2007 ACCESSORIES & EQUIPMENT

Cruise Control - Outlook

SCHEMATIC AND ROUTING DIAGRAMS

CRUISE CONTROL SCHEMATIC ICONS

Cruise Control Schematic Icons

Icon	Icon Definition
	**CAUTION:** **When performing service on or near the SIR components or the SIR wiring, the SIR system must be disabled. Refer to SIR DISABLING AND ENABLING . Failure to observe the correct procedure could cause deployment of the SIR components, personal injury or unnecessary SIR system repairs.**

CRUISE CONTROL SCHEMATICS

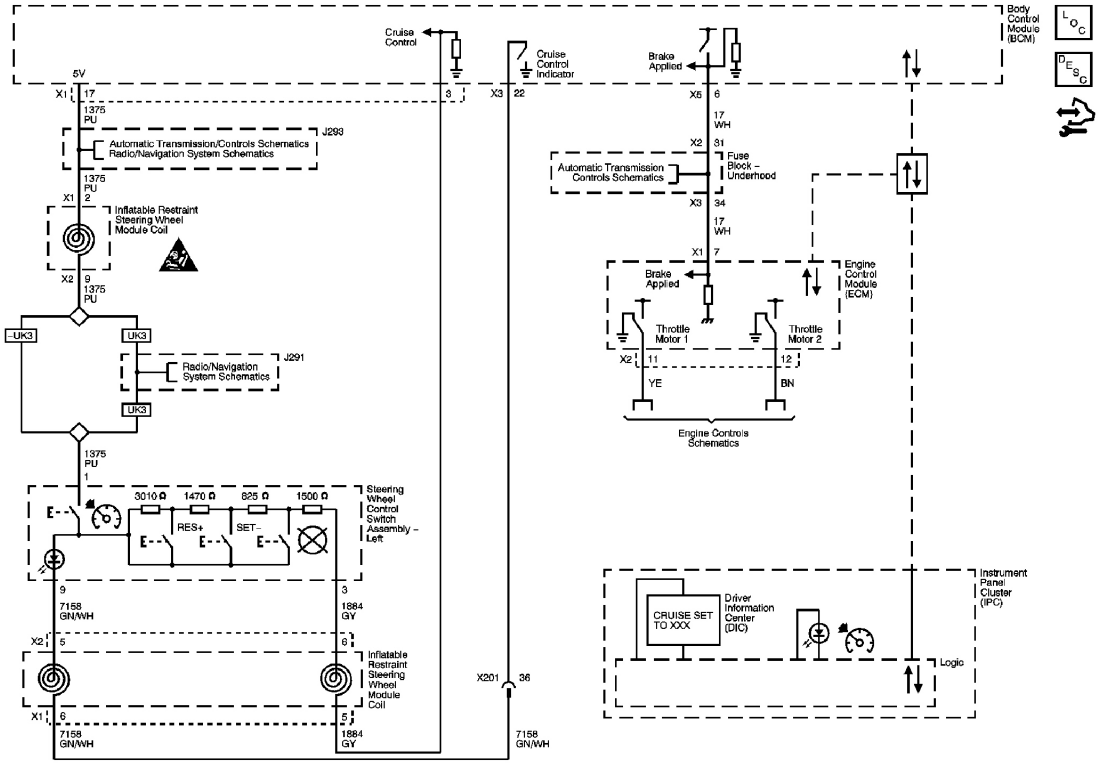

Fig. 1: Cruise Control Schematic
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
DTC B3794	Cruise Control Function Request Circuit Signal Invalid Or Actuators tuck
DTC P0572	Brake Switch Circuit 1 Low Voltage
DTC P0573	Brake Switch Circuit 1 High Voltage
DTC P0575	Cruise Control Switch Signal Circuit
DTC P0703	Brake Switch Circuit 2

DIAGNOSTIC STARTING POINT - CRUISE CONTROL

Begin the cruise control system diagnosis with the Diagnostic System Check. Refer to the **Diagnostic System Check - Vehicle** .

The Diagnostic System Check will provide the following information:

- The identification of the control modules which command the system.
- The ability of the control modules to communicate through the serial data circuit.
- The identification of any stored diagnostic trouble codes (DTCs) and their status.

