Electronic Locking Differential (ELD) - Raptor

Principles of Operation

The ELD system allows the operator to lock the rear differential side gears. When the ELD is engaged both rear wheels turn at the same speed, providing added traction on slippery and/or off road surfaces. The operator can engage the ELD per the charts below:

ELD Engagement/Disengagement Speeds — 4WD Vehicles

Switch Position	Engage	Disengage	Re-engage
4A/4H	31 km/h (19 mph)a	42 km/h (25 mph)	31 km/h (19 mph)a
4L	90 km/h (56 mph)a	100 km/h (62 mph)	90 km/h (56 mph)a

a The ELD system engages/re-engages at or below the speed noted.

When the operator activates the ELD, the ELD icon displays in the IPC message center. If the vehicle is driven above the disengage speed, the IPC message center no longer displays the ELD icon, alerting the operator that the ELD is disengaged. Once the vehicle speed drops below the re-engage speed, the IPC message center displays the ELD icon again. If there is a malfunction with the ELD system, a CHECK LOCKING DIFFERENTIAL message is displayed in the IPC message center, letting the operator know the ELD is not engaged.

Under certain conditions the ELD system has the ability to modulate powertrain torque output as well as system engagement/disengagement to protect internal ELD hardware.

The ELD feature allows the ABS to override the engage state during special events. When this condition occurs the ELD icon flashes on and off rapidly.

The differential locks when a PWM controlled magnetic field coil located inside the differential energizes. This locks the differential side gears and creates the locked differential.

The ELD system also informs the customer when there is too much wheel slip to safely engage the ELD by displaying TO ENGAGE LOCKING DIFFERENTIAL RELEASE ACCELERATOR PEDAL message in IPC message center.When the ELD is engaged, the TCCM sends PWM voltage to the ELD field coil located in the differential. This voltage is initially 98% duty cycle, and then tapers off after 30 seconds. In order for the TCCM to activate the ELD, certain conditions must be met.

- ELD 4X4 switch module set to On.
- Wheel speed information via HS-CAN communication from ABS module)
- Operating range (voltage 11.5-16 volts)
- DTC setting range (voltage 10-15 volts)
- Ignition in the ON position
- Throttle Position (TP)

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 and refer to the Symptom Chart.

Visual Inspection Chart

Mechanical	Electrical

• Rear axle assembly
• Matching tire sizes
	• BJB Fuses
	  ○ fuse 110 (10A)
	  ○ fuse 72 (25A)
	  ○ fuse 40 (15A)
	• Wiring, terminals or connectors
	• 4X4 switch module
	• ELD field coil
	• TCCM

DTC Chart: TCCM

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	Description	Action
C1979:11	IWE Solenoid Circuit Failure: Circuit Short To Ground	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
C1979:12	IWE Solenoid Circuit Failure: Circuit Short To Battery	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
C1979:13	IWE Solenoid Circuit Failure: Circuit Open	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .

P0562:00	System Voltage Low: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P0563:00	System Voltage High: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P06B8:00	Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error: No Sub Type Information	CLEAR the DTC. REPEAT the self-test. If the DTC still sets, INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).
P1825:00	4-Wheel Drive Clutch Relay Open Circuit: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P1826:00	4-Wheel Drive Low Clutch Relay Circuit To Battery: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P1827:00	4-Wheel Drive Low Clutch Relay Circuit To Ground: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .

P1839:00	Transfer Case Shift Motor Open Circuit: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P1840:00	Transfer Case Shift Motor Short Circuit To Battery: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P1841:00	Transfer Case Shift Motor Short Circuit To Ground: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P1849:00	Transfer Case Contact Plate 'A' Short Circuit To Ground: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P184A:00	Transfer Case Unable To Transition Between 4x2LOW and 4x4 High Mode	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P184B:00	Transfer Case Unable To Transition Between 4X4 High and 4X4 Low Range: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .

