. Check for an open, short to ground or the transmission connector disconnected. The PCM disables power to the transmission solenoids when certain transmission DTCs are set.

Solenoid Operation Chart

Selector Lever Position	PCM Commanded Gear	SSA (1, 2, 3, 4, 5, 6, M1, M2, R)	SSB (2, 8, 9, 10, M1, M2, R)	SSC (2, 3, 4, 5, 7, 9, 10, M2)	SSD (2, 3, 4, 6, 7, 8, 10, M2, R)	SSE (1, 3, 5, 6, 7, 8, 9, M1)	SSF (4, 5, 6, 7, 8, 9, 10, R)	TCC Solenoid
P	P	On	On	Off	On	Off	Off	Off
R	R	On	On	Off	On	Off	On	Off
N	N	On	On	Off	On	Off	Off	Off
D	1	On	Off	Off	On ^a	On	Off	Off
	2	On	Off	On	On	Off	Off	On/Off
	3	On	Off	On	On	On	Off	On/Off
	4	On	Off	On	On	Off	On	On/Off
	5	On	Off	On	Off	On	On	On/Off
	6	On	Off	Off	On	On	On	On/Off
	7	Off	Off	On	On	On	On	On/Off
	8	Off	On	Off	On	On	On	On/Off
	9	Off	On	On	Off	On	On	On/Off
	10	Off	On	On	On	Off	On	On/Off
M1	1	On	On	Off	On ^a	On	Off	Off
M2	2	On	On	On	On	Off	Off	Off

- On to reduce frictional losses from a released clutch, but does not contribute to power flow.

DTC Chart: PCM

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

DTC Chart

DTC	Description	Warning Light/DTC Type	Action
P0602	Powertrain Control Module Programming Error	MIL/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P0603	Internal Control Module Keep Alive Memory (KAM) Error	MIL/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P0604	Internal Control Module Random Access Memory (RAM) Error	MIL, Wrench/Initialization	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P0605	Internal Control Module Read Only Memory (ROM) Error	MIL/Initialization	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P0607	Control Module Performance	MIL/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P060A	Internal Control Module Monitoring Processor Performance	MIL, Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P060B	Internal Control Module A/D Processing Performance	MIL, Wrench	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).

P060C	Internal Control Module Main Processor Performance	MIL, Wrench	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P060D	Internal Control Module Accelerator Pedal Position Performance	MIL, Wrench	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P060F	Internal Control Module Engine Coolant Temperature Performance	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P0610	Control Module Vehicle Options Error	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P061A	Internal Control Module Torque Performance	None/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P061B	Internal Control Module Torque Calculation Performance	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P061C	Internal Control Module Engine RPM Performance	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).

P061D	Internal Control Module Engine Air Mass Performance	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P061E	Internal Control Module Brake Signal Performance	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P062B	Internal Control Module Fuel Injector Control Performance	None/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P062C	Internal Control Module Vehicle Speed Performance	None/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P0630	VIN Not Programmed or Incompatible - ECM/PCM	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P064F	Unauthorized Software/Calibration Detected	MIL, Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).

P0657	Actuator Supply Voltage "A" Circuit Open	MIL, Wrench/Continuous	If the power circuit to the transmission solenoids is interrupted then all solenoids are failed electrically off. CHECK for an open, short to ground or the transmission connector disconnected. REPAIR as required. CLEAR the DTC. GO to Pinpoint Test A
P068A	ECM/PCM Power Relay De-Energized - Too Early	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P06B8	Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error	MIL/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P0702	Transmission Control System Electrical	Wrench/Continuous	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. RERUN the KOEO and KOER self-test. If DTC P0702 returns, REFER to: Charging System - 3.3L Duratec - V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing).

P0706	Transmission Range Sensor "A" Circuit Range/Performance	Wrench/KOEO, Continuous	The TR sensor outputs a duty cycle indicating manual lever position. This DTC sets when the frequency is greater or less than the expected duty cycle by 25Hz or more. Engine may not crank. CLEAR the DTC. If DTC P0706 returns, GO to Pinpoint Test C
P0707	Transmission Range Sensor "A" Circuit Low	Wrench/KOEO, Continuous	Engine may not crank, CLEAR the DTC. If DTC P0707 returns, GO to Pinpoint Test C
P0708	Transmission Range Sensor "A" Circuit High	Wrench/KOEO, Continuous	Engine may not crank, CLEAR the DTC. If DTC P0708 returns, GO to Pinpoint Test C
P0709	Transmission Range Sensor "A" Circuit Intermittent	Wrench/Continuous	The TR sensor outputs a duty cycle indicating manual lever position. This DTC sets when the duty cycle is within range but is in the dead band between the design position, and an in-range but invalid duty cycle. GO to Pinpoint Test C
P0710	Transmission Fluid Temperature Sensor "A" Circuit	Wrench/Continuous	CLEAR the DTC. If DTC P0710 returns, GO to Pinpoint Test B
P0711	Transmission Fluid Temperature Sensor "A" Circuit Range/Performance	MIL/Continuous	CLEAR the DTC. Road test the vehicle at least 5 minutes. If DTC P0711 returns, GO to Pinpoint Test B
P0712	Transmission Fluid Temperature Sensor "A" Circuit Low	MIL/KOEO, Continuous	DTC P0710 may set. CLEAR the DTC. If DTC P0712 returns, GO to Pinpoint Test B

P0713	Transmission Fluid Temperature Sensor "A" Circuit High	MIL/KOEO, Continuous	DTC P0710 may set. CLEAR the DTC. If DTC P0713 returns, GO to Pinpoint Test B
P0715	TSS Sensor "A" Circuit	MIL/KOEO, Continuous	CLEAR DTC. If DTC P0715 returns during KOEO, GO to Pinpoint Test D
P0716	TSS Sensor "A" Circuit Range/Performance	MIL/Continuous	The PCM detected TSS sensor drop out, noise spike, or TSS not corresponding to other speed sensor inputs for current gear. REPAIR all clutch faults first. INSPECT TSS sensor for proper mounting. INSPECT TSS tone wheel (part of No. 2 planetary carrier) for damage.
P0717	TSS Sensor "A" Circuit No Signal	Wrench/Continuous	P0717 illuminates the wrench light in conjunction with P0715, P07BF, and/or P07C0. Service the more specific DTC first. GO to Pinpoint Test D
P0718	TSS Sensor "A" Circuit Intermittent	MIL/Continuous	The PCM detected TSS fault, but the fault did not last long enough for the PCM to set a more specific TSS DTC. Inspect TSS wiring and connectors for damage.
P0720	Output Shaft Speed Sensor Circuit	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P0720 returns during KOEO, GO to Pinpoint Test D
P0721	Output Shaft Speed Sensor Circuit Range/Performance	MIL/Continuous	The PCM detected OSS sensor drop out, noise spike, or OSS not corresponding to other speed sensor inputs for current gear. REPAIR all clutch faults first. INSPECT OSS sensor for proper mounting. INSPECT OSS sensor tone wheel (part of planetary carrier No. 4 output shaft) for damage.

P0722	Output Shaft Speed Sensor Circuit No Signal	Wrench/Continuous	DTC P0722 illuminates the wrench light in conjunction with P0720, P077C, and/or P077D. Service the more specific DTC first. GO to Pinpoint Test D
P0723	Output Shaft Speed Sensor Circuit Intermittent	MIL/Continuous	The PCM detected OSS sensor fault, but the fault did not last long enough for the PCM to set a more specific OSS sensor DTC. Inspect OSS sensor wiring and connectors for damage.
P0729	Gear 6 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 6th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0731	Gear 1 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to first gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0732	Gear 2 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 2nd gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0733	Gear 3 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 3rd gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0734	Gear 4 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 4th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0735	Gear 5 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 5th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0736	Reverse Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to Reverse. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0740	Torque Converter Clutch Solenoid Circuit/Open	Wrench/KOEO, Continuous	CLEAR DTC. If DTC P0740 returns during KOER, GO to Pinpoint Test G
P0741	Torque Converter Clutch Solenoid Circuit Performance/Stuck Off	Wrench/Continuous	DTC P0741 is a non-electrical failure that caused the TCC to fail to apply. For TCC Does Not Apply Symptom, REFER to: Torque Converter Clutch (TCC) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0743	Torque Converter Clutch Solenoid Circuit Electrical	Wrench/KOEO, Continuous	DTC P0743 illuminates the wrench light in conjunction with P0740, P2769, and/or P2770. Service the more specific DTC first. GO to Pinpoint Test G
P0748	Pressure Control Solenoid Electrical	Wrench/KOEO, Continuous	DTC P0748 illuminates the wrench light in conjunction with P0960, P0962, and/or P0963. Service the more specific DTC first. GO to Pinpoint Test G
P0751	Shift Solenoid "A" Performance/ Stuck Off	MIL/KOEO, Continuous	DTC P0751 is a non-electrical failure indicating the A clutch failed to apply. For A clutch Does Not Apply symptom, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0752	Shift Solenoid "A" Stuck On	MIL/Continuous	DTC P0752 is a non-electrical failure indicating A clutch stayed applied when SSA was de-energized. For A clutch Always Applied symptom, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0753	Shift Solenoid "A" Electrical	Wrench/KOEO, Continuous	DTC P0753 illuminates the wrench light in conjunction with P0973, P0974, and/or P097A. Service the more specific DTC first. GO to Pinpoint Test A

P0754	Shift Solenoid "A" Intermittent	MIL/Continuous	The PCM detected a SSA fault, but the fault did not last long enough for the PCM to set a more specific SSA DTC. Inspect SSA wiring and connectors for damage.
P0756	Shift Solenoid "B" Performance/ Stuck Off	MIL/Continuous	DTC P0756 is a non-electrical failure indicating the B clutch failed to apply. For B clutch Does Not Apply symptom, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0757	Shift Solenoid "B" Stuck On	MIL/Continuous	DTC P0757 is a non-electrical failure indicating the B clutch stayed applied when SSB was de-energized. For B clutch Always Applied symptom, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0758	Shift Solenoid "B" Electrical	Wrench, KOEO, Continuous	DTC P0758 illuminates the wrench light in conjunction with P0976, P0977, and/or P097B. Service the more specific DTC first. GO to Pinpoint Test A
P0759	Shift Solenoid "B" Intermittent	MIL/Continuous	The PCM detected SSB fault, but the fault did not last long enough for the PCM to set a more specific SSB DTC. Inspect SSB wiring and connectors for damage.

P0761	Shift Solenoid "C" Performance/ Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating the C clutch failed to apply. For C clutch Does Not Apply symptom, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0762	Shift Solenoid "C" Stuck On	MIL/Continuous	DTC P0762 is a non-electrical failure indicating the C clutch stayed applied when SSC was de-energized. For C clutch Always Applied symptom, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0763	Shift Solenoid "C" Electrical	Wrench, KOEO, Continuous	DTC P0763 illuminates the wrench light in conjunction with P0779, P097C, and/or P0980. Service the more specific DTC first. GO to Pinpoint Test A
P0764	Shift Solenoid "C" Intermittent	MIL/Continuous	The PCM detected SSC fault, but the fault did not last long enough for the PCM to set a more specific SSC DTC. Inspect SSC wiring and connectors for damage.
P0766	Shift Solenoid "D" Performance/ Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating the D clutch failed to apply. For D clutch Does Not Apply symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0767	Shift Solenoid "D" Stuck On	MIL/Continuous	DTC P0757 is a non-electrical failure indicating the D clutch stayed applied when SSD was de-energized. For D clutch Always Applied symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0768	Shift Solenoid "D" Electrical	Wrench, KOEO, Continuous	DTC P0768 illuminates the wrench light in conjunction with P097D, P0982, P0982. Service the more specific DTC first. GO to Pinpoint Test A
P0769	Shift Solenoid "D" Intermittent	MIL/Continuous	The PCM detected SSD fault, but the fault did not last long enough for the PCM to set a more specific SSD DTC. Inspect SSD wiring and connectors for damage.
P076F	Gear 7 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 7th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0771	Shift Solenoid "E" Performance/ Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating the E clutch failed to apply. For E clutch Does Not Apply symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0772	Shift Solenoid "E" Stuck On	MIL/Continuous	DTC P0772 is a non-electrical failure indicating the E clutch stayed applied when SSE was de-energized. For E clutch Always Applied symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0773	Shift Solenoid "E" Electrical	Wrench/Continuous	DTC P0773 illuminates the wrench light in conjunction with P097E, P0985, P0986. Service the more specific DTC first. GO to Pinpoint Test A
P0774	Shift Solenoid "E" Intermittent	MIL/Continuous	The PCM detected SSE fault, but the fault did not last long enough for the PCM to set a more specific SSE DTC. Inspect SSE wiring and connectors for damage.
P077D	Output Shaft Speed Sensor Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D
P0791	Intermediate Shaft Speed Sensor "A" Circuit	MIL/Continuous	GO to Pinpoint Test D
P0792	Intermediate Shaft Speed Sensor "A" Circuit Range/ Performance	MIL/Continuous	GO to Pinpoint Test D
P0793	Intermediate Shaft Speed Sensor "A" Circuit No Signal	Wrench	GO to Pinpoint Test D

P0794	Intermediate Shaft Speed Sensor "A" Circuit Intermittent	MIL/Continuous	GO to Pinpoint Test D
P07A9	Transmission Friction Element "D" Stuck On	None/Continuous	The PCM detected that D clutch failed to release multiple times and determined the SSD is not stuck on. For D clutch Always Applied symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07AB	Transmission Friction Element "E" Stuck On	None/Continuous	The PCM detected that E clutch failed to release multiple times and determined the SSE is not stuck on. For E clutch Always Applied symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07AD	Transmission Friction Element "F" Stuck On	None/Continuous	The PCM detected that F clutch failed to release multiple times and determined the SSF is not stuck on. For F clutch Always Applied symptom, REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07C0	TSS Sensor "A" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D
P07C6	Intermediate Shaft Speed Sensor "A" Circuit High	MIL/Continuous	GO to Pinpoint Test D

P07C8	Intermediate Shaft Speed Sensor "B" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D
P07D9	Gear 8 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 8th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07F6	Gear 9 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 9th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07F7	Gear 10 Incorrect Ratio	Wrench/Continuous	The PCM detected multiple ratio error either in or while shifting to 10th gear. The ratio error did not last long enough for the PCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0868	Transmission Fluid Pressure Low	Wrench/Continuous	CLEAR the DTC. Road test vehicle, if DTC P0868 returns, If DTCs P0751, P0756, P0761, P0766, P0771 or P2707 are set, TEST for low pump pressure or fluid contamination. PERFORM the line pressure test. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0882	TCM Power Input Signal Low	MIL/KOEO, Continuous	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. If DTC P0882 returns, REFER to: Charging System - 3.3L Duratec - V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing).
P0883	TCM Power Input Signal High	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P0883 returns, REFER to: Charging System - 3.3L Duratec - V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing).
P0884	TCM Power Input Signal Intermittent	MIL/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).

P0960	Pressure Control Solenoid Control Circuit/Open	MIL/KOEO, Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G
P0961	Pressure Control Solenoid Control Circuit Range/Performance	MIL/Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G
P0962	Pressure Control Solenoid Control Circuit Low	MIL/KOEO, Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G
P0963	Pressure Control Solenoid Control Circuit High	MIL/KOEO, Continuous	The LPC solenoid failed to high current which is maximum pressure indicating short to ground, wiring or solenoid issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test G
P0973	Shift Solenoid "A" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSA electrical. Since SSA shorted to ground causes SSA to be failed to high current (maximum pressure since SSA is directly proportional). A clutch is failed on. GO to Pinpoint Test A

P0974	Shift Solenoid "A" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSA electrical. Since SSA shorted to power causes SSA to be failed to low current (minimum pressure since SSA is directly proportional). A clutch is failed off. GO to Pinpoint Test A
P0976	Shift Solenoid "B" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSB electrical. Since SSB shorted to ground causes SSB to be failed to high current (maximum pressure since SSB is directly proportional). B clutch is failed on. GO to Pinpoint Test A
P0977	Shift Solenoid "B" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSB electrical. Since SSB shorted to power causes SSB to be failed to low current (minimum pressure since SSB is directly proportional). B clutch is failed off. GO to Pinpoint Test A
P0979	Shift Solenoid "C" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSC electrical. Since SSC shorted to ground causes SSC to be failed to high current (maximum pressure since SSC is directly proportional). C clutch is failed on. GO to Pinpoint Test A

P097A	Shift Solenoid "A" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSA electrical. Since SSA shorted to power causes SSA to be failed to low current (minimum pressure since SSA is directly proportional). A clutch is failed off. GO to Pinpoint Test A
P097B	Shift Solenoid "B" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates an open circuit in the SSB electrical. Since SSB shorted to power causes SSB to be failed to low current (minimum pressure since SSB is directly proportional). B clutch is failed off. GO to Pinpoint Test A
P097C	Shift Solenoid "C" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSC electrical. Since SSC shorted to power causes SSC to be failed to low current (minimum pressure since SSC is directly proportional). C clutch is failed off. GO to Pinpoint Test A
P097D	Shift Solenoid "D" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSD electrical. Since SSD shorted to power causes SSD to be failed to low current (minimum pressure since SSD is directly proportional). D clutch is failed off. GO to Pinpoint Test A

P097E	Shift Solenoid "E" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSE electrical. Since SSE shorted to power causes SSE to be failed to low current (minimum pressure since SSE is directly proportional). E clutch is failed off. GO to Pinpoint Test A
P097F	Shift Solenoid "F" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSF electrical. Since SSF shorted to power causes SSF to be failed to low current (minimum pressure since SSF is directly proportional). F clutch is failed off. GO to Pinpoint Test A
P0980	Shift Solenoid "C" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSC electrical. Since SSC shorted to power causes SSC to be failed to low current (minimum pressure since SSC is directly proportional). C clutch is failed off. GO to Pinpoint Test A
P0982	Shift Solenoid "D" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSD electrical. Since SSD shorted to ground causes SSD to be failed to high current (maximum pressure since SSD is directly proportional). D clutch is failed on. GO to Pinpoint Test A

P0983	Shift Solenoid "D" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSD electrical. Since SSD shorted to power causes SSD to be failed to low current (minimum pressure since SSD is directly proportional). D clutch is failed off. GO to Pinpoint Test A
P0985	Shift Solenoid "E" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSE electrical. Since SSE shorted to ground causes SSE to be failed to high current (maximum pressure since SSE is directly proportional). E clutch is failed on. GO to Pinpoint Test A
P0986	Shift Solenoid "E" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSE electrical. Since SSE shorted to power causes SSE to be failed to low current (minimum pressure since SSE is directly proportional). E clutch is failed off. GO to Pinpoint Test A
P0998	Shift Solenoid "F" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSF electrical. Since SSF shorted to ground causes SSF to be failed to high current (maximum pressure since SSE is directly proportional). F clutch is failed on. GO to Pinpoint Test A

P0999	Shift Solenoid "F" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSF electrical. Since SSF shorted to power causes SSF to be failed to low current (minimum pressure since SSF is directly proportional). E clutch is failed off. GO to Pinpoint Test A
P0B0D	Electric Transmission Fluid Pump Motor Control Module	None/Continuous	CLEAR the DTC. If the DTC returns, INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
P0C27	Electric Transmission Fluid Pump Motor Current Low	None/Continuous	This DTC applies to auto-start-stop vehicles only. This DTC sets when the PCM detects low current (10% to 15% duty cycle). Auto-Start-Stop unavailable and the engine will only stop when the operator turns the ignition off. The engine may restart unexpectedly when the vehicle is stopped. CLEAR the DTC. If the DTC returns, GO to Pinpoint Test F
P0C28	Electric Transmission Fluid Pump Motor Current Low	None/Continuous	GO to Pinpoint Test F
P0C29	Electric Transmission Fluid Pump Motor Current High	None/Continuous	GO to Pinpoint Test F
P0C2A	Electric Transmission Fluid Pump Motor Stalled	None/Continuous	GO to Pinpoint Test F

P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/Performance	Wrench/Continuous	GO to Pinpoint Test E
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	Wrench/Continuous	GO to Pinpoint Test E
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	Wrench/Continuous	GO to Pinpoint Test E
P1001	The KOER Not Able to Complete, KOER Aborted	None/KOER	RETRIEVE and RECORD all DTCs. REPAIR any self-test or CMDTCs first. CLEAR the DTC. RERUN the KOER self-test. If the DTC returns, REPROGRAM the PCM to the latest software. RERUN the KOER self-test. If the DTC returns, INSTALL a new PCM REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). After installing the new PCM PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P1397	System Voltage Out Of Self Test Range	None/KOEO	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. RUN the KOEO self-test. If DTC P1397 returns, REFER to: Charging System - 3.3L Duratec - V6/5.0L 32V Ti-VCT (414-00 Charging System - General Information, Diagnosis and Testing).
P1501	Vehicle Speed Sensor Out Of Self Test Range	None/KOEO	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P160A	Control Module Vehicle Options Reconfiguration Error	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P162D	Internal Control Module Cruise Control Performance	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P162E	Internal Control Module PTO Control Performance	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).

