• Transmission returns to park automatically	• The criteria for the return to park feature was met • Driver door ajar switch, circuits, BCM or GSM	• Check the system for normal operation. REFER to: External Controls - System Operation and Component Description (307-05 Automatic Transmission External Controls, Description and Operation). • Open then close the drivers door and cycle the door locks. If the door ajar icon is illuminated on the IPC and the door lock and unlock are not working correctly, REFER to: Locks, Latches and Entry Systems (501-14 Handles, Locks, Latches and Entry Systems, Diagnosis and Testing). If the door ajar and locks are working correctly, GO to Pinpoint Test H
• Transmission does not return to park when the door is opened	• Driver door ajar switch, circuits, BCM or GSM	• GO to Pinpoint Test H
• Transmission stuck in drive	• GSM	• CHECK for DTCs related to the GSM.
	• Internal transmission components damaged	• CHECK the park lock pawl actuator, park lock pawl actuator valve and linkage for damage. REFER to: Transmission (307-01A Automatic Transmission - 8-Speed Automatic Transmission â€“ 8F35/8F40, Overhaul).
• Paddle shift does not operate correctly	• Selector lever not fully engaging in S position • Selector lever damaged • PCM	• GO to Pinpoint Test L

Pinpoint Tests

PINPOINT TEST A : DTC P0562:00

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

Normal Operation and Fault Conditions

The GSM requires an operating voltage between 9 and 16 volts. The GSM receives this voltage from the BCM and has a single ground circuit. Excessive resistance or an open in one or more of these circuits, a discharged battery or a inoperative charging system results in the GSM setting a DTC.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM P0562:00	System Voltage Low: No Sub Type Information	This DTC sets in continuous memory if the voltage supplied to the GSM falls below 9 volts for more than 3 seconds.

Possible Sources

- Fuses
- Wiring, terminals or connectors
- GSM

A1 RECHECK THE GSM (GEAR SHIFT MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, clear the GSM DTCs.
- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, carry out the GSM self-test.

Is DTC P0562 still present?

Yes	GO to A2
No	The system is operating correctly at this time. The DTC may have set due to a previous low battery voltage condition.

A2 CHECK FOR CHARGING SYSTEM DIAGNOSTIC TROUBLE CODES (DTCS) IN THE PCM (POWERTRAIN CONTROL MODULE)

- Using a diagnostic scan tool, retrieve all CMDTCs.

Are any charging system Diagnostic Trouble Codes (DTCs) present in the PCM?

Yes	DIAGNOSE the vehicle charging concern.
No	GO to A3

A3 CHECK THE BATTERY CONDITION AND STATE OF CHARGE

- Carry out the Battery Condition Test.
  REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Did the battery pass the condition test?

Yes	GO to A4
No	INSTALL a new battery. REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

A4 CHECK THE GSM (GEAR SHIFT MODULE) VOLTAGE SUPPLY

- Ignition OFF.
- Disconnect GSM C2503.
- Ignition ON.
- Measure:

GEAR SHIFT MODULE (GSM)	

Positive Lead	Measurement / Action	Negative Lead
C2503-1		Ground
C2503-15		Ground

Is the voltage within 1 volt of the recorded battery voltage?

Yes	GO to A5
No	VERIFY BCM fuse 12 (7.5A) is OK. If OK, REPAIR the affected circuit for high resistance or an open. If not OK, REFER to the Wiring Diagrams manual to identify the cause of the circuit short.

A5 CHECK THE GSM (GEAR SHIFT MODULE) GROUND CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

GEAR SHIFT MODULE (GSM)	

Positive Lead	Measurement / Action	Negative Lead
C2503-18	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to A6
No	Verify ground G202 is clean and torqued to specification. If OK, REPAIR the circuit.

A6 VERIFY ALL WIRING CONNECTIONS

- Disconnect and inspect GSM C2503 and related in-line electrical connectors.
- Using a good light source, inspect **all** disconnected electrical connectors for the following:
  - corrosion - install new connector or terminal and clean the module pins
  - damaged or bent pins - install new terminals or pins
  - pushed-out pins - install new pins as necessary
  - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	GO to A7
No	REPAIR the connector, terminals as necessary.

A7 CHECK FOR CORRECT GSM (GEAR SHIFT MODULE) OPERATION

- Connect GSM C2503 and all related in-line electrical connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB (general service bulletin), SSM (special service message) or FSA (Field Service Action). If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, Removal and Installation).
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 pin issues.

PINPOINT TEST B : DTC (DIAGNOSTIC TROUBLE CODE) P0563

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

Normal Operation and Fault Conditions

The GSM requires an operating voltage between 9 and 16 volts. The GSM receives this voltage from the BCM and has a single ground circuit. Excessive resistance or an open in one or more of these circuits, a discharged battery or a inoperative charging system results in the GSM setting a DTC.

An overcharging condition in the charging system results in the GSM module setting a DTC. This DTC may also set in the GSM module due to battery charging or vehicle jump starting events.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM P0563:00	System Voltage High: No Sub Type Information	This DTC sets in continuous memory if the voltage supplied to the GSM module is above 16 volts for more than 3 seconds.

Possible Sources

- Charging system concern
- GSM module

B1 CHECK FOR HIGH VOLTAGE DTCS SET IN OTHER MODULES

- Using a diagnostic scan tool, retrieve all CMDTCs.

Are any charging system Diagnostic Trouble Codes (DTCs) present in the PCM?

Yes	DIAGNOSE the vehicle charging concern.
No	GO to B2

B2 CHECK THE BATTERY VOLTAGE

- Turn off all interior lights, exterior lights and accessories.
- **NOTE:** *Do not allow the engine speed to increase above 2,000 RPM while performing this step or the generator may self-excite and result in default charging system output voltage. If engine speed goes above 2,000 RPM, turn the engine off and restart the engine before performing this step.*

  Start and run the engine at approximately 1,500 RPM for 3 minutes while monitoring the battery voltage.

Is the battery voltage between 13 and 15.2 volts?

Yes	GO to B3
No	DIAGNOSE the overcharging condition.

B3 RECHECK THE GSM (GEAR SHIFT MODULE) FOR DTC (DIAGNOSTIC TROUBLE CODE) P0563

- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, clear the GSM DTCs.
- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, carry out the GSM self-test.

