

ACCESSORIES & EQUIPMENT

Object Detection and Pedestrian Protection - Coupe And Wagon

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Active Hood Hinge Actuator	22 N.m	16 lb ft
Pedestrian Impact Detection Module	10 N.m	89 lb in
Pedestrian Impact Detection Sensor Bolt	3 N.m	27 lb in

SCHEMATIC WIRING DIAGRAMS

OBJECT DETECTION WIRING SCHEMATICS

Rear Park Assist System (UD7)

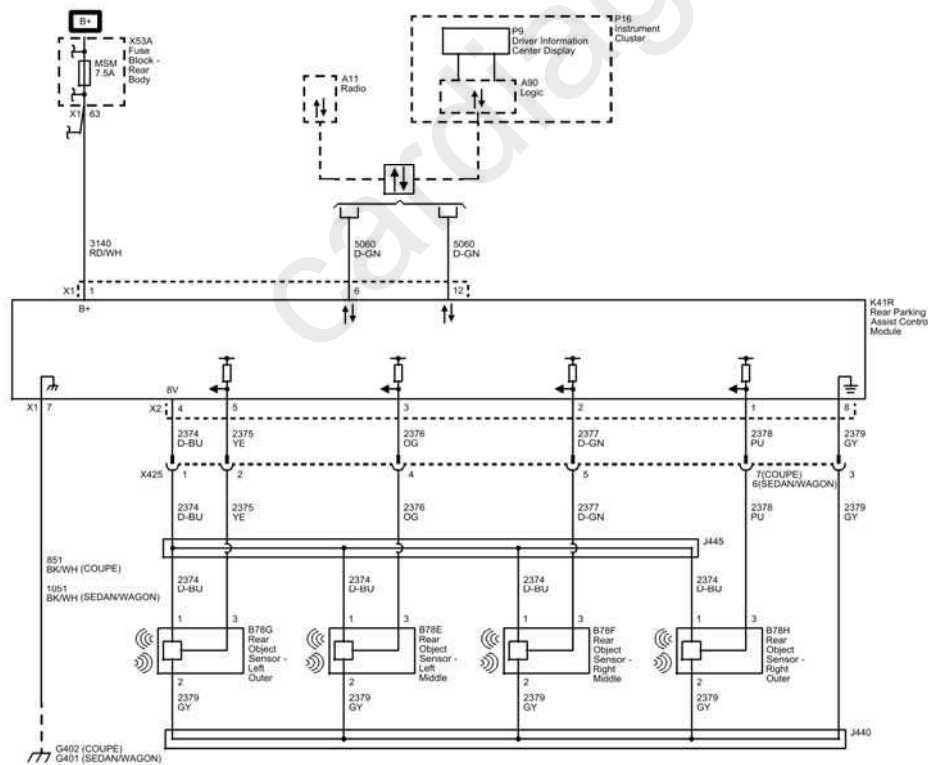


Fig. 1: Rear Park Assist System (UD7)

Courtesy of GENERAL MOTORS COMPANY

Pedestrian Impact Detection System (B37)

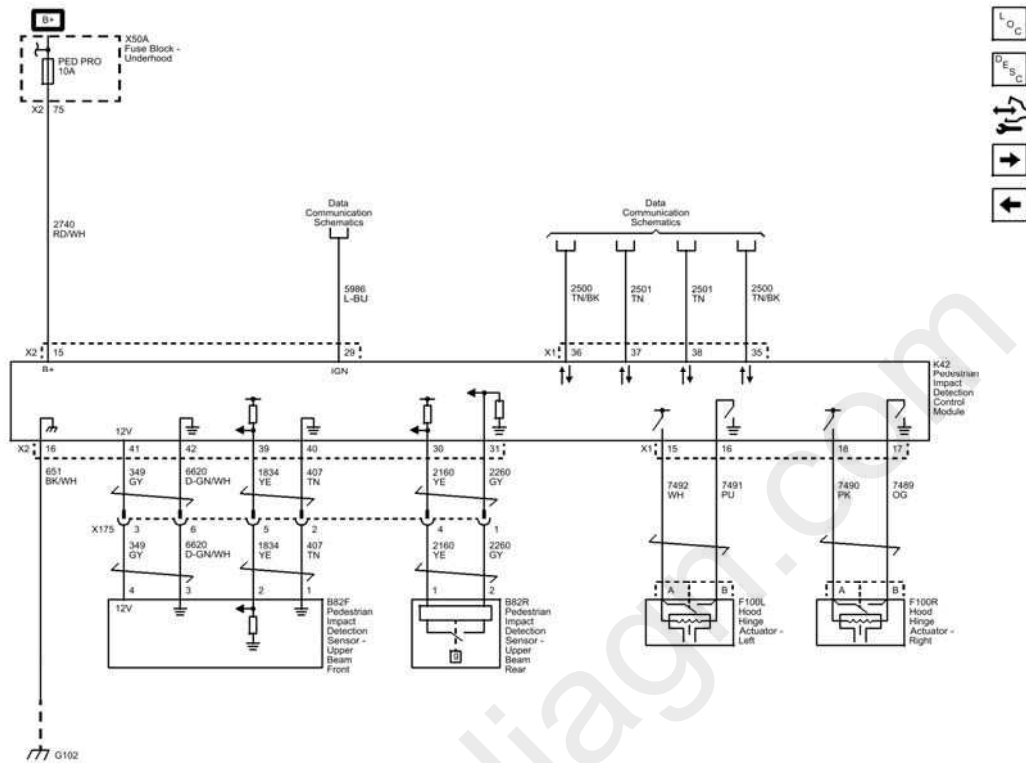


Fig. 2: Pedestrian Impact Detection System (B37)

Courtesy of GENERAL MOTORS COMPANY

Rearview Camera (UVC)