P1636	Inductive Signature Chip Communication Error	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P1636 returns, INSTALL a new . PCM. REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). After installing the new PCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P1639	Vehicle ID Block Corrupted Not Programmed	KOEO, KOER, Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P163E	Transmission Control Module Programming Error	MIL/KOEO, Continuous	CLEAR the DTC. REPROGRAM the original PCM with the latest software. If DTC P163E returns, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). After installing the new PCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B

			Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P163F	Transmission ID Block Corrupted, Not Programmed	MIL/KOEO, Continuous	CLEAR the DTC. REPROGRAM the original PCM with the latest software. If DTC P163F returns, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). After installing the new PCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P164C	Internal control Module Start Stop Performance	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P1674	Control Module Software Corrupted	MIL, Wrench/KOEO, Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P1705	Transmission Range Circuit Not Indicating Park/Neutral During Self Test	None/KOEO	CLEAR the DTC. RERUN the KOEO and KOER self-test. If DTC P1705 returns, GO to Pinpoint Test C

P1711	Transmission Fluid Temperature Sensor Out Of Self Test Range	None/KOEO	CLEAR the DTC and RERUN the KOEO and KOER self-test. If the DTC returns, GO to Pinpoint Test B
P1744	Torque Converter Clutch Solenoid Circuit Performance	Wrench/Continuous	DTC P1744 is a non-electrical DTC. CLEAR the DTC. If DTC P1744 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	None/Continuous	GO to Pinpoint Test F
P1783	Transmission Over Temperature Condition	Wrench/Continuous	CLEAR the DTC. If DTC P1783 returns, determine if this DTC was set in conjunction with any TFT sensor circuit DTCs and RESOLVE them first, otherwise REFER to: Transmission Cooling (307-02 Transmission Cooling) .
P1A02	Transmission One Way Clutch Performance	Wrench/Continuous	This DTC sets when the PCM detects 3 failures of the one-way clutch to lock in 1st or 2nd gear allowing sun gear 1 to rotate backwards. CLEAR the DTC, road test the vehicle. If DTC P1A02 returns, it may indicate a one way clutch failure. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

P2531	Ignition Switch Run Position Circuit Low	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P2532	Ignition Switch Run Position Circuit High	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P264F	Engine Serial Number Not Programmed Or Incompatible	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
P2669	Actuator Supply Voltage "B" Circuit/Open	MIL/Continuous	GO to Pinpoint Test A
P26C3	Internal Control Module Transmission Range Sensor Performance	MIL, Wrench/KOEO, Continuous	CLEAR the DTC. If DTC P26C3 returns, TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
P26C4	Internal Control Module Transmission Range Sensor Performance	None	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).

P2700	Transmission Friction Element "A" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0751 (A clutch stuck off) and P0752 (A clutch stuck on), service the more specific DTC first. See DTCs P0751 and P0752 for potential causes. If P0751 and P0752 are not set refer to the associated symptoms, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2701	Transmission Friction Element "B" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0756 (B clutch stuck off) and P0757 (B clutch stuck on), service the more specific DTC first. See DTCs P0756 and P0757 for potential causes, if these DTCs are not set refer to the associated symptoms, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2702	Transmission Friction Element "C" Apply Time Range/Performance	Wrench/Continuous	This DTC set with either P0761 (C clutch stuck off) and P0762 (C clutch stuck on) - service the more specific DTC first (if present). See P0761 and P0762 for potential causes first. If these DTCs are not set refer to the associated symptoms, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P2703	Transmission Friction Element "D" Apply Time Range/Performance	Wrench/Continuous	This DTC set with either P0766 (D clutch stuck off) and P0767 (D clutch stuck on) service the more specific DTC first (if present). See P0766 and P0767 for potential causes first. If these DTCs are not set, refer to the associated symptoms, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2704	Transmission Friction Element "E" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0771 (E clutch stuck off) and P0772 (E clutch stuck on) service the more specific DTC first (if present). See P0771 and P0772 for potential causes. If these DTCs are not set, refer to the associated symptoms, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2705	Transmission Friction Element "F" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P2707 (F clutch stuck off) and P2708 (F clutch stuck on), service the more specific DTC first. See DTCs P2707 and P2708 for potential causes. If these DTCs are not set, refer to the associated symptoms, REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P2707	Shift Solenoid "F" Performance/ Stuck Off	MIL/Continuous	F clutch stuck off due to a non-electrical fault. Multiple attempts to apply F clutch failed. GO to Pinpoint Test A
P2708	Shift Solenoid "F" Stuck On	MIL/Continuous	F clutch stuck on due to a non-electrical fault. Multiple attempts to apply F clutch failed. GO to Pinpoint Test A
P2709	Shift Solenoid "F" Electrical	MIL/KOEO, Continuous	SSF (controls F clutch) VFS circuit failure non-MIL "sister" DTCs of P097F, P0998, P0999 used to illuminate the Wrench Light. If one of the more specific circuit codes is set, follow repair procedures for that code. GO to Pinpoint Test A
P2710	Shift Solenoid "F" Intermittent	MIL/Continuous	The PCM detected SSF fault, but the fault did not last long enough for the PCM to set a more specific SSF DTC. Inspect SSF wiring and connectors for damage.
P2745	Intermediate Shaft Speed Sensor "B" Circuit	MIL/KOEO, Continuous	An open circuit fault was detected by the PCM smart driver. GO to Pinpoint Test D
P2746	Intermediate Shaft Speed Sensor "B" Circuit Range/ Performance	MIL/Continuous	GO to Pinpoint Test D
P2747	Intermediate Shaft Speed Sensor "B" Circuit No Signal	Wrench/Continuous	GO to Pinpoint Test D
P2748	Intermediate Shaft Speed Sensor "B" Circuit Intermittent	MIL/Continuous	GO to Pinpoint Test D

P2758	Torque Converter Clutch Pressure Control Solenoid Stuck On	MIL/Continuous	TCC stuck on when commanded off due to non-electrical failure. CLEAR the DTC. If DTC P2758 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2760	Torque Converter Clutch Pressure Control Solenoid Intermittent	MIL/Continuous	The PCM detected TCC fault, but the fault did not last long enough for the PCM to set a more specific TCC DTC. Inspect TCC solenoid wiring and connectors for damage.
P2769	Torque Converter Clutch Circuit Low	MIL/Continuous	This DTC indicates a short to ground in the TCC electrical. Since TCC shorted to ground causes TCC to be failed to high current (maximum pressure since TCC is directly proportional). TCC is failed on. GO to Pinpoint Test G
P2770	Torque Converter Clutch Circuit High	MIL/Continuous	This DTC indicates a short to power in the TCC electrical. Since TCC shorted to power causes TCC to be failed to low current (minimum pressure since TCC is directly proportional). TCC is failed off. CLEAR the DTC. If DTC P2783 returns, INSPECT TCC control valve for sticking. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

P2783	Torque Converter Temperature Too High	None/Continuous	The TCC control valve is stuck in a position that provides no flow when the TCC is commanded off. The TCC pumps down when commanded off, causing loss of torque multiplication through the TCC.
P2796	Electric Transmission Fluid Pump Control Circuit	None/Continuous	This DTC sets when the transmission auxiliary fluid pump reports to the PCM that it is not receiving a PWM from the PCM. CLEAR the DTC. If the DTC returns, GO to Pinpoint Test E
P27B4	Internal Control Module Transmission Gear Ratio Control Performance	None/Continuous	May be caused by clutch faults that cause reverse in forward range or a forward gear in reverse, or a speed sensor error, CLEAR the DTC. If DTC P27B4 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P27B5	Internal Control Module Transmission Gear Select Performance	None/Continuous	CLEAR the DTC. If DTC P27B5 returns, if any TR DTCs are set RESOLVE them first. If DTC P27B5 returns, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure.

			REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P27B6	Internal Control Module Transmission Speed Sensor Performance	MIL, Wrench/Continuous	CLEAR the DTC. Road test the vehicle. If any speed sensor DTCs are set, RESOLVE them first. If DTC P27B6 returns, PCM. REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P2801	Transmission Range Sensor "B" Circuit Range/Performance	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2802	Transmission Range Sensor "B" Circuit Low	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2803	Transmission Range Sensor "B" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2804	Transmission Range Sensor "B" Circuit Intermittent	Wrench/KOEO, Continuous	GO to Pinpoint Test C
P2805	Transmission Range Sensor "A"/"B" Correlation	MIL/KOEO, Continuous	GO to Pinpoint Test C

U0028	Vehicle Communication Bus "A"	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
U0037	Vehicle Communication Bus "B"	Wrench/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
U0073	Control Module Communication Bus "A" Off	MIL/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).
U0074	Control Module Communication Bus "B" Off	MIL/Continuous	REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing).

Pinpoint Tests

Power is routed through the transmission solenoid power control (inside the PCM) to all transmission solenoids. If the power circuit to the transmission solenoids or the transmission solenoid power control fails open, all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The transmission solenoid power control disables power to the transmission solenoids when certain transmission DTCs are set.

- Carry out KOEO and KOER procedures.
- Retrieve and record all DTCs.
- Repair all non-transmission DTCs first.
- Repair all transmission DTCs second.
- Clear all CMDTCs and attempt to repeat them.
- Repair all CMDTCs.
- If only pass codes are obtained,

REFER to: [Diagnosis By Symptom](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

Transmission Control Solenoids

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The 10R80 utilizes 6 shift (A through F) solenoids that are linear force solenoids. Unlike previous shift solenoids they are mechanical in nature meaning no transmission fluid passes through them. CIDASs use an armature pin assembly that moves a control valve in the main control valve body to control and apply hydraulic fluid pressure. Each clutch (A through F) has a corresponding shift solenoid (A through F) that is directly proportional in that zero current equals zero pressure and maximum current equals maximum pressure. Since there is no pressure with zero current, none of the clutch packs are able to engage if the power is interrupted to the shift solenoids .

PINPOINT TEST A : TRANSMISSION CONTROL SOLENOIDS

A1 CHECK THE SOLENOID POWER CIRCUIT FOR VOLTAGE	
NOTE: <i>Read and record all DTCs.</i>	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C168A. • Ignition ON.	
Is the maximum recorded voltage greater than 11 volts?	
Yes	GO to A4
No	GO to A2
A2 CHECK THE SOLENOID POWER CIRCUIT FOR AN OPEN	

- Ignition OFF.
- Disconnect: PCM C1381T
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms?

Yes	GO to A3
No	REPAIR transmission vehicle harness circuit for an open.

A3 CHECK THE SOLENOID POWER CIRCUIT FOR A SHORT TO GROUND

-

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C1381T-2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

A4 CHECK SOLENOID CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect: PCM C1381T
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A5
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

A5 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms on the suspect circuit?

Yes	GO to A6
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

A6 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO POWER

Is any voltage detected?

Yes	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.
No	GO to A7

A7 CHECK MAIN CONTROL WIRING HARNESS SOLENOID POWER CIRCUIT FOR AN OPEN CIRCUIT

- Drain the transmission fluid and remove the transmission fluid pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Disconnect Shift Solenoid Connectors (A through F).
- Disconnect Main Control Wiring Harness C177.
- Measure resistance of the suspect solenoid power circuit of the main control wiring harness, using the table below:

Positive Lead	Measurement / Action	Negative Lead
C177-5	Ω	SSA C1843-1
C177-5		SSB C1844-1
C177-5		SSC C1845-1
C177-5		SSD C1846-1
C177-5		SSE C1847-1

C177-5		SSF C1848-1
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Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A8 CHECK MAIN CONTROL WIRING HARNESS SOLENOID POWER CIRCUIT FOR A SHORT TO GROUND

- INSPECT main control wiring harness for chafes or bare wires.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C177-5	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to A9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A9 CHECK MAIN CONTROL WIRING HARNESS SOLENOID CONTROL CIRCUIT FOR AN OPEN CIRCUIT

- Measure resistance of the suspect solenoid control circuit of the main control wiring harness, using the table below:

Positive Lead	Measurement / Action	Negative Lead
C177-8	Ω	SSA C1843-2
C177-9		SSB C1844-2
C177-10		SSC C1845-2
C177-11		SSD C1846-2
C177-3		SSE C1847-2
C177-4		SSF C1848-2

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A11
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A10 CHECK MAIN CONTROL WIRING HARNESS SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

- Disconnect Shift Solenoid Connectors (A through F) (If not disconnected already).
- Measure:

Positive Lead	Measurement / Action	Negative Lead
SSA C1843-2	Ω	Ground
SSB C1844-2		Ground
SSC C1845-2		Ground
SSD C1846-2		Ground
SSE C1847-2		Ground

SSF C1848-2		Ground
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Is the resistance greater than 10,000 ohms?

Yes	GO to A11
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A11 CHECK SOLENOID RESISTANCE

- Disconnect the suspect solenoid connector and remove the suspect shift solenoid.
REFER to: [Shift Solenoids \(SS\)](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Measure and record the resistance of the suspected solenoid.

Is the shift solenoid resistance between 4.8 and 5.4 ohms?

Yes	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new solenoid for the solenoid that failed the resistance check. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TFT sensor is a temperature dependent resistor that is in contact with transmission fluid in the transmission sump area. The PCM monitors the voltage across the TFT sensor, which changes as transmission fluid temperature varies. The PCM uses the TFT sensor signal as an input for its strategy for shifting and TCC operation. The PCM also uses the TFT sensor signal for transmission fault detection and diagnostics.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals
- TFT sensor
- Transmission internal wiring harness frame
- PCM

PINPOINT TEST B : TFT (TRANSMISSION FLUID TEMPERATURE) SENSOR

B1 CHECK TFT INPUT SIGNAL	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C168A. • Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals. • Connect the diagnostic tool. • Ignition ON. • Enter the following mode on the diagnostic scan tool: Datalogger. Monitor the following TFT PIDs, TFT and TFTV.	
Does the TFT PID display -40°C (-40°F) and the TFTV PID display 4.96 to 5.10 volts?	
Yes	GO to B2
No	REPAIR the circuit.

B2 CHECK TFT SIGNAL INPUT CIRCUIT FOR VOLTAGE

Is the voltage between 4.8 and 5.1 volts?

Yes	GO to B3
No	INSPECT and REPAIR the open circuit. If an open circuit is not found, INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

B3 CHECK TFT SIGNAL RETURN CIRCUIT

Does the TFT PID display 190°-195°C (374°-383°F) and the TFTV PID display 0 volts?

Yes	GO to B4
No	INSPECT and REPAIR the open circuit. If an open circuit is not found, INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

B4 CHECK INTERNAL WIRING HARNESS FOR AN OPEN

- Ignition OFF.
- Disconnect TFT Sensor C1842.
- Disconnect TR Sensor C167.

Are the resistances less than 3 ohms?

Yes	GO to B5
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

B5 CHECK INTERNAL WIRING HARNESS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	INSPECT and CLEAN the TFT sensor for metallic contamination. INSTALL a new TFT sensor. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). CLEAR the DTCs.
No	GO to B6

B6 CHECK TFT SENSOR RESISTANCE

- Connect TFT sensor C1842.

Does the temperature to resistance specification match?

Yes	To diagnose an overheating concern, REFER to: Transmission Cooling (307-02 Transmission Cooling, Diagnosis and Testing).
No	INSTALL a new TFT. REFER to: Transmission Fluid Temperature (TFT) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

TR Sensor

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TR sensor is comprised of a dual set of TR sensors. The manual shifter engages and disengages Park and the shifter position is detected by reading TR sensors A and B. There is no manual valve, the PCM provides forward or reverse based on the dual TR sensor inputs. The 10R80 transmission uses dual PWM output (at 125 Hz) TR sensors where: TR sensor A increases as the shifter is moved from Park to Sport and TR sensor B decreases as the shifter is moved from Park to Sport, together the sum of the two signals should add up to 100%. The 10R80 transmission mechanical shifter variant is range by wire with mechanical Park. The dual TR sensor's signals determine customer selected range (P, R, N, D, S). PIDs, TR_A_DC and TR_B_DC may be utilized to monitor the TR sensor duty cycles.

Typical TR Sensors PWM Output

	Transmission Range Sensor A		Transmission Range Sensor B	
Gear	Min	Max	Min	Max
P	8.00	18.96	81.04	92.00

R	35.50	47.90	52.10	64.50
N	51.75	61.75	38.25	48.25
D	67.45	77.45	22.55	32.55
Sport	81.12	92.00	8.00	18.88

PINPOINT TEST C : TR SENSOR

C1 VERIFY DTCS

NOTE: Read and record all DTCs.

- Ignition OFF.
- Select PARK.
- Connect the diagnostic tool.
- Carry out the KOEO then the KOER test.

Are TR sensor DTCs present?

Yes	GO to C2
No	If no DTCs are present, and to diagnose any symptoms that may be present, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

C2 CHECK TR SENSOR ELECTRICAL OPERATION

- Ignition ON.
- Enter the following diagnostic mode on the scan tool: TR PID: TR_A_DC and TR_B_DC.
- Move the selector lever into each range and stop.
- Observe the PIDs: TR_A_DC and TR_B_DC while wiggling the harness or driving the vehicle.
- Compare the duty cycles shown by the PIDs TR_A_DC and TR_B_DC to the selector lever position duty cycle, using the following chart.

Typical TR Sensor(s) PWM Output

Gear	Transmission Range Sensor A		Transmission Range Sensor B	
	Min	Max	Min	Max
P	8.00	18.96	81.04	92.00
R	35.50	47.90	52.10	64.50
N	51.75	61.75	38.25	48.25
D	67.45	77.45	22.55	32.55
Sport	81.12	92.00	8.00	18.88

Are the TR_A_DC and TR_B_DC duty cycles within range?

Yes	The problem is not in the TR sensor. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
No	GO to C3

C3 CHECK TR SENSOR CIRCUITS FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Are the voltages approximately 5 volts?

Yes	GO to C4
No	GO to C5

C4 CHECK TR SENSOR VOLTAGE CIRCUIT FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is the voltage approximately 9 volts?

Yes	GO to C7
No	GO to C5

C5 CHECK TR SENSOR VOLTAGE CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	GO to C6
No	REPAIR the circuit.

C6 CHECK TR SENSOR VOLTAGE CIRCUIT FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

C7 CHECK TR SENSOR GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	INSTALL a new TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	REPAIR the circuit.

C8 CHECK TR SENSOR TRP1, TRP2, CIRCUITS FOR POWER

- Drain the transmission fluid and remove the transmission fluid pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Connect Transmission Vehicle Harness C168A.
- Disconnect TR sensor C167.
- Ignition ON.

Are the voltages approximately 5 volts?

Yes	GO to C9
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

C9 CHECK TR SENSOR VREF CIRCUIT FOR POWER

- Connect Transmission Vehicle Harness C168A.
- Disconnect TR sensor C167.
- Ignition ON.

Is the voltage approximately 9 volts?

Yes	GO to C10
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

C10 CHECK TRANSMISSION INTERNAL WIRING HARNESS FOR AN OPEN CIRCUIT

- Ignition OFF.

Are the resistances less than 3 ohms?

Yes	INSTALL a new TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

OSS, TSS Sensor, ISSA and ISSB

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation TSS Sensor

The TSS sensor is a Hall-effect type sensor that provides a signal to the PCM that changes in frequency as the rotating speed of the planetary carrier No. 2 varies. The PCM compares the TSS sensor signal with the engine speed information to determine the amount of slip occurring in the torque converter. The PCM also compares the TSS sensor signal with the OSS sensor signal to determine the gear ratio provided by the planetary carrier No. 4. The PCM uses the TSS sensor signal as an input for its strategies for shifts and TCC operation. The PCM also uses the TSS sensor signal for transmission fault detection and diagnostics.

Normal Operation OSS Sensor

The OSS sensor is a Hall-effect type sensor that provides a signal to the PCM that changes in frequency as the rotating speed of the rear planetary carrier No. 4 varies. The PCM also compares the OSS sensor signal with the TSS sensor signal to determine the gear ratio provided by the rear planetary gearset. The PCM uses the OSS sensor signal as an input for its strategies for shifts and TCC operation. The PCM also uses the OSS sensor signal for transmission fault detection and diagnostics.