Is DTC P0563 still present?

Yes	GO to B4
No	The system is operating normally at this time. The DTC may have been set previously during battery charging or while jump starting the vehicle.

B4 VERIFY ALL WIRING CONNECTIONS

- Ignition OFF.
- Disconnect and inspect GSM C482A and related in-line electrical connectors.
- Using a good light source, inspect **all** disconnected electrical connectors for the following:
  - corrosion - install new connector or terminal and clean the module pins
  - damaged or bent pins - install new terminals or pins
  - pushed-out pins - install new pins as necessary
  - spread terminals - install new terminals as necessary

Are the connectors free of corrosion, damaged pins, bent pins, pushed-out pins and spread terminals?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB (general service bulletin), SSM (special service message) or FSA (Field Service Action). If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new GSM module. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, Removal and Installation).
No	REPAIR as necessary.

PINPOINT TEST C : DTC U0155

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

Normal Operation and Fault Conditions

The IPC, GSM and BCM use information contained in messages on the HS-CAN.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM U0155:00	Lost Communication With Instrument Panel Cluster (IPC) Control Module: No Sub Type Information	This DTC sets if the GSM does not receive some or all of an expected message from the IPC.

Possible Sources

- Connectors damaged or pushed-out terminals, circuitry open, shorted to power or shorted to ground
- BCM fuses 13 and 19 (7.5A)
- IPC

C1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- **NOTE:** *If a GSM self-test is performed, make sure the drivers door is closed and locked.*

  Using the diagnostic scan tool, perform the network test.

Does the IPC module pass the network test?

Yes	GO to C2
No	To diagnose the module does not respond to the scan tool, REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

C2 CHECK FOR GSM (GEAR SHIFT MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Clear all DTCs.
- Using the diagnostic scan tool, perform the GSM self-test.

Is DTC U0155 present?

Yes	GO to C3
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.

C3 RETRIEVE THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE GSM (GEAR SHIFT MODULE) SELF-TEST

- Check for DTCs from the self-test.

Are any GSM DTCs present?

Yes	REFER to the GSM DTC chart and diagnose those DTCs first.
No	GO to C4

C4 RETRIEVE THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE IPC (INSTRUMENT PANEL CLUSTER) SELF-TEST

- Check for DTCs from the self-test.

Is DTC U3000:49 present?

Yes	REFER to: Instrumentation, Message Center and Warning Chimes (413-01 Instrumentation, Message Center and Warning Chimes, Diagnosis and Testing).
No	GO to C5

C5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0155 SET IN OTHER MODULES

- Using the diagnostic scan tool, perform the self-test for all modules.
- Retrieve the DTCs from all modules.

Is DTC U0155 present in the PCM or SCCM?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB (general service bulletin), SSM (special service message) or FSA (Field Service Action). If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new IPC. Click here to access Guided Routine (IPC).
No	If the reporting module is the GSM, INSTALL a new GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, Removal and Installation).

PINPOINT TEST D : U0140

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

Normal Operation and Fault Conditions

The DTC sets if there is a loss or gap in module communications for more than 5 seconds. Modules that don't communicate with the scan tool are obvious concerns.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM U0140:00	Lost Communication With Body Control Module: No Sub Type Information	Sets in continuous memory in the GSM module if data messages received from the BCM are missing for 5 seconds or longer.

Possible Sources

- Communication concern
- GSM
- BCM

D1 VERIFY THE SCAN TOOL COMMUNICATES WITH THE BCM (BODY CONTROL MODULE)

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

Can a vehicle session be established?

Yes	GO to D2
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

D2 CHECK THE GSM (GEAR SHIFT MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

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

Are any non-network DTCs present?

Yes	DIAGNOSE all non-network DTCs. REFER to DTC Chart: GSM.
No	GO to D3

D3 PERFORM THE BCM (BODY CONTROL MODULE) SELF-TEST

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

Are any non-network Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE all non-network DTCs. REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing).
No	GO to D4

D4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, check the GWM Continuous Memory DTCs.

Are any DTCs set?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to D5

D5 RECHECK THE GSM (GEAR SHIFT MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, clear the GSM DTCs.
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the GSM DTCs.

Is DTC U0140 still present?

Yes	GO to D6
No	The system is operating correctly at this time. The DTC may have set due to high network traffic or an intermittent fault condition.

D6 CHECK FOR OTHER CAUSES OF COMMUNICATION NETWORK CONCERNS

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

- CHECK the vehicle service history for recent service actions related to the BCM or GSM. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part application
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to D7
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

D7 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION

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

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB (general service bulletin), SSM (special service message) or FSA (Field Service Action). If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine, Click here to access Guided Routine (BCM).
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.

PINPOINT TEST E : DTC U0121

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

Normal Operation and Fault Conditions

The DTC sets if there is a loss or gap in module communications for more than 5 seconds. Modules that don't communicate with the scan tool are obvious concerns.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM U0121:00	Lost Communication With Anti-Lock Brake System (ABS) Control Module "A": No Sub Type Information	Sets in continuous memory in the GSM if data messages received from the ABS are missing for 5 seconds or longer.

Possible Sources

- Communication concern
- ABS
- GSM

E1 VERIFY THE SCAN TOOL COMMUNICATES WITH THE ABS (ANTI-LOCK BRAKE SYSTEM)

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

Can a vehicle session be established?

Yes	GO to E2
No	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

E2 CHECK THE GSM (GEAR SHIFT MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

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

Are any non-network DTCs present?

Yes	DIAGNOSE all non-network DTCs. REFER to DTC Chart: GSM.
No	GO to E3

E3 PERFORM THE ABS (ANTI-LOCK BRAKE SYSTEM) SELF-TEST

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

Are any non-network DTCs present?

Yes	DIAGNOSE all non-network DTCs. 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 E4

E4 CHECK THE GWM (GATEWAY MODULE A) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, check the GWM Continuous Memory Diagnostic Trouble Codes (CMDTCs).

Are any DTCs set?

Yes	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
No	GO to E5

E5 RECHECK THE GSM (GEAR SHIFT MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, clear the GSM DTCs.
- Ignition OFF.
- Ignition ON.
- Wait 10 seconds.
- Using a diagnostic scan tool, perform the continuous memory self-test.
- Check the GSM DTCs.