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

SCAN TOOL DATA LIST

Body Control Module (BCM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition OFF/Engine OFF/Vehicle is in Park or Neutral/Cruise On/Off Switch is Turned Off			
Cruise Control Switch	Cruise Control Data	On/Off/Set/Resume/Error	Off

Engine Control Module (ECM)

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature/Vehicle is in Park or Neutral/Cruise On/Off Switch is Turned Off			
BPP Circuit Signal	Cruise/PTO/Traction Data	Applied/Released	Released
BPP Signal	Cruise/PTO/Traction Data	Applied/Released/Invalid	Released
Cruise Control Active	Cruise/PTO/Traction Data	Yes/No	No
Cruise Disengage (1-8) History	Cruise/PTO/Traction Data	Last reason for cruise control disengagement	Varies
Cruise Inhibited	Cruise/PTO/Traction Data	Yes/No	Yes
Cruise On/Off Switch	Cruise/PTO/Traction Data	On/Off	Off
Cruise Resume/Accel.	Cruise/PTO/Traction Data	On/Off	Off

Switch (3.6L)			
Cruise Resume/Accel. Switch (4.6L)	Cruise/PTO/Traction Data	Active/Inactive/Invalid	Inactive
Cruise Set/Coast Switch (3.6L)	Cruise/PTO/Traction Data	On/Off	Off
Cruise Set/Coast Switch (4.6L)	Cruise/PTO/Traction Data	Active/Inactive/Invalid	Inactive
Engine Speed	Cruise/PTO/Traction Data	RPM	650
Initial Brake Apply Signal (3.6L)	Cruise/PTO/Traction Data	Applied/Released	Released
Stoplamp Pedal Switch (3.6L)	Cruise/PTO/Traction Data	Applied/Released	Released
Traction Control Status	Cruise/PTO/Traction Data	Active/Inactive	Active
Vehicle Speed Sensor	Cruise/PTO/Traction Data	km/h (mph)	0

SCAN TOOL DATA DEFINITIONS (CRUISE CONTROL)

The Scan Tool Data Definitions contains a brief description of all cruise control related parameters available on the scan tool.

BPP Circuit Signal

The scan tool displays Applied or Released. The electronic brake control module (EBCM) monitors the brake pedal position (BPP) circuit signal. The engine control module (ECM) receives a GMLAN serial data message from the EBCM indicating the status of the BPP circuit signal.

BPP Signal

The scan tool displays Applied, Released or Invalid. The electronic brake control module (EBCM) monitors the status of the brake pedal position (BPP) sensor. The ECM receives a GMLAN serial data message from the EBCM indicating the status of the BPP signal.

Cruise Control Active

The scan tool displays Yes or No. The ECM determines the current status of cruise control operation. An active cruise control system is displayed as Yes.

Cruise Control Switch

The scan tool displays On, Off, Set, Resume or Error. The BCM monitors the signal circuit of the cruise control switch.

Cruise Disengage (1 - 8) History

The scan tool displays the last 8 reasons why the cruise control system was disengaged. Refer to **Scan Tool Data Definitions** (Disengaged History) for descriptions.

Cruise Inhibited

The scan tool displays Yes or No. The ECM determines when the conditions for inhibiting the cruise control system exists. An inhibited cruise control system is displayed as Yes.

Cruise Inhibit Reason

The scan tool displays the reason that the cruise control is inhibited as detected by the ECM.

Cruise On/Off Switch

The scan tool displays On or Off. The ECM monitors the signal circuit of the cruise control switch. A closed switch is displayed as On.

Cruise Resume/Accel. Switch

The scan tool displays On or Off. The ECM the monitors the cruise control switch signal circuit. A closed switch is displayed as On. The cruise control On/Off switch must be switched On in order to correctly view the Cruise Resume/Accel. Switch parameter. The BCM sends a GMLAN message to the ECM indicating the status of the resume/accel switch.

Cruise Resume/Accel. Switch

The scan tool displays Active, Inactive or Invalid. The BCM the monitors the cruise control switch signal circuit. A closed switch is displayed as On. The cruise control On/Off switch must be switched On in order to correctly view the Cruise Resume/Accel. Switch parameter. The BCM sends a GMLAN message to the ECM indicating the status of the cruise resume/accel switch.

Cruise Set/Coast Switch

The scan tool displays On or Off. The BCM the monitors the cruise control switch signal circuit. A closed switch is displayed as On. The cruise control On/Off switch must be switched On in order to correctly view the Cruise Set/Coast Switch parameter. The BCM sends a GMLAN message to the ECM indicating the status of the cruise set/coast switch.