Normal Operation Intermediate Speed Sensors A and B

The Intermediate Speed Sensors A (ISSA) and B (ISSB) are Hall-effect type sensors that provide a signal to the PCM that changes in frequency as the rotating speed of the component being monitored changes. ISSA monitors the speed and rotational direction of ring gear 1 and ISSB monitors the speed and rotational direction of planetary carrier-1/ring gear 4. The Intermediate speed sensors are used to monitor clutch states for transmission fault detection and diagnostics.

TSS Sensor DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0715	TSS Sensor Circuit	This DTC sets if the PCM detects an open or short to ground in the TSS sensor circuitry.
P0716	TSS Sensor Circuit Range/Performance	This DTC sets if the PCM detects too large of a sensor air gap, a TSS sensor fault or an undetected clutch fault.
P0717	TSS Sensor Circuit No Signal	This DTC sets relationally if the DTCs P0715, P07BF, P07C0 are set, RESOLVE these DTCs first.
P0718	TSS Sensor Circuit Intermittent	This DTC sets if the PCM detects an intermittent circuit fault in the TSS circuit.
P07BF	ITSS Sensor Circuit Low	This DTC sets if the PCM detects an open or short to ground in the TSS sensor circuitry.
P07C0	TSS Sensor Circuit High	This DTC sets if the PCM detects an open circuit in the TSS sensor circuitry.

Intermediate Sensor A (ISSA) DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0791	Intermediate Shaft Speed Sensor "A" Circuit	This DTC sets if the PCM detects an open or short to ground in the ISSA sensor circuitry.

P07C6	Intermediate Shaft Speed Sensor "A" Circuit High	This DTC sets relationally if the DTCs P0715, P07BF, P07C0 are set, RESOLVE these DTCs first.
P0792	Intermediate Shaft Speed Sensor "A" Circuit Range/Performance	This DTC sets if the PCM detects an intermittent circuit fault in the ISSA sensor circuit.
P0793	Intermediate Shaft Speed Sensor "A" Circuit No Signal	This DTC sets if the PCM detects an open or short to ground in the ISSA sensor circuitry.
P0794	Intermediate Shaft Speed Sensor "A" Circuit Intermittent	This DTC sets if the PCM detects an open circuit in the ISSA sensor circuitry.

Intermediate Sensor B (ISSB) DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P2745	Intermediate Shaft Speed Sensor "B" Circuit	This DTC sets if the PCM detects an open or short to ground in the ISSB sensor circuitry.
P2746	Intermediate Shaft Speed Sensor "B" Circuit Range/Performance	This DTC sets if the PCM detects an intermittent circuit fault in the ISSB sensor circuit..
P2747	Intermediate Shaft Speed Sensor "B" Circuit No Signal	This DTC sets if the PCM detects an open or short to ground in the ISSB sensor circuitry.
P2748	Intermediate Shaft Speed Sensor "B" Circuit Intermittent	This DTC sets if the PCM detects an open circuit in the ISSB sensor circuitry.

OSS Sensor DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions

P0720	OSS Sensor Circuit	This DTC sets if the PCM detects an open or short to ground in the OSS sensor circuitry.
P0721	OSS Sensor Circuit Range Performance	This DTC sets if the PCM detects too large of a sensor air gap, a TSS sensor fault or an undetected clutch fault.
P0722	OSS Sensor Circuit No Signal	This DTC sets relationally if the DTCs P0720, P077C or P077D are set, RESOLVE these DTCs first.
P0793	OSS Sensor "A" Circuit No Signal	This DTC sets if the PCM detects an open or short to ground in the OSS sensor circuitry.
P077D	OSS Sensor Circuit High	This DTC sets relationally if the DTCs P0720, P0721, P0793 are set, RESOLVE these DTCs first.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires or ground and missing or damaged seals
- TSS sensor
- OSS sensor
- Intermediate Speed Sensor A (ISSA)
- Intermediate Speed Sensor B (ISSB)

PINPOINT TEST D : OSS (OUTPUT SHAFT SPEED) , TSS (TURBINE SHAFT SPEED) SENSORS, INTERMEDIATE SPEED SENSORS A AND B

D1 CHECK SENSOR POWER CIRCUIT FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is the voltage on the suspect circuit 8.8 to 9.2 volts?

Yes	GO to D5
No	GO to D2

D2 CHECK THE SENSOR POWER CIRCUIT FOR A SHORT TO GROUND

- Disconnect: PCM C1381T.
- Ignition OFF.

Is the resistance on the suspect circuit greater than 10,000 ohms?

Yes	GO to D3
No	INSPECT and REPAIR transmission vehicle harness sensor power circuit for a short to ground.

D3 CHECK THE SENSOR POWER CIRCUIT FOR AN OPEN

- Ignition ON.

Is the resistance on the suspect circuit less than 3 ohms?

Yes	INSTALL a new PCM, REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

D4 CHECK THE SENSOR SIGNAL CIRCUIT FOR A SHORT TO POWER

- Ignition OFF.
- Disconnect: PCM C1381T.
- Disconnect: Transmission Vehicle Harness C168A (If not already disconnected).
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to D5

D5 CHECK THE SENSOR RETURN CIRCUIT FOR AN OPEN

- Ignition OFF.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to D6
No	REPAIR the transmission vehicle harness signal return circuit for an open.

D6 CHECK THE SENSOR RETURN CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.

Is the resistance greater than 10,000 ohms?

Yes	GO to D7
No	REPAIR the circuit.

D7 CHECK THE SENSOR RETURN INTERNAL HARNESS CIRCUITS FOR A SHORT TO POWER

- Disconnect for OSS sensor C1107.
- Disconnect for TSS sensor C3106.
- Disconnect for ISSA sensor C1836.
- Disconnect for ISSB sensor C1837.
- Ignition ON.

Is any voltage detected on the suspect circuit?

Yes	GO to D8
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

D8 CHECK THE SENSOR INTERNAL HARNESS POWER CIRCUITS FOR AN OPEN

- Disconnect Suspect Sensor Connector .
- Ignition ON.

Is the resistance greater than 10,000 ohms?

Yes	GO to D9
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

D9 CHECK THE SENSOR INTERNAL HARNESS CIRCUITS FOR A SHORT TO GROUND

- Ignition ON.

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new sensor as necessary. REFER to: Output Shaft Speed (OSS) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Turbine Shaft Speed (TSS) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Intermediate Speed Sensor A (ISSA) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Intermediate Speed Sensor B (ISSB) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

DTCS P0C2A, P0C2C, P0C2D, P0C2E, P2796

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation and Fault Conditions

The electric transmission fluid pump keeps the transmission engaged when the engine is stopped and the transmission is in drive. The electric transmission fluid pump has an internal microprocessor and communicates with the PCM over a PWM circuit with a frequency of 150 Hz with a duty cycle range of 10% to 90%.

DTC	Duty Cycle Range	Condition
P0C2D	Less than 10%	Out of range Low
P0C27	10% to 15%	Pump current too Low, Speed OK
P0C28	20% to 25%	Pump Current Too High, Speed OK
P175A	30% to 34%	Pump Over Temperature
P0C2A	35% to 40%	Pump Stalled
NONE	44% to 50%	Normal Value Of Signal
P0B0D	55% to 60%	Pump Over Speed – current OK
P0B0D	65% to 70%	Pump Under Speed – current OK
P0C29	75% to 80%	Both Current and Speed out of range
P2796	85% to 90%	No Command received from Control Module
P0C2E	Greater than 90%	Duty Cycle Out of range HI - undefined
P0C2C	Any other value (between)	Invalid duty cycle or invalid frequency. This could include no signal.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0B0D	Electric Transmission Fluid Pump Motor Control Module	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz and a valid duty cycle was detected (55% to 60% or 65% to 70%). The electric transmission fluid pump has detected a pump over or under speed condition. The current flow through the pump was within specification.
P0C27	Electric Transmission Fluid Pump Motor Control Module	Possible causes are loss of pump prime or low transmission fluid level. This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (10% to 15% duty cycle).
P0C28	Electric Transmission Fluid Pump Motor Current Low	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (20% to 25% duty cycle).
P0C29	Electric Transmission Fluid Pump Motor Current High	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a high current is detected.
P0C2A	Electric Transmission Fluid Pump Motor Stalled	This DTC sets if the PCM commands the electric transmission fluid pump motor on and does not detect a corresponding increase in pump speed, indicating a stalled pump motor.
P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/ Performance	This DTC sets if the E-Pump frequency is between 125 and 175Hz but has an invalid duty cycle or the frequency is outside of the 125-175Hz range. This can be caused by a loss of power to the E-Pump.
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	This DTC sets if the duty cycle is less than 10%.
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	This DTC sets if the duty cycle is greater than 90%.
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but an over temperature condition is detected (30% to 34% duty cycle). This DTC can be caused by high transmission fluid temperatures

P2796	Electric Transmission Fluid Pump Control Circuit	This DTC sets when the transmission auxiliary oil pump reports to the PCM that it is not receiving a PWM from the PCM.
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Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires or ground and missing or damaged seals
- BJB fuse 98 (15A)
- Electric transmission fluid pump
- PCM

PINPOINT TEST E : DTCS P0C2A, P0C2C, P0C2D, P0C2E, P2796

E1 RETRIEVE AND RECORD ALL DTCS

- Using the diagnostic scan tool, retrieve all DTCS.

Are DTCS P0C2A:00, P0C2C:00, P0C2D:00, P0C2E:00, P2796:00 present?

Yes	For DTC P2796, GO to E7 For all other DTCS, GO to E2
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or terminal issues.

E2 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP POWER CIRCUITS

- Ignition OFF.
- Disconnect Transmission Vehicle Harness C168A.
- Ignition ON.

Is the voltage greater than 11 volts?

Yes	GO to E3
No	VERIFY the BJB 98 (15A) is OK. If the fuse is OK, REPAIR the suspect circuit for an open. If the fuse is not OK, REFER to the Wiring Diagrams manual to identify the cause of the affected circuit shorted to ground.

E3 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	For DTC P0C2A:00, GO to Pinpoint Test F For all other DTCs, GO to E4
No	REPAIR the circuit

E4 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK MONITOR CIRCUIT FOR OPEN

- Ignition OFF.
- Disconnect PCM C1381T.
- Ignition ON.

Is the resistance less than 3 ohms?

Yes	GO to E5
No	REPAIR the circuit.

E5 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK / MONITOR CIRCUIT FOR SHORT TO GROUND

- Ignition OFF.

Is the resistance greater than 10,000 ohms?

Yes	GO to E6
No	REPAIR the circuit

E6 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK / MONITOR CIRCUIT FOR SHORT TO POWER

- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E7

E7 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR SHORT TO POWER

- Ignition OFF.
- Disconnect PCM C1381T (If not already disconnected) .
- Disconnect Transmission Harness Connector C168A.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E8

E8 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR OPEN

Is the resistance less than 3 ohms?

Yes	GO to E9
No	REPAIR the circuit

E9 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP VEHICLE WIRING HARNESS COMMAND CIRCUITS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	GO to E10
No	REPAIR the circuit

E10 CHECK ELECTRIC TRANSMISSION FLUID PUMP TRANSMISSION VEHICLE HARNESS FEEDBACK / MONITOR CIRCUIT FOR SHORT TO POWER

- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E11

E11 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR SHORT TO GROUND

- Ignition OFF.
- Disconnect PCM C1381T (If not already disconnected) .
- Disconnect Transmission Harness Connector C168A.

Is the resistance greater than 10,000 ohms?

Yes	GO to E12
No	REPAIR the circuit.

E12 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP INTERNAL WIRING HARNESS POWER CIRCUIT FOR AN OPEN

- REMOVE the transmission pan.
REFER to: [Transmission Fluid Drain and Refill](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
- Ignition ON.

Are the resistances less than 3 ohms?

Yes	GO to E13
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No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
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E13 CHECK THE TRANSMISSION INTERNAL WIRING HARNESS GROUND CIRCUIT

- Ignition OFF.

Is the resistance less than 3 ohms?

Yes	GO to E14
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E14 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP INTERNAL WIRING HARNESS POWER CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect Transmission Vehicle Harness C168A (If not already disconnected) .

Is the resistance greater than 10,000 ohms?

Yes	GO to E15
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E15 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR AN OPEN CIRCUIT

- Ignition OFF.
- Disconnect Transmission Vehicle Harness C168A (If not already disconnected) .

Are the resistances less than 3 ohms?

Yes	GO to E16
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E16 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP DUTY CYCLE OPERATION

- Connect PCM C1381T.
- Connect Transmission Vehicle Harness C168A.
- Connect Electric Transmission Fluid Pump C1792.
- Connect the diagnostic tool.
- Ignition ON.
- Using a diagnostic scan tool, COMMAND the electric transmission fluid pump ON using, TRANS_PMP_CMD and set to a duty cycle of 70%.
- MONITOR the PIDs, TRANS_PMP_MEAS.

Does TRANS_PMP_MEAS quickly return to 44% to 50% after the command percentage changes?

Yes	The electric transmission fluid pump is operating correctly at this time.
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No	INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
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DTCs P0B0D, P0C27, P0C28, P0C29, P0C2A, P175A

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

Normal Operation and Fault Conditions

The electric transmission fluid pump keeps the transmission fluid circulating during extended drive times without engine charging. The electric transmission fluid pump has an internal microprocessor and communicates with the C1232E over a PWM circuit with a frequency of 150 Hz with a duty cycle range of 10% to 90%. If the transmission fluid level is low or overfilled or there are any restrictions in the transmission lines, hoses (if vehicle is equipped with external lines or hoses) or cooler it may affect the transmission fluid pump operation.

DTC	Duty Cycle Range	Condition
P0C2D	Less than 10%	Out of range Low
P0C27	10% to 15%	Pump current too Low, Speed OK
P0C28	20% to 25%	Pump Current Too High, Speed OK
P175A	30% to 34%	Pump Over Temperature
P0C2A	35% to 40%	Pump Stalled
NONE	44% to 50%	Normal Value Of Signal
P0B0D	55% to 60%	Pump Over Speed – current OK
P0B0D	65% to 70%	Pump Under Speed – current OK
P0C29	75% to 80%	Both Current and Speed out of range
P2796	85% to 90%	No Command received from Control Module
P0C2E	Greater than 90%	Duty Cycle Out of range HI - undefined

P0C2C	Any other value (between)	Invalid duty cycle or invalid frequency. This could include no signal.
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DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0B0D	Electric Transmission Fluid Pump Motor Control Module	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz and a valid duty cycle was detected (55% to 60% or 65% to 70%). The electric transmission fluid pump has detected a pump over or under speed condition. The current flow through the pump was within specification.
P0C27	Electric Transmission Fluid Pump Motor Control Module	Possible causes are loss of pump prime or low transmission fluid level. This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (10% to 15% duty cycle).
P0C28	Electric Transmission Fluid Pump Motor Current Low	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (20% to 25% duty cycle).
P0C29	Electric Transmission Fluid Pump Motor Current High	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a high current is detected.
P0C2A	Electric Transmission Fluid Pump Motor Stalled	This DTC sets if the PCM commands the electric transmission fluid pump motor on and does not detect a corresponding increase in pump speed, indicating a stalled pump motor.
P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/Performance	This DTC sets if the E-Pump frequency is between 125 and 175Hz but has an invalid duty cycle or the frequency is outside of the 125-175Hz range. This can be caused by a loss of power to the E-Pump.

P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	This DTC sets if the duty cycle is less than 10%.
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	This DTC sets if the duty cycle is greater than 90%.
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but an over temperature condition is detected (30% to 34% duty cycle). This DTC can be caused by high transmission fluid temperatures
P2796	Electric Transmission Fluid Pump Control Circuit	This DTC sets when the electric transmission fluid pump reports to the PCM that it is not receiving a PWM from the PCM.

PINPOINT TEST F : DTCS P0B0D, P0C27, P0C28,P0C29, P0C2A, P175A

F1 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP POWER CIRCUITS

- Ignition OFF.
- Disconnect Transmission Harness Connector C168A.
- Ignition ON.

Is the voltage greater than 11 volts?

Yes	GO to F2
No	VERIFY the BJB fuse 98 (15A) is OK. If the fuse is OK, REPAIR the affected circuit for an open. If the fuse is not OK, REFER to the Wiring Diagrams manual to identify the cause of the affected circuit shorted to ground.

F2 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	GO to F3
No	REPAIR the circuit.

F3 CHECK THE TRANSMISSION FLUID LEVEL

- Ignition OFF.
- CHECK the transmission fluid level.
REFER to: [Transmission Fluid Level Check](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

Is the transmission fluid level correct?

Yes	GO to F4
No	CORRECT the transmission fluid to the proper level.

F4 CHECK THE AUXILIARY PUMP SUMP SEALS

- Ignition OFF.
- DRAIN the transmission fluid and REMOVE the transmission pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- REMOVE the transmission fluid pump and sump and inspect the seals.

Are the transmission fluid pump seals OK?

Yes	INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
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No	INSTALL new seals on the electric transmission fluid pump REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
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TCC, LPC Solenoids

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

When the electrical connector or solenoid is disconnected, inspect the connector for terminal condition, corrosion and contamination and the connector seal for damage. Also inspect the connector seal for damage. Clean, repair or install new components as required. If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The TCC is controlled by a directly proportional solenoid. Like the shift solenoids the TCC solenoid is controlled by a “smart driver” capable of detecting open, short to ground and short to power faults. In the event of an open circuit or short to power fault the TCC circuit is failed open. The TCC and LPC solenoids share a high side driver. Anytime power is removed the transmission defaults to MAX line pressure with open TCC. LPC is controlled by an inversely proportional solenoid (0 current = max pressure, max current = min line pressure). The LPC solenoid is controlled by a “smart driver” capable of detecting open, short to ground or short to power faults.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals
- TCC and LPC solenoid(s)
- Main control wiring harness
- Transmission internal wiring harness
- PCM

PINPOINT TEST G : TCC, LPC SOLENOIDS

G1 CHECK THE SOLENOID POWER CIRCUIT TSPC2 FOR VOLTAGE

- Ignition OFF.
- Disconnect: Transmission Harness C168A.
- Ignition ON.

Is the maximum recorded voltage greater than 11 volts?

Yes	GO to G4
No	GO to G2

G2 CHECK THE SOLENOID POWER CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect: PCM C1381T.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms?

Yes	GO to G3
No	REPAIR the transmission vehicle harness circuit for an open. CLEAR the DTCs. If DTC P0657 returns, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14D Electronic Engine Controls - 5.0L 32V Ti-VCT, Removal and Installation). PROGRAM the PCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

G3 CHECK THE SOLENOID POWER CIRCUIT FOR SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	GO to G4
No	REPAIR the transmission vehicle harness circuit short to ground.

G4 CHECK VEHICLE HARNESS SOLENOID CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect: PCM C1381T
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to G5
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

G5 CHECK VEHICLE HARNESS SOLENOID CONTROL CIRCUITS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms on the suspect circuit?

Yes	GO to G6
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

G6 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO POWER

Is any voltage detected on the suspect circuit?

Yes	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.
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No	GO to G7
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G7 CHECK MAIN CONTROL WIRING HARNESS FOR AN OPEN CIRCUIT

Are the resistances less than 3 ohms?

Yes	GO to G9
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No	INSTALL a new main control wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
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G8 CHECK MAIN CONTROL WIRING HARNESS FOR A SHORT TO GROUND

Are the resistances greater than 10,000 ohms?

Yes	GO to G9
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No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
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G9 CHECK SOLENOID RESISTANCE

- Measure and record the resistance of the suspected solenoid.
REFER to: [Shift Solenoids \(SS\)](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
Compare the recorded value with the chart below:

Solenoid	Ohms
LPC solenoid	4.6 to 5.2
TCC solenoid	4.6 to 5.2

Is the solenoid resistance within specification?

Yes	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new solenoid for the solenoid that failed the resistance check. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Diagnostic Trouble Code (DTC) Charts and Pinpoint Tests - 3.5L EcoBoost (272kW/370PS)

Principles of Operation

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.
3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom.
REFER to: [Diagnosis By Symptom](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically OFF. Check for an open, short to ground or the transmission connector disconnected. The TCM disables power to the transmission solenoids when certain transmission DTCs are set.