Is DTC U0121 still present?

Yes	GO to E6
No	The system is operating correctly at this time. The DTC may have set due to high network traffic or an intermittent fault condition.

E6 CHECK FOR OTHER CAUSES OF NETWORK COMMUNICATION CONCERNS

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

- CHECK the vehicle service history for recent service actions related to the ABS or AWD. If recent service history is found:
  - verify correct replacement module was installed
    - HVBOM may be used to verify correct part application
  - verify the configuration of replacement module was correct
    - re-configure module using as-built data if prior configuration is suspect
  - verify the module was not obtained from a like vehicle and installed into customer vehicle
    - return the swapped module to source vehicle and obtain new replacement module
- Operate the system and determine if the observable symptom is still present.

Is the observable symptom still present?

Yes	GO to E7
No	The system is operating correctly at this time. The concern may have been due to incorrect parts replacement procedures or incorrect module configuration.

E7 CHECK FOR CORRECT ABS (ANTI-LOCK BRAKE SYSTEM) OPERATION

- Ignition OFF.
- Disconnect and inspect the ABS and related in-line connectors.
- Repair:
  - corrosion (install new connector or terminals â€“ clean module pins)
  - damaged or bent pins â€“ install new terminals/pins
  - pushed-out pins â€“ install new pins as necessary
- Reconnect the ABS and all related in-line connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB (general service bulletin), SSM (special service message) or FSA (Field Service Action). If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine, Click here to access Guided Routine (ABS).
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.

PINPOINT TEST F : DTC U0100

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

Normal Operation and Fault Conditions

The GSM uses information contained in messages from the PCM sent on the HS-CAN.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM U0100:00	Lost Communication With ECM/PCM "A": No Sub Type Information	This DTC sets if the GSM does not receive some or all of an expected message from the PCM.

Possible Sources

- Connectors damaged or pushed-out terminals, circuitry open, shorted to power or shorted to ground
- PCM

F1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- **NOTE:** *If a GSM self-test is performed, make sure the drivers door is closed and locked.*

  Using the diagnostic scan tool, perform the network test.

Does the PCM pass the network test?

Yes	GSM, GO to F2
No	To diagnose the module does not respond to the scan tool, REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

F2 CHECK FOR GSM (GEAR SHIFT MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Clear all DTCs.
- Using the diagnostic scan tool, perform the GSM self-test.

Is DTC U0100 present?

Yes	GO to F3
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.

F3 RETRIEVE THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE GSM (GEAR SHIFT MODULE) SELF-TEST

- Check for DTCs from the self-test.

Are any GSM DTCs present?

Yes	REFER to the GSM DTC chart and diagnose those DTCs first.
No	GO to F4

F4 RETRIEVE THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Check for DTCs from the self-test.

Are DTCs P0562, P0563 and/or P1397 present?

Yes	REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).
No	GO to F5

F5 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0100 SET IN OTHER MODULES

- Using the diagnostic scan tool, perform the self-test for all modules.
- Retrieve the DTCs from all modules.

Is DTC U0100 present in the ABS or IPC modules?

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, Click here to access Guided Routine (PCM).
No	If the reporting module is the GSM, 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 GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, Removal and Installation). .

PINPOINT TEST G : DTCS P0919, P0929, P1753

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

Normal Operation and Fault Conditions

The GSM

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM P0919:00	Gear Shift Position Control Error: No Sub Type Information	This CMDTC sets if the GSM detects that the rotary gear shift knob is unable to return the rotary gear shift knob to Park within 10 attempts.
GSM P0929:00	Gear Shift Lock Solenoid/Actuator Circuit "A" Range/Performance: No Sub Type Information	This CMDTC sets if the GSM detects that the rotary gear shift knob is not returning to park during the auto rotate function.
GSM P1753:00	Gear Shift Position Sensor Alignment: No Sub Type Information	This CMDTC sets if the GSM detects that the rotary gear shift knob is not within calibrated band (dead band) for at least 60 seconds.

Possible Sources

- INSPECT rotary shift knob or piano keys for any interference issues that would cause it not to return to park.
- Connectors damaged or pushed-out terminals, circuitry open or high resistance in the voltage feed wiring to the GSM or a loose ground.
- Discharged battery/charging system
- GSM

G1 VERIFY THE BATTERY IS FULLY CHARGED

- **NOTE:** *If necessary connect the battery charger to the vehicle battery to insure a steady battery voltage while performing this test.*

  VERIFY battery is fully charged before proceeding with this test.
  REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Is the battery fully charged?

Yes	GO to G2
No	CHARGE or INSTALL a new battery if necessary. REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

G2 CHECK THE GSM (GEAR SHIFT MODULE) CONTINUOUS MEMORY DTC (DIAGNOSTIC TROUBLE CODE) S

- Using a diagnostic scan tool, perform the GSM self-test.
- Clear the CMDTCs.
- Ignition OFF.
- Wait 10 seconds.
- Start the engine.
- Repeat the GSM self-test.

Are any DTCs retrieved?

Yes	If DTC P0929 is retrieved alone, GO to G3 If any other GSM DTCs are retrieved RESOLVE them first, REFER to the DTC chart.
No	GO to G4

G3 CHECK THE GSM (GEAR SHIFT MODULE) AUTO ROTATE FUNCTION

- Ignition OFF.
- Start the engine.
- Sit in the drivers seat with the seat belt unbuckled.
- Select DRIVE.
- OPEN the drivers door.

Does the rotary shift selector return to PARK?

Yes	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.
No	GO to Pinpoint Test H

G4 CHECK FOR CORRECT GSM (GEAR SHIFT MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all GSM 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 GSM 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 GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, 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.

PINPOINT TEST H : DTC P166B

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

Normal Operation and Fault Conditions

The GSM uses the drivers door unlock switch input and drivers door status input to shift the transmission into the park position when the operator is preparing to exit the vehicle.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM P166B:00	Drivers Door Status Correlation: No Sub Type Information	The GSM monitors the voltage signals on the door status and door unlock switch inputs. If these inputs fail a rational test between them, the DTC sets.