P1853:00	Transfer Case Contact Plate 'B' Short Circuit To Ground: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P1857:00	Transfer Case Contact Plate 'C' Short Circuit To Ground: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P185D:00	Differential Lock-Up Control Circuit Performance: No Sub Type Information	GO to Pinpoint Test A
P1861:00	Transfer Case Contact Plate 'D' Short Circuit To Ground: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P1867:00	Transfer Case Contact Plate General Circuit Failure: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
P187A:00	Transfer Case Control Module System Voltage Low - Rear Locking Differential Disabled	GO to Pinpoint Test A
P187C:00	Differential Lock-Up Control Circuit/Open: No Sub Type Information	GO to Pinpoint Test A
P187D:00	Differential Lock-Up Control Circuit Low: No Sub Type Information	GO to Pinpoint Test A
P187E:00	Differential Lock-Up Control Circuit High: No Sub Type Information	GO to Pinpoint Test B

P1891:00	Transfer Case Contact Plate Ground Return Open Circuit: No Sub Type Information	CLEAR the DTC. REPEAT the self-test. If the DTC still sets, REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
U0100:00	Lost Communication With ECM/PCM "A": No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
U0101:00	Lost Communication With TCM "A": No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
U0121:00	Lost Communication With Anti-Lock Brake System (ABS) Control Module: No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
U0138:00	Lost Communication with All Terrain Control Module	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
U0140:00	Lost Communication With Body Control Module (BCM): No Sub Type Information	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .

U0155:00	Lost Communication With Instrument Panel Cluster (IPC) Control Module	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .
U0418:00	Invalid Data Received From Brake System Control Module: No Sub Type Information	To diagnose the wheel speed sensor concern, REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control) .
U0439:00	Invalid Data Received From All Terrain Control Module: No Sub Type Information	To diagnose the wheel speed sensor concern, REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control) .
U2300:54	Central Configuration: Missing Calibration	This DTC sets if one or more expected configuration data identifications is missing (gearbox type, tire circumference) from the BCM. CARRY OUT a self-test of the BCM. If DTCs are present, REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules) . If no DTCs are present, CARRY OUT a self-test. If U2300:54 returns, INSTALL a new TCCM.
U2300:55	Central Configuration: Not Configured	This DTC sets upon power up only until all expected configuration data parameters (gearbox type, axle ratio, tire circumference) are received from the BCM. CARRY OUT a self-test of the BCM. If DTCs are present, REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules) . If no DTCs are present, CLEAR the DTCs. CARRY OUT self-test. If U2300:55 returns, INSTALL a new

		Terrain Management Module.
U2300:56	Central Configuration: Invalid / Incompatible Configuration	This DTC sets if a expected configuration data parameter is out of range (gearbox type, axle ratio, tire circumference) from the BCM. CARRY OUT a self-test of the BCM. If DTCs are present, REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules) . If no DTCs are present, CARRY OUT a self-test. If U2300:56 returns, INSTALL a new Terrain Management Module.
U2300:64	Central Configuration: Signal Plausibility Failure	This DTC sets if the expected axle ratio or tire circumference is out of range from the BCM. CARRY OUT a self-test of the BCM. If DTCs are present, REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules) . If no DTCs are present, CARRY OUT a self-test. If U2300:64 returns, INSTALL a new Terrain Management Module.
U3000:04	Control Module: System Internal Failure	CLEAR the DTC. REPEAT the self-test. If DTC U3000:04 is retrieved again, INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).
U3000:46	Control Module: Calibration / Parameter Memory Failure	CLEAR the DTC. REPEAT the self-test. If DTC U3000:46 is retrieved again, INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).
U3000:49	Control Module: Internal Electronic Failure	CLEAR the DTC. REPEAT the self-test. If DTC U3000:49 is retrieved again, INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).

U300D:11	Ignition Input On/Start: Circuit Short To Ground	REFER to: Four-Wheel Drive Systems - Raptor, Vehicles With: 2-Speed Torque On Demand Transfer Case/4HI-LOC Torque on Demand Transfer Case (308-07 Four-Wheel Drive Systems) .