Solenoid Operation Chart

Selector Lever Position	TCM Commanded Gear	SSA (1, 2, 3, 4, 5, 6, M1, M2, R)	SSB (2, 8, 9, 10, M1, M2, R)	SSC (2, 3, 4, 5, 7, 9, 10, M2)	SSD (2, 3, 4, 6, 7, 8, 10, M2, R)	SSE (1, 3, 5, 6, 7, 8, 9, M1)	SSF (4, 5, 6, 7, 8, 9, 10, R)	TCC Solenoid
P	P	On	On	Off	On	Off	Off	Off
R	R	On	On	Off	On	Off	On	Off
N	N	On	On	Off	On	Off	Off	Off
D	1	On	Off	Off	On ^a	On	Off	Off
	2	On	Off	On	On	Off	Off	On/Off
	3	On	Off	On	On	On	Off	On/Off
	4	On	Off	On	On	Off	On	On/Off
	5	On	Off	On	Off	On	On	On/Off
	6	On	Off	Off	On	On	On	On/Off
	7	Off	Off	On	On	On	On	On/Off
	8	Off	On	Off	On	On	On	On/Off
	9	Off	On	On	Off	On	On	On/Off
	10	Off	On	On	On	Off	On	On/Off
M1	1	On	On	Off	On ^a	On	Off	Off
M2	2	On	On	On	On	Off	Off	Off

- On to reduce frictional losses from a released clutch, but does not contribute to power flow.

DTC Chart: TCM

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

DTC Chart

DTC	Description	Warning Light/DTC Type	Action
P0603	Internal Control Module Keep Alive Memory (KAM) Error	MIL/Continuous	REPROGRAM the TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P0604	Internal Control Module Random Access Memory (RAM) Error	MIL, Wrench/Initialization	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P0605	Internal Control Module Read Only Memory (ROM) Error	MIL/Initialization	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General

			Procedures).
P0607	Control Module Performance	MIL/Continuous	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P060A	Internal Control Module Monitoring Processor Performance	MIL, Wrench/Continuous	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P060B	Internal Control Module A/D Processing Performance	MIL, Wrench	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P060C	Internal Control Module Main Processor Performance	MIL, Wrench	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P061A	Internal Control Module Torque Performance	None/Continuous	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P062C	Internal Control Module Vehicle Speed Performance	None/Continuous	OSS and ABS vehicle speeds do not match. Resolve all ABS DTCs first. REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing). Verify correct axle ratio installed in vehicle.

P064F	Unauthorized Software/ Calibration Detected	MIL, Wrench/ Continuous	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P0657	Actuator Supply Voltage "A" Circuit Open	MIL, Wrench/ Continuous	If the power circuit to the transmission solenoids is interrupted then all solenoids are failed electrically off. CHECK for an open, short to ground or the transmission connector disconnected. REPAIR as required. CLEAR the DTC. GO to Pinpoint Test A
P068A	ECM/PCM Power Relay De-Energized - Too Early	Wrench/Continuous	CHECK connections to the TCM. TEST battery and charging system. REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing). REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).

P06B8	Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error	MIL/Continuous	REPROGRAM the original TCM to the latest calibration. CLEAR the DTCs. If the DTCs return, INSTALL a new TCM. After installing the new TCM, PROGRAM it with the latest calibration and PERFORM the Solenoid Body Strategy Data Download. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P0702	Transmission Control System Electrical	Wrench/Continuous	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. RERUN the KOEO and KOER self-test. If DTC P0702 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
P0706	Transmission Range Sensor "A" Circuit Range/Performance	Wrench/KOEO, Continuous	The TR sensor outputs a duty cycle indicating manual lever position. This DTC sets when the frequency is greater or less than the expected frequency by 25Hz or more. Engine may not crank. CLEAR the DTC. If DTC P0706 returns, GO to Pinpoint Test C
P0707	Transmission Range Sensor "A" Circuit Low	Wrench/KOEO, Continuous	Engine may not crank, CLEAR the DTC. If DTC P0707 returns, GO to Pinpoint Test C

P0708	Transmission Range Sensor "A" Circuit High	Wrench/KOEO, Continuous	Engine may not crank, CLEAR the DTC. If DTC P0708 returns, GO to Pinpoint Test C
P0709	Transmission Range Sensor "A" Circuit Intermittent	Wrench/Continuous	The TR sensor outputs a duty cycle indicating manual lever position. This DTC sets when the duty cycle is within range but is in the dead band between the design position, and an in-range but invalid duty cycle. GO to Pinpoint Test C
P0710	Transmission Fluid Temperature Sensor "A" Circuit	Wrench/Continuous	CLEAR the DTC. If DTC P0710 returns, GO to Pinpoint Test B
P0711	Transmission Fluid Temperature Sensor "A" Circuit Range/Performance	MIL/Continuous	CLEAR the DTC. Road test the vehicle at least 5 minutes. If DTC P0711 returns, GO to Pinpoint Test B
P0712	Transmission Fluid Temperature Sensor "A" Circuit Low	MIL/KOEO, Continuous	DTC P0710 may set. CLEAR the DTC. If DTC P0712 returns, GO to Pinpoint Test B
P0713	Transmission Fluid Temperature Sensor "A" Circuit High	MIL/KOEO, Continuous	DTC P0710 may set. CLEAR the DTC. If DTC P0713 returns, GO to Pinpoint Test B
P0715	TSS Sensor Circuit	MIL/KOEO, Continuous	CLEAR DTC. If DTC P0715 returns during KOEO, GO to Pinpoint Test D
P0716	TSS Sensor Circuit Range/Performance	MIL/Continuous	The TCM detected TSS sensor drop out, noise spike, or TSS speed not corresponding to other speed sensor inputs for current gear. REPAIR all clutch faults first. INSPECT TSS sensor for proper mounting. INSPECT TSS tone wheel (part of No. 2 carrier) for damage.
P0717	TSS Sensor Circuit No Signal	Wrench/Continuous	P0717 is used to illuminate the wrench light in conjunction with P0715, P07BF, and/or P07C0. Service the more specific DTC first. GO to Pinpoint Test D

P0718	TSS Sensor Circuit Intermittent	MIL/Continuous	The TCM detected TSS fault, but the fault did not last long enough for the TCM to set a more specific TSS DTC. Inspect TSS wiring and connectors for damage.
P0720	Output Shaft Speed Sensor Circuit	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P0720 returns during KOEO, GO to Pinpoint Test D
P0721	Output Shaft Speed Sensor Circuit Range/Performance	MIL/Continuous	The TCM detected OSS sensor drop out, noise spike, or OSS speed not corresponding to other speed sensor inputs for current gear. REPAIR all clutch faults first. INSPECT OSS sensor for proper mounting. INSPECT OSS sensor tone wheel (part of No. 4 carrier/output shaft) for damage.
P0722	Output Shaft Speed Sensor Circuit No Signal	Wrench/Continuous	DTC P0722 is used to illuminate the wrench light in conjunction with P0720, P077C, and/or P077D. Service the more specific DTC first. GO to Pinpoint Test D
P0723	Output Shaft Speed Sensor Circuit Intermittent	MIL/Continuous	The TCM detected OSS sensor fault, but the fault did not last long enough for the TCM to set a more specific OSS sensor DTC. Inspect OSS sensor wiring and connectors for damage.
P0729	Gear 6 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 6th gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0731	Gear 1 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 1st gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0732	Gear 2 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 2nd gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0733	Gear 3 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 3rd gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0734	Gear 4 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 4th gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0735	Gear 5 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 5th gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0736	Reverse Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to Reverse. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0740	Torque Converter Clutch Solenoid Circuit/Open	Wrench/KOEO, Continuous	CLEAR DTC. If DTC P0740 returns during KOER, GO to Pinpoint Test L
P0741	Torque Converter Clutch Solenoid Circuit Performance/Stuck Off	Wrench/Continuous	DTC P0741 is a non-electrical failure that caused the TCC to fail to apply. For TCC Does Not Apply Symptom, REFER to: Torque Converter Clutch (TCC) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0743	Torque Converter Clutch Solenoid Circuit Electrical	Wrench/KOEO, Continuous	DTC P0743 is used to illuminate the wrench light in conjunction with P0740, P2769, and/or P2770. Service the more specific DTC first. GO to Pinpoint Test A
P0748	Pressure Control Solenoid Electrical	Wrench/KOEO, Continuous	DTC P0748 is used to illuminate the wrench light in conjunction with P0960, P0962, and/or P0963. Service the more specific DTC first. GO to Pinpoint Test L

P0751	Shift Solenoid "A" Performance/Stuck Off	MIL/KOEO, Continuous	DTC P0751 is a non-electrical failure indicating A Clutch failed to apply. For A Clutch Does Not Apply symptom, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0752	Shift Solenoid "A" Stuck On	MIL/Continuous	DTC P0752 is a non-electrical failure indicating A Clutch stayed applied when SSA was de-energized. For A Clutch Always Applied symptom, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0753	Shift Solenoid "A" Electrical	Wrench/KOEO, Continuous	DTC P0753 is used to illuminate the wrench light in conjunction with P0973, P0974, and/or P097A. Service the more specific DTC first. GO to Pinpoint Test A
P0754	Shift Solenoid "A" Intermittent	MIL/Continuous	The TCM detected a SSA fault, but the fault did not last long enough for the TCM to set a more specific SSA DTC. Inspect SSA wiring and connectors for damage.
P0756	Shift Solenoid "B" Performance/Stuck Off	MIL/Continuous	DTC P0756 is a non-electrical failure indicating B Clutch failed to apply. For B Clutch Does Not Apply symptom, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0757	Shift Solenoid "B" Stuck On	MIL/Continuous	DTC P0757 is a non-electrical failure indicating B Clutch stayed applied when SSB was de-energized. For B Clutch Always Applied symptom, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0758	Shift Solenoid "B" Electrical	Wrench, KOEO, Continuous	P0758 is used to illuminate the wrench light in conjunction with P0976, P0977, and/or P097B. Service the more specific DTC first. GO to Pinpoint Test A
P0759	Shift Solenoid "B" Intermittent	MIL/Continuous	The TCM detected SSB fault, but the fault did not last long enough for the TCM to set a more specific SSB DTC. Inspect SSB wiring and connectors for damage.
P0761	Shift Solenoid "C" Performance/Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating C Clutch failed to apply. For C Clutch Does Not Apply symptom, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0762	Shift Solenoid "C" Stuck On	MIL/Continuous	DTC P0762 is a non-electrical failure indicating C Clutch stayed applied when SSC was de-energized. For C Clutch Always Applied symptom, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0763	Shift Solenoid "C" Electrical	Wrench, KOEO, Continuous	DTC P0763 is used to illuminate the wrench light in conjunction with P0779, P097C, and/or P0980. Service the more specific DTC first. GO to Pinpoint Test A

P0764	Shift Solenoid "C" Intermittent	MIL/Continuous	The TCM detected SSC fault, but the fault did not last long enough for the TCM to set a more specific SSC DTC. Inspect SSC wiring and connectors for damage.
P0766	Shift Solenoid "D" Performance/Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating D Clutch failed to apply. For D Clutch Does Not Apply symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0767	Shift Solenoid "D" Stuck On	MIL/Continuous	DTC P0757 is a non-electrical failure indicating D Clutch stayed applied when SSD was de-energized. For D Clutch Always Applied symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0768	Shift Solenoid "D" Electrical	Wrench, KOEO, Continuous	DTC P0768 is used to illuminate the wrench light in conjunction with P097D, P0982, P0982 is used to illuminate the Wrench light. Service the more specific DTC first. GO to Pinpoint Test A
P0769	Shift Solenoid "D" Intermittent	MIL/Continuous	The TCM detected SSD fault, but the fault did not last long enough for the TCM to set a more specific SSD DTC. Inspect SSD wiring and connectors for damage.

P076F	Gear 7 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 7th gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0771	Shift Solenoid "E" Performance/Stuck Off	MIL/Continuous	DTC P0761 is a non-electrical failure indicating E Clutch failed to apply. For E Clutch Does Not Apply symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0772	Shift Solenoid "E" Stuck On	MIL/Continuous	DTC P0772 is a non-electrical failure indicating E Clutch stayed applied when SSE was de-energized. For E Clutch Always Applied symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0773	Shift Solenoid "E" Electrical	Wrench/Continuous	DTC P0773 is used to illuminate the wrench light in conjunction with P097E, P0985, P0986 is used to illuminate the Wrench light. Service the more specific DTC first. GO to Pinpoint Test A
P0774	Shift Solenoid "E" Intermittent	MIL/Continuous	The TCM detected SSE fault, but the fault did not last long enough for the TCM to set a more specific SSE DTC. Inspect SSE wiring and connectors for damage.
P077D	Output Shaft Sensor Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D

P0791	Intermediate Shaft Speed Sensor "A" Circuit	MIL/Continuous	GO to Pinpoint Test D
P0792	Intermediate Shaft Speed Sensor "A" Circuit Range/Performance	MIL/Continuous	GO to Pinpoint Test D
P0793	Intermediate Shaft Speed Sensor "A" Circuit No Signal	Wrench	GO to Pinpoint Test D
P0794	Intermediate Shaft Speed Sensor "A" Circuit Intermittent	MIL/Continuous	GO to Pinpoint Test D
P07A9	Transmission Friction Element "D" Stuck On	None/Continuous	The TCM detected that D clutch failed to release multiple times and determined the SSD is not stuck on. For D Clutch Always Applied symptom, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07AB	Transmission Friction Element "E" Stuck On	None/Continuous	The TCM detected that E clutch failed to release multiple times and determined the SSE is not stuck on. For E Clutch Always Applied symptom, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07AD	Transmission Friction Element "F" Stuck On	None/Continuous	The TCM detected that F clutch failed to release multiple times and determined the SSF is not stuck on. For F Clutch Always Applied symptom, REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P07C0	TSS Sensor Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D
P07C6	Intermediate Shaft Speed Sensor "A" Circuit High	MIL/Continuous	GO to Pinpoint Test D
P07C8	Intermediate Shaft Speed Sensor "B" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test D
P07D9	Gear 8 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 8th gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07F6	Gear 9 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 9th gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P07F7	Gear 10 Incorrect Ratio	Wrench/Continuous	The TCM detected multiple ratio errors either in or while shifting to 10th gear. The ratio errors did not last long enough for the TCM to isolate the fault to a specific clutch. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P0868	Transmission Fluid Pressure Low	Wrench/Continuous	CLEAR the DTC. Road test vehicle, if DTC P0868 returns, If DTCs P0751, P0756, P0761, P0766, P0771 or P2707 are set, TEST for low pump pressure or fluid contamination. PERFORM the line pressure test. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P0882	TCM Power Input Signal Low	MIL/KOEO, Continuous	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the PCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. If DTC P0882 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
P0883	TCM Power Input Signal High	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P0883 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
P0884	TCM Power Input Signal Intermittent	MIL/Continuous	CLEAR the DTC. If DTC P0883 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).

P0960	Pressure Control Solenoid Control Circuit/Open	MIL/KOEO, Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test LGO to Pinpoint Test L
P0961	Pressure Control Solenoid Control Circuit Range/Performance	MIL/Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test LGO to Pinpoint Test L
P0962	Pressure Control Solenoid Control Circuit Low	MIL/KOEO, Continuous	The LPC solenoid failed to max pressure indicating wiring or connector issues, or a solenoid electrical issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test LGO to Pinpoint Test L
P0963	Pressure Control Solenoid Control Circuit High	MIL/KOEO, Continuous	The LPC solenoid failed to high current which is maximum pressure indicating short to ground, wiring or solenoid issue. INSPECT the LPC solenoid wiring, connectors and pins. GO to Pinpoint Test L
P0973	Shift Solenoid "A" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSA electrical. Since SSA shorted to ground causes SSA to be failed to high current (maximum pressure since SSA is directly proportional). A Clutch is failed on. GO to Pinpoint Test A

P0974	Shift Solenoid "A" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSA electrical. Since SSA shorted to power causes SSA to be failed to low current (minimum pressure since SSA is directly proportional). A Clutch is failed off. GO to Pinpoint Test A
P0976	Shift Solenoid "B" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSB electrical. Since SSB shorted to ground causes SSB to be failed to high current (maximum pressure since SSB is directly proportional). B Clutch is failed on. GO to Pinpoint Test A
P0977	Shift Solenoid "B" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSB electrical. Since SSB shorted to power causes SSB to be failed to low current (minimum pressure since SSB is directly proportional). B Clutch is failed off. GO to Pinpoint Test A
P0979	Shift Solenoid "C" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSC electrical. Since SSC shorted to ground causes SSC to be failed to high current (maximum pressure since SSC is directly proportional). C Clutch is failed on. GO to Pinpoint Test A
P097A	Shift Solenoid "A" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSA electrical. Since SSA shorted to power causes SSA to be failed to low current (minimum pressure since SSA is directly proportional). A Clutch is failed off. GO to Pinpoint Test A

P097B	Shift Solenoid "B" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates an open circuit in the SSB electrical. Since SSB shorted to power causes SSB to be failed to low current (minimum pressure since SSB is directly proportional). B Clutch is failed off. GO to Pinpoint Test A
P097C	Shift Solenoid "C" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSC electrical. Since SSC shorted to power causes SSC to be failed to low current (minimum pressure since SSC is directly proportional). C Clutch is failed off. GO to Pinpoint Test A
P097D	Shift Solenoid "D" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSD electrical. Since SSD shorted to power causes SSD to be failed to low current (minimum pressure since SSD is directly proportional). D Clutch is failed off. GO to Pinpoint Test A
P097E	Shift Solenoid "E" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSE electrical. Since SSE shorted to power causes SSE to be failed to low current (minimum pressure since SSE is directly proportional). E Clutch is failed off. GO to Pinpoint Test A
P097F	Shift Solenoid "F" Control Circuit/Open	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSF electrical. Since SSF shorted to power causes SSF to be failed to low current (minimum pressure since SSF is directly proportional). F Clutch is failed off. GO to Pinpoint Test A

P0980	Shift Solenoid "C" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSC electrical. Since SSC shorted to power causes SSC to be failed to low current (minimum pressure since SSC is directly proportional). C Clutch is failed off. GO to Pinpoint Test A
P0982	Shift Solenoid "D" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSD electrical. Since SSD shorted to ground causes SSD to be failed to high current (maximum pressure since SSD is directly proportional). D Clutch is failed on. GO to Pinpoint Test A
P0983	Shift Solenoid "D" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSD electrical. Since SSD shorted to power causes SSD to be failed to low current (minimum pressure since SSD is directly proportional). D Clutch is failed off. GO to Pinpoint Test A
P0985	Shift Solenoid "E" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSE electrical. Since SSE shorted to ground causes SSE to be failed to high current (maximum pressure since SSE is directly proportional). E Clutch is failed on. GO to Pinpoint Test A
P0986	Shift Solenoid "E" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSE electrical. Since SSE shorted to power causes SSE to be failed to low current (minimum pressure since SSE is directly proportional). E Clutch is failed off. GO to Pinpoint Test A

P0998	Shift Solenoid "F" Control Circuit Low	MIL/KOEO, Continuous	This DTC indicates a short to ground in the SSF electrical. Since SSF shorted to ground causes SSF to be failed to high current (maximum pressure since SSE is directly proportional). F Clutch is failed on. GO to Pinpoint Test A
P0999	Shift Solenoid "F" Control Circuit High	MIL/KOEO, Continuous	This DTC indicates a short to power in the SSF electrical. Since SSF shorted to power causes SSF to be failed to low current (minimum pressure since SSF is directly proportional). E Clutch is failed off. GO to Pinpoint Test A
P0B0D	Electric Transmission Fluid Pump Motor Control Module	None/Continuous	CLEAR the DTC. If the DTC returns, INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
P0C27	Electric Transmission Fluid Pump Motor Current Low	None/Continuous	This DTC applies to auto-start-stop vehicles only. This DTC sets when the PCM detects low current (10% to 15% duty cycle). Auto-Start-Stop unavailable and the engine will only stop when the operator turns the ignition off. The engine may restart unexpectedly when the vehicle is stopped. CLEAR the DTC. If the DTC returns, GO to Pinpoint Test F
P0C28	Electric Transmission Fluid Pump Motor Current Low	None/Continuous	GO to Pinpoint Test F
P0C29	Electric Transmission Fluid Pump Motor Current High	None/Continuous	GO to Pinpoint Test F
P0C2A	Electric Transmission Fluid Pump Motor Stalled	None/Continuous	GO to Pinpoint Test F

P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/Performance	Wrench/Continuous	GO to Pinpoint Test E
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	Wrench/Continuous	GO to Pinpoint Test E
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	Wrench/Continuous	GO to Pinpoint Test E
P1001	The KOER Not Able to Complete, KOER Aborted	None/KOER	RETRIEVE and RECORD all DTCs. REPAIR any self-test or CMDTCs first. CLEAR the DTC. RERUN the KOER self-test. If the DTC returns, REPROGRAM the PCM to the latest software. RERUN the KOER self-test. If the DTC returns, INSTALL a new TCM REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). After installing the new TCM PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P1397	System Voltage Out Of Self Test Range	None/KOEO	INSPECT the PCM power and ground circuits for opens or short to ground. INSPECT the TCM connector for damaged or pushed-out terminals, corrosion or loose wires. CLEAR the DTC. RUN the KOEO self-test. If DTC P1397 returns, REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
P1501	Vehicle Speed Sensor Out Of Self Test Range	None/KOEO	Vehicle speed not at 0.0 mph (km/h) during the KOEO self-test. CLEAR the DTC and RERUN the KOEO self-test. If DTC P1501 returns, REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing).
P160A	Control Module Vehicle Options Reconfiguration Error	Wrench/Continuous	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. INSTALL As-Built data from Professional Technician Society (PTS) following scan tool instructions under Module Programming As-Built.