Cruise Set/Coast Switch

The scan tool displays Active, Inactive or Invalid. The BCM the monitors the cruise control switch signal circuit. A closed switch is displayed as On. The cruise control On/Off switch must be switched On in order to correctly view the Cruise Set/Coast Switch parameter. The BCM sends a GMLAN message to the ECM indicating the status of the cruise set/coast switch.

Engine Speed

The scan tool displays 0 to 9,999 RPM. The ECM monitors the crankshaft position (CKP) signal circuit in order to determine the engine RPM.

Initial Brake Apply Signal

The scan tool displays Applied or Released. The EBCM monitors the signal circuit of the brake pedal position sensor. When the ECM receives a GMLAN serial data message from the EBCM indicating that the brake pedal has been applied, the scan tool displays Applied.

Stoplamp Pedal Switch

The scan tool displays Applied or Released. The ECM monitors the stop lamp switch signal circuit. An open switch is displayed as Applied.

Traction Control Status

The scan tool displays Active or Inactive. When the ECM receives a GMLAN serial data message from the EBCM requesting a traction control related function, the scan tool displays Active.

Vehicle Speed Sensor

The scan tool displays 0 to 150 km/h (93.2 mph). The ECM monitors the vehicle speed sensor signal circuit in order to calculate the vehicle speed for display.

DTC B3794

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptors

DTC B3794 08

Cruise Control Function Request Circuit Signal Invalid

DTC B3794 61

Cruise Control Function Request Circuit Actuator Stuck

Diagnostic Fault Information

DTC B3794

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Steering Wheel Control Supply Voltage	1	B3794	1	B3794
Cruise Control Switch Signal	B3794	B3794	1	B3794
1. Cruise Control Inoperative/Malfunctioning				

Circuit/System Description

The cruise control switch is an input to the body control module (BCM). The BCM monitors the cruise control on/off, set/coast, resume/accelerate and cancel switch signal circuit in order to detect when the driver has requested to perform a cruise control function. The BCM detects a specific voltage signal on the cruise control switch signal circuit when a switch is applied.

Conditions for Running the DTC

- The cruise switch is ON.
- The ignition is ON.

Conditions for Setting the DTC

- The BCM detects an invalid voltage signal on the cruise control switch signal circuit.
- The above condition is present for greater than 1 second.

Action Taken When the DTC Sets

- The BCM stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The cruise control system is disabled.

Conditions for Clearing the DTC

- The DTC becomes history when the fault is no longer present.
- A History DTC clears after 100 malfunction-free ignition cycles.
- The BCM receives a clear code command from the scan tool.

Diagnostic Aids

- Rotate the steering wheel to both steering stops and activate each cruise control switch separately. With a scan tool, observe the Cruise Control Switch parameter in the BCM Cruise Control data list. This will help eliminate the possibility of a internally open or shorted inflatable restraint steering wheel module coil.
- For an intermittent, refer to **Testing for Intermittent Conditions and Poor Connections** .

Reference Information

Schematic Reference

Cruise Control Schematics

Connector End View Reference

- **Secondary/Configurable Control Connector End Views**
- **Data Communication Connector End Views**

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Circuit/System Verification

Ignition ON, observe the scan tool Cruise Control Switch parameter in the BCM while pressing the various cruise control switches. The reading should be Error.

- If the Cruise Control Switch parameter toggles between On, Off, Resume and Set accordingly with the depressed switches, go to **Testing for Intermittent Conditions and Poor Connections** .

Circuit/System Testing

CAUTION: Refer to SIR Caution .

Disable the inflatable restraint steering wheel module when performing this diagnostic. Refer to **SIR Disabling and Enabling** .

1. Ignition OFF, remove the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** .
2. Disconnect the harness connector at the multifunction switch.
3. Ignition ON, measure for 10 volts or greater at the 12-volt reference circuit.
   - If less than the specified value, check for an open/high resistance or a short to ground on the 12-volt reference circuit.
4. Test the cruise control switch signal circuit for an open/high resistance, a short to ground or a short to voltage.
5. If the circuits test normal, test the component. If the component tests normal, replace the BCM.

Component Testing

CAUTION: Refer to SIR Caution .

Disable the inflatable restraint steering wheel module when performing this diagnostic. Refer to **SIR Disabling and Enabling** .

1. Ignition OFF, remove the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** .
2. Ignition OFF, disconnect the harness connector C4 at the multifunction switch.