Symptom Chart Electronic Locking Differential (ELD) System

Symptom	Possible Sources	Action
• A module does not respond to the scan tool	• Wiring, terminals or connectors • Scan tool • DLC • TCCM	• CHECK the module communications network, module does not respond to the scan tool. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
• Rear wheels binding when turning corners with the ELD 4X4 switch module in 2WD or OFF	• Wiring, terminals or connectors • ELD field coil • Rear differential • TCCM	• GO to Pinpoint Test B
• The ELD is inoperative	• Wiring, terminals or connectors • 4X4 switch module	• GO to Pinpoint Test C

Pinpoint Tests

DTC P185D:00, P187C:00 AND P187D:00

Refer to Wiring Diagrams Cell 34 for schematic and connector information.

Normal Operation

When the ELD 4X4 switch module is engaged to lock the rear differential, the TCCM sends a PWM signal to the ELD field coil through the differential lock control circuit. This PWM signal is initially 98% duty cycle to lock the differential and then tapers off to a lower duty cycle once the differential is locked. If the differential lock control circuit is open or shorted to ground, the TCCM senses a signal is not reaching the differential and sets a DTC.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P185D:00	Differential Lock-Up Control Circuit Performance: No Sub Type Information	This DTCsets if locker is not able to engage after a calibratable number of retries or a delta rear wheel condition persists while commanding the ELD ON. The DTC clears if the locker successfully engages.
P187C:00	Differential Lock-Up Control Circuit/Open: No Sub Type Information	This DTC sets when the TCCM senses the differential lock control circuit is open. The ELD differential is not engaged.
P187D:00	Differential Lock-Up Control Circuit Low: No Sub Type Information	This DTC sets when the TCCM senses the differential lock control circuit is shorted to ground. The ELD differential is not engaged.

Possible Sources

- Wiring, terminals or connectors
- TCCM

PINPOINT TEST A : DTC P185D:00, P187C:00 AND P187D:00

NOTE: *Make sure the battery is fully charged before carrying out this pinpoint test.*

A1 CHECK FOR TCCM DTCS

- Ignition ON.
- Set the ELD 4X4 switch module to OFF.
- Enter the following diagnostic mode: TCCM Self-Test .

Are any DTCs present?

Yes	For DTCs P185D:00, P187D:00, GO to A3 For DTC P187C:00, GO to A4 For all other DTCs, REFER to the DTC Chart: TCCM .
No	VERIFY the customer concern and GO to the Symptom Chart.

A2 CHECK FOR TCCM DTCS WITH THE ELD FIELD COIL DISCONNECTED

- Ignition OFF.
- Disconnect ELD Field Coil C4359.
- Ignition ON.
- Set the ELD 4X4 switch module to OFF.
- Enter the following diagnostic mode: TCCM Self-Test .

CLEAR the DTCs. REPEAT the self-test. Does DTC P187D:00 return?

Yes	GO to A3
No	INSTALL a new ELD field coil. REFER to: Differential Carrier - Vehicles With: Electronic Locking Differential (ELD) (205-02A Rear Drive Axle/Differential - Vehicles With: Ford 8.8 Inch Ring Gear, Disassembly and Assembly). CLEAR the DTCs.

A3 CHECK THE ELD DIFFERENTIAL LOCK CONTROL CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect TCCM C2371B.

Is the resistance greater than 10,000 ohms?

Yes	GO to A4
No	REPAIR the circuit.

A4 CHECK THE ELD DIFFERENTIAL LOCK CONTROL CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect TCCM C2371A.
- Disconnect ELD Field Coil C4359.

Is the resistance less than 3 ohms?

Yes	GO to A5
No	REPAIR the circuit.

A5 CHECK FIELD COIL GROUND CIRCUIT

Is the resistance less than 3 ohms?

Yes	GO to A6
No	REPAIR the circuit.