P1636	Inductive Signature Chip Communication Error	MIL/KOEO, Continuous	CLEAR the DTC. If DTC P1636 returns, INSTALL a new . TCM After installing the new TCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P163E	Transmission Control Module Programming Error	MIL/KOEO, Continuous	CLEAR the DTC. REPROGRAM the original TCM with the latest software. If DTC P163E returns, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). After installing the new TCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P163F	Transmission ID Block Corrupted, Not Programmed	MIL/KOEO, Continuous	CLEAR the DTC. REPROGRAM the original TCM with the latest software. If DTC P163F returns, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). After installing the new TCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P1674	Control Module Software Corrupted	MIL, Wrench/KOEO, Continuous	CLEAR the DTC. REPROGRAM the original TCM with the latest software. If DTC P163F returns, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). After installing the new TCM, PROGRAM it with the latest software and PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P1705	Transmission Range Circuit Not Indicating Park/Neutral During Self Test	None/KOEO	CLEAR the DTC. RERUN the KOEO and KOER self-test. If DTC P1705 returns, GO to Pinpoint Test C
P1711	Transmission Fluid Temperature Sensor Out Of Self Test Range	None/KOEO	CLEAR the DTC and RERUN the KOEO and KOER self-test.
P1744	Torque Converter Clutch Solenoid Circuit Performance	Wrench/Continuous	DTC P1744 is a non-electrical DTC. CLEAR the DTC. If DTC P1744 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	None/Continuous	GO to Pinpoint Test F
P1783	Transmission Over Temperature Condition	Wrench/Continuous	CLEAR the DTC. If DTC P1783 returns, determine if this DTC was set in conjunction with any transmission fluid temperature sensor circuit DTCs and RESOLVE them first, otherwise REFER to: Transmission Cooling (307-02 Transmission Cooling) .
P1A02	Transmission One Way Clutch Performance	Wrench/Continuous	This DTC sets when the TCM detects 3 failures of the one-way clutch to lock in 1st or 2nd gear allowing sun gear 1 to rotate backwards. CLEAR the DTC, road test the vehicle. If DTC P1A02 returns, it may indicate a one way clutch failure. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

P2531	Ignition Switch Run Position Circuit Low	Wrench/Continuous	CLEAR the DTC. If DTC P2531 returns, it may indicate a communication issue between the BCM and the TCM. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
P2532	Ignition Switch Run Position Circuit High	Wrench/Continuous	CLEAR the DTC. If DTC P2532 returns, it may indicate a communication issue between the BCM and the TCM. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
P2669	Actuator Supply Voltage "B" Circuit/Open	MIL/Continuous	GO to Pinpoint Test A
P26C3	Internal Control Module Transmission Range Sensor Performance	MIL, Wrench/KOEO, Continuous	CLEAR the DTC. If DTC P26C3 returns, INSTALL a new TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
P2700	Transmission Friction Element "A" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0751 (Clutch A stuck off) and P0752 (Clutch A stuck on), service the more specific DTC. See DTCs P0751 and P0752 for potential causes. If P0751 and P0752 are not set refer to the associated symptoms, REFER to: A Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P2701	Transmission Friction Element "B" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0756 (Clutch B stuck off) and P0757 (Clutch B stuck on), service the more specific DTC first. See DTCs P0756 and P0757 for potential causes, if these DTCs are not set refer to the associated symptoms, REFER to: B Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2702	Transmission Friction Element "C" Apply Time Range/Performance	Wrench/Continuous	This DTC set with either P0761 (Clutch C stuck off) and P0762 (Clutch C stuck on) - service the more specific DTC 1st (if present). See P0761 and P0762 for potential causes first. If these DTCs are not set refer to the associated symptoms, REFER to: C Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2703	Transmission Friction Element "D" Apply Time Range/Performance	Wrench/Continuous	This DTC set with either P0766 (Clutch D stuck off) and P0767 (Clutch D stuck on) service the more specific DTC 1st (if present). See P0766 and P0767 for potential causes first. If these DTCs are not set, refer to the associated symptoms, REFER to: D Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P2704	Transmission Friction Element "E" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P0771 (E Clutch stuck off) and P0772 (E Clutch stuck on) service the more specific DTC first (if present). See P0771 and P0772 for potential causes. If these DTCs are not set, refer to the associated symptoms, REFER to: E Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2705	Transmission Friction Element "F" Apply Time Range/Performance	Wrench/Continuous	This DTC sets with either P2707 (Clutch F stuck off) and P2708 (Clutch F stuck on), service the more specific DTC first. See DTCs P2707 and P2708 for potential causes. If these DTCs are not set, refer to the associated symptoms, REFER to: F Clutch (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2707	Shift Solenoid "F" Performance/Stuck Off	MIL/Continuous	F clutch stuck off due to a non-electrical fault. Multiple attempts to apply F failed. GO to Pinpoint Test A
P2708	Shift Solenoid "F" Stuck On	MIL/Continuous	F clutch stuck on due to a non-electrical fault. Multiple attempts to apply F clutch failed. GO to Pinpoint Test A
P2709	Shift Solenoid "F" Electrical	MIL/KOEO, Continuous	SSF (controls F clutch) VFS circuit failure non-MIL "sister" DTCs of P097F, P0998, P0999 used to illuminate the Wrench Light. If one of the more specific circuit codes is set, follow repair procedures for that code. GO to Pinpoint Test A

P2710	Shift Solenoid "F" Intermittent	MIL/Continuous	The TCM detected SSF fault, but the fault did not last long enough for the TCM to set a more specific SSF DTC. Inspect SSF wiring and connectors for damage.
P2745	Intermediate Shaft Speed Sensor "B" Circuit	MIL/KOEO, Continuous	An open circuit fault was detected by the TCM smart driver. GO to Pinpoint Test A
P2746	Intermediate Shaft Speed Sensor "B" Circuit Range/ Performance	MIL/Continuous	GO to Pinpoint Test D
P2747	Intermediate Shaft Speed Sensor "B" Circuit No Signal	Wrench/Continuous	GO to Pinpoint Test D
P2748	Intermediate Shaft Speed Sensor "B" Circuit Intermittent	MIL/Continuous	GO to Pinpoint Test D
P2758	Torque Converter Clutch Pressure Control Solenoid Stuck On	MIL/Continuous	TCC stuck on when commanded off due to non-electrical failure. CLEAR the DTC. If DTC P2758 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
P2760	Torque Converter Clutch Pressure Control Solenoid Intermittent	MIL/Continuous	The TCM detected TCC fault, but the fault did not last long enough for the TCM to set a more specific TCC DTC. Inspect TCC solenoid wiring and connectors for damage.
P2769	Torque Converter Clutch Circuit Low	MIL/Continuous	This DTC indicates a short to ground in the TCC electrical. Since TCC shorted to ground causes TCC to be failed to high current (maximum pressure since TCC is directly proportional). TCC is failed on. GO to Pinpoint Test L

P2770	Torque Converter Clutch Circuit High	MIL/Continuous	This DTC indicates a short to power in the TCC electrical. Since TCC shorted to power causes TCC to be failed to low current (minimum pressure since TCC is directly proportional). TCC is failed off. CLEAR the DTC. If DTC P2783 returns, INSPECT TCC control valve for sticking. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
P2783	Torque Converter Temperature Too High	None/Continuous	The TCC control valve is stuck in a position that provides no flow when the TCC is commanded off. TCC pumps down when commanded off, causing loss of torque multiplication through the TCC.
P2796	Electric Transmission Fluid Pump Control Circuit	None/Continuous	This DTC sets when the electric transmission fluid pump reports to the TCM that it is not receiving a PWM from the TCM. CLEAR the DTC. If the DTC returns, GO to Pinpoint Test E
P27B4	Internal Control Module Transmission Gear Ratio Control Performance	None/Continuous	May be caused by clutch faults that cause R in forward range or a forward gear in R, or a speed sensor error, CLEAR the DTC. If DTC P27B4 returns, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

P27B5	Internal Control Module Transmission Gear Select Performance	None/Continuous	CLEAR the DTC. If DTC P27B5 returns, if any TR DTCs are set RESOLVE them first. If DTC P27B5 returns, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
P27B6	Internal Control Module Transmission Speed Sensor Performance	MIL, Wrench/ Continuous	CLEAR the DTC. Road test the vehicle, if any speed sensor DTCs are set, RESOLVE them first. If DTC P27B6 returns, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

P2801	Transmission Range Sensor "B" Circuit Range/Performance	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2802	Transmission Range Sensor "B" Circuit Low	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2803	Transmission Range Sensor "B" Circuit High	MIL/KOEO, Continuous	GO to Pinpoint Test C
P2804	Transmission Range Sensor "B" Circuit Intermittent	Wrench/KOEO, Continuous	GO to Pinpoint Test C
P2805	Transmission Range Sensor "A"/"B" Correlation	MIL/KOEO, Continuous	GO to Pinpoint Test C
U0028	Vehicle Communication Bus "A"	Wrench/Continuous	A CAN fault was present at a point in time. The fault is not currently present since the module is communicating with the diagnostic scan tool. CLEAR the DTC. REPEAT the network test with the diagnostic scan tool. VERIFY the integrity of the connectors and wiring. Refer to Wiring Diagrams Cell 14 for schematic and connector information.
U0037	Vehicle Communication Bus "B"	Wrench/Continuous	A CAN fault was present at a point in time. The fault is not currently present since the module is communicating with the diagnostic scan tool. CLEAR the DTC. REPEAT the network test with the diagnostic scan tool. VERIFY the integrity of the connectors and wiring. Refer to Wiring Diagrams Cell 14 for schematic and connector information.

U0073	Control Module Communication Bus "A" Off	MIL/Continuous	A CAN fault was present at a point in time. The fault is not currently present since the module is communicating with the diagnostic scan tool. CLEAR the DTC. REPEAT the network test with the diagnostic scan tool. VERIFY the integrity of the connectors and wiring. Refer to Wiring Diagrams Cell 14 for schematic and connector information.
U0074	Control Module Communication Bus "B" Off	MIL/Continuous	A CAN fault was present at a point in time. The fault is not currently present since the module is communicating with the diagnostic scan tool. CLEAR the DTC. REPEAT the network test with the diagnostic scan tool. VERIFY the integrity of the connectors and wiring. Refer to Wiring Diagrams Cell 14 for schematic and connector information.
U0100	Lost Communication With ECM / PCM "A"	MIL/Continuous	GO to Pinpoint Test G
U0121	Lost Communication With Anti-Lock Brake System (ABS) Control Module	None/Continuous	GO to Pinpoint Test H
U0140	Lost Communication With Body Control Module	None/Continuous	GO to Pinpoint Test I
U0146	Lost Communication With Gateway "A"	None/Continuous	GO to Pinpoint Test K
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	None/Continuous	GO to Pinpoint Test J

U0401	Invalid Data Received from ECM/PCM "A"	MIL/Continuous	This DTC sets when the TCM receives invalid network data from the PCM for the engine speed and vehicle speed input. RETRIEVE and REPAIR all non-network DTCs in the PCM and other modules on the network. For the correct navigation of all DTCs, REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules) .
U0415	Invalid Data Received from Anti-Lock Brake System (ABS) Control Module	Wrench/Continuous	This DTC sets when the TCM receives invalid data from the ABS module. DETERMINE which module (TCM or ABS module) has been replaced. CARRY OUT the PMI (when the original module is not available) for the module in question. REFER to: Module Configuration (418-01 Module Configuration) .
U0422	Invalid Data Received from Body Control Module	None/Continuous	This DTC sets when the TCM receives invalid BCM data such as global time, engine off time. RETRIEVE and REPAIR all non-network DTCs in the BCM. For the correct navigation of all DTCs, REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules) .
U2100	Initial configuration Not Complete	Wrench/Continuous	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. INSTALL As-Built data from Professional Technician Society (PTS) following scan tool instructions under Module Programming As-Built.

U2101	Control Module Configuration Incompatible	None/Continuous	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. INSTALL As-Built data from Professional Technician Society (PTS) following scan tool instructions under Module Programming As-Built.
U2200	Control Module Configuration Memory Corrupt	MIL/Continuous	CHECK the vehicle service history for recent service actions related to this module. This DTC sets due to incomplete or incorrect PMI procedures. INSTALL As-Built data from Professional Technician Society (PTS) following scan tool instructions under Module Programming As-Built.

Pinpoint Tests

Power is routed through the transmission solenoid power control (inside the TCM) to all transmission solenoids. If the power circuit to the transmission solenoids or the transmission solenoid power control fails open, all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The transmission solenoid power control disables power to the transmission solenoids when certain transmission DTCs are set.

- Carry out KOEO and KOER procedures.
- Retrieve and record all DTCs.
- Repair all non-transmission DTCs first.
- Repair all transmission DTCs second.
- Clear all CMDTCs and attempt to repeat them.
- Repair all CMDTCs.
- If only pass codes are obtained,
REFER to: [Diagnosis By Symptom](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

Transmission Control Solenoids

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The 10R80 utilizes 6 shift (A through F) solenoids that are linear force solenoids. Unlike previous shift solenoids they are mechanical in nature meaning no transmission fluid passes through them. CIDASs use an armature pin assembly that moves a control valve in the main control valve body to control and apply hydraulic fluid pressure. Each clutch (A through F) has a corresponding shift solenoid (A through F) that is directly proportional in that zero current equals zero pressure and maximum current equals maximum pressure. Since there is no pressure with zero current, none of the clutch packs are able to engage if the power is interrupted to the shift solenoids .

PINPOINT TEST A : TRANSMISSION CONTROL SOLENOIDS

A1 CHECK THE SOLENOID POWER CIRCUIT FOR VOLTAGE	
NOTE: <i>Read and record all DTCs.</i>	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C168A. • Ignition ON.	
Is the maximum recorded voltage greater than 11 volts?	
Yes	GO to A4
No	GO to A2
A2 CHECK THE SOLENOID POWER CIRCUIT FOR AN OPEN	

- Ignition OFF.
- Disconnect: TCM C1822
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms?

Yes	GO to A3
No	REPAIR transmission vehicle harness circuit for an open.

A3 CHECK THE SOLENOID POWER CIRCUIT FOR A SHORT TO GROUND

•

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C1822-47	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new TCM, REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

A4 CHECK SOLENOID CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect: TCM C1822
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A5
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

A5 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms on the suspect circuit?

Yes	GO to A6
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

A6 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO POWER

Is any voltage detected?

Yes	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.
No	GO to A7

A7 CHECK MAIN CONTROL WIRING HARNESS SOLENOID POWER CIRCUIT FOR AN OPEN CIRCUIT

- Drain the transmission fluid and remove the transmission fluid pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01A Automatic Transmission - 6-Speed Automatic Transmission - 6R80, Removal and Installation).
REFER to: [Transmission Fluid Pan, Gasket and Filter - Raptor](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Disconnect Shift Solenoid Connectors (A through F).
- Disconnect Main Control Wiring Harness C177.
- Measure resistance of the suspect solenoid power circuit of the main control wiring harness, using the table below:

Positive Lead	Measurement / Action	Negative Lead
C177-5	Ω	SSA C1843-1
C177-5		SSB C1844-1
C177-5		SSC C1845-1
C177-5		SSD C1846-1
C177-5		SSE C1847-1

C177-5		SSF C1848-1
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Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A8 CHECK MAIN CONTROL WIRING HARNESS SOLENOID POWER CIRCUIT FOR A SHORT TO GROUND

- INSPECT main control wiring harness for chafes or bare wires.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C177-5	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to A9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A9 CHECK MAIN CONTROL WIRING HARNESS SOLENOID CONTROL CIRCUIT FOR AN OPEN CIRCUIT

- Measure resistance of the suspect solenoid control circuit of the main control wiring harness, using the table below:

Positive Lead	Measurement / Action	Negative Lead
C177-8	Ω	SSA C1843-2
C177-9		SSB C1844-2
C177-10		SSC C1845-2
C177-11		SSD C1846-2
C177-3		SSE C1847-2
C177-4		SSF C1848-2

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to A11
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A10 CHECK MAIN CONTROL WIRING HARNESS SOLENOID CONTROL CIRCUIT FOR A SHORT TO GROUND

- Disconnect Shift Solenoid Connectors (A_F) (If not disconnected already).
- Measure:

Positive Lead	Measurement / Action	Negative Lead
SSA C1843-2	Ω	Ground
SSB C1844-2		Ground
SSC C1845-2		Ground
SSD C1846-2		Ground
SSE C1847-2		Ground

SSF C1848-2		Ground
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Is the resistance greater than 10,000 ohms?

Yes	GO to A11
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A11 CHECK SOLENOID RESISTANCE

- Disconnect the suspect solenoid connector and remove the suspect shift solenoid.
REFER to: [Shift Solenoids \(SS\)](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Measure and record the resistance of the suspected solenoid.

Is the shift solenoid resistance between 4.8 and 5.4 ohms?

Yes	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new solenoid for the solenoid that failed the resistance check. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TFT sensor is a temperature dependent resistor that is in contact with transmission fluid in the transmission sump area. The TCM monitors the voltage across the TFT sensor, which changes as transmission fluid temperature varies. The TCM uses the TFT sensor signal as an input for its strategy for shifting and TCC operation. The TCM also uses the TFT sensor signal for transmission fault detection and diagnostics.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals
- TFT sensor
- Transmission internal wiring harness frame
- TCM

PINPOINT TEST B : TFT (TRANSMISSION FLUID TEMPERATURE) SENSOR

B1 CHECK TFT INPUT SIGNAL	
• Ignition OFF. • Disconnect: Transmission Vehicle Harness C168A. • Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals. • Connect the diagnostic tool. • Ignition ON. • Enter the following mode on the diagnostic scan tool: Datalogger. Monitor the following TFT PIDs, TFT and TFTV.	
Does the TFT PID display -40°C (-40°F) and the TFTV PID display 4.96 to 5.10 volts?	
Yes	GO to B2
No	REPAIR the circuit.

B2 CHECK TFT SIGNAL INPUT CIRCUIT FOR VOLTAGE

Is the voltage between 4.8 and 5.1 volts?

Yes	GO to B3
No	INSPECT and REPAIR the open circuit. If an open circuit is not found, INSTALL a new TCM, REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

B3 CHECK TFT SIGNAL RETURN CIRCUIT

Does the TFT PID display 190°-195°C (374°-383°F) and the TFTV PID display 0 volts?

Yes	GO to B4
No	INSPECT and REPAIR the transmission vehicle harness signal return circuit for an open. If an open circuit is not found, INSTALL a new TCM, REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

B4 CHECK INTERNAL WIRING HARNESS FOR AN OPEN

- Ignition OFF.
- Disconnect TFT Sensor C1842.
- Disconnect TR Sensor C167.

Are the resistances less than 3 ohms?

Yes	GO to B5
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

B5 CHECK INTERNAL WIRING HARNESS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	INSPECT and CLEAN the TFT sensor for metallic contamination. INSTALL a new TFT sensor. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). CLEAR the DTCs.
No	GO to B6

B6 CHECK TFT SENSOR RESISTANCE

- Connect TFT sensor C1842.

Does the temperature to resistance specification match?

Yes	To diagnose an overheating concern, REFER to: Transmission Cooling (307-02 Transmission Cooling) .
No	INSTALL a new TFT. REFER to: Transmission Fluid Temperature (TFT) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

TR Sensor

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TR sensor is comprised of a dual set of TR sensors. The manual shifter engages and disengages Park and the shifter position is detected by reading TR sensors A and B. There is no manual valve, the TCM provides forward or reverse based on the dual TR sensor inputs. The 10R80 transmission uses dual PWM output (at 125 Hz) TR sensors where: TR sensor A increases as the shifter is moved from Park to Sport and TR sensor B decreases as the shifter is moved from Park to Sport, together the sum of the two signals should add up to 100%. The 10R80 transmission mechanical shifter variant is range by wire with mechanical Park. The dual TR sensor's signals determine customer selected range (P, R, N, D, S). PIDs, TR_A_DC and TR_B_DC may be utilized to monitor the TR sensor duty cycles.

Typical TR Sensors PWM Output

	Transmission Range Sensor A		Transmission Range Sensor B	
Gear	Min	Max	Min	Max
P	8.00	18.96	81.04	92.00
R	35.50	47.90	52.10	64.50

N	51.75	61.75	38.25	48.25
D	67.45	77.45	22.55	32.55
Sport	81.12	92.00	8.00	18.88

PINPOINT TEST C : TR SENSOR

C1 VERIFY DTCS

NOTE: Read and record all DTCs.