3. Measure the resistance between terminals 1 and 5 at the cruise control switch side of the connector. Individually activate and hold each cruise control function switch and compare the resistance reading to the values for the On, Off, - SET and + RES switches.
    - If any of the resistance measurements for the On, Off, - SET and + RES switches are not within the listed resistance values, replace the multifunction switch.

DTC B3794

Function Switch	Minimum Resistance Value	Maximum Resistance Value
Off	O.L.	O.L.
On	6.5k Ohms	7.1k Ohms
- SET	1.4k Ohms	1.6k Ohms
+ RES	3.7k Ohms	3.9k Ohms

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for BCM replacement, setup and programming

DTC P0572

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0572 00

Brake Switch Circuit 1 Low Voltage

Diagnostic Fault Information

DTC P0572

Circuit	Short to Ground	Open or High Resistance	Short to Voltage	Signal Performance

Stop Lamp Switch Signal	P0572 00	P0573 00	P0573 00	-

Circuit/System Description

The stop lamp switch signal circuit is a direct hardwire input from the engine control module (ECM) to the body control module (BCM) and transmission control module (TCM). The ECM monitors the stop lamp switch circuit to detect when the brake pedal has been applied. The BCM monitors the brake pedal position (BPP) sensor to determine when the brake pedal is applied. When the brake pedal is applied, the BCM sends a GMLAN serial data message to the ECM indicating that the brake pedal has been applied. The ECM sends a voltage signal on the stop lamp switch circuit to the BCM and TCM.

Conditions for Running the DTC

- The ignition is ON.
- The engine is running.
- Battery voltage is greater than 11.5 volts.

Conditions for Setting the DTC

The ECM detects a short to ground on the stop lamp switch signal circuit when the serial data message from the BCM indicates the brakes are applied.

Action Taken When the DTC Sets

- The ECM stores the DTC to memory.
- The ECM will record the operating conditions at the time the diagnostic failed. The ECM stores this information in Failure Records.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- The ECM receives a CLEAR DTCs command from the scan tool.
- A history DTC will clear once 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

- **Cruise Control Schematics**
- **Exterior Lights Schematics**

Connector End View Reference

- **Secondary/Configurable Control Connector End Views**
- **Data Communication Connector End Views**
- **Lighting Systems Connector End Views**

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

- **Scan Tool Data List**
- **Scan Tool Data Definitions**

Circuit/System Testing

Test the stop lamp switch signal circuit for a short to ground.

- If the circuit tests OK, replace the ECM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup and programming

DTC P0573

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0573 00

Brake Switch Circuit 1 High Voltage

Diagnostic Fault Information

DTC P0573

Circuit	Short to Ground	Open or High Resistance	Short to Voltage	Signal Performance
Stop Lamp Switch Signal	P0572 00	P0573 00	P0573 00	-

Circuit/System Description

The stop lamp switch signal circuit is a direct hardwire input from the engine control module (ECM) to the body control module (BCM) and transmission control module (TCM). The ECM monitors the stop lamp switch circuit to detect when the brake pedal has been applied. The BCM monitors the brake pedal position (BPP) sensor to determine when the brake pedal is applied. When the brake pedal is applied, the BCM sends a GMLAN serial data message to the ECM indicating that the brake pedal has been applied. The ECM sends a voltage signal on the stop lamp switch circuit to the BCM and TCM.

Conditions for Running the DTC

- The ignition is ON.
- The engine is running.
- Battery voltage is greater than 11.5 volts.

Conditions for Setting the DTC

The ECM detects an open, a high resistance or a short to voltage on the stop lamp switch signal circuit when the serial data message from the BCM indicates the brakes are applied.

Action Taken When the DTC Sets

- The ECM stores the DTC to memory.
- The ECM will record the operating conditions at the time the diagnostic failed. The ECM stores this information in Failure Records.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- The ECM receives a CLEAR DTCs command from the scan tool.
- A history DTC will clear once 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

- **Cruise Control Schematics**
- **Exterior Lights Schematics**

Connector End View Reference

- **Secondary/Configurable Control Connector End Views**
- **Data Communication Connector End Views**
- **Lighting Systems Connector End Views**

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

- **Scan Tool Data List**
- **Scan Tool Data Definitions**

Circuit/System Testing

Test the stop lamp switch signal circuit for an open/high resistance or a short to voltage.

- If the circuit tests OK, replace the ECM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup and programming

DTC P0575

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0575 00

Cruise Control Switch Signal Circuit

Circuit/System Description

When a cruise control function switch is activated, the body control module (BCM) detects a predetermined voltage signal. The BCM sends a GMLAN serial data message to the engine control module (ECM) indicating the function that has been requested.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

- The ECM receives an invalid cruise control switch status GMLAN serial data message from the BCM.
- This diagnostic runs continuously.