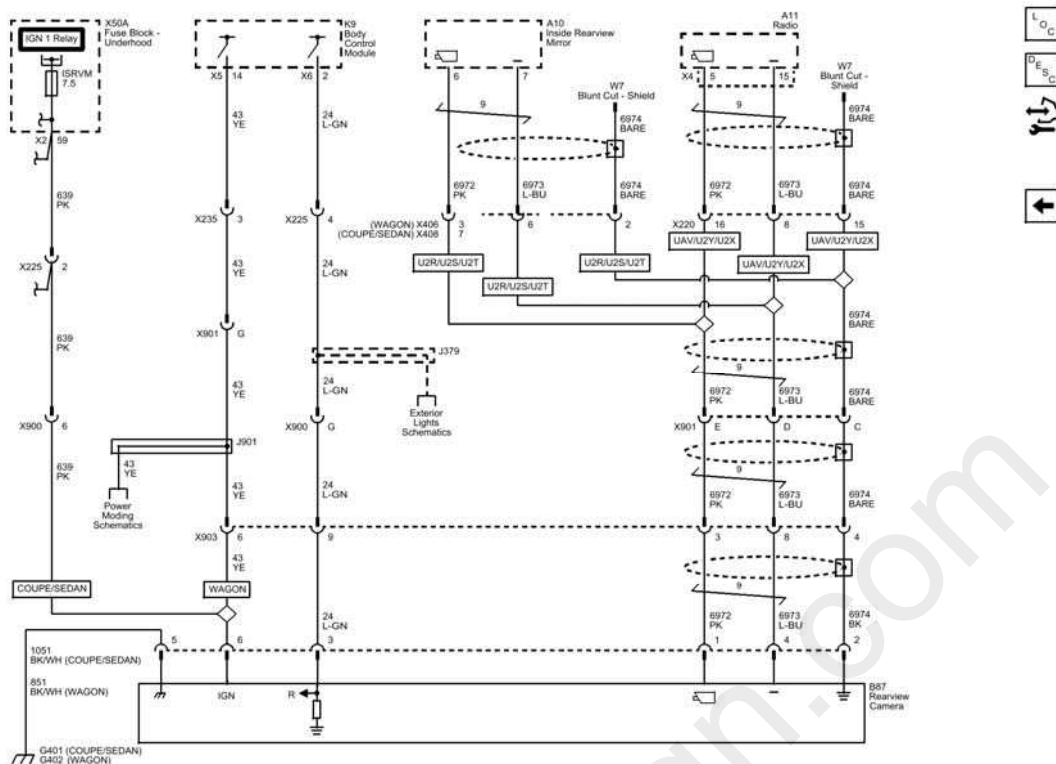


Fig. 3: Rearview Camera (UVC)
Courtesy of GENERAL MOTORS COMPANY

Side Object Detection (UFT)

DTC	Description
<u>DTC B0099</u>	B0099 00 Deployment Commanded Circuit
<u>DTC B009A</u>	B009A 01 Left Active Hood Hinge Actuator Deployment Loop Short to Battery B009A 02 Left Active Hood Hinge Actuator Deployment Loop Short to Ground B009A 04 Left Active Hood Hinge Actuator Deployment Loop Open B009A 0D Left Active Hood Hinge Actuator Deployment Loop Above Threshold B009A 0E Left Active Hood Hinge Actuator Deployment Loop Below Threshold
<u>DTC B009B</u>	B009B 01 Right Active Hood Hinge Actuator Deployment Loop Short to Battery B009B 02 Right Active Hood Hinge Actuator Deployment Loop Short to Ground B009B 04 Right Active Hood Hinge Actuator Deployment Loop Open B009B 0D Right Active Hood Hinge Actuator Deployment Loop Above Threshold B009B 0E Right Active Hood Hinge Actuator Deployment Loop Below Threshold
<u>DTC B009C</u>	B009C 01 Pedestrian Impact Detection Discrimination Sensor Short to Battery B009C 02 Pedestrian Impact Detection Discrimination Sensor Short to Ground B009C 08 Pedestrian Impact Detection Discrimination Sensor Signal Invalid/Open

	B009C 39 Pedestrian Impact Detection Discrimination Sensor Internal Electronic Failure B009C 3A Pedestrian Impact Detection Discrimination Sensor Incorrect Component Installed
<u>DTC B009D</u>	B009D 01 Pedestrian Impact Detection Safing Sensor Short to Battery B009D 02 Pedestrian Impact Detection Safing Sensor Short to Ground B009D 08 Pedestrian Impact Detection Safing Sensor Signal Invalid/Open Circuit B009D 39 Pedestrian Impact Detection Safing Sensor Internal Electronic Failure B009D 3A Pedestrian Impact Detection Safing Sensor Incorrect Component Installed
<u>DTC B0958, B0959, B0960, or B0961</u>	DTC B0958 01 Parking Aid Rear Sensor 1 Circuit Short to Battery DTC B0958 06 Parking Aid Rear Sensor 1 Circuit Short to Ground or Open DTC B0958 08 Parking Aid Rear Sensor 1 Circuit Signal Invalid DTC B0958 21 Parking Aid Rear Sensor 1 Circuit Incorrect Period DTC B0958 3A Parking Aid Rear Sensor 1 Circuit Incorrect Component Installed DTC B0959 01 Parking Aid Rear Sensor 2 Circuit Short to Battery DTC B0959 06 Parking Aid Rear Sensor 2 Circuit Short to Ground or Open DTC B0959 08 Parking Aid Rear Sensor 2 Circuit Signal Invalid DTC B0959 21 Parking Aid Rear Sensor 2 Circuit Incorrect Period DTC B0959 3A Parking Aid Rear Sensor 2 Circuit Incorrect Component Installed DTC B0960 01 Parking Aid Rear Sensor 3 Circuit Short to Battery DTC B0960 06 Parking Aid Rear Sensor 3 Circuit Short to Ground or Open DTC B0960 08 Parking Aid Rear Sensor 3 Circuit Signal Invalid DTC B0960 21 Parking Aid Rear Sensor 3 Circuit Incorrect Period DTC B0960 3A Parking Aid Rear Sensor 3 Circuit Incorrect Component Installed DTC B0961 01 Parking Aid Rear Sensor 4 Circuit Short to Battery DTC B0961 06 Parking Aid Rear Sensor 4 Circuit Short to Ground or Open DTC B0961 08 Parking Aid Rear Sensor 4 Circuit Signal Invalid DTC B0961 21 Parking Aid Rear Sensor 4 Circuit Incorrect Period DTC B0961 3A Parking Aid Rear Sensor 4 Circuit Incorrect Component Installed
<u>DTC B1008</u>	DTC B1008 42 Calibration Data Not Programmed Calibration Data Set Not Programmed
<u>DTC B1015 (Object Alarm and Side Blind Zone)</u>	DTC B1015 00 Vehicle Identification Number Information Malfunction
<u>DTC B1405</u>	DTC B1405 02 Control Module Voltage Reference Output 2 Circuit Short to Ground DTC B1405 03 Control Module Voltage Reference Output 2 Circuit Low Voltage DTC B1405 07 Control Module Voltage Reference Output 2 Circuit High Voltage

DTC B0099: DEPLOYMENT COMMANDED CIRCUIT

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

B0099 00

Deployment Commanded Circuit

Circuit/System Description

The pedestrian impact detection system senses and discriminates vehicle impacts and deploys the pedestrian hood hinge actuators in a timely manner to protect vulnerable pedestrians. The discrimination sensor provides discrete force information to the pedestrian impact detection module. The pedestrian impact detection module uses vehicle acceleration information from the safing sensor and force information from the discrimination sensor to determine those events when the deployment of the hood hinge actuator is expected. The pedestrian hood actuators deploy only when a valid signal whose energy is capable of triggering deployment of the hood is present. During a frontal pedestrian impact of sufficient force, the pedestrian impact detection module will allow current to flow through the deployment loop in order to deploy the hood hinge actuator. The pedestrian impact detection module provides a minimum of 1.2 amps and a maximum of 1.95 amps of current for a minimum of 2 ms when an actuator deployment is commanded. The pedestrian impact detection module performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity. The pedestrian impact detection module sets this DTC in the current ignition cycle when a hood hinge actuator deployment has been commanded. After a deployment, the hood hinge actuators and the pedestrian impact detection module need to be replaced.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

- The pedestrian impact detection module detects a frontal impact to warrant deployment of the hood hinge actuators.
- The pedestrian impact detection module provides a minimum of 1.2 amps and a maximum of 1.95 amps of current for a minimum of 2 ms to command deployment of the hood hinge actuators

Action Taken When the DTC Sets

- The pedestrian impact detection module commands the DIC to display Reset Hood See Owners Manual for the following two ignition cycles.
- The pedestrian impact detection module commands the DIC to display Service Pedestrian Protection System at the third ignition cycle after the hood hinge actuators have been deployed until service is performed.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.