A6 CHECK FOR CORRECT TCCM OPERATION

- Ignition OFF.
- Disconnect and inspect all TCCM connectors.
- Check for the following:
  - 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
- Connect all TCCM connectors. Make sure they seat and latch correctly.
- Operate the system and verify the concern is still present.

Is the concern still present?

Yes	INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).
No	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. ADDRESS the root cause of the connector or pin issues.

Rear Wheels Binding When Turning Corners With The ELD 4X4 switch module Set To OFF

Refer to Wiring Diagrams Cell 34 for schematic and connector information.

Normal Operation

When the ELD 4X4 switch module is engaged to lock the rear differential, the TCCM sends a PWM signal to the ELD field coil through the differential lock control circuit. This PWM signal is initially 98% duty cycle to lock the differential and then tapers off to a lower duty cycle once the differential is locked. If the differential does not lock, the TCCM continues to send the signal for a set amount of time. Once the differential is locked, the indicator illuminates steadily.

Possible Sources

- Wiring, terminals or connectors

- ELD field coil
- TCCM (4WD only)

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
P187E:00	Differential Lock-Up Control Circuit High: No Sub Type Information	This DTC sets when the TCCM senses the differential lock control circuit is shorted to battery voltage. The differential is constantly engaged.

PINPOINT TEST B : REAR WHEELS BINDING WHEN TURNING CORNERS WITH THE ELD 4X4 SWITCH MODULE SET TO OFF

NOTE: *Make sure the battery is fully charged before carrying out this pinpoint test.*

B1

- Ignition OFF.
- Disconnect ELD Field Coil C4359.
- Ignition ON.
- Set the ELD 4X4 switch module to OFF.

Is any voltage present?

Yes	GO to B2
No	To repair the rear differential, REFER to: Rear Drive Axle and Differential (205-02A Rear Drive Axle/ Differential - Vehicles With: Ford 8.8 Inch Ring Gear, Diagnosis and Testing). REFER to: Electronic Locking Differential (ELD) (205-02B Rear Drive Axle/ Differential - Vehicles With: Ford 9.75 Inch Ring Gear, Diagnosis and Testing).

B2 CHECK THE ELD FIELD COIL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect TCCM C2371B.
- Ignition ON.

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to B3

B3 CHECK THE TCCM REAR LOCKING DIFFERENTIAL PWM OUTPUT CONTROL (DIFF_PWM_OS) PID

- Ignition OFF.
- Connect PWM Field Coil C4359.
- Connect TCCM C2371B.
- Ignition ON.
- Enter the following diagnostic mode: TCCM DataLogger.
- 4X4 switch module to OFF monitor the DIFF_PWM_OS PID.

Does the DIFF_PWM_OS PID read OFF?

Yes	GO to B4
No	INSTALL a new 4X4 switch module. REFER to: Mode Select Switch (MSS) (308-07A Four-Wheel Drive Systems, Removal and Installation).

B4 CHECK FOR CORRECT TCCM OPERATION

- Ignition OFF.
- Disconnect and inspect all TCCM connectors.
- Check for the following:
  - 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
- Connect all TCCM connectors. Make sure they seat and latch correctly.
- Operate the system and verify the concern is still present.

Is the concern still present?

Yes	INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).
No	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. ADDRESS the root cause of the connector or pin issues.

The Eld Is Inoperative

Refer to Wiring Diagrams Cell 34 for schematic and connector information.

Normal Operation

The 4X4 switch module controls the 4X4 modes and the ELD by sending the selected mode request via the HS-CAN to the TCCM. The TCCM then sends a message to the IPC so that the correct 4X4 mode is displayed in the message center. The 4X4 switch module is known as the All-Terrain Control Module by the scan tool.

PINPOINT TEST C : THE ELD IS INOPERATIVE

C1 CHECK FOR TCCM AND ATCM DTCS

- Ignition ON.
- **NOTE:** *Confirm that the Terrain Management system is not in a mode where the ELD is not available.*

  Enter the following diagnostic mode on the scan tool: All-Terrain Control Module (ATCM) and TCCM Self-Test.

Are any DTCs present?