Action Taken When the DTC Sets

- The Cruise Control System is disabled.
- The ECM stores the DTC information into memory when the diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The ECM records the operating conditions at the time the diagnostic fails. The ECM stores this information in the Failure Records.
- All cruise control function switches are set to OFF.

Conditions for Clearing the DTC

- The DTC becomes history when the conditions for setting the DTC are no longer present.
- The history DTC clears after 40 consecutive warm-up cycles.
- The ECM receives a clear code command from the scan tool.

Diagnostic Aids

- This DTC may be stored as a history DTC without affecting the operation of the BCM. If stored only as a history DTC and not retrieved as a current DTC, do not replace the BCM or ECM.
- Using the Failure Records data may help locate an intermittent condition. If you cannot duplicate the DTC, the information in the Failure Records can help determine how many miles since the DTC set. The Fail Counter and Pass Counter can help determine how many ignition cycles that the diagnostic test reported a pass and/or a fail.

Reference Information

Schematic Reference

Cruise Control Schematics

Connector End View Reference

- **Secondary/Configurable Control Connector End Views**
- **Data Communication Connector End Views**

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Scan Tool Data List

Circuit/System Verification

IMPORTANT: Verify that B3794 is not set as current or history before performing this diagnostic. If B3794 is set as current or history, go to Cylinder Head Installation - Right Side .

Ignition ON, observe the scan tool Cruise Control Switch parameter in the BCM while pressing the cruise control switch ON and OFF. The reading should change between ON and OFF.

- If the parameter does not switch between ON and OFF, replace the BCM.

Circuit/System Testing

Ignition ON, verify that DTC P0575 is stored in the ECM.

- If the DTC is stored as a current DTC, replace the ECM.
- If the DTC is stored only as a history DTC, refer to **Diagnostic Aids**. Do not replace the ECM or BCM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for BCM or ECM replacement, setup and programming

DTC P0703

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0703 00

Brake Switch Circuit 2

Circuit/System Description

The body control module (BCM) monitors the brake pedal position sensor. When the brake pedal is applied, the BCM detects a predetermined voltage signal. The BCM sends a GMLAN serial data message to the engine control module (ECM) indicating the status of the stop lamps.

Conditions for Running the DTC

The engine is ON.

Conditions for Setting the DTC

- The ECM receives an invalid brake pedal status GMLAN serial data message from the BCM.
- This diagnostic runs continuously.

Action Taken When the DTC Sets

- The Cruise Control System is disabled.
- The ECM stores the DTC information into memory when this diagnostic runs and fails.
- The malfunction indicator lamp (MIL) will not illuminate.
- The ECM records the operating conditions at the time the diagnostic fails. The ECM stores this information in the Failure Records.

Conditions for Clearing the DTC

- A last test failed or the current DTC, clears when the diagnostic runs and does not fail.
- A history DTC clears after 40 consecutive warm-up cycles, if failures are not reported by this or any other emission related diagnostic.
- Use the scan tool in order to clear the DTC.

Diagnostic Aids

IMPORTANT: Repair any brake system related DTCs before performing this diagnostic.

- If a BCM has been replaced, the brake pedal position (BPP) sensor must be calibrated. Refer to **Brake Pedal Position Sensor Calibration** .
- This DTC may be stored as a history DTC without affecting the operation of the ECM. If stored only as a history DTC and not retrieved as a current DTC, do not replace the BCM or ECM.
- If this DTC is retrieved as both a current and a history DTC, replace the ECM.
- For an intermittent condition, refer to **Testing for Intermittent Conditions and Poor Connections** .

Reference Information

Schematic Reference

- **Cruise Control Schematics**
- **Lighting Systems Connector End Views**

Connector End View Reference

- **Secondary/Configurable Control Connector End Views**
- **Data Communication Connector End Views**
- **Lighting Systems Connector End Views**

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Scan Tool Data List

Circuit/System Verification

Ignition ON, observe for proper operation of the brake system including the brake lights. Refer to **Exterior Lighting Systems Description and Operation** .

Circuit/System Testing

IMPORTANT: Fix any Brake System related DTCs or symptoms before using this diagnostic.

IMPORTANT: This DTC may be stored as a history DTC without affecting the operation of the ECM. Do not replace the BCM or ECM if this DTC is stored only as a history DTC and is not retrieved as a current DTC.