- Ignition OFF.
- Select PARK.
- Connect the diagnostic tool.
- Carry out the KOEO then the KOER test.

Are TR sensor DTCs present?

Yes	GO to C2
No	If no DTCs are present, and to diagnose any symptoms that may be present, REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

C2 CHECK TR SENSOR ELECTRICAL OPERATION

- Ignition ON.
- Enter the following diagnostic mode on the scan tool: TR PID: TR_A_DC and TR_B_DC.
- Move the selector lever into each range and stop.
- Observe the PIDs: TR_A_DC and TR_B_DC while wiggling the harness or driving the vehicle.
- Compare the duty cycles shown by the PIDs TR_A_DC and TR_B_DC to the selector lever position duty cycle, using the following chart.

Typical TR Sensor(s) PWM Output

Gear	Transmission Range Sensor A		Transmission Range Sensor B	
	Min	Max	Min	Max
P	8.00	18.96	81.04	92.00
R	35.50	47.90	52.10	64.50
N	51.75	61.75	38.25	48.25
D	67.45	77.45	22.55	32.55
Sport	81.12	92.00	8.00	18.88

Are the TR_A_DC and TR_B_DC duty cycles within range?

Yes	The problem is not in the TR sensor. REFER to: Diagnosis By Symptom (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
No	GO to C3

C3 CHECK TR SENSOR CIRCUITS FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Are the voltages approximately 5 volts?

Yes	GO to C4
No	GO to C5

C4 CHECK TR SENSOR VOLTAGE CIRCUIT FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is the voltage approximately 9 volts?

Yes	GO to C7
No	GO to C5

C5 CHECK TR SENSOR VOLTAGE CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	GO to C6
No	REPAIR the circuit.

C6 CHECK TR SENSOR VOLTAGE CIRCUIT FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

C7 CHECK TR SENSOR GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	INSTALL a new TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	REPAIR the circuit.

C8 CHECK TR SENSOR TRP1, TRP2, CIRCUITS FOR POWER

- Drain the transmission fluid and remove the transmission fluid pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
REFER to: [Transmission Fluid Pan, Gasket and Filter - Raptor](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- Connect Transmission Vehicle Harness C168A.
- Disconnect TR sensor C167.
- Ignition ON.

Are the voltages approximately 5 volts?

Yes	GO to C9
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

C9 CHECK TR SENSOR VREF CIRCUIT FOR POWER

- Connect Transmission Vehicle Harness C168A.
- Disconnect TR sensor C167.
- Ignition ON.

Is the voltage approximately 9 volts?

Yes	GO to C10
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

C10 CHECK TRANSMISSION INTERNAL WIRING HARNESS FOR AN OPEN CIRCUIT

- Ignition OFF.

Are the resistances less than 3 ohms?

Yes	INSTALL a new TR sensor. REFER to: Transmission Range (TR) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

OSS Sensor, TSS Sensor, ISSA Sensor and ISSB Sensor

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation TSS Sensor

The TSS sensor is a Hall-effect type sensor that provides a signal to the TCM that changes in frequency as the rotating speed of the planetary carrier No. 2 varies. The TCM compares the TSS sensor signal with the engine speed information to determine the amount of slip occurring in the torque converter. The TCM also compares the TSS sensor signal with the OSS sensor signal to determine the gear ratio provided by the planetary carrier No. 4. The TCM uses the TSS sensor signal as an input for its strategies for shifts and TCC operation. The TCM also uses the TSS sensor signal for transmission fault detection and diagnostics.

Normal Operation OSS Sensor

The OSS sensor is a Hall-effect type sensor that provides a signal to the TCM that changes in frequency as the rotating speed of the rear planetary carrier No. 4 varies. The TCM also compares the OSS sensor signal with the TSS sensor signal to determine the gear ratio provided by the rear planetary gearset. The TCM uses the OSS sensor signal as an input for its strategies for shifts and TCC operation. The TCM also uses the OSS sensor signal for transmission fault detection and diagnostics.

Normal Operation Intermediate Speed Sensors A and B

The Intermediate Speed Sensors A (ISSA) and B (ISSB) are Hall-effect type sensors that provide a signal to the TCM that changes in frequency as the rotating speed of the component being monitored changes. ISSA monitors the speed and rotational direction of ring gear 1 and ISSB monitors the speed and rotational direction of planetary carrier-1/ring gear 4. The Intermediate speed sensors are used to monitor clutch states for transmission fault detection and diagnostics.

TSS Sensor DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0715	TSS Sensor Circuit	This DTC sets if the TCM detects an open or short to ground in the TSS sensor circuitry.
P0716	TSS Sensor Circuit Range/Performance	This DTC sets if the TCM detects too large of a sensor air gap, a TSS sensor fault or an undetected clutch fault.
P0717	TSS Sensor Circuit No Signal	This DTC sets relationally if the DTCs P0715, P07BF, P07C0 are set, RESOLVE these DTCs first.
P0718	TSS Sensor Circuit Intermittent	This DTC sets if the TCM detects an intermittent circuit fault in the TSS circuit.
P07BF	ITSS Sensor Circuit Low	This DTC sets if the TCM detects an open or short to ground in the TSS sensor circuitry.
P07C0	TSS Sensor Circuit High	This DTC sets if the TCM detects an open circuit in the TSS sensor circuitry.

Intermediate Sensor A (ISSA) DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0791	Intermediate Shaft Speed Sensor "A" Circuit	This DTC sets if the TCM detects an open or short to ground in the ISSA sensor circuitry.

P07C6	Intermediate Shaft Speed Sensor "A" Circuit High	This DTC sets relationally if the DTCs P0715, P07BF, P07C0 are set, RESOLVE these DTCs first.
P0792	Intermediate Shaft Speed Sensor "A" Circuit Range/Performance	This DTC sets if the TCM detects an intermittent circuit fault in the ISSA sensor circuit.
P0793	Intermediate Shaft Speed Sensor "A" Circuit No Signal	This DTC sets if the TCM detects an open or short to ground in the ISSA sensor circuitry.
P0794	Intermediate Shaft Speed Sensor "A" Circuit Intermittent	This DTC sets if the TCM detects an open circuit in the ISSA sensor circuitry.

Intermediate Sensor B (ISSB) DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P2745	Intermediate Shaft Speed Sensor "B" Circuit	This DTC sets if the TCM detects an open or short to ground in the ISSB sensor circuitry.
P2746	Intermediate Shaft Speed Sensor "B" Circuit Range/Performance	This DTC sets if the TCM detects an intermittent circuit fault in the ISSB sensor circuit..
P2747	Intermediate Shaft Speed Sensor "B" Circuit No Signal	This DTC sets if the TCM detects an open or short to ground in the ISSB sensor circuitry.
P2748	Intermediate Shaft Speed Sensor "B" Circuit Intermittent	This DTC sets if the TCM detects an open circuit in the ISSB sensor circuitry.

OSS Sensor DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions

P0720	OSS Sensor Circuit	This DTC sets if the TCM detects an open or short to ground in the OSS sensor circuitry.
P0721	OSS Sensor Circuit Range Performance	This DTC sets if the TCM detects too large of a sensor air gap, a TSS sensor fault or an undetected clutch fault.
P0722	OSS Sensor Circuit No Signal	This DTC sets relationally if the DTCs P0720, P077C or P077D are set, RESOLVE these DTCs first.
P0793	OSS Sensor "A" Circuit No Signal	This DTC sets if the TCM detects an open or short to ground in the OSS sensor circuitry.
P077D	OSS Sensor Circuit High	This DTC sets relationally if the DTCs P0720, P0721, P0793 are set, RESOLVE these DTCs first.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires or ground and missing or damaged seals
- TSS sensor
- OSS sensor
- Intermediate Speed Sensor A (ISSA)
- Intermediate Speed Sensor B (ISSB)

PINPOINT TEST D : OSS (OUTPUT SHAFT SPEED) SENSOR, TSS (TURBINE SHAFT SPEED) SENSOR, ISSA SENSOR AND ISSB SENSOR

D1 CHECK SENSOR POWER CIRCUIT FOR POWER

- Ignition OFF.
- Disconnect: Transmission Vehicle Harness C168A
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is the voltage on the suspect circuit 8.0 to 9.2 volts?

Yes	GO to D5
No	GO to D2

D2 CHECK THE SENSOR POWER CIRCUIT FOR A SHORT TO GROUND

- Disconnect: TCM C1822.
- Ignition OFF.

Is the resistance on the suspect circuit greater than 10,000 ohms?

Yes	GO to D3
No	INSPECT and REPAIR transmission vehicle harness sensor power circuit for a short to ground.

D3 CHECK THE SENSOR POWER CIRCUIT FOR AN OPEN

- Ignition ON.

Is the resistance on the suspect circuit less than 3 ohms?

Yes	INSTALL a new TCM, REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	REPAIR the circuit.

D4 CHECK THE SENSOR SIGNAL CIRCUIT FOR A SHORT TO POWER

- Ignition OFF.
- Disconnect: TCM C1822.
- Disconnect: Transmission Vehicle Harness C168A (If not already disconnected).
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.
- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to D5

D5 CHECK THE SENSOR RETURN CIRCUIT FOR AN OPEN

- Ignition OFF.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to D6
No	REPAIR the transmission vehicle harness signal return circuit for an open.

D6 CHECK THE SENSOR RETURN CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.

Is the resistance greater than 10,000 ohms?

Yes	GO to D7
No	REPAIR the circuit.

D7 CHECK THE SENSOR RETURN INTERNAL HARNESS CIRCUITS FOR A SHORT TO POWER

- Disconnect for OSS sensor C1107.
- Disconnect for TSS sensor C3106.
- Disconnect for ISSA sensor C1836.
- Disconnect for ISSB sensor C1837.
- Ignition ON.

Is any voltage detected on the suspect circuit?

Yes	REPAIR the circuit.
No	GO to D8

D8 CHECK THE SENSOR INTERNAL HARNESS POWER CIRCUITS FOR AN OPEN

- Disconnect Suspect Sensor Connector .
- Ignition ON.

Is the resistance less than 3 ohms?

Yes	GO to D9
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

D9 CHECK THE SENSOR INTERNAL HARNESS CIRCUITS FOR A SHORT TO GROUND

- Ignition ON.

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new sensor as necessary. REFER to: Output Shaft Speed (OSS) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Turbine Shaft Speed (TSS) Sensor (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Intermediate Speed Sensor A (ISSA) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). REFER to: Intermediate Speed Sensor B (ISSB) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

DTCS P0B0D P0C27, P0C28, P0C29, P0C2A, P175A, P0C2D

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation and Fault Conditions

The electric transmission fluid pump keeps the transmission engaged when the engine is stopped and the transmission is in drive. The electric transmission fluid pump has an internal microprocessor and communicates with the PCM over a PWM circuit with a frequency of 150 Hz with a duty cycle range of 10% to 90%.

DTC	Duty Cycle Range	Description
P0C2D	Less than 10%	Out of range Low
P0C27	10% to 15%	Pump current too Low, Speed OK
P0C28	20% to 25%	Pump Current Too High, Speed OK
P175A	30% to 34%	Pump Over Temperature
P0C2A	35% to 40%	Pump Stalled
NONE	44% to 50%	EVERYTHING IS OK – NORMAL VALUE OF SIGNAL
P0B0D	55% to 60%	Pump Over Speed – current OK
P0B0D	65% to 70%	Pump Under Speed – current OK
P0C29	75% to 80%	Both Current and Speed out of range
P2796	85% to 90%	No Command received from Control Module
P0C2E	Greater than 90%	Duty Cycle Out of range HI - undefined
P0C2C	Any other value (between)	Invalid duty cycle or invalid frequency. This could include no signal.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0B0D	Electric Transmission Fluid Pump Motor Control Module	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz and a valid duty cycle was detected (55% to 60% or 65% to 70%). The Electric Transmission Fluid Pump has detected a pump over or under speed condition. The current flow through the pump was within specification.
P0C27	Electric Transmission Fluid Pump Motor Control Module	Possible causes are loss of pump prime or low transmission fluid level. This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (10% to 15% duty cycle).
P0C28	Electric Transmission Fluid Pump Motor Current Low	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (20% to 25% duty cycle).
P0C29	Electric Transmission Fluid Pump Motor Current High	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a high current is detected.
P0C2A	Electric Transmission Fluid Pump Motor Stalled	This DTC sets if the PCM commands the electric transmission fluid pump motor on and does not detect a corresponding increase in pump speed, indicating a stalled pump motor.
P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/ Performance	This DTC sets if the E-Pump frequency is between 125 and 175Hz but has an invalid duty cycle or the frequency is outside of the 125-175Hz range. This can be caused by a loss of power to the E-Pump.
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	This DTC sets if the duty cycle is less than 10%.
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	This DTC sets if the duty cycle is greater than 90%.
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but an over temperature condition is detected (30% to 34% duty cycle). This DTC can be caused by high transmission fluid temperatures

P2796	Electric Transmission Fluid Pump Control Circuit	This DTC sets when the electric transmission oil pump reports to the TCM that it is not receiving a PWM from the TCM.
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Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires or ground and missing or damaged seals
- BJB fuse 111 (15A)
- Electric transmission fluid pump
- TCM

PINPOINT TEST E : DTCS P0B0D P0C27, P0C28, P0C29, P0C2A, P175A, P0C2D

E1 RETRIEVE AND RECORD ALL DTCS	
• Using the diagnostic scan tool, retrieve all DTCs.	
Are DTCs P0C2A, P0C2C, P0C2D, P0C2E, P2796 present?	
Yes	For DTC P2796, GO to E7 For all other DTCs, GO to E2
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or terminal issues.
E2 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP POWER CIRCUITS	

- Ignition OFF.
- Disconnect Transmission Vehicle Harness C168A.
- Ignition ON.

Is the voltage greater than 11 volts?

Yes	GO to E3
No	VERIFY the BJB 111 (15A) is OK. If the fuse is OK, REPAIR the suspect circuit for an open. If the fuse is not OK, REFER to the Wiring Diagrams manual to identify the cause of the affected circuit shorted to ground.

E3 CHECK THE ELECTRIC TRANSMISSION PUMP GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	For DTC P0C2A, GO to Pinpoint Test F For all other DTCs, GO to E4
No	REPAIR the circuit

E4 CHECK ELECTRIC TRANSMISSION PUMP FEEDBACK MONITOR CIRCUIT FOR OPEN

- Ignition OFF.
- Disconnect TCM C1822.
- Ignition ON.

Is the resistance less than 3 ohms?

Yes	GO to E5
No	REPAIR the circuit.

E5 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK MONITOR CIRCUIT FOR SHORT TO GROUND

- Ignition OFF.

Is the resistance greater than 10,000 ohms?

Yes	GO to E6
No	REPAIR the circuit

E6 CHECK ELECTRIC TRANSMISSION FLUID PUMP FEEDBACK / MONITOR CIRCUIT FOR SHORT TO POWER

- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E7

E7 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR SHORT TO POWER

- Ignition OFF.
- Disconnect TCM C1822 (If not already disconnected) .
- Disconnect Transmission Harness Connector C168A.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E8

E8 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR OPEN

Is the resistance less than 3 ohms?

Yes	GO to E9
No	REPAIR the circuit

E9 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP VEHICLE WIRING HARNESS COMMAND CIRCUITS FOR AN OPEN

Is the resistance greater than 10,000 ohms?

Yes	GO to E10
No	REPAIR the circuit

E10 CHECK ELECTRIC TRANSMISSION FLUID PUMP VEHICLE HARNESS FEEDBACK MONITOR CIRCUIT FOR SHORT TO POWER

- Ignition ON.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E11

E11 CHECK ELECTRIC TRANSMISSION FLUID PUMP COMMAND CIRCUIT FOR SHORT TO GROUND

- Ignition OFF.
- Disconnect TCM C1822 (If not already disconnected) .
- Disconnect Transmission Harness Connector C168A.

Is any voltage detected?

Yes	REPAIR the circuit.
No	GO to E12

E12 CHECK TRANSMISSION INTERNAL WIRING HARNESS ELECTRIC TRANSMISSION FLUID PUMP POWER CIRCUIT FOR AN OPEN

- REMOVE the transmission pan.
REFER to: Transmission Fluid Drain and Refill (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) .
- Ignition ON.

Are the resistances less than 3 ohms?

Yes	GO to E13
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No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
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E13 CHECK THE TRANSMISSION INTERNAL WIRING HARNESS GROUND CIRCUIT

- Ignition OFF.

Is the resistance less than 3 ohms?

Yes	GO to E14
No	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

E14 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP DUTY CYCLE OPERATION

- Connect TCM C1822.
- Connect Transmission Vehicle Harness C168A.
- Connect Electric Transmission Fluid Pump C1792.
- Connect the diagnostic tool.
- Ignition ON.
- Using a diagnostic scan tool, COMMAND the electric transmission fluid pump ON using, TRANS_PMP_CMD and set to a duty cycle of 70%.
- MONITOR the PIDs, TRANS_PMP_MEAS.

Does TRANS_PMP_MEAS quickly return to 44% to 50% after the command percentage

changes?

Yes	The electric transmission fluid pump is operating correctly at this time.
No	INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

DTCs P0B0D, P0C27, P0C28, P0C29, P0C2A, P175A

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation and Fault Conditions

The electric transmission fluid pump keeps the transmission fluid circulating during extended drive times without engine charging. The electric transmission fluid pump has an internal microprocessor and communicates with the C1232E over a PWM circuit with a frequency of 150 Hz with a duty cycle range of 10% to 90%. If the transmission fluid level is low or overfilled or there are any restrictions in the transmission lines, hoses (if vehicle is equipped with external lines or hoses) or cooler it may affect the transmission fluid pump operation.

DTC	Duty Cycle Range	Condition
P0C2D	Less than 10%	Out of range Low
P0C27	10% to 15%	Pump current too Low, Speed OK
P0C28	20% to 25%	Pump Current Too High, Speed OK
P175A	30% to 34%	Pump Over Temperature
P0C2A	35% to 40%	Pump Stalled
NONE	44% to 50%	EVERYTHING IS OK – NORMAL VALUE OF SIGNAL
P0B0D	55% to 60%	Pump Over Speed – current OK
P0B0D	65% to 70%	Pump Under Speed – current OK
P0C29	75% to 80%	Both Current and Speed out of range

P2796	85% to 90%	No Command received from Control Module
P0C2E	Greater than 90%	Duty Cycle Out of range HI - undefined
P0C2C	Any other value (between)	Invalid duty cycle or invalid frequency. This could include no signal.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P0B0D	Electric Transmission Fluid Pump Motor Control Module	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz and a valid duty cycle was detected (55% to 60% or 65% to 70%). The transmission fluid pump has detected a pump over or under speed condition. The current flow through the pump was within specification.
P0C27	Electric Transmission Fluid Pump Motor Control Module	Possible causes are loss of pump prime or low transmission fluid level. This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (10% to 15% duty cycle).
P0C28	Electric Transmission Fluid Pump Motor Current Low	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a low current is detected (20% to 25% duty cycle).
P0C29	Electric Transmission Fluid Pump Motor Current High	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but a high current is detected.
P0C2A	Electric Transmission Fluid Pump Motor Stalled	This DTC sets if the PCM commands the electric transmission fluid pump motor on and does not detect a corresponding increase in pump speed, indicating a stalled pump motor.

P0C2C	Electric Transmission Fluid Pump Control Module Feedback Signal Range/Performance	This DTC sets if the E-Pump frequency is between 125 and 175Hz but has an invalid duty cycle or the frequency is outside of the 125-175Hz range. This can be caused by a loss of power to the E-Pump.
P0C2D	Electric Transmission Fluid Pump Control Module Feedback Signal Low	This DTC sets if the duty cycle is less than 10%.
P0C2E	Electric Transmission Fluid Pump Control Module Feedback Signal High	This DTC sets if the duty cycle is greater than 90%.
P175A	Transmission Fluid Over Temperature Condition - Electric Transmission Fluid Pump Disabled	This DTC sets if the E-pump communication is OK. The frequency is between 130 Hz and 170 Hz but an over temperature condition is detected (30% to 34% duty cycle). This DTC can be caused by high transmission fluid temperatures
P2796	Electric Transmission Fluid Pump Control Circuit	This DTC sets when the electric transmission oil pump reports to the TCM that it is not receiving a PWM from the TCM.

PINPOINT TEST F : DTCS P0B0D, P0C27, P0C28, P0C29, P0C2A, P175A

F1 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP POWER CIRCUITS

- Ignition OFF.
- Disconnect Transmission Harness Connector C168A.
- Ignition ON.