Possible Sources

- Connectors damaged or pushed-out terminals, circuitry open, shorted to power or shorted to ground
- Driver door lock/unlock switch
- Driver door ajar switch
- GSM

H1 RUN GSM SELF-TEST AND RETRIEVE AND RECORD ALL DTCS

- Ignition ON.
- **NOTE:** *If a GSM self-test is performed, the driver door must be closed and locked. A false P166B DTC sets if the driver door is opened or unlocked during the self-test. Do not apply the brake pedal during the self-test.*

  Using the diagnostic scan tool, run the GSM self-test and retrieve all DTCs.

Is DTC P166B present?

Yes	GO to H2
No	The system is operating correctly at this time.

H2 MONITOR THE DOOR UNLOCK/LOCK PID

- Using the diagnostic scan tool, monitor the GSM PID, DR_UNLCK_HWI while locking and unlocking the driver's door.

Does the PID toggle while locking and unlocking the driver's door?

Yes	The system is operating correctly at this time.
No	GO to H3

H3 CHECK THE DOOR UNLOCK CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect GSM C2503 .
- Disconnect Driver Door Ajar Switch C573 .
- Inspect the connectors for damaged or pushed-out terminals.
- Measure:

GEAR SHIFT MODULE (GSM)	FRONT DOOR LOCK INDICATOR LH

Positive Lead	Measurement / Action	Negative Lead
C2503-4	Ω	C573-2

Is the resistance less than 3 ohms?

Yes	GO to H4
No	REPAIR the circuit.

H4 CHECK THE DOOR UNLOCK CIRCUIT FOR A SHORT TO GROUND

- Connect Driver Door Ajar Switch C573 .
- Measure:

GEAR SHIFT MODULE (GSM)	

Positive Lead	Measurement / Action	Negative Lead
C2503-4	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to H5
No	REPAIR the circuit.

H5 CHECK THE DOOR STATUS CIRCUIT FOR AN OPEN

- Disconnect BCM C2280D .
- Inspect the connector for damaged or pushed-out terminals.
- Measure:

GEAR SHIFT MODULE (GSM)	BODY CONTROL MODULE (BCM)

Positive Lead	Measurement / Action	Negative Lead
C2503-15	Ω	C2280D-33

Is the resistance less than 3 ohms?

Yes	GO to H6
No	REPAIR the circuit.

H6 CHECK THE DOOR STATUS CIRCUIT FOR A SHORT TO GROUND

- Measure:

GEAR SHIFT MODULE (GSM)	

Positive Lead	Measurement / Action	Negative Lead
C2503-15	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to H7
No	REPAIR the circuit.

H7 CHECK THE DOOR UNLOCK CIRCUIT AND DOOR STATUS CIRCUITS FOR A SHORT TO POWER

- Ignition ON.
- Measure:

GEAR SHIFT MODULE (GSM)	

Positive Lead	Measurement / Action	Negative Lead
C2503-4	V	Ground
C2503-15	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to H8

H8 VERIFY THE GSM FAULT

- Ignition OFF.
- Connect BCM C2280E .
- Connect Driver Door Ajar Switch C526 .
- Connect GSM C2503 .
- Ignition ON.
- **NOTE:** *If a GSM self-test is performed, the driver door must be closed and locked. A false P166B DTC sets if the driver door is opened or unlocked during the self-test.*

  Using the diagnostic scan tool, run the GSM self-test and retrieve all DTCs.

Is the concern still present?

Yes	INSTALL a new GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, Removal and Installation).
No	The system is operating correctly at this time.

PINPOINT TEST I : DTC P0814, P0915

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

Normal Operation and Fault Conditions

The GSM cannot sense the selected gear position or is unable to boot up upon the ignition being put into the Run position.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM P0814:00	Transmission Range Display Circuit: No Sub Type Information	This CMDTC sets if the GSM is not able to detect selector lever position indicator LED illumination.
GSM P0915:00	Gear Shift Position Circuit "A" Range/Performance: No Sub Type Information	This CMDTC sets if the GSM cannot successfully boot up when the key is turned to the RUN position. Boot failures are typically caused by low system voltage.

Possible Sources

- Connectors damaged or pushed-out terminals, circuitry open or high resistance in the voltage feed wiring to the GSM or a loose ground.
- Discharged battery/charging system
- GSM
- Selector lever cable misadjusted

I1 VERIFY THE BATTERY IS FULLY CHARGED

- **NOTE:** *If necessary connect the battery charger to the vehicle battery to insure a steady battery voltage while performing this test.*

  VERIFY battery is fully charged before proceeding with this test.
  REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Is the battery fully charged?

Yes	GO to I2
No	CHARGE or INSTALL a new battery if necessary. REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

I2 CHECK GSM CALIBRATION LEVEL

- Ignition ON.
- Using a diagnostic scan tool, VERIFY the GSM calibration is at the latest level.

Is the GSM calibration at the latest level?

Yes	GO to I3
No	REFER to: Module Programming (418-01 Module Configuration, General Procedures).

I3 CHECK THE GSM (GEAR SHIFT MODULE) CONTINUOUS MEMORY DTC (DIAGNOSTIC TROUBLE CODE) S

- Using a diagnostic scan tool, perform the GSM self-test.
- Clear the CMDTCs.
- Ignition OFF.
- Wait 10 seconds.
- Start the engine.
- Repeat the GSM self-test.

Is DTC P0814 or P0915 the only DTC retrieved again?

Yes	GO to I4
No	GO to I5

I4 CHECK FOR CORRECT GSM (GEAR SHIFT MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all GSM 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 GSM 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 GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, 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.

I5 CHECK POWER CIRCUIT TO GSM FOR AN OPEN

- Ignition OFF.
- Disconnect GSM C2503 .
- Ignition ON.
- Measure:

GEAR SHIFT MODULE (GSM)	

Positive Lead	Measurement / Action	Negative Lead
C2503-1	V	Ground

Is the voltage 12.5 volts or greater

Yes	GO to I6
No	CHECK fuse 12 (7.5A), if OK REPAIR the open circuit, if not OK, REFER to the wiring diagram manual to diagnose the short circuit.

I6 CHECK GSM GROUND FOR AN OPEN

- Ignition OFF.
- **NOTE:** *INSPECT the ground eyelet and verify it is clean and tight.*

  Measure:

GEAR SHIFT MODULE (GSM)	

Positive Lead	Measurement / Action	Negative Lead
C2503-18	Ω	Ground
C2503-9	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to I4
No	REPAIR the circuit.