- A history DTC will clear once 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

Ignition ON, verify DTC B0099 is not set.

- If DTC is set, replace the pedestrian impact detection module and the active hood hinge actuators.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Active Hood Hinge Actuator Replacement
- Control Module References for pedestrian impact detection module replacement, setup, and programming

DTC B009A: LEFT ACTIVE HOOD HINGE ACTUATOR DEPLOYMENT LOOP

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

B009A 01

Left Active Hood Hinge Actuator Deployment Loop Short to Battery

B009A 02

Left Active Hood Hinge Actuator Deployment Loop Short to Ground

B009A 04

Left Active Hood Hinge Actuator Deployment Loop Open

B009A 0D

Left Active Hood Hinge Actuator Deployment Loop Above Threshold

B009A 0E

Left Active Hood Hinge Actuator Deployment Loop Below Threshold

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Left Active Hood Hinge Actuator- Low Control Circuit	B009A 02	B009A 04	B009A 0D	B009A 01	B009A 0E
Left Active Hood Hinge Actuator- High Control Circuit	B009A 02	B009A 04	B009A 0D	B009A 01	B009A 0E

Circuit/System Description

The pedestrian hood actuators deploy only when a valid signal whose energy is capable of triggering deployment of the hood is present. The pedestrian hood actuators only deploys in those events where the activation of the hood is expected. The hood actuator is not expected to deploy in low severity event where the risk of injury is low or in a high severity event like a car to car crash. During a frontal pedestrian impact of sufficient force the pedestrian impact detection module will allow current to flow through the deployment loop in order to deploy the hood hinge actuator. The pedestrian impact detection module performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity, shorts to ground and shorts to

voltage. There are 2 shorting bars used within the hood hinge actuator connector which will short together both high and low control circuits, when the hood hinge connector is disconnected. This helps to prevent unwanted deployment of the actuator during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B009A 01

The pedestrian impact detection module deployment loop resistance leakage is less than 3.5 k ohms for 2.5 seconds.

B009A 02

The pedestrian impact detection module deployment loop resistance leakage is less than 3.5 k ohms for 2.5 seconds.

B009A 04

The pedestrian impact detection module deployment loop resistance is greater than 7.2 ohms for 2.5 seconds.

B009A 0D

The pedestrian impact detection module deployment loop resistance is greater than 3.1 ohms for 2.5 seconds.

B009A 0E

The pedestrian impact detection module deployment loop resistance is less than 1.6 ohms for 2.5 seconds.

Action Taken When the DTC Sets

- The pedestrian impact detection module commands the DIC to display Service Pedestrian Protection System.
- The pedestrian impact detection module stores DTC in memory.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the left active hood hinge actuator.
2. Ignition ON, test for less than 1 volt between the high control circuit terminal A and ground.
 - If greater than the specified range, test the circuit for a short to voltage. If the circuit tests normal, replace the pedestrian impact detection module.
3. Test for less than 1 volt between the low control circuit terminal B and ground.
 - If greater than the specified range, test the circuit for a short to voltage. If the circuit tests normal, replace the pedestrian impact detection module.
4. Ignition OFF, test for infinite resistance between the high control circuit terminal A and ground.
 - If not the specified value, test the circuit for a short to ground. If the circuit tests normal, replace the pedestrian impact detection module.
5. Test for infinite resistance between the low control circuit terminal B and ground.
 - If not the specified value, test the circuit for a short to ground. If the circuit tests normal, replace the pedestrian impact detection module.
6. Test for less than 1 ohm between the high control circuit terminal A and ground.
 - If not within the specified range, test the circuit for an open/high resistance.
7. Test for less than 1 ohm between the low control circuit terminal B and ground.
 - If not within the specified range, test the circuit for an open/high resistance.
8. If all circuits test normal, replace the left active hood hinge actuator.

Repair Instructions

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

- **Active Hood Hinge Actuator Replacement**
- **Control Module References** for pedestrian impact detection module replacement, setup, and programming

DTC B009B: RIGHT ACTIVE HOOD HINGE ACTUATOR DEPLOYMENT LOOP

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

B009B 01

Right Active Hood Hinge Actuator Deployment Loop Short to Battery

B009B 02

Right Active Hood Hinge Actuator Deployment Loop Short to Ground

B009B 04

Right Active Hood Hinge Actuator Deployment Loop Open

B009B 0D

Right Active Hood Hinge Actuator Deployment Loop Above Threshold

B009B 0E

Right Active Hood Hinge Actuator Deployment Loop Below Threshold

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Right Active Hood Hinge Actuator - Low Control Circuit	B009B 02	B009B 04	B009B 0D	B009B 01	B009B 0E
Right Active Hood Hinge					

Actuator - High Control Circuit	B009B 02	B009B 04	B009B 0D	B009B 01	B009B 0E
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Circuit/System Description

The pedestrian hood actuators deploy only when a valid signal whose energy is capable of triggering deployment of the hood is present. The pedestrian hood actuators only deploys in those events where the activation of the hood is expected. The hood actuator is not expected to deploy in low severity event where the risk of injury is low or in a high severity event like car to car crash. During a frontal pedestrian impact of sufficient force the pedestrian impact detection module will allow current to flow through the deployment loop in order to deploy the hood hinge actuator. The pedestrian impact detection module performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity, shorts to ground and shorts voltage. There are 2 shorting bars used within the hood hinge actuator connector which will short together both high and low control circuits, when the hood hinge connector is disconnected. This helps to prevent unwanted deployment of the actuator during servicing.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B009B 01

The pedestrian impact detection module deployment loop resistance leakage is less than 3.5 k ohms for 2.5 seconds.

B009B 02

The pedestrian impact detection module deployment loop resistance leakage is less than 3.5 k ohms for 2.5 seconds.

B009B 04

The pedestrian impact detection module deployment loop resistance is greater than 7.2 ohms for 2.5 seconds.

B009B 0D

The pedestrian impact detection module deployment loop resistance is greater than 3.1 ohms for 2.5 seconds.

B009B 0E

The pedestrian impact detection module deployment loop resistance is less than 1.6 ohms for 2.5 seconds.

Action Taken When the DTC Sets

- The pedestrian impact detection module commands the DIC to display Service Pedestrian Protection System.

- The pedestrian impact detection module stores DTC in memory.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the right active hood hinge actuator.
2. Ignition ON, test for less than 1 volt between the high control circuit terminal A and ground.
 - If greater than the specified range, test the circuit for a short to voltage. If the circuit tests normal, replace the pedestrian impact detection module.
3. Test for less than 1 volt between the low control circuit terminal B and ground.
 - If greater than the specified range, test the circuit for a short to voltage. If the circuit tests normal, replace the pedestrian impact detection module.
4. Ignition OFF, test for infinite resistance between the high control circuit terminal A and ground.
 - If not the specified value, test the circuit for a short to ground. If the circuit tests normal, replace the

pedestrian impact detection module.