Is the voltage greater than 11 volts?

Yes	GO to F2
No	VERIFY the BJB fuse 111 (15A) is OK. If the fuse is OK, REPAIR the affected circuit for an open. If the fuse is not OK, REFER to the Wiring Diagrams manual to identify the cause of the affected circuit shorted to ground.

F2 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP GROUND CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms?

Yes	GO to F3
No	REPAIR the circuit

F3 CHECK THE TRANSMISSION FLUID LEVEL

- Ignition OFF.
- CHECK the transmission fluid level.

Is the transmission fluid level correct?

Yes	GO to F4
No	CORRECT the transmission fluid to the proper level.

F4 CHECK THE ELECTRIC TRANSMISSION FLUID PUMP SUMP SEALS

- Ignition OFF.
- DRAIN the transmission fluid and REMOVE the transmission pan.
REFER to: [Transmission Fluid Pan, Gasket and Filter](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
REFER to: [Transmission Fluid Pan, Gasket and Filter - Raptor](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
- REMOVE the transmission fluid pump and sump and inspect the seals.

Are the transmission fluid pump seals OK?

Yes	INSTALL a new electric transmission fluid pump. REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL new seals on the electric transmission fluid pump REFER to: Transmission Fluid Auxiliary Pump (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

U0100

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TCM sets one or more of the DTC U0100 when it has not received messages for more than 5 seconds from the PCM. Other modules that require data from the PCM all set communication DTCs and may also exhibit system function concerns.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U0100	Lost Communication With ECM/PCM "A"	Sets in continuous memory in the TCM if powertrain data messages received from the PCM over the HS-CAN are missing for longer than 5 seconds.

Possible Sources

- Communication concern
- Battery voltage concern
- PCM
- TCM

PINPOINT TEST G : U0100

G1 VERIFY THE SCAN TOOL COMMUNICATES WITH THE PCM (POWERTRAIN CONTROL MODULE)

- Ignition ON.
- Connect a diagnostic scan tool.
- Check that a vehicle session can be established using a diagnostic scan tool.

Can a vehicle session be established?

Yes	GO to G2
No	REFER to: Communications Network (418-00 Module Communications Network) .

G2 CHECK THE TCM (TRANSMISSION CONTROL MODULE) CONTINUOUS MEMORY DTC (DIAGNOSTIC TROUBLE CODE) S

- Using a diagnostic scan tool, perform the TCM self-test.
- Clear the DTCs.
- Wait 10 seconds.
- Repeat the TCM self-test.

Is DTCs U0100 retrieved again?

Yes	GO to G3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

G3 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S FROM THE PCM (POWERTRAIN CONTROL MODULE) KOEO (KEY ON, ENGINE OFF) SELF-TEST

- Using a diagnostic scan tool, perform the PCM KOEO self-test.

Are any DTCs recorded?

Yes	REFER to: Electronic Engine Controls (303-14C Electronic Engine Controls - 3.5L EcoBoost (272kW/370PS), Diagnosis and Testing).
No	GO to G4

G4 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S FROM THE TCM (TRANSMISSION CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the TCM self-test.

Is DTC P1397 recorded?

Yes	REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
No	GO to G5

G5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0100 SET IN OTHER MODULES

- Using a diagnostic scan tool, clear all DTCs.
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Retrieve the CMDTCs from all modules.

Is DTC U0100 set in other modules on the network?

Yes	GO to G6
No	GO to G7

G6 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the PCM connectors. Make sure they seat and latch correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new PCM. REFER to: Powertrain Control Module (PCM) (303-14C Electronic Engine Controls - 3.5L EcoBoost (272kW/370PS), Removal and Installation). PROGRAM the PCM with the latest calibration level.
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

G7 CHECK FOR CORRECT TCM (TRANSMISSION CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the TCM connector.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the TCM connector. Make sure it seats and latches correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
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No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.
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U0121

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

The TCM sets the DTC U0121 when key messages such as wheel speed, brake pressure or torque are not received for longer than 5 seconds. This loss of key messages degrades the transmission functionality. Other modules that require data from the ABS module all set communication DTCs and may also exhibit system function concerns.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U0121	Lost Communication With Anti-Lock Brake System (ABS) Control Module	Sets in continuous memory in the TCM if ABS data messages received from the ABS module over the HS-CAN are missing for longer than 5 seconds.

Possible Sources

- Communication concern
- Battery voltage concern
- ABS module
- TCM

PINPOINT TEST H : U0121

H1 VERIFY THE SCAN TOOL COMMUNICATES WITH THE ABS (ANTI-LOCK BRAKE SYSTEM)

- Ignition ON.
- Connect a diagnostic scan tool.
- Check that a vehicle session can be established using a diagnostic scan tool.

Can a vehicle session be established?

Yes	GO to H2
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

H2 CHECK THE TCM (TRANSMISSION CONTROL MODULE) CMDTC (CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODE) S

- Using a diagnostic scan tool, perform the TCM self-test.
- Clear the DTCs.
- Wait 10 seconds.
- Repeat the TCM self-test.

Is DTC U0121 retrieved again?

Yes	GO to H3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

H3 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S FROM THE ABS (ANTI-LOCK BRAKE SYSTEM) MODULE SELF-TEST

- Using a diagnostic scan tool, perform the ABS module self-test.

Are any DTCs recorded?

Yes	REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control, Diagnosis and Testing).
No	GO to H4

H4 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S FROM THE TCM (TRANSMISSION CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the TCM self-test.

Is DTC P1397 recorded?

Yes	REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
No	GO to H5

H5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0121 SET IN OTHER MODULES

- Using a diagnostic scan tool, clear all DTCs.
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Retrieve the CMDTCs from all modules.

Is DTC U0121 set in other modules on the network?

Yes	GO to H6
No	GO to H7

H6 CHECK FOR CORRECT ABS (ANTI-LOCK BRAKE SYSTEM) MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the ABS module connector.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the ABS module connector. Make sure it seat and latches correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern,
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

H7 CHECK FOR CORRECT TCM (TRANSMISSION CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the TCM connector.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the TCM connector. Make sure it seats and latches correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

U0140

Refer to Wiring Diagrams Cell 14 for schematic and connector information.

Normal Operation

The TCM sets the DTCs U0140 when key messages are not received for longer than 5 seconds. Other modules that require data from the BCM all set communication DTCs and may also exhibit system function concerns.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U0140	Lost Communication With Body Control Module	Sets in continuous memory in the TCM if BCM data messages such as tire size, axle ratio, global real time, engine off time received from the BCM over the HS-CAN are missing for longer than 2 seconds.

Possible Sources

- Communication concern
- Battery voltage concern
- BCM
- TCM

PINPOINT TEST I : U0140

I1 VERIFY THE SCAN TOOL COMMUNICATES WITH THE BODY CONTROL MODULE

- Ignition ON.
- Connect a diagnostic scan tool.
- Check that a vehicle session can be established using a diagnostic scan tool.

Can a vehicle session be established?

Yes	GO to I2
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

I2 CHECK THE TCM (TRANSMISSION CONTROL MODULE) CMDTC (CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODE) S

- Using a diagnostic scan tool, perform the TCM self-test.
- Clear the DTCs.
- Wait 10 seconds.
- Repeat the TCM self-test.

Are DTCs U0140 retrieved again?

Yes	GO to I3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

I3 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S FROM THE BCM (BODY CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the BCM module self-test.

Are any DTCs recorded?

Yes	REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules) .
No	GO to I4

I4 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S) FROM THE TCM (TRANSMISSION CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the TCM self-test.

Is DTC P1397 recorded?

Yes	REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
No	GO to I5

I5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0140 SET IN OTHER MODULES

- Using a diagnostic scan tool, clear all DTCs.
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Retrieve the CMDTCs from all modules.

Are DTC U0140 set in other modules on the network?

Yes	GO to I6
No	GO to I7

I6 CHECK FOR CORRECT BODY CONTROL MODULE (BCM) OPERATION

- Ignition OFF.
- Disconnect and inspect all BCM connectors.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the BCM connectors. Make sure they seat and latch correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern,
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

I7 CHECK FOR CORRECT TCM (TRANSMISSION CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the TCM connector.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the TCM connector. Make sure it seats and latches correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

U0155

Refer to Wiring Diagrams Cell 14 for schematic and connector information.

Normal Operation

The TCM sets the DTCs U0155 when key messages are not received for longer than 5 seconds. Other modules that require data from the IPC all set communication DTCs and may also exhibit system function concerns.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	Sets in continuous memory in the TCM if IPC data messages received from the IPC over the HS-CAN are missing for longer than 2 seconds.

Possible Sources

- Communication concern
- Battery voltage concern
- IPC
- TCM

PINPOINT TEST J : U0155

J1 VERIFY THE SCAN TOOL COMMUNICATES WITH THE INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

- Ignition ON.
- Connect a diagnostic scan tool.
- Check that a vehicle session can be established using a diagnostic scan tool.

Can a vehicle session be established?

Yes	GO to J2
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

J2 CHECK THE TCM (TRANSMISSION CONTROL MODULE) CMDTC (CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODE) S

- Using a diagnostic scan tool, perform the TCM self-test.
- Clear the DTCs.
- Wait 10 seconds.
- Repeat the TCM self-test.

Is DTC U0155 retrieved again?

Yes	GO to J3
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No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.
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J3 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S FROM THE IPC (INSTRUMENT PANEL CLUSTER) MODULE SELF-TEST

- Using a diagnostic scan tool, perform the IPC module self-test.

Are any DTCs recorded?

Yes	REFER to: Instrumentation, Message Center and Warning Chimes (413-01 Instrumentation, Message Center and Warning Chimes, Diagnosis and Testing).
No	GO to J4

J4 RETRIEVE THE RECORDED DTC (DIAGNOSTIC TROUBLE CODE) S FROM THE TCM (TRANSMISSION CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the TCM self-test.

Is DTC P1397 recorded?

Yes	REFER to: Charging System - 2.7L EcoBoost (238kW/324PS)/3.5L EcoBoost (272kW/370PS) (414-00 Charging System - General Information, Diagnosis and Testing).
No	GO to J5

J5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0155 SET IN OTHER MODULES

- Using a diagnostic scan tool, clear all DTCs.
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Retrieve the CMDTCs from all modules.

Is DTC U0155 set in other modules on the network?

Yes	GO to J6
No	GO to J7

J6 CHECK FOR CORRECT INSTRUMENT PANEL CONTROL OPERATION

- Ignition OFF.
- Disconnect and inspect the IPC connector.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the IPC connector. Make sure it seats and latches correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a IPC. REFER to: Instrument Panel Cluster (IPC) (413-01 Instrumentation, Message Center and Warning Chimes, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

J7 CHECK FOR CORRECT TCM (TRANSMISSION CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the TCM connector.
- Repair:
 - corrosion (install new connector or terminals - clean module pins)
 - damaged or bent pins - install new terminals/pins
 - pushed-out pins - install new pins as necessary
- Reconnect the TCM connector. Make sure it seats and latches correctly.
- Operate the system and verify the concern is still present

Is the concern still present?

Yes	CHECK OASIS for any applicable TSBs. If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no TSBs address this concern, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

U0146:00

Normal Operations and Fault Conditions

The TCM communicates with the GWM over the CAN. If the TCM does not receive messages from the GWM, features such as the keyless entry can be inoperative.

RTM DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U0146:00	Lost Communication With Gateway "A": No Sub Type Information	Sets when the TCM detects data messages are missing from the GWM over the CAN.

Possible Causes

- Network communication concern
- TCM
- GWM

PINPOINT TEST K : U0146:00

K1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is an observable symptom present?

Yes	GO to K2
No	The system is operating normally at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

K2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, perform a network test.

Does the GWM pass the network test?

Yes	GO to K3
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

K3 CHECK FOR CHARGING SYSTEM RELATED DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve all Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any battery voltage related Diagnostic Trouble Codes (DTCs) retrieved?

Yes	DIAGNOSE the charging system. Refer to the appropriate section in Group 303 for the procedure.
No	GO to K4

K4 RECHECK THE TCM (TRANSMISSION CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

NOTE: *If new modules were installed prior to the DTC being set, the module configuration may be incorrectly set during PMI or the PMI may not have been performed.*

- Using a diagnostic scan tool, clear the Diagnostic Trouble Codes (DTCs) and repeat the TCM self-test.

Is DTC U0146:00 still present?

Yes	GO to K5
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

K5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0146 SET IN OTHER MODULES

- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Wait 30 seconds.
- Using a diagnostic scan tool, retrieve the Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules.

Is DTC U0140 set in other modules?

Yes	INSTALL a new GWM. REFER to: Gateway Module A (GWM) (418-00 Module Communications Network, Removal and Installation).
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No

REFER to: [Transmission Control Module \(TCM\) - 3.0L Power Stroke Diesel/3.5L EcoBoost \(272kW/370PS\)](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure.
REFER to: [Transmission Strategy Download](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

TCC, LPC Solenoids

Refer to Wiring Diagrams Cell 30 for schematic and connector information.

Normal Operation

When the electrical connector or solenoid is disconnected, inspect the connector for terminal condition, corrosion and contamination and the connector seal for damage. Also inspect the connector seal for damage. Clean, repair or install new components as required. If the power circuit to the transmission solenoids fails open, then all solenoids are failed electrically off. Check for an open, short to ground or the transmission connector disconnected. The TCC is controlled by a directly proportional solenoid. Like the shift solenoids the TCC solenoid is controlled by a “smart driver” capable of detecting open, short to ground and short to power faults. In the event of an open circuit or short to power fault the TCC circuit is failed open. The TCC and LPC solenoids share a high side driver. Anytime power is removed the transmission defaults to MAX line pressure with open TCC. LPC is controlled by an inversely proportional solenoid (0 current = max pressure, max current = min line pressure). The LPC solenoid is controlled by a “smart driver” capable of detecting open, short to ground or short to power faults.

Possible Sources

- Connectors damaged or pushed-out terminals, corrosion, loose wires and missing or damaged seals
- TCC and LPC solenoid(s)
- Main control wiring harness
- Transmission internal wiring harness
- TCM

PINPOINT TEST L : TCC, LPC SOLENOIDS

L1 CHECK THE SOLENOID POWER CIRCUIT TSPC2 FOR VOLTAGE

- Ignition OFF.
- Disconnect: Transmission Harness C168A.
- Ignition ON.

Is the maximum recorded voltage greater than 11 volts?

Yes	GO to L4
No	GO to L2

L2 CHECK THE SOLENOID POWER CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect: TCM C1822.
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms?

Yes	GO to L3
No	REPAIR the transmission vehicle harness circuit for an open. CLEAR the DTCs. If DTC P0657 returns, INSTALL a new TCM. REFER to: Transmission Control Module (TCM) - 3.0L Power Stroke Diesel/3.5L EcoBoost (272kW/370PS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation). PROGRAM the TCM with the latest calibration level. PERFORM the Solenoid Body Strategy Data Download procedure. REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).

L3 CHECK THE SOLENOID POWER CIRCUIT FOR SHORT TO GROUND

Is the resistance greater than 10,000 ohms?

Yes	GO to L4
No	REPAIR transmission vehicle harness circuit short to ground.

L4 CHECK VEHICLE HARNESS SOLENOID CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect: TCM C1822
- Inspect the connector for damaged or pushed out terminals, corrosion, loose wires and missing or damaged seals.

Is the resistance less than 3 ohms on the suspect circuit?

Yes	GO to L5
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

L5 CHECK VEHICLE HARNESS SOLENOID CONTROL CIRCUITS FOR A SHORT TO GROUND

Is the resistance greater than 10,000 ohms on the suspect circuit?

Yes	GO to L6
No	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.

L6 CHECK SOLENOID CONTROL CIRCUITS FOR A SHORT TO POWER

Is any voltage detected on the suspect circuit?

Yes	REPAIR the transmission vehicle harness circuit. CLEAR the DTCs.
No	GO to L7

L7 CHECK MAIN CONTROL WIRING HARNESS FOR AN OPEN CIRCUIT

Are the resistances less than 3 ohms?

Yes	GO to L9
No	INSTALL a new main control wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

L8 CHECK MAIN CONTROL WIRING HARNESS FOR A SHORT TO GROUND

Are the resistances greater than 10,000 ohms?

Yes	GO to L9
No	INSTALL a new main control wiring harness. REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

L9 CHECK SOLENOID RESISTANCE

- Measure and record the resistance of the suspected solenoid.
REFER to: [Shift Solenoids \(SS\)](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
Compare the recorded value with the chart below:

Solenoid	Ohms
LPC solenoid	4.6 to 5.2
TCC solenoid	4.6 to 5.2

Is the solenoid resistance within specification?

Yes	INSTALL a new transmission internal wiring harness. REFER to: Transmission Internal Wiring Harness (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
No	INSTALL a new solenoid for the solenoid that failed the resistance check. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

Road Testing Vehicle

Shift Point Road Test

NOTE: Always drive the vehicle in a safe manner according to driving conditions and obey all traffic laws.

Upshift Gear Sequence

At times the 10-speed transmission may **skip** gears when the vehicle starts from a complete stop. This is **normal** and desired **behavior**.

At part pedal when acceleration is brisk, single step upshifts would result in very frequent shift events (very short time in gear). Double step upshifts results when a longer time is spent in gear.

However, at light pedal or road load, single step upshifts **will** occur. The small 10-speed gear steps allow the engine speed to drop to lower values than it would in the 6-speed transmission; providing for the best fuel economy. In contrast, when the 10-speed transmission is at heavy or max pedal, the small steps keep the engine closer to the horsepower peak for best performance.

Downshift Gear Sequence

At times the 10-speed transmission may **skip** gears when the vehicle down shifts to a complete stop. This is **normal** and desired **behavior**.

The same **skip** shift strategy that is used for the upshift may be applied during down shift.

Most performance based automatic transmission DTCs require the fault to be detected multiple times before setting a DTC. In many instances the faults must be detected consecutively a predetermined number of times (up to five). Performing the shift point road test as detailed below increases the likelihood that a DTC sets if a fault is present in the system.

Shift Point Road Test

1. Bring engine and transmission up to normal operating temperature.
2. Operate the vehicle with the selector lever in the D position.
3. From a stop, accelerate the vehicle to 80 km/h (50 mph) with the shifts occurring at approximately 2000 rpm. Stay in 10th gear for 30 seconds or until the TCC applies. Repeat this two times.
4. From a stop, accelerate the vehicle to 80 km/h (50 mph) with the shifts occurring at approximately 3000 rpm. Stay in 10th gear for 30 seconds or until the TCC applies. Repeat this two times.
5. If the transmission fails to upshift/downshift,
REFER to: [Diagnosis By Symptom](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).