PINPOINT TEST J : DTCS P07EC, P07ED

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

Normal Operation and Fault Conditions

The GSM contains 3 contacts beneath the center button. If one contact is not recognized by the GSM then DTC sets. The brake transmission shift interlock (BTSI) override switch has two redundant contacts that allow the vehicle to override the BTSI.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
GSM P07EC:00	Transmission Range Multi-Function Select Circuit: No Sub Type Information	This DTC sets in continuous memory if two Brake Transmission Shift Interlock (BTSI) override switch inputs do not change state, P07EC may set. A message is displayed on the message center warning that a given range is unavailable.
GSM P07ED:00	Transmission Range Multi-Function Select Circuit Stuck: No Sub Type Information	A DTC P07ED can be set in â€œHistoryâ€, if the Center Button is held down for 30 seconds or more. If DTC P07ED is set in continuousâ€™ memory continue with the diagnostics. The GSM contains 3 contacts beneath the center button. If two or more contacts report â€˜closedâ€™ for 30 seconds or more, the GSM then sets DTC P07ED.

Possible Sources

- Connectors damaged or pushed-out terminals, circuitry open, shorted to power or shorted to ground
- Brake transmission shift interlock override switch
- Clean or remove any foreign material or debris found near the BTSI override switch or the rotary gear shift knob center button.
- GSM

J1 INSPECT GEAR SHIFT M BUTTON AND BTSI OVERRIDE SWITCH

- INSPECT the gear shift M button and the BTSI override switch for debris or foreign materials that might cause binding or sticking.

Is any debris or foreign material present?

Yes	CLEAN any debris or foreign material from the gear shift buttons or BTSI override switch. GO to J2
No	GO to J2

J2 RETRIEVE AND RECORD ALL DTCS

- Ignition ON.
- Using the diagnostic scan tool, retrieve all DTCs.
- **NOTE:** *If a GSM self-test is performed, the driver door must be closed and locked and the brake pedal should not be applied. A false P081F or P166B DTC sets if the brake pedal is applied during the self-test or the driver's door is open.*

  PERFORM a GSM self-test.

Is DTC P07ED present?

Yes	GO to J3
No	The system is operating correctly at this time.

J3 CHECK GSM AND BTSI OVERRIDE SWITCHES PID STATUS

- Using a diagnostic scan tool, MONITOR the following PIDs:
  - M button: SBW_SLM_SW_1, SBW_SLM_SW_2, SBW_SLM_SW_3
  - BTSI override switch: SBW_OVR_SW_1, SBW_OVR_SW_2.

Do any of the switch PID readings indicate that any of the gear shift M button or the BTSI overide switch is pressed?

Yes	If the gear shift M button PID indicates one or more of the switch contacts are pressed, GO to J6 If the BTSI override switch PID indicates one or both BTSI switch contacts are pressed, GO to J4
No	System is working properly at this time, if a symptom is present go to the symptom chart.

J4 CHECK THE BTSI OVERRIDE SWITCH

- Ignition OFF.
- Disconnect BTSI Override Switch C3433 .
- Ignition ON.
- Using the diagnostic scan tool, observe the PIDs SBW_OVR_SW_1 and the SBW_OVR_SW_2 .

Does the SBW_OVR_SW_1 and the SBW_OVR_SW_2 status indicate the BTSI overide switch is pressed?

Yes	GO to J5
No	INSTALL a new BTSI override switch.

J5 CHECK THE BTSI OVERIDE SWITCH FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect GSM C2503 .
- Measure:

SHIFT INTERLOCK OVERRIDE SWITCH	

Positive Lead	Measurement / Action	Negative Lead
C3433-4	Ω	Ground
C3433-6	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to J6
No	REPAIR the circuit.

J6 CHECK FOR CORRECT GSM (GEAR SHIFT MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all GSM 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 GSM 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 GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, 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.

PINPOINT TEST K : BTSI OVERRIDE SWITCH DOES NOT RELEASE CORRECTLY

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

Normal Operation and Fault Conditions

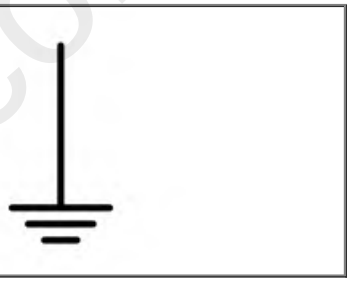
The brake shift interlock override switch allows the shift by wire system to override the Brake Transmission Shift Interlock through an override switch located in the floor console. To activate this mode, press and hold the override button (The GSM will flash once after one second), press any non P button then release the override button. If vehicle system has low voltage, this function requires the vehicle to be powered using an auxiliary power source.

Possible Sources

- Circuitry open/shorted
- Brake shift interlock override switch
- GSM

K1 CHECK THE BTSI OVERRIDE SWITCH CIRCUIT FOR VOLTAGE

- Ignition OFF.
- Disconnect Brake Shift Interlock Override Switch C3433 .
- Inspect the connector for damaged or pushed-out terminals.
- Ignition ON.
- Measure:

SHIFT INTERLOCK OVERRIDE SWITCH	

Positive Lead	Measurement / Action	Negative Lead
C3433-4	V	Ground
C3433-6	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to K4
No	GO to K2

K2 CHECK THE BTSI OVERRIDE SWITCH CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect GSM C2503 .
- Inspect the connector for damaged or pushed-out terminals.
- Measure:

SHIFT INTERLOCK OVERRIDE SWITCH	

Positive Lead	Measurement / Action	Negative Lead
C3433-4	Ω	Ground
C3433-6	Ω	Ground

Are the resistances less than 3 ohms?

Yes	GO to K3
No	REPAIR the circuit.

K3 CHECK THE BTSI OVERRIDE SWITCH CIRCUIT FOR A SHORT TO GROUND

- Measure:

SHIFT INTERLOCK OVERRIDE SWITCH	

Positive Lead	Measurement / Action	Negative Lead
C3433-4	Ω	Ground
C3433-6	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to K6
No	REPAIR the circuit.