5. Test for infinite resistance between the low control circuit terminal B and ground.
 - If not the specified value, test the circuit for a short to ground. If the circuit tests normal, replace the pedestrian impact detection module.
6. Test for less than 1 ohm between the high control circuit terminal A and ground.
 - If not within the specified range, test the circuit for an open/high resistance.
7. Test for less than 1 ohm between the low control circuit terminal B and ground.
 - If not within the specified range, test the circuit for an open/high resistance.
8. If all circuits test normal, replace the right active hood hinge actuator.

Repair Instructions

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

- **Active Hood Hinge Actuator Replacement**
- **Control Module References** for pedestrian impact detection module replacement, setup, and programming

DTC B009C: PEDESTRIAN IMPACT DETECTION DISCRIMINATION SENSOR

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

B009C 01

Pedestrian Impact Detection Discrimination Sensor Short to Battery

B009C 02

Pedestrian Impact Detection Discrimination Sensor Short to Ground

B009C 08

Pedestrian Impact Detection Discrimination Sensor Signal Invalid/Open Circuit

B009C 39

Pedestrian Impact Detection Discrimination Sensor Internal Electronic Failure

B009C 3A

Pedestrian Impact Detection Discrimination Sensor Incorrect Component Installed

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Front Upper Beam Sensor Supply Voltage Circuit	B009C 02	B009C 08	B009C 08	-	B009C 39, B009C 3A
Front Upper Beam Sensor Ground Circuit	-	B009C 08	B009C 08	B009C 01	B009C 39, B009C 3A
Front Upper Beam Sensor Low Reference Circuit	B009C 02	B009C 08	B009C 08	B009C 01	B009C 39, B009C 3A
Front Upper Beam Sensor Signal Circuit	B009C 02	B009C 08	B009C 08	B009C 01	B009C 39, B009C 3A

Circuit/System Description

The pedestrian impact detection system senses and discriminates vehicle impacts and deploys the pedestrian hood hinge actuators in a timely manner to protect vulnerable pedestrians. The discrimination sensor provides discrete force information to the pedestrian impact detection module. The pedestrian impact detection module uses vehicle acceleration information from the safing sensor and force information from the discrimination sensor to determine those events when the deployment of the hood hinge actuator is expected. The pedestrian impact detection module provides a two wire current loop interface to the discrimination sensor. The pedestrian impact detection module also provides power and ground to the discrimination sensor over two separate discrete circuits. The pedestrian impact detection module monitors the discrimination sensor for any system malfunction and when a malfunction is detected, a DTC will be stored in non volatile memory.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B009C 01

The discrimination sensor voltage is greater than 3.2 V and the discrimination sensor voltage is not supplied by the pedestrian impact detection module.

B009C 02

The discrimination sensor voltage is less than 3.5 V and the discrimination sensor voltage is supplied by the pedestrian impact detection module.

B009C 08

The discrimination sensor high and/or low circuit is open or no new data received. An open circuit indicates as no new data received.

B009C 39

The discrimination sensor sends an error message or invalid data to the pedestrian impact detection module.

B009C 3A

Invalid discrimination sensor ID data received by the pedestrian impact detection module

Action Taken When the DTC Sets

- The pedestrian impact detection module commands the DIC to display Service Pedestrian Protection System.
- The pedestrian impact detection module stores DTC in memory.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the front upper beam pedestrian impact detection sensor.
2. Ignition OFF, test for less than 5 ohms between the sensor ground circuit terminal 3 and ground.
 - If greater than the specified value, test the circuit for a short to voltage and an open/high resistance. If the circuit tests normal, replace the pedestrian impact detection module.
3. Ignition ON, verify a test lamp illuminates between the sensor supply voltage circuit terminal 4 and ground.
 - If the test lamp does not illuminate, test the circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the pedestrian impact detection module.
4. Ignition OFF, disconnect the harness connector at the pedestrian impact detection module.
5. Test for infinite resistance between the sensor signal circuit terminal 2 and ground.
 - If less than infinite resistance, test the circuit for a short to ground.
6. Ignition ON, test for less than 1 volt between the sensor signal circuit terminal 2 and ground.
 - If greater than the specified value, test the circuit for a short to voltage.
7. Ignition ON, test for less than 1 volt between the sensor low reference circuit terminal 1 and ground.
 - If greater than the specified value, test the circuit for a short to voltage.
8. Test for less than 1 ohm between the sensor low reference circuit terminal 1 and the pedestrian impact detection module terminal 40.
 - If greater than the specified value, test the circuit for an open/high resistance.
9. Test for less than 1 ohm between the sensor signal circuit terminal 2 and the pedestrian impact detection module terminal 39.
 - If greater than the specified value, test the circuit for an open/high resistance.
10. If all circuits test normal, replace the front upper beam pedestrian impact detection sensor.
11. With a scan tool, clear DTCs.
12. Verify DTC B009C is not set.
 - If DTC is set, replace the pedestrian impact detection module.

Repair Instructions

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

- **Pedestrian Impact Detection Sensor Replacement - Front Upper Beam**
- **Control Module References** for pedestrian impact detection module replacement, setup, and programming

DTC B009D: PEDESTRIAN IMPACT DETECTION SAFING SENSOR

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

B009D 01

Pedestrian Impact Detection Safing Sensor Short to Battery

B009D 02

Pedestrian Impact Detection Safing Sensor Short to Ground

B009D 08

Pedestrian Impact Detection Safing Sensor Signal Invalid/Open Circuit

B009D 39

Pedestrian Impact Detection Safing Sensor Internal Electronic Failure

B009D 3A

Pedestrian Impact Detection Safing Sensor Incorrect Component Installed

Diagnostic Fault Information

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Rear Upper Beam Sensor Low Reference Circuit	B009D 02	B009D 08	B009D 08	B009D 01	B009D 39, B009D 3A
Rear Upper Beam Sensor Signal Circuit	B009D 02	B009D 08	B009D 08	B009D 01	B009D 39, B009D 3A

Circuit/System Description

The pedestrian impact detection system senses and discriminates vehicle impacts and deploys the pedestrian hood hinge actuators in a timely manner to protect vulnerable pedestrians. The safing sensor provides vehicle acceleration information to the pedestrian impact detection module. The pedestrian impact detection module uses vehicle acceleration information from the safing sensor and force information from the discrimination sensor to determine those events when the deployment of the hood hinge actuator is expected. The pedestrian impact detection module provides a two wire current loop interface to the safing sensor. The pedestrian impact detection module also provides power and ground to the safing sensor over the same two wire discrete interface. The pedestrian impact detection module monitors the safing sensor for any system malfunction and when a malfunction is detected, a DTC will be stored in non volatile memory.

Conditions for Running the DTC

Ignition voltage is between 9-16 volts.

Conditions for Setting the DTC

B009D 01

The safing sensor voltage is greater than 3.2 V and the safing sensor voltage is not supplied by the pedestrian impact detection module.

B009D 02

The safing sensor voltage is less than 3.5 V and the safing sensor voltage is being supplied by the pedestrian impact detection module.

B009D 08

The safing sensor high and/or low circuit is open. An open circuit indicates no new data received.

B009D 39

The safing sensor sends an error message or invalid data to the pedestrian impact detection module.