1. Ignition ON, perform the brake pedal position (BPP) sensor calibration procedure and verify the BPP is calibrated properly. Refer to **Brake Pedal Position Sensor Calibration** .
   - If the BPP will not calibrate properly, replace the BPP.
2. Cycle the ignition, apply and release the brake pedal. Using a scan tool, check for DTC P0703 in the ECM.
   - If DTC P0703 sets as current in the ECM, replace the ECM.
   - If DTC P0703 does not set in the ECM, the system is OK.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Brake Pedal Position Sensor Replacement**
- **Control Module References** for ECM replacement, setup and programming

SYMPTOMS - CRUISE CONTROL

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Before using the symptom diagnostic table, perform the **Diagnostic System Check - Vehicle** in order to verify the following conditions:
   - There are no DTCs set.
   - The module can communicate via the serial data link.
2. Review the system operation in order to understand the system functions. Refer to **Cruise Control Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices which can affect the operation of the cruise control system. Refer to **Checking Aftermarket Accessories** .
- Inspect the accessible system components or the visible system components for obvious damage or for obvious conditions which can cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections** .

Symptom List

Refer to **Cruise Control Inoperative/Malfunctioning** in order to diagnose the system.

CRUISE CONTROL SWITCH INDICATOR INOPERATIVE

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Circuit/System Description

The body control module (BCM) monitors the cruise control indicator switch. When the cruise on/off switch is pressed ON, the cruise control switch is closed and the signal circuit is low. When the cruise on/off switch is pressed OFF, the cruise control switch is open and the signal

circuit is high.

Reference Information

Schematic Reference

- **Cruise Control Schematics**
- **Body Control System Schematics**

Connector End View Reference

- **Secondary/Configurable Control Connector End Views**
- **Data Communication Connector End Views**

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Scan Tool Data List

Circuit/System Testing

1. Ignition OFF, disconnect the cruise control switch assembly.
2. Connect a fused jumper between the voltage signal circuit and the low reference circuit.
3. Ignition ON, observe the Cruise On/Off Switch parameter.
    - If the Cruise On/Off Switch parameter displays ON, replace the cruise control switch assembly.
    - If the Cruise On/Off Switch parameter displays Off, test the voltage signal circuit and the low reference circuit for an open or for a high resistance.
4. If all circuits test normal, replace the BCM.

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Steering Wheel Control Switch Assembly Replacement**

- **Control Module References** for BCM replacement, setup and programming.

CRUISE CONTROL INOPERATIVE/MALFUNCTIONING

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Circuit/System Description

The cruise control switch is an input to the body control module (BCM). The BCM monitors the cruise control switch signal circuit in order to detect when the driver has requested to perform a cruise control function. The BCM detects a specific voltage signal on the cruise control switch signal circuit when a switch is applied. The BCM sends a GMLAN serial data message to the engine control module (ECM) indicating the status of the cruise control switch.

Conditions for Enabling Cruise Control

- The vehicle speed is greater than 40 km/h (25 mph).
- The vehicle is not in PARK, REVERSE, NEUTRAL or 1st gear.
- The system voltage is within 9-16 volts.
- The park brake or brakes are not applied.

Diagnostic Aids

IMPORTANT: Repair any brake system related symptoms and DTCs before performing this diagnostic.

CAUTION: Refer to SIR Caution .

Disable the inflatable restraint steering wheel module when performing this diagnostic table. Refer to **SIR Disabling and Enabling** .

In order to avoid misdiagnosis, inspect for the following:

- Ensure that the following cruise control switches are not stuck in the engaged position:
  - On/Off switch

  - - SET switch
  - + RES switch
- Rotate the steering wheel to both steering stops and activate each cruise control switch separately. With a scan tool, observe the Cruise On/Off Switch, Cruise Resume/Accel Switch and Cruise Set/Coast Switch parameters in the ECM Cruise Control data list. This will help eliminate the possibility of an internally shorted inflatable restraint steering wheel module coil.
- Inspect for proper operation of the stop lamps and the braking system. Refer to **Exterior Lighting Systems Description and Operation** .
- Electromagnetic interference (EMI) on the speed sensor signal circuit may cause erratic cruise control operation.
- For an intermittent condition, refer to **Testing for Intermittent Conditions and Poor Connections** .