K4 CHECK THE BTSI OVERRIDE SWITCH GROUND CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

SHIFT INTERLOCK OVERRIDE SWITCH	

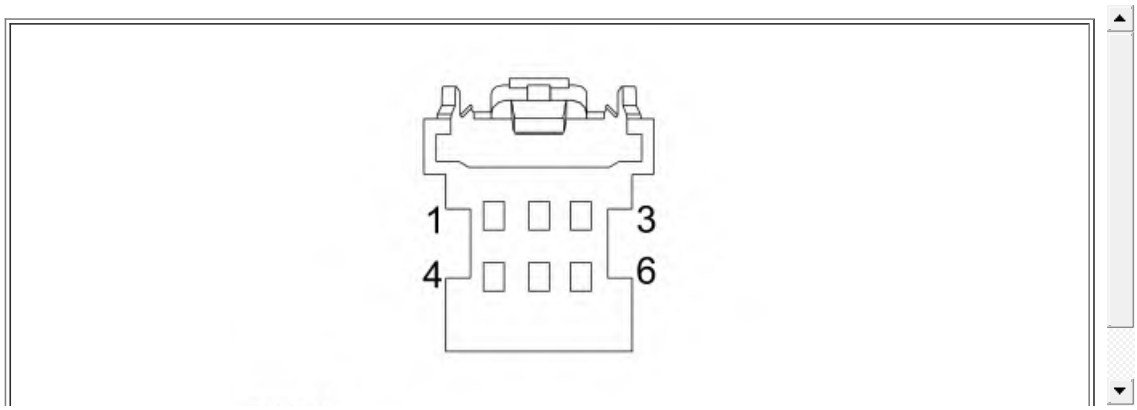
Positive Lead	Measurement / Action	Negative Lead
C3433-2	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to K5
No	REPAIR the circuit.

K5 CHECK THE BTSI OVERRIDE SWITCH

- Measure:



Positive Lead	Measurement / Action	Negative Lead
C3433, Component side pin 4.	Ω	C3433, Component side pin 2.
C3433, Component side pin 6.	Ω	C3433, Component side pin 2.

Is the resistance less than 3 ohms when pressing the brake shift interlock override switch, and greater than 10,000 ohms when releasing the switch?

Yes	GO to K6
No	INSTALL a new brake shift interlock override switch.

K6 CHECK FOR CORRECT GSM (GEAR SHIFT MODULE) OPERATION

- Disconnect and inspect all GSM 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 GSM 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 GSM. REFER to: Gear Shift Module (GSM) (307-05 Automatic Transmission External Controls, 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.

PINPOINT TEST L : PADDLE SHIFT DOES NOT OPERATE CORRECTLY

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

Normal Operation and Fault Conditions

Each paddle shift switch is a momentary contact switch integral to the steering wheel. When the selector lever is placed in the sport shift position, the upshift/downshift feature becomes activated and allows the operator to upshift or downshift without removing their hands from the steering wheel.

Possible Sources

- Circuitry open/shorted
- Clockspring
- Paddle Shift Switch(es)
- SCCM
- PCM

L1 MONITOR SHIFT SELECT PIDS

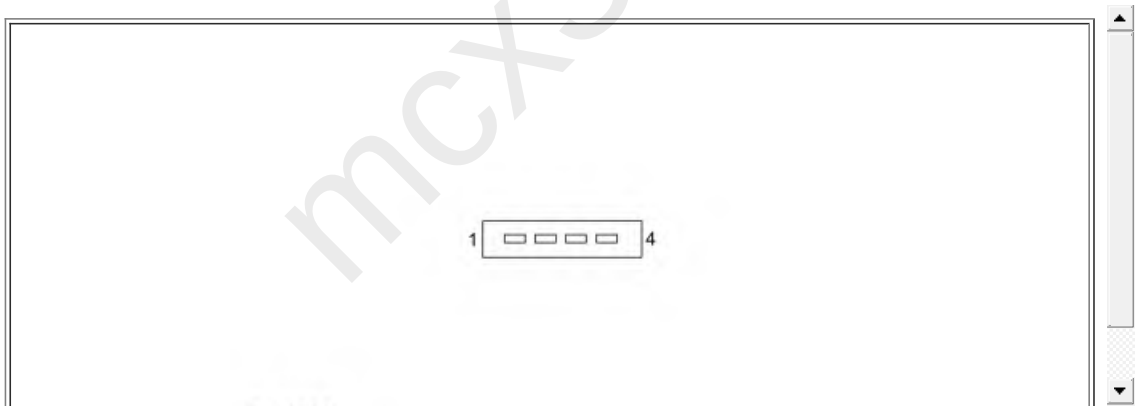
- Ignition ON.
- Enter the following diagnostic mode: Datalogger.
- Monitor the PCM PIDs, SST_D and SST_U while depressing the upshift and downshift switches.

Do both the upshift and downshift PIDs show low when their respective switch is depressed and high when the switch is not depressed?

Yes	The system is operating correctly at this time. The concern may have been caused by a loose connector.
No	If the Upshift switch PID reads high when the switch is pressed, or if the Upshift PID reads low when the switch is not pressed, GO to L2 If the Downshift switch PID reads high when the switch is pressed, or if the Downshift PID reads low when the switch is not pressed, GO to L8 If the PIDs for both switches show no change when both of the switches are pressed, GO to L14

L2 CHECK THE UPSHIFT PADDLE SWITCH

- Remove the driver air bag module.
  REFER to: Driver Airbag (501-20B Supplemental Restraint System, Removal and Installation).
  REFER to: Driver Airbag (501-20B Supplemental Restraint System, Removal and Installation).
- Disconnect Upshift Paddle Switch C2428 .
- Measure:



Positive Lead	Measurement / Action	Negative Lead
Component side resistance pin 1.	Ω	Component side resistance pin 2.

Is the resistance less than 1.5 ohms with upshift switch pressed and greater than 10,000 ohms when released?

Yes	GO to L3
No	INSTALL a new upshift paddle switch. REFER to: Upshift Paddle Switch (307-05 Automatic Transmission External Controls, Removal and Installation).