Shift Speed Chart

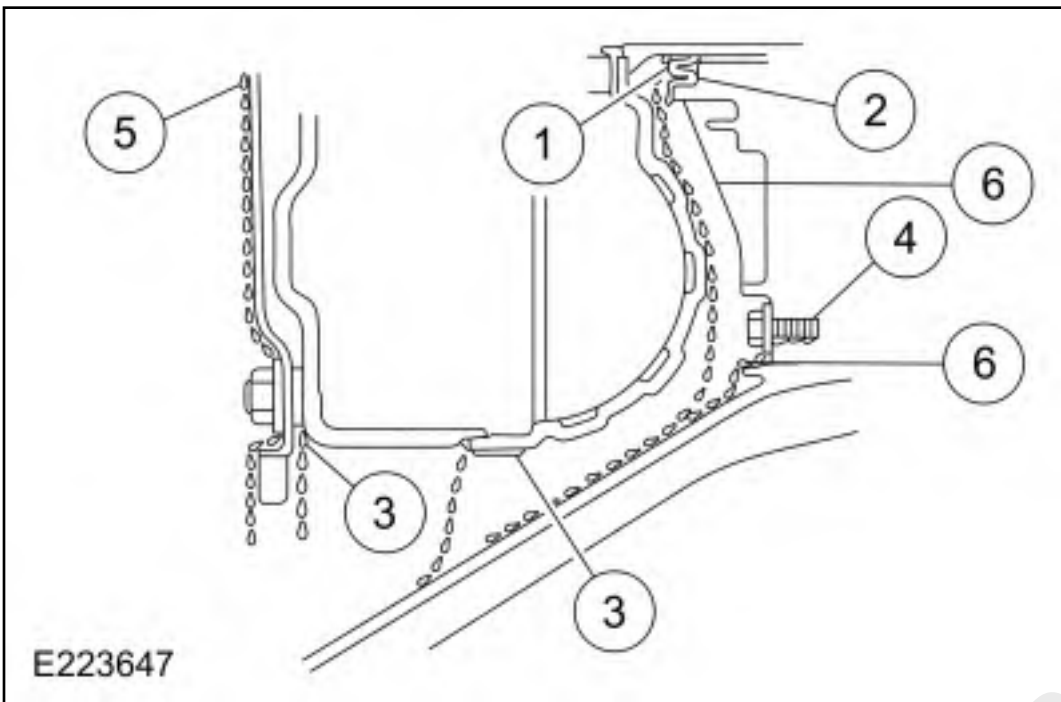
Shift	Speed
1-2	15 mph (24 km/h)
2-3	20 mph (32 km/h)
3-4	27 mph (43 km/h)
4-5	32 mph (51 km/h)
5-6	37 mph (60 km/h)
6-7	42 mph (68 km/h)
7-8	48 mph (77 km/h)
8-9	52 mph (84 km/h)
9-10	60 mph (97 km/h)

Leakage Inspection

Leak Check Test

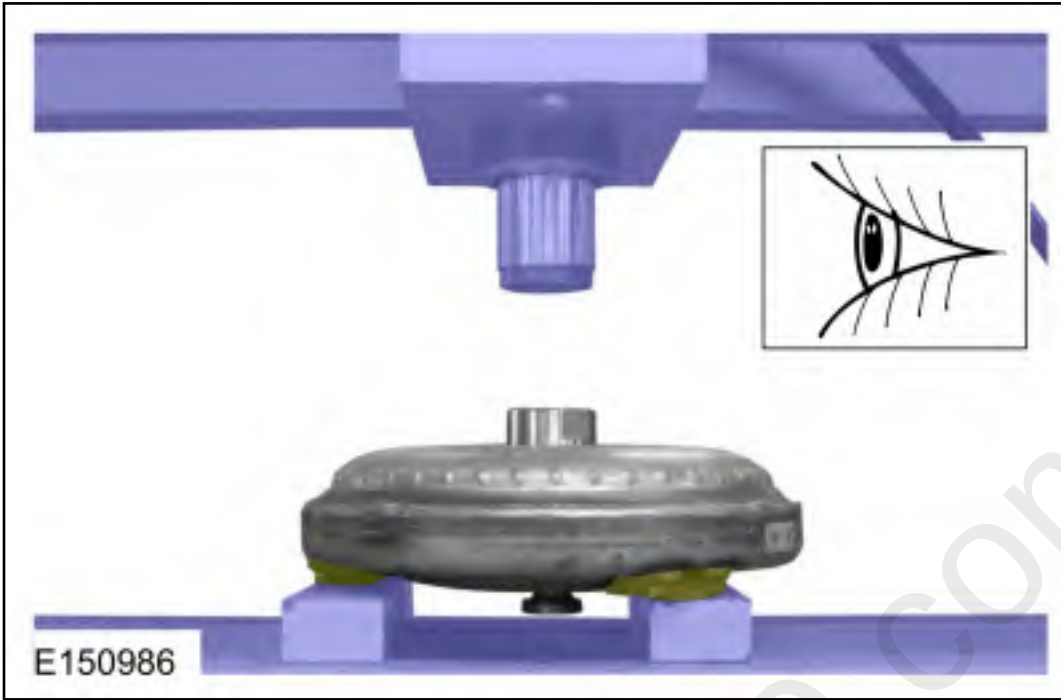
1. With the vehicle in NEUTRAL, position the vehicle on a hoist.
REFER to: Jacking and Lifting (100-02) .
2. Inspect the gasket and sealing areas for evidence of leakage.
3. Trace the transmission fluid leak to the highest point.
4. Clean area of suspected leak.
5. Lower vehicle.
6. Remove the transmission fluid fill plug or fluid level indicator.
7. Add leak detection dye to the transmission fluid. Use 1 fl oz (30 ml) of dye solution for every 4 qt (3.8 L) of transmission fluid.
8. With the transmission fluid at normal operating temperature, road test the vehicle for at least 1 mile with at least 1 application of the TCC.
9. With the vehicle in NEUTRAL, position the vehicle on a hoist.
REFER to: Jacking and Lifting (100-02) .
10. If the source of the leak is obvious, repair as required.
11. After the repair, clean the affected area.

Leakage From Torque Converter Housing

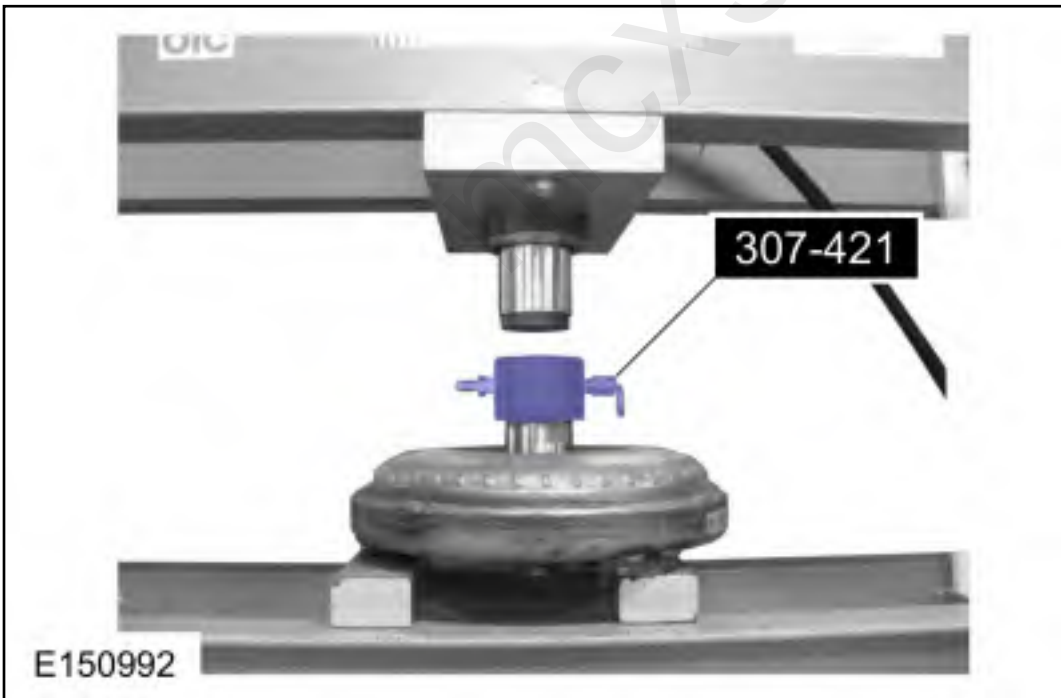


12. Leaks from the torque converter housing can originate from several locations. The paths which the transmission fluid takes to reach the bottom of the torque converter housing is shown in the illustration. The following 6 steps correspond with the numbers in the illustration.
 1. Transmission fluid leaking by the converter hub seal lip will tend to move along the drive hub and onto the back of the torque converter. Except in the case of a total seal failure, transmission fluid leakage by the lip of the seal will be deposited on the inside of the torque converter housing only, near the outside diameter of the housing.
 2. Transmission fluid leakage by the outside diameter of the torque converter impeller hub seal and the case will follow the same path that leaks by the inside diameter of the converter hub seal follow.
 3. Transmission fluid leakage from the converter cover weld or the converter-to-flexplate stud weld will appear at outside diameter of torque converter on the back face of the flexplate and in the converter housing only near the flexplate. If a converter-to-flexplate lug, lug weld or converter cover weld leak is suspected, remove the converter and pressure check.
 4. Transmission fluid leakage from the bolts inside the converter housing will flow down the back of the torque converter housing. Leakage may be from loose or missing bolts.
 5. Engine oil leaks from the rear main oil.
 6. Transmission fluid leak from front support cover and seal assembly.
13. Remove the torque converter.
14. Using a black light, observe the torque converter housing. Inspect for evidence of dye from the pump bolts, front support cover and seal assembly, and torque converter hub seal. Repair as required.

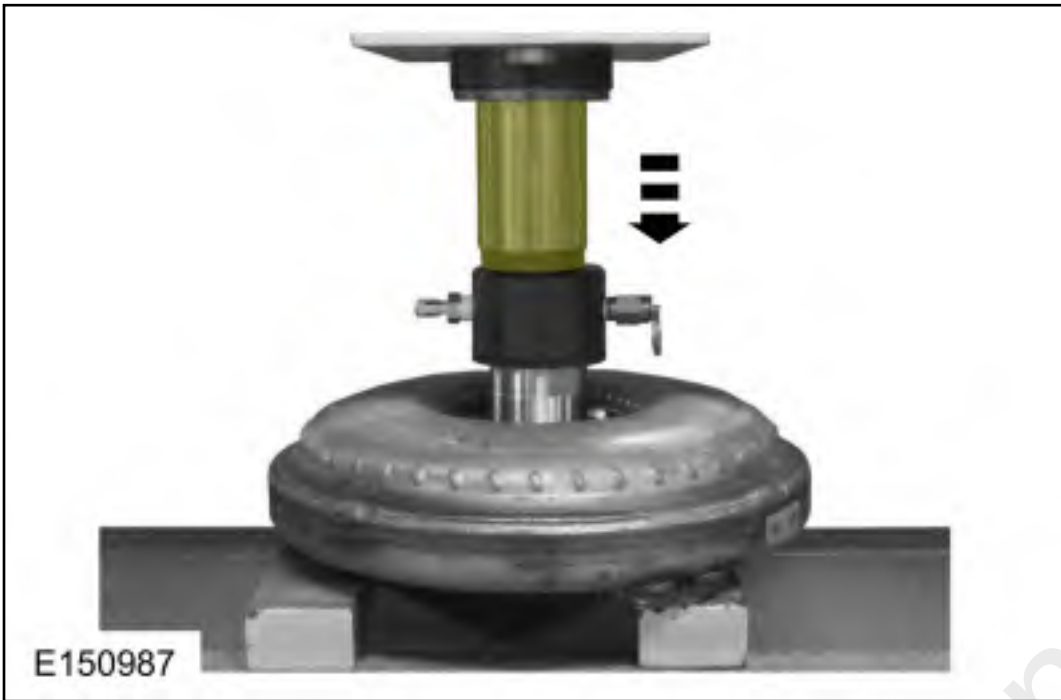
15. If the source of the leak is not evident, continue with this procedure to leak test the torque converter.
16. Place the torque converter in an arbor press. Support the torque converter on the mounting pads.



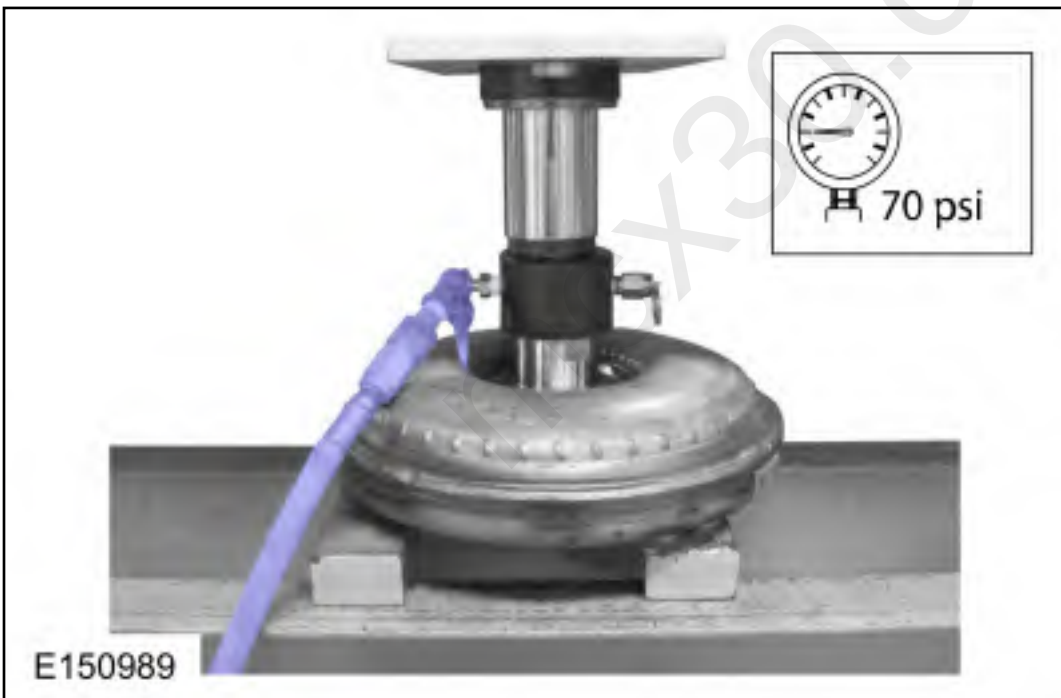
17. Install the torque converter leak tester (307-421) into the torque converter hub.



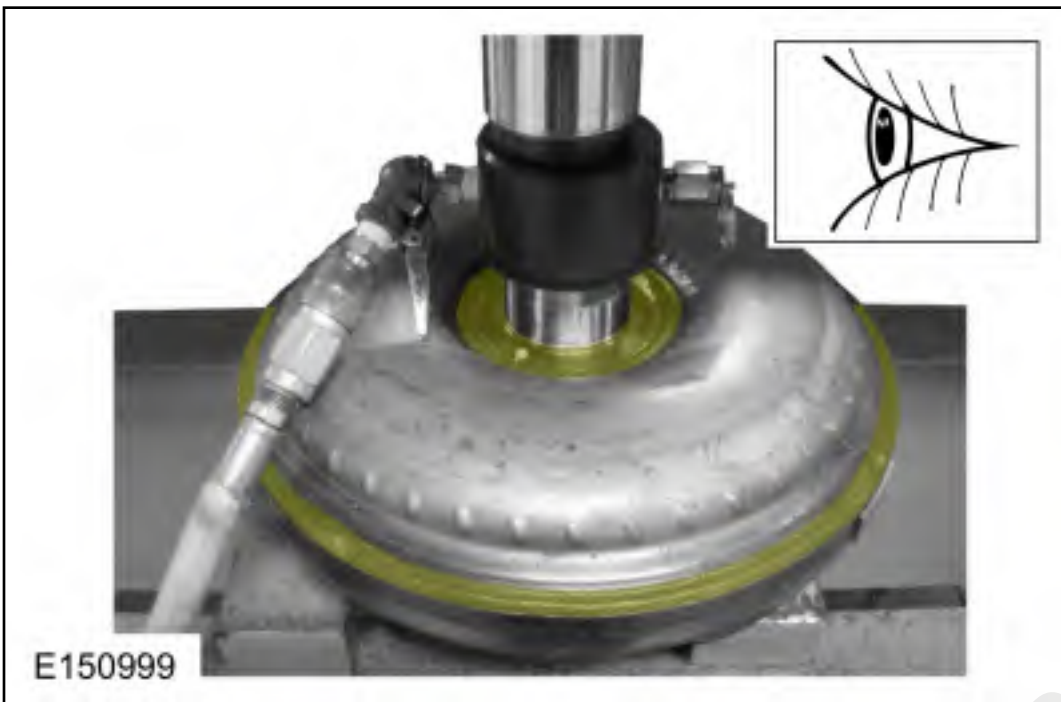
18. Secure the press. Apply enough force from the press to seal the torque converter leak tester (307-421) into the torque converter hub.



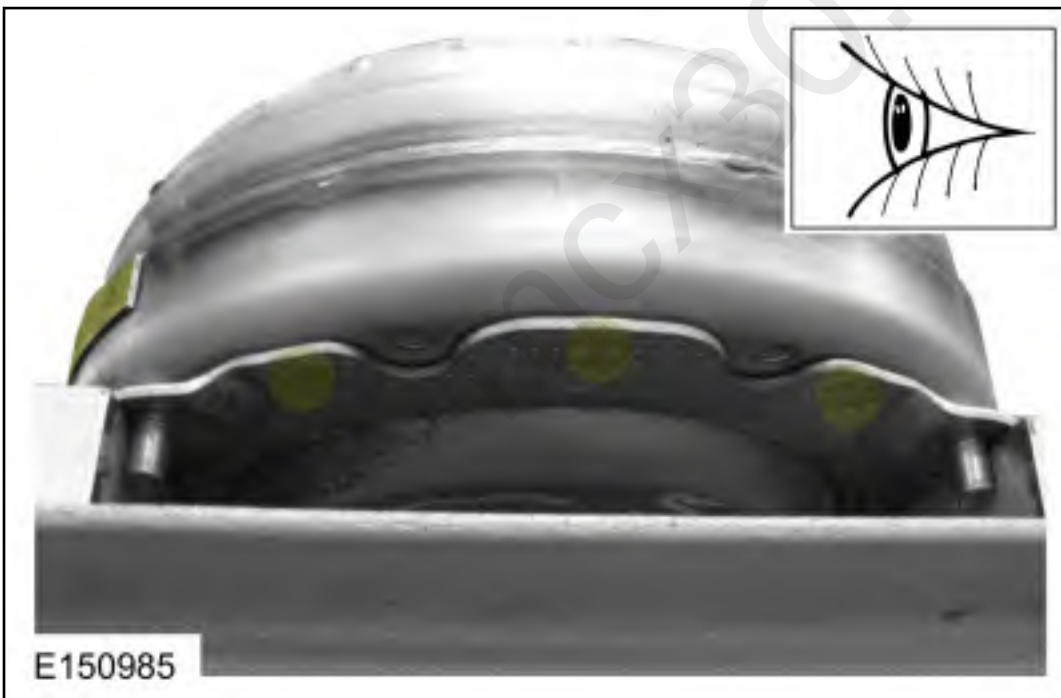
19. Connect a compressed air supply to the torque converter leak tester (307-421).



20. Inspect for leaks at the torque converter hub weld and seams with air pressure applied to the valve. A soap bubble solution can be applied around those areas to aid in the diagnosis. If any leaks are present, install a new torque converter.



21. Inspect for leaks at the stud or mounting pad and balance weight welds. A soap bubble solution can be applied around those areas to aid in the diagnosis. If any leaks are present, install a new torque converter.



22. After leaks are repaired, clean the remaining transmission fluid dye from serviced areas.

A Clutch

Symptom Chart

A Clutch Assembly

A Clutch

For A clutch operation,
REFER to: [A Clutch](#) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80,
Description and Operation).

A Clutch

Condition	Possible Sources	Action
A clutch does not apply	SSA is mechanically stuck OFF	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A Clutch regulator valve stuck OFF	DISASSEMBLE, CLEAN and INSPECT the regulator valve. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
A CL CONTR, hydraulic circuit blocked/leaking	DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
A clutch hub	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
A clutch friction plates	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

	A clutch piston seals	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
A clutch always applied	SSA mechanically stuck	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
	A Clutch regulator valve or CL A latch valve stuck ON	DISASSEMBLE, CLEAN and INSPECT the regulator valve. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
	A CL CONTR, hydraulic circuit cross leaks	DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

	A clutch hub, clutch and planetary carrier, No. 4 ring gear	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	A clutch friction plates	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	A clutch piston seals	INSPECT components wear and damage. CLEAN and/or INSTALL new components necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
A clutch delayed/soft/slipping apply	Incorrect transmission strategy programmed into PCM/ TCM.	PERFORM the Transmission Strategy Download, REFER to: Transmission Strategy Download (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, General Procedures).
	Low line pressure	PERFORM line pressure test. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	SSA mechanically sticking	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

A Clutch regulator valve sticking	DISASSEMBLE, CLEAN and INSPECT the valves. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
A CL CONTR, hydraulic circuits blocked/leaking	DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
A clutch friction plates	DISASSEMBLE and INSPECT the transmission passages for debris/blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
A clutch piston seals	DISASSEMBLE and INSPECT the transmission passages for debris/blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).

A clutch harsh apply	Incorrect transmission strategy programmed into PCM/ TCM.	PERFORM the Transmission Strategy Download, REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	High line pressure	PERFORM line pressure test. REFER to: Special Testing Procedures (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Diagnosis and Testing).
	SSA mechanically sticking	INSTALL a new solenoid. REFER to: Shift Solenoids (SS) (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
A Clutch regulator valve sticking		DISASSEMBLE, CLEAN and INSPECT the valves. If bore or valve is damaged, INSTALL a new main control valve body. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).
A CL CONTR hydraulic circuit blocked/leaking		DISASSEMBLE and INSPECT the main control valve body and separator plate passages for debris/blockage. CLEAN as necessary. REFER to: Main Control Valve Body (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80) . REFER to: Main Control Valve Body (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Removal and Installation).

	A clutch friction plates	DISASSEMBLE and INSPECT the transmission passages for debris/ blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
	A clutch piston return springs	DISASSEMBLE and INSPECT the transmission passages for debris/ blockage. CLEAN as necessary. REFER to: Transmission (307-01B Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).