Reference Information

Schematic Reference

- **Cruise Control Schematics**
- **Exterior Lights Schematics**
- **Body Control System Schematics**

Connector End View Reference

- **Secondary/Configurable Control Connector End Views**
- **Data Communication Connector End Views**
- **Lighting Systems Connector End Views**

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Scan Tool Data List

Circuit/System Verification

IMPORTANT: Repair any brake system related symptoms and DTCs before performing this diagnostic.

Ignition ON, cruise on/off switch ON, rotate the steering wheel to both steering stops while activating each cruise control switch separately. With a scan tool, observe all cruise control switch parameters in the ECM. Verify that each cruise control switch activated and that each displayed switch position parameters do not match or reads Invalid, as the steering wheel is turned.

- If the parameters match with each depressed switch accordingly, go to **Diagnostic Aids**.

Circuit/System Testing

CAUTION: Refer to SIR Caution .

Disable the inflatable restraint steering wheel module when performing this diagnostic. Refer to **SIR Disabling and Enabling** .

IMPORTANT: Repair any brake system related symptoms and DTCs before performing this diagnostic.

1. Ignition OFF, remove the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** .
2. Disconnect the harness connector C4 of the multifunction turn signal lever.
3. Ignition ON, measure for 10 volts or greater at the 12-volt reference circuit terminal 1.
    - If less than the specified value, check for an open/high resistance or a short to ground on the multifunction turn signal lever control supply voltage circuit.
4. Test the cruise control switch signal circuit for an open/high resistance, a short to ground or a short to voltage.
5. If the circuits test normal, test the component. If the component tests normal, replace the ECM.

Component Testing

CAUTION: Refer to SIR Caution .

Disable the inflatable restraint steering wheel module when performing this diagnostic. Refer to **SIR Disabling and Enabling** .

IMPORTANT: The cruise control switch must be ON in order to properly measure the resistance of the - SET and the + RES switches.

1. Ignition OFF, remove the inflatable restraint steering wheel module. Refer to **Inflatable Restraint Steering Wheel Module Replacement** .
2. Disconnect the harness connector C4 at the turn signal/multifunction switch.
3. Cruise control switch ON, measure the resistance between terminals 1 and 5 at the cruise control switch side of the connector. Individually activate and hold each cruise control function switch and compare the resistance reading to the values on the schematic for the On, Off, - SET and + RES switches.
    - If any of the resistance measurements for the On, Off, - SET and + RES switches are not within the listed resistance values, replace the turn signal/multifunction switch.

Cruise Control Inoperative/Malfunctioning

Function Switch	Minimum Resistance Value	Maximum Resistance Value
Off	O.L.	O.L.
On	6.5k Ohms	7.1k Ohms
- SET	1.4k Ohms	1.6k Ohms
+ RES	3.7k Ohms	3.9k Ohms

Repair Procedures

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Turn Signal Multifunction Switch Replacement**
- **Control Module References** for ECM replacement, setup and programming

DESCRIPTION AND OPERATION

CRUISE CONTROL DESCRIPTION AND OPERATION

Cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions at vehicle speeds above 40 km/h (25 mph). Steep grades may cause variations in the selected vehicle speeds.

The following are the main components of the cruise control system:

- The accelerator pedal
- The brake pedal position (BPP) sensor
- The body control module (BCM)
- The engine control module (ECM)
- The on/off switch
- The cancel switch
- The + RES switch, equivalent to resume/accel switch
- The - SET switch, equivalent to set/coast switch
- The throttle actuator control (TAC) motor
- The vehicle speed sensor

The body control module (BCM) monitors the signal circuit of the cruise control switches, which are located on the steering wheel. The BCM relays the cruise control switch status to the engine control module (ECM) via the GMLAN serial data circuit. The ECM uses the status of the cruise control switch to determine when to capture and maintain the vehicle speed. The ECM monitors the vehicle speed signal circuit in order to determine the desired vehicle speed. The ECM uses the TAC motor in order to maintain the vehicle speed. For further information on the TAC system, refer to **Throttle Actuator Control (TAC) System Description** .

Voltage is supplied to the cruise control switch via the steering wheel control switch reference voltage circuit supplied by the BCM. The cruise control function switches are arranged in a resistive ladder design, with each cruise control function switch having a different resistance value. The BCM detects a specific voltage value that is associated with the cruise control function switch being activated. When the normally open cruise control on/off switch is turned ON, the switch closes and the BCM supplies a ground to the cruise control switch ON indicator circuit as it becomes illuminated. The BCM sends a GMLAN serial data message to the ECM indicating that the on/off switch is active. Similarly, when the normally open + RES switch or the normally open - SET switch are pressed, the switch closes and the BCM detects the predetermined voltage signal on the cruise control resume/accel and set/coast switch signal circuit. The BCM sends a GMLAN serial data message to the ECM indicating that the + RES switch or the - SET switch is active. The + RES switch or the - SET switch will remain inactive when the BCM has not received the predetermined voltage signal from the on/off switch.