B009D 3A

Invalid safing sensor ID data received by the pedestrian impact detection module

Action Taken When the DTC Sets

- The pedestrian impact detection module commands the DIC to display Service Pedestrian Protection System.
- The pedestrian impact detection module stores DTC in memory.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear once 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the rear upper beam sensor and the harness connector at the pedestrian impact detection module.
2. Test for infinite resistance between the sensor signal circuit terminal 1 and ground.
 - If less than infinite resistance, test the circuit for a short to ground.
3. Ignition ON, test for less than 1 volt between the sensor signal circuit terminal 1 and ground.
 - If greater than the specified range, test the circuit for a short to voltage.
4. Test for less than 1 volt between the sensor low reference circuit terminal 2 and ground.
 - If greater than the specified range, test the circuit for a short to voltage.
5. Test for less than 1 ohm between the sensor low reference circuit terminal 2 and the pedestrian impact detection module terminal 31.
 - If greater than the specified value, test the circuit for an open/high resistance. If the circuit tests normal, replace the rear upper beam sensor.
6. Test for less than 1 ohm between the sensor signal circuit terminal 1 and the pedestrian impact detection module terminal 30.
 - If greater than the specified value, test the circuit for an open/high resistance. If the circuit tests normal, replace the rear upper beam sensor.
7. If all circuits test normal, replace the rear upper beam sensor.
8. With a scan tool, clear DTCs.
9. Verify DTC B009D is not set.
 - If DTC is set, replace the pedestrian impact detection module.

Repair Instructions

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

- **Pedestrian Impact Detection Sensor Replacement - Rear Upper Beam**
- **Control Module References** for pedestrian impact detection module replacement, setup, and programming

DTC B0958, B0959, B0960, OR B0961: PARKING AID REAR SENSOR 1/2 CIRCUIT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using the 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 B0958 01

Parking Aid Rear Sensor 1 Circuit Short to Battery

DTC B0958 06

Parking Aid Rear Sensor 1 Circuit Short to Ground or Open

DTC B0958 08

Parking Aid Rear Sensor 1 Circuit Signal Invalid

DTC B0958 21

Parking Aid Rear Sensor 1 Circuit Incorrect Period

DTC B0958 3A

Parking Aid Rear Sensor 1 Circuit Incorrect Component Installed

DTC B0959 01

Parking Aid Rear Sensor 2 Circuit Short to Battery

DTC B0959 06

Parking Aid Rear Sensor 2 Circuit Short to Ground or Open

DTC B0959 08

Parking Aid Rear Sensor 2 Circuit Signal Invalid

DTC B0959 21

Parking Aid Rear Sensor 2 Circuit Incorrect Period

DTC B0959 3A

Parking Aid Rear Sensor 2 Circuit Incorrect Component Installed

DTC B0960 01

Parking Aid Rear Sensor 3 Circuit Short to Battery

DTC B0960 06

Parking Aid Rear Sensor 3 Circuit Short to Ground or Open

DTC B0960 08

Parking Aid Rear Sensor 3 Circuit Signal Invalid

DTC B0960 21

Parking Aid Rear Sensor 3 Circuit Incorrect Period

DTC B0960 3A

Parking Aid Rear Sensor 3 Circuit Incorrect Component Installed

DTC B0961 01

Parking Aid Rear Sensor 4 Circuit Short to Battery

DTC B0961 06

Parking Aid Rear Sensor 4 Circuit Short to Ground or Open

DTC B0961 08

Parking Aid Rear Sensor 4 Circuit Signal Invalid

DTC B0961 21

Parking Aid Rear Sensor 4 Circuit Incorrect Period

DTC B0961 3A

Parking Aid Rear Sensor 4 Circuit Incorrect Component Installed

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
8 V Reference	B138A 03	B0958 06, B0959 06, B0960 06, B0961 06, B138A 03	B138A 07	-
Left Rear Corner Object Alarm Sensor Signal	B0958 06	B0958 06	B0958 01	B0958 08, B0958 21
Left Rear Middle Object Alarm Sensor Signal	B0959 06	B0959 06	B0959 01	B0959 08, B0959 21
Right Rear Middle Object Alarm Sensor Signal	B0960 06	B0960 06	B0960 01	B0960 08, B0960 21
Right Rear Corner Object Alarm Sensor Signal	B0961 06	B0961 06	B0961 01	B0961 08, B0961 21
Low Reference	-	B0958 01, B0959 01, B0960 01, B0961 01, B0958 06, B0959 06, B0960 06, B0961 06	-	-

Circuit/System Description

The object alarm sensors are 3-wire sensors that are used to determine the distance between the vehicle and an object of interest. The rear object sensor control module supplies 8 V to the object alarm sensors via the 8 V reference circuit and provides ground via the low reference circuit. The rear object sensor control module triggers the sensors in a sequential loop. After each sensor transmits, the rear object sensor control module uses the sensor echo received through the signal circuit to calculate the distance and position of an object.

Conditions for Running the DTC

- DTC B1325 is not set
- Ignition voltage is between 9-16 V
- Transmission in REVERSE

Conditions for Setting the DTC

B0958 01, B0959 01, B0960 01, or B0961 01

Voltage seen on the object alarm sensor signal circuit is greater than 11.5 V or the object alarm sensor is not grounded.

B0958 06, B0959 06, B0960 06, or B0961 06

Voltage seen on the object alarm sensor signal circuit is less than 0.5 V.

B0958 08, B0959 08, B0960 08, or B0961 08

An invalid signal is received by the rear object sensor control module.

B0958 21, B0959 21, B0960 21, or B0961 21

The object alarm sensor determines no change in the position of an object while the vehicle is in motion.

B0958 3A, B0959 3A, B0960 3A, B0961 3A

The rear object sensor control module determines there is an incorrect sensor installed.

Action Taken When the DTC Sets

- The parking assist system is disabled.
- The rear object sensor control module sends a serial data message to the instrument panel cluster (IPC) to display SERVICE PARK ASSIST message in the driver information center (DIC).

Conditions for Clearing the DTC

- The DTC will transition to history when the fault is no longer present.
- A history DTC will clear after 100 malfunction-free ignition cycles.

Diagnostic Aids

Make sure the object alarm sensors located on the rear vehicle bumper are clear. Remove any snow, mud or ice that is blocking the sensors.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Verify that DTC B1405 is not set.
 - If DTC is set, refer to **DTC B1405**.
2. Verify that DTC B0958 3A, B0959 3A, B0960 3A, or B0961 3A is not set.
 - If DTC is set, replace the appropriate object alarm sensor.
3. Transmission in REVERSE, verify the parking assist system is enabled and one audible beep sounds.

Circuit/System Testing

Single Object Alarm Sensor DTC Set

1. Ignition OFF, disconnect the harness connector at the appropriate object alarm sensor.
2. Ignition OFF for 30 seconds, test for less than 20 ohms between the low reference circuit terminal 2 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the rear object sensor control module.
3. Ignition ON, transmission in REVERSE, test for 8.0-9.0 V between the voltage reference circuit terminal 1 and ground.
 - If greater than the specified range, test the voltage reference circuit for a short to voltage. If the circuit tests normal, replace the rear object sensor control module.
 - If less than the specified range, test the voltage reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the rear object sensor control module.
4. Ignition OFF, remove the malfunctioning object alarm sensor and swap locations with another properly functioning object alarm sensor.
5. Connect the harness connector at both sensors.
6. Ignition ON, verify DTC is set for the new location in which the malfunctioning object alarm sensor is installed.
 - If the DTC does not set for the new location, test the signal circuit terminal 3 for a short to voltage, short to ground, or an open/high resistance. If the circuit tests normal, replace the rear object sensor control module.
7. If the DTC sets for the new location in which the malfunctioning object alarm sensor is installed, replace the appropriate object alarm sensor.