Yes	If DTCs U0121, U0155, or ATCM DTC U0102 are present RESOLVE then first before proceeding with this test, For all other TCCM DTCs, REFER to the TCCM DTC chart.
No	GO to C2

C2 CHECK THE MSS POSITION MONITORING THE TCCM 4WD SWITCH STATUS (4X4_SW) PID

- Ignition ON.
- Enter the following diagnostic mode: TCCM Datalogger.
- Drive the vehicle.
- Dynamically monitor the 4X4_SW PID while driving the vehicle in each shift position.

Does the 4X4_SW PID always agree with the switch position?

Yes	GO to C3
No	GO to C4

C3 CHECK THE 4WD INDICATORS

- Stop the vehicle.
- Transmission in NEUTRAL.
- Depress the brake pedal.
- Observe the 4WD indication in the message center while cycling through each MSS position.

Does the 4WD indicator(s) match the 4X4 switch module position?

Yes	GO to C6
No	GO to C4

C4 CHECK THE 4X4 SWITCH MODULE VOLTAGE CIRCUIT

- Disconnect 4X4 Switch Module C2071.
- Ignition ON.

Is the voltage 11 volts or greater?

Yes	GO to C5
No	CHECK BCM fuse 33, (7.5A), if OK REPAIR the open circuit. If not OK, REFER to the wiring diagram manual to repair the short circuit.

C5 CHECK THE 4X4 SWITCH MODULE GROUND CIRCUIT

- Ignition OFF.

Is the resistance less than 3 ohms?

Yes	INSTALL a new 4X4 switch module.
No	REPAIR the circuit.

C6 CHECK THE ABS MODULE WHEEL SPEED SENSOR PIDS

- Enter the following diagnostic mode: ABS Module Datalogger.
- While driving the vehicle at 30 km/h (18 mph), monitor the following wheel speed sensor PIDs:
  - Left Front Wheel Speed Sensor (LF_WSPD)
  - Left Rear Wheel Speed Sensor (LR_WSPD)
  - Right Front Wheel Speed Sensor (RF_WSPD)
  - Right Rear Wheel Speed Sensor (RR_WSPD)
- Compare the speedometer reading to the wheel speed sensor PIDs.

Do the wheel speed sensor PIDs and speedometer speeds match within 1.5 km/h (1 mph)?

Yes	GO to C7
No	VERIFY that the 4 road wheels are the same size and have similar tread depth. CHECK the ABS for faults. REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control) .

C7 CHECK THE TCCM ABSOLUTE THROTTLE POSITION (TP_TCCM) PID

- Enter the following diagnostic mode: TCCM Datalogger.
- **NOTE:** *The TP_TCCM PID is APP as communicated by the PCM via HS-CAN.*

  Slowly move accelerator pedal from closed throttle to and observe the TP_TCCM PID.

Does the TP_TCCM PID value vary between 0% at closed throttle and 100% at WOT?

Yes	GO to C8
No	DIAGNOSE the PCM. Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual.

C8 CHECK THE PSCM FOR STEERING WHEEL POSITION SENSOR DTCS

- Enter the following diagnostic mode: ABS Module Datalogger.

Are any steering wheel position sensor DTCS retrieved?

Yes	REFER to: Anti-Lock Brake System (ABS) and Stability Control (206-09 Anti-Lock Brake System (ABS) and Stability Control) .
No	GO to C9

C9 CHECK FOR CORRECT TCCM OPERATION

- Ignition OFF.
- Disconnect and inspect all TCCM connectors.
- Check for the following:
  - 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
  - Refer to Wiring Diagrams Cell 34 and verify module ground to vehicle ground connection.
- Connect all TCCM connectors. Make sure they seat and latch correctly.

- Operate the system and verify the concern is still present.

Is the concern still present?

Yes	INSTALL a new TCCM. REFER to: Transfer Case Control Module (TCCM) (308-07A Four-Wheel Drive Systems, Removal and Installation).
No	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. ADDRESS the root cause of the connector or pin issues.