Cruise Control Engaged

The cruise control system will engage and adjust vehicle speeds, based on the activation of the following cruise control switches, which are located on the steering wheel:

- On/off
- + RES
- - SET

To engage the cruise control system, ensure that the vehicle speed is above 40.2 km/h (25 mph), turn the cruise On/Off switch ON and momentarily press the - SET switch. The ECM will engage the cruise control system and record the vehicle speed. The ECM sends a GMLAN serial data message to the instrument panel cluster (IPC) in order to illuminate the Cruise Engaged indicator in the IPC.

Pressing the accelerator pedal while the cruise control system is engaged, allows the driver to override the cruise control system in order to accelerate the vehicle beyond the current set vehicle speed. When the accelerator pedal is released, the vehicle will decelerate and resume the current set vehicle speed. The driver can also override the current set vehicle speed via the - SET switch and the + RES switch. When the cruise control system is engaged, pressing and holding the - SET switch will allow the vehicle to decelerate from the current set vehicle speed without deactivating the cruise control system. When the - SET switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the cruise control system is engaged, momentarily pressing the - SET switch will allow the vehicle to decelerate at 1.6 km/h (1 mph) increments for each time that the - SET is momentarily pressed, with a minimum vehicle speed of 37 km/h (23 mph).

Pressing and holding the + RES switch, when the cruise control system is engaged, will allow the vehicle to accelerate to a greater vehicle speed than the current set vehicle speed. When the + RES switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the cruise control system is engaged, momentarily pressing the + RES switch will allow the vehicle to accelerate at 1.6 km/h (1 mph) increments for each time that the + RES switch is momentarily pressed, with the maximum acceleration total of 16 km/h (10 mph) over the current set vehicle speed. Momentarily activating the + RES switch will recall the previous vehicle speed, after the cruise control system is disengaged by pressing the brake pedal or by activating the CANCEL switch.

Cruise Control Disengaged

The engine control module (ECM) disengages the cruise control operation based on the signals from the following switches:

- The on/off switch
- The cancel switch
- The brake pedal position (BPP) sensor

The cruise control system will disengage when the brake pedal is applied. The body control module (BCM) monitors the BPP sensor via the BPP sensor signal circuit as the voltage signal increases while the pedal reaches the fully applied position. The ECM monitors the BPP signal through a discrete input and a GMLAN serial data message signal from the BCM indicating the brake status. When both signals indicate the brake pedal is applied, the ECM will disengage the cruise control system. For further information on the BPP sensor, refer to **Exterior Lighting Systems Description and Operation** and **Brake Pedal Position Sensor Calibration** .

The cruise control system will also disengage when the cruise control on/off switch is switched OFF or the cruise control cancel switch is activated. The body control module (BCM) determines when the cruise control cancel switch is activated. When the normally open cancel switch is closed, the BCM detects the predetermined voltage signal on the cruise control function switch circuit. The vehicle speed stored in the memory of the engine control module will be erased when the cruise control On/Off switch is turned OFF or the ignition switch is turned OFF. The BCM sends a GMLAN serial data message to the ECM in order to disengage the cruise control system. The cruise control system will disengage when the ECM detects that a driver override function has been active for approximately 60 seconds. When the cruise control system has been disengaged, the ECM sends a GMLAN serial message to the instrument panel cluster (IPC) in order to turn OFF the Cruise Engaged indicator.

The cruise control system will disengage when the ECM detects that a driver override function has been active for approximately 60 seconds.

Cruise Control Inhibited

The engine control module (ECM) inhibits the cruise control operation when any of the following conditions exist:

- The ECM has not detected a brake pedal activation from the body control module (BCM).
- A cruise control related DTC has been set.
- The antilock brake system/traction control system is active for more than 2 seconds.
- The engine RPM is too low.
- The engine RPM is too high.
- The system voltage is not between 9-16 volts.
- The vehicle speed is less than 40 km/h (25 mph).
- The vehicle speed is too high.
- The vehicle is in PARK, REVERSE, NEUTRAL or 1st gear.