Multiple Object Alarm Sensor DTCs Set

1. Ignition OFF, disconnect the harness connector at each of the object alarm sensors.
2. Ignition OFF for 30 seconds, test for less than 20 ohms between the low reference circuit terminal 2 and ground.
 - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the rear object sensor control module.
3. Ignition ON, transmission in REVERSE, test for 8.0-9.0 V between the voltage reference circuit terminal 1 and ground.
 - If greater than the specified range, test the voltage reference circuit for a short to voltage. If the circuit tests normal, replace the rear object sensor control module.
 - If less than the specified range, test the voltage reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the rear object sensor control module.

Repair Instructions

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

- **Rear Parking Assist Alarm Sensor Replacement**
- **Control Module References** for object alarm module replacement, setup, and programming

DTC B1008: CALIBRATION DATA NOT PROGRAMMED CALIBRATION DATA SET NOT PROGRAMMED

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 B1008 42

Calibration Data Not Programmed Calibration Data Set Not Programmed

Circuit/System Description

When the ignition is turned ON, the rear object sensor control module performs a self-test to verify if a critical malfunction exists within the system. During the power-up mode, the rear object sensor control module checks for a valid calibration data set.

Conditions for Running the DTC

- DTC B1325 is not set
- Ignition voltage is between 9-16 volts

Conditions for Setting the DTC

A valid calibration is not detected upon module power-up.

Action Taken When the DTC Sets

- Rear parking assist system is disabled.
- The rear object sensor control module commands the red indicator ON.
- The rear object sensor control module sends a serial data message to the instrument panel cluster (IPC) to display SERVICE PARK ASSIST message in the driver information center (DIC) and a chime will sound.

Conditions for Clearing

- The DTC will transition to history when the fault is no longer present.
- A history DTC will clear after 100 malfunction-free ignition cycles.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Verify that DTC B1008 is not set.

- If DTC is set, program the rear object sensor control module. If DTC resets, replace the rear object sensor control module.

Repair Instructions

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

Control Module References for Rear Object Sensor Control Module replacement, setup, and programming.

DTC B1015 (OBJECT ALARM AND SIDE BLIND ZONE): VEHICLE IDENTIFICATION NUMBER INFORMATION MALFUNCTION

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 B1015 00

Vehicle Identification Number Information Malfunction

Circuit/System Description

When the ignition is turned ON, the parking assist control module and the side object sensors receive the vehicle identification number (VIN) from the body control module. The control modules will compare the VIN received to the VIN stored in memory.

Conditions for Running the DTC

Ignition voltage is between 9-16 V.

Conditions for Setting the DTC

The stored VIN does not match the received VIN.

Action Taken When the DTC Sets

- The parking assist or the side blind zone alert system is disabled.
- The driver information center displays SERVICE PARK ASSIST or SERVICE SIDE BLIND ZONE ALERT SYSTEM.

Conditions for Clearing the DTC

The stored VIN matches the VIN stored in the body control module.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, verify the DTC B1015 is not set in either side object sensing module.
 - If the DTC is set, refer to Side Object Sensing Module Malfunction.
2. Verify the DTC B1015 is not set at the parking assist control module.
 - If the DTC is set, refer to Parking Assist Control Module Malfunction.

Circuit/System Testing

Side Object Sensing Module Malfunction

1. Ignition ON, with a scan tool, clear the DTCs.
2. Ignition OFF.
3. Wait 60 seconds, then ignition ON and verify the DTC is not reset.
 - If the DTC is reset, replace the side object sensor the code set in.

Parking Assist Control Module Malfunction

1. Ignition ON, program the control module.
2. With a scan tool, clear the DTCs.
3. Ignition OFF.
4. Wait 60 seconds, then ignition ON and verify the DTC is not reset.
 - o If the DTC is reset, replace the K41 parking assist control module.

Repair Instructions

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

Control Module References for object alarm module replacement, programming and setup

DTC B1405: CONTROL MODULE VOLTAGE REFERENCE OUTPUT 2 CIRCUIT

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 B1405 02

Control Module Voltage Reference Output 2 Circuit Short to Ground

DTC B1405 03

Control Module Voltage Reference Output 2 Circuit Low Voltage

DTC B1405 07

Control Module Voltage Reference Output 2 Circuit High Voltage

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
8 V Reference	B0958 06, B0959 06, B0960 06, B0961 06, B1405 02	B0958 06, B0959 06, B0960 06, B0961 06, B1405 03	B0958 06, B0959 06, B0960 06, B0961 06, B1405 07	-
				B0958 08, B0958

Left Rear Object Sensor Signal	B0958 06	B0958 06	B0958 01	21
Left Middle Rear Object Sensor Signal	B0959 06	B0959 06	B0959 01	B0959 08, B0959 21
Right Middle Rear Object Sensor Signal	B0960 06	B0960 06	B0960 01	B0960 08, B0960 21
Right Rear Object Sensor Signal	B0961 06	B0961 06	B0961 01	B0961 08, B0961 21
Low Reference	-	B0958 06, B0959 06, B0960 06, B0961 06	-	-

Circuit/System Description

The object sensors are 3-wire sensors that are used to determine the distance between the vehicle and an object of interest. The parking assist control module supplies 8 V to the object sensors via the 8 V reference circuit and provides ground via the low reference circuit. The parking assist control module triggers the sensors in a sequential loop. After each sensor transmits, the parking assist control module uses the sensor echo received through the signal circuit to calculate the distance and position of an object.

Conditions for Running the DTC

- Ignition ON
- Transmission in REVERSE

Conditions for Setting the DTC

B1405 02

The parking assist control module has detected the 8 V reference circuit is shorted to ground.

B1405 03

The parking assist control module has detected the 8 V reference circuit is less than 6.3 V.

B1405 07

The parking assist control module has detected the 8 V reference circuit is greater than 10.4 V.

Action Taken When the DTC Sets

- The parking assist is disabled.
- The driver information center displays SERVICE PARK ASSIST.

Conditions for Clearing the DTC

The condition for setting the DTC is no longer present.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Ignition ON, transmission in REVERSE, observe the scan tool Sensor Feed Voltage Output parameter. The reading should be between 6.3-10.4 V.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at each of the object sensors.
2. Ignition ON, transmission in REVERSE, test for 6.3-10.4 V between the 8 V reference circuit terminal 1 at the rear object sensor harness connector and ground.
 - If less than the specified range, test the 8 V reference circuit for a short to ground. If the circuit tests normal, replace the rear object alarm module.
 - If greater than the specified range, test the 8 V reference circuit for a short to voltage. If the circuit tests normal, replace the rear object alarm module.
3. Install each object alarm sensor harness connector one at a time, checking DTCs after each sensor is connected. Verify DTC B1405 is not set as current.
 - If the DTC is set, replace the object alarm sensor that was connected immediately before the DTC set.