L3 CHECK THE UPSHIFT SIGNAL CIRCUIT FOR VOLTAGE

- Ignition OFF.
- Disconnect Upshift Paddle Shifter, C2428 .
- Inspect the connector for damaged or pushed-out terminals.
- Ignition ON.
- Measure:

UPSHIFT PADDLE SWITCH	

Positive Lead	Measurement / Action	Negative Lead
C2428-2	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to L14
No	GO to L4

L4 CHECK THE UPSHIFT SIGNAL CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect For the 2.0L, PCM C1381B .
- Disconnect For the 2.7L, PCM C1551B .
- Disconnect For vehicles not equipped with **adaptive steering**, SCCM C226A .
- Disconnect For vehicles equipped with **adaptive steering**, Clockspring C218A .
- Inspect the connectors for damaged or pushed-out terminals.
- For the 2.0L engine, **without active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead

Positive Lead	Measurement / Action	Negative Lead
C226A-10	Ω	C1381B-6

- For the 2.7L engine, **without active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C226A-10	Ω	C1551B-53

- For the 2.0L engine, **with active steering** measure:

CLOCKSPRING	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C218A-3	Ω	C1381B-6

- For the 2.7L engine, **with active steering** measure:

CLOCKSPRING	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C218A-3	Ω	C1551B-53

Is the resistance less than 3 ohms?

Yes	GO to L5
No	REPAIR the circuit.

L5 CHECK THE UPSHIFT SIGNAL CIRCUIT FOR A SHORT TO GROUND

- With **active steering** measure:

CLOCKSPRING	

Positive Lead	Measurement / Action	Negative Lead
C218A-3	Ω	Ground

- Without **active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	

Positive Lead	Measurement / Action	Negative Lead
C226A-10	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to L6
No	REPAIR the circuit.

L6 CHECK THE CLOCKSPRING CIRCUIT FOR AN OPEN

- Disconnect For vehicles with adaptive steering, Clockspring C218A .
- Ignition OFF.
- With **active steering** measure:

CLOCKSPRING	CLOCKSPRING

Positive Lead	Measurement / Action	Negative Lead
Component Side C218A-3	Ω	Component Side C218E-2

Is the resistance less than 3 ohms?

Yes	Click here to access Guided Routine (PCM).
No	INSTALL a new clockspring. REFER to: Clockspring (501-20B Supplemental Restraint System, Removal and Installation).

L7 CHECK THE SCCM/CLOCKSPRING CIRCUIT FOR AN OPEN

- Disconnect For vehicles without adaptive steering, SCCM C226A .
- Ignition OFF.
- Without **active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	CLOCKSPRING

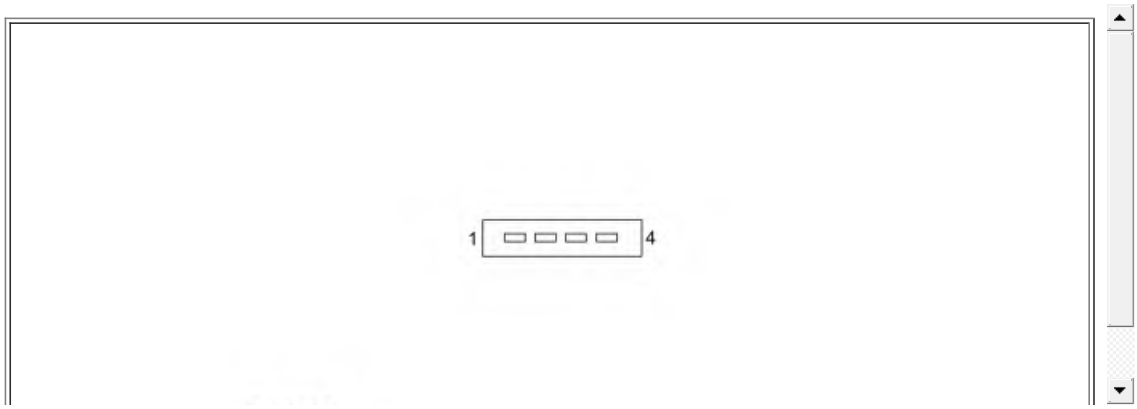
Positive Lead	Measurement / Action	Negative Lead
Component Side C226A-10	Ω	C218B-12

Is the resistance less than 3 ohms?

Yes	Click here to access Guided Routine (PCM).
No	INSTALL a new SCCM. REFER to: Steering Column Control Module (SCCM) - Vehicles With: Active Steering (211-05 Steering Wheel and Column Electrical Components, Removal and Installation).

L8 CHECK THE DOWNSHIFT PADDLE SWITCH

- Remove the driver air bag module.
  REFER to: Driver Airbag (501-20B Supplemental Restraint System, Removal and Installation).
  REFER to: Driver Airbag (501-20B Supplemental Restraint System, Removal and Installation).
- Disconnect Downshift Paddle Shifter C2429 .
- Measure:



Positive Lead	Measurement / Action	Negative Lead
Component side resistance pin 4	Ω	Component side resistance pin 3

Is the resistance less than 1.5 ohms with upshift switch pressed and greater than 10,000 ohms when released?

Yes	GO to L9
No	INSTALL a new upshift paddle switch. REFER to: Downshift Paddle Switch (307-05 Automatic Transmission External Controls, Removal and Installation).

L9 CHECK THE DOWNSHIFT CIRCUIT FOR VOLTAGE

- Disconnect Downshift Paddle Shifter C2429 .
- Inspect the connector for damaged or pushed-out terminals.
- Ignition ON.
- Measure:

DOWNSHIFT PADDLE SWITCH	

Positive Lead	Measurement / Action	Negative Lead
C2429-4	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to L14
No	GO to L10

L10 CHECK THE DOWNSHIFT SIGNAL CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect For the 2.0L, PCM C1381B .
- Disconnect For the 2.7L, PCM C1551B .
- Disconnect For vehicles not equipped with **adaptive steering**, SCCM C226A .
- Disconnect For vehicles equipped with **adaptive steering**, Clockspring C218A .
- Inspect the connectors for damaged or pushed-out terminals.
- For the 2.0L engine, **without active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C226A-9	Ω	C1381B-5

- For the 2.7L engine, **without active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C226A-9	Ω	C1551B-65

- For the 2.0L engine, **with active steering** measure:

CLOCKSPRING	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C218A-2	Ω	C1381B-5

- For the 2.7L engine, **with active steering** measure:

CLOCKSPRING	POWERTRAIN CONTROL MODULE (PCM)

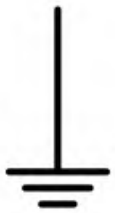
Positive Lead	Measurement / Action	Negative Lead
C218A-2	Ω	C1551B-65

Is the resistance less than 3 ohms?