4. If all circuits test normal, replace the rear object alarm module.

Repair Instructions

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

- **Rear Parking Assist Alarm Sensor Replacement**
- **Control Module References** for rear object alarm module replacement, setup and programming

SYMPTOMS - OBJECT DETECTION

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

1. Perform the **Diagnostic System Check - Vehicle** before using the Symptom Tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Object Detection Description and Operation (Side Blind Zone Alert, UFT)**, **Object Detection Description and Operation (Rearvision Camera, UVC)**, **Object Detection Description and Operation (Rear Park Assist, UD7)**, **Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)**.

Visual/Physical Inspection

- Inspect for aftermarket devices which may affect the operation of the system. Refer to **Checking Aftermarket Accessories**.
- Inspect the easily accessible or visible system components for obvious damage or conditions which may cause the symptom.
- Make sure the parking assist sensors located on the rear bumper are clear. Remove any snow, mud or ice that is blocking the sensors.

Intermittent

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

Symptom List

- **Parking Assist System Malfunction**
- **Rear Vision Camera System Malfunction (with Navigational Radio)**, **Rear Vision Camera System Malfunction (without Navigational Radio)**
- **Side Object Sensor Malfunction**

PARKING ASSIST SYSTEM MALFUNCTION

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 parking assist system is designed to identify and notify the driver of an object in the vehicle's path when reversing at speeds of less than 8 km/h (5 mph). The distance and location of the object is determined by four object alarm sensors located in the rear bumper. The parking assist system will notify the driver using an audible signal through the radio speakers.

Diagnostic Aids

When the "Park Assist Off", "Park Asst Blocked See Owners Manual", or "Park Assist Blocked See Owners Manual" message is displayed in the DIC the disable reason is stored in the Park Assist Disable History.

The scan tool Park Assist Disable History parameters are a list of the seven previous reasons the park assist system was disabled. These parameters may help in the diagnosis of an intermittent concern or a customer concern which is the result of normal system operation. The following is a brief description of potential causes which may aid in diagnosis:

- Manual Disable - The parking assist system has been disabled by the vehicle operator through the DIC.
- Hitch/Object Attached - The object alarm module is detecting an object is attached to the vehicle. Common items such as a hitch receiver, trailer, object hanging out of liftgate, or a bicycle rack may cause this concern. Additionally, damage to the rear of the vehicle or a misaligned sensor may cause this concern. If the vehicle is damaged in a manner that causes the sensor to detect the bumper itself, the object alarm module will interpret this as an attached object and disable the system. Carefully inspect the bumper, bumper mounting surface, and sensor retainers before continuing with normal diagnosis. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 mph).
- Reverse Overspeed - The vehicle is traveling too fast in reverse at speeds of greater than 8 km/h (5 mph).
- Inhibit - The object alarm module has lost or received invalid GMLAN signal(s).
- Sensor Disturbance - An outside interference is causing sensor movement. Such interference may be caused by a heavy pounding, like that of a nearby jackhammer, or large changes in pressure, such as a large truck's air brakes.
- Sensor Ring Time - If the sensor fails its own diagnostic initialization the object alarm module will set this error. After the detected cause has been addressed the vehicle must be driven at speed greater than 40 km/h (25 mph). The following is a list of reasons this cause might have set:
 - One or more of the sensors may be blocked by snow, mud, ice, or other debris. This might happen after going through a car wash in cold weather.
 - Silicone insulator surrounding sensor maybe missing, cut, or twisted.
 - Improperly installed sensor, sensor maybe be crooked due to a tight wire harness.
 - One or more of the sensors may be scratched or the paint maybe chipped.
 - Excessive paint thickness on a sensor may cause an excessive sensor ring time. When replacing or

refinishing a sensor, do not apply an excessive amount of paint or clear coat.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, verify the park assist system is enabled through the DIC.
 - If the park assist system is manually disabled, enable the system. Refer to the vehicle owners manual for instructions on enabling the system.

NOTE: **After completing the next step the vehicle might need to be driven at speed greater than 40 km/h (25 mph).**

2. Transmission in REVERSE, verify one audible beep sounds and the scan tool Park Assist System Status parameter is Enable.
 - If not the specified values, refer to Diagnostic Aids and the scan tool Park Assist Disable History parameters to determine the cause of the inhibit.

PEDESTRIAN IMPACT DETECTION SYSTEM DISABLING AND ENABLING

There are several reasons for disabling the pedestrian impact detection system (PIDS), such as repairs to the

system or servicing a component near or attached to a PIDS component. There are several ways to disable the PIDS depending on what type of service is being performed. The following information covers the proper procedures for disabling/enabling the pedestrian impact detection system (PIDS).

Condition	Action
If the vehicle was involved in an accident with a hinge deployment.	Disconnect the negative battery cable(s). Refer to <u>Repairs and Inspections Required After a Collision</u> .
When performing PIDS diagnostics.	Follow the appropriate PIDS service manual diagnostic procedure(s)
When removing or replacing a PIDS component or a component attached to a PIDS component.	Disconnect the negative battery cable(s)
If the vehicle is suspected of having shorted electrical wires.	Disconnect the negative battery cable(s)
When performing electrical diagnosis on components other than the PIDS.	Remove the PIDS fuse(s) when indicated by the diagnostic procedure to disable the SIR system

Pedestrian Impact Detection System (PIDS) Service Precautions

WARNING: When performing service on or near the pedestrian impact detection system (PIDS) components or the PIDS wiring, the PIDS must be disabled. Failure to observe the correct procedure could cause deployment of the PIDS components. Serious injury can occur. Failure to observe the correct procedure could also result in unnecessary PIDS repairs

The pedestrian impact detection system (PIDS) maintains a reserve energy supply. The PIDS reserve energy supply provides deployment power for the hood hinge actuators if the PIDS loses battery power during a collision. Deployment power is available for as much as 1 minute after disconnecting the vehicle power. Waiting 1 minute before working on the system after disabling the SIR system prevents deployment of the air bags from the reserved energy supply.

General Service Instructions

The following are general service instructions which must be followed in order to properly repair the vehicle and return it to its original integrity:

- Do not expose the PIDS modules to temperatures above 65°C (150°F).
- Verify the correct replacement part number. Do not substitute a component from a different vehicle.
- Use only original GM replacement parts available from your authorized GM dealer. Do not use salvaged parts for repairs to the PIDS.

Discard any of the following components if it has been dropped from a height of 100 cm (3 feet) or greater:

- Pedestrian impact detection system module
- Pedestrian impact detection system safing sensor

- Pedestrian impact detection system discrimination sensor
- Pedestrian impact detection system hood hinge actuators

Disabling Procedure - Pedestrian Impact Detection System (PIDS) Fuse

1. Place the ignition in the OFF position.
2. Locate and remove the fuse supplying power to the PIDS. Refer to **Object Detection Schematics**, or **Electrical Center Identification Views** . With all PIDS fuses removed and the ignition switch in the ON position, the PIDS warning indicator illuminates. This is normal operation, and does not indicate a PIDS system malfunction.
3. Wait 1 minute before working on the system.

Enabling Procedure - Pedestrian Impact Detection System (PIDS) Fuse

1. Place the ignition in the OFF position.
2. Install the fuse supplying power to the PIDS. Refer to **Object Detection Schematics**, or **Electrical Center Identification Views** .
3. Turn the ignition switch to the ON position. The PIDS indicator will flash then turn OFF.
4. Perform the Diagnostic System Check - Vehicle if the PIDS warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle** .