Yes	GO to L11
No	REPAIR the circuit.

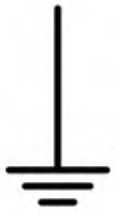
L11 CHECK THE DOWNSHIFT SIGNAL CIRCUIT FOR A SHORT TO GROUND

- With **active steering** measure:

CLOCKSPRING	

Positive Lead	Measurement / Action	Negative Lead
C218A-2	Ω	Ground

- Without **active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	

Positive Lead	Measurement / Action	Negative Lead
C226A-9	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to L12
No	REPAIR the circuit.

L12 CHECK THE CLOCKSPRING CIRCUIT FOR AN OPEN

- Connect PCM .
- Disconnect For vehicles with adaptive steering, Clockspring C218A .
- With **active steering** measure:

CLOCKSPRING	CLOCKSPRING

Positive Lead	Measurement / Action	Negative Lead
Component side C218A-2	Ω	C218E-6

Is the resistance less than 3 ohms?

Yes	Click here to access Guided Routine (PCM).
No	INSTALL a new Clockspring REFER to: Clockspring (501-20B Supplemental Restraint System, Removal and Installation).

L13 CHECK THE SCCM/CLOCKSPRING CIRCUIT FOR AN OPEN

- Connect PCM .
- Disconnect For vehicles without adaptive steering SCCM C226A .
- Ignition OFF.
- Without **active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	CLOCKSPRING

Positive Lead	Measurement / Action	Negative Lead
Component side C226A-9	Ω	C218B-5

Is the resistance less than 3 ohms?

Yes	Click here to access Guided Routine (PCM).
No	Install a new SCCM REFER to: Steering Column Control Module (SCCM) - Vehicles With: Active Steering (211-05 Steering Wheel and Column Electrical Components, Removal and Installation).

L14 CHECK THE SIGNAL RETURN CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect For the 2.0L engine, PCM C1381B .
- Disconnect For the 2.7L engine, PCM C1551B .
- **without active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	

Positive Lead	Measurement / Action	Negative Lead
C226A-11	Ω	Ground

- **with active steering** measure:

CLOCKSPRING	

Positive Lead	Measurement / Action	Negative Lead
C218A-1	Ω	Ground

Is the resistenance greater than 10,000 ohms?

Yes	GO to L15
No	REPAIR the circuit.

L15 CHECK THE SIGNAL RETURN CIRCUIT FOR AN OPEN

- For the 2.0L engine, **without active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C226A-11	Ω	C1381B-4

- For the 2.7L engine, **without active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C226A-11	Ω	C1551B-73

- For the 2.0L engine, **with active steering** measure:

CLOCKSPRING	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C218A-1	Ω	C1381B-4

- For the 2.7L engine, **with active steering** measure:

CLOCKSPRING	POWERTRAIN CONTROL MODULE (PCM)

Positive Lead	Measurement / Action	Negative Lead
C218A-1	Ω	C1551B-73

L16 CHECK THE CLOCKSPRING CIRCUIT FOR AN OPEN

Is the resistance less than 3 ohms

- Without active steering, measure:

Yes	For vehicles without active steering, GO to L16 For vehicles with active steering, GO to L17
No	REPAIR the circuit.

CLOCKSPRING	CLOCKSPRING

Positive Lead	Measurement / Action	Negative Lead
Component side C218A-1	Ω	Component side C218E-5

Is the resistance less than 3 ohms?

Yes	Click here to access Guided Routine (PCM).
No	INSTALL a new clockspring. REFER to: Clockspring (501-20B Supplemental Restraint System, Removal and Installation).

L17 CHECK THE SCCM CIRCUIT FOR AN OPEN

- With **active steering** measure:

STEERING COLUMN CONTROL MODULE (SCCM)	CLOCKSPRING

Positive Lead	Measurement / Action	Negative Lead
Component side C226A-11	Ω	Component side C218B-13

Is the resistance less than 3 ohms?

Yes	Click here to access Guided Routine (PCM).
No	INSTALL a new SCCM. REFER to: Steering Column Control Module (SCCM) - Vehicles With: Active Steering (211-05 Steering Wheel and Column Electrical Components, Removal and Installation).

General Procedures

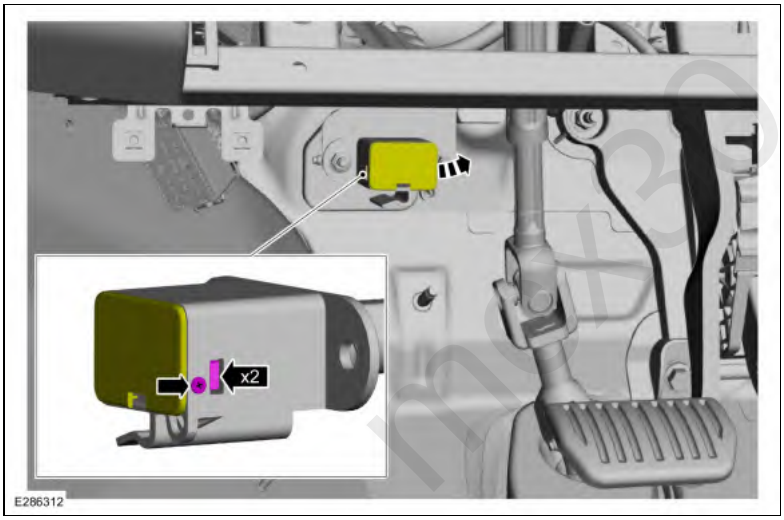
Transmission Park by Wire Manual Release

Activation

1. **NOTE:** *If the vehicle battery is dead or there is no electrical power available, connect an external power source.*

   Apply the parking brake.

2. Remove the retainer, press the tabs and open the transmission park manual release cable door.



3. **NOTE:** *The brakes must be applied from the driver's seat while releasing the vehicle from park.*

   While applying the brakes, pull the transmission park manual release cable out and lock the cable into the notch in the housing.