Disabling Procedure - Negative Battery Cable

1. Place the ignition in the OFF position.
2. Disconnect the negative battery cable from the battery. Refer to **Battery Negative Cable Disconnection and Connection (Coupe)** , **Battery Negative Cable Disconnection and Connection (Wagon)** .
3. Wait 1 minute before working on system.

Enabling Procedure - Negative Battery Cable

1. Place the ignition in the OFF position.
2. Connect the negative battery cable to the battery. Refer to **Battery Negative Cable Disconnection and Connection (Coupe)** , **Battery Negative Cable Disconnection and Connection (Wagon)** .
3. Turn the ignition switch to the ON position. The PIDS indicator will flash then turn OFF.
4. Perform the Diagnostic System Check - Vehicle if the PIDS warning indicator does not operate as described. Refer to **Diagnostic System Check - Vehicle** .

REAR VISION CAMERA SYSTEM MALFUNCTION (WITHOUT NAVIGATIONAL RADIO)

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

When the transmission is placed into REVERSE while engine is running, a signal is sent to the inside rearview mirror and rearview camera indicating that camera operation is requested. Ignition voltage and ground are supplied to the rearview camera; the inside rearview mirror is supplied a common ignition voltage and ground source that is shared with other mirror operations. The rearview camera sends video information to the inside rearview mirror through a video signal + and a video signal - circuit. A grounded shielding also wraps the video signal circuits to reduce electronic interference which may degrade the video signal and cause a distorted or otherwise degraded image.

Diagnostic Aids

A poor video image can be caused by ice, snow, and mud buildup on the lens of the rearview camera. Also, extreme lighting conditions can affect performance, such as operating in the dark or with bright sunlight shining on the camera. Extreme high or low temperatures can also affect the image quality.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Circuit/System Verification

1. Verify there are no debris on the rearview camera lens.
 - **If debris are found on the lens**

Clean the debris from the lens.
 - **If no debris are found on the lens**

2. Engine running, transmission in park.
3. Verify the backup lamps are not ON.
 - **If the backup lamps are ON**

Refer to **Backup Lamps Malfunction** .

- **If the backup lamps are not ON**
4. Engine running with the drive wheels chocked, set the park brake and place the transmission in reverse.
 5. Verify backup lamps are ON.
 - **If the backup lamps are not ON**

Refer to **Backup Lamps Malfunction** .

- **If the backup lamps are ON**
6. Verify a clear rear vision image is displayed on the inside rearview mirror.
 - **If a clear image is not displayed**

Refer to Rearview Camera System Does Not Display.

- **If a clear image is displayed**
7. All OK.

Circuit/System Testing

Rearview Camera System Always On

1. Engine running, transmission in park.
2. Verify a rear vision image is not displayed on the inside rearview mirror.
 - **If a rear vision image is displayed**

Replace the inside rearview mirror.

- **If a rear vision image is not displayed**
3. All OK.

Rearview Camera System Does Not Display

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the inside rearview mirror.
It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 5 and ground.
 - **If 10 ohms or greater**
 1. Ignition OFF.
 2. Test for less than 2 ohms in the ground circuit end to end.

- If 2 ohms or greater, repair the open/high resistance in the circuit.
- If less than 2 ohms, repair the open/high resistance in the ground connection.
- **If less than 10 ohms**

NOTE: Use only the J39200 DMM. Using a DMM other than the J39200 may result in an inaccurate measurement and lead to a misdiagnosis.

3. Ignition OFF, connect a DMM between the signal circuit terminal 6 and the signal circuit terminal 7. Set the DMM to the AC voltage mode and press the Hz button to measure frequency. Ignition ON.
4. Engine running with the drive wheels chocked, set the park brake and place the transmission in reverse.
5. Verify the frequency is between 1 Khz and 100 Khz.
 - **If the frequency is not between 1 Khz and 100 Khz**
1. Ignition OFF, disconnect the harness connector at the rearview camera. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 ohms between the ground circuit terminal 5 and ground.
 - If 10 ohms or greater, test the ground circuit for an open/high resistance.
 - If less than 10 ohms
3. Ignition ON.
4. Verify a test lamp illuminates between the ignition circuit terminal 6 and ground.
 - If the test lamp does not illuminate and the circuit fuse is good, test the ignition circuit for an open/high resistance.
 - If the test lamp does not illuminate and the circuit fuse is open, test the ignition circuit for a short to ground. If the circuit tests normal, replace the rearview camera.
 - If the test lamp illuminates
5. Engine running with the drive wheels chocked, set the park brake and place the transmission in reverse.
6. Verify a test lamp illuminates between the control circuit terminal 3 and ground.
 - If the test lamp does not illuminate, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
 - If the test lamp illuminates.
7. Ignition ON.
8. Test for less than 1 V between the signal circuits listed below and ground.
 - Terminal 1
 - Terminal 4
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V.
9. Ignition OFF.
10. Test for infinite resistance between the signal circuits listed below and ground.
 - Terminal 1
 - Terminal 4

- If less than infinite resistance, repair the short to ground on the circuit.
- If infinite resistance.

11. Test for less than 2 ohms in the signal circuits listed below end to end.

- Terminal 1 at the rearview camera harness connector and terminal 6 at the inside rearview mirror harness connector
- Terminal 4 at the rearview camera harness connector and terminal 7 at the inside rearview mirror harness connector
- If 2 ohms or greater, repair the open/high resistance on the circuit.
- If less than 2 ohms.

12. Replace the rearview camera.

- **If the frequency is between 1 Khz and 100 Khz**

6. Connect the harness connector at the inside rearview mirror.

7. Engine running with the drive wheels chocked, set the park brake and place the transmission in reverse.

8. Verify a clear rear vision image is displayed on the inside rearview mirror.

- **If a clear image is not displayed**

Replace the inside rearview mirror.

- **If a clear image is displayed**

9. All OK.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Rearview Driver Information Camera Replacement (Wagon)**
- **Control Module References** for inside rearview mirror replacement, programming and setup

REAR VISION CAMERA SYSTEM MALFUNCTION (WITH NAVIGATIONAL RADIO)

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

When the vehicle is running and the transmission is placed into REVERSE, a 12 V signal is sent to the rearview camera indicating that camera operation is requested. Ignition voltage and ground are supplied to the rearview camera. The rearview camera sends video information to the radio through a video signal + and a video signal - circuit. A grounded shielding also wraps the video signal circuits to reduce electronic interference which may degrade the video signal and cause a distorted or otherwise degraded image.

Diagnostic Aids

A poor video image can be caused by ice, snow, and mud buildup on the lens of the rearview camera. Extreme lighting conditions may also affect performance, such as operating in the dark or with bright sunlight shining on the camera. Extreme high or low temperatures can also affect the image quality.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Circuit/System Verification

1. Inspect the rearview camera and verify there is no debris on the lens and that the bezel or bezel seal is not damaged.
 - If debris is found on the lens, clean the lens. If the lens, bezel, or bezel seal are damaged, replace as necessary.
2. Vehicle running in PARK, verify the backup lamps are off.
 - If the backup lamps are illuminated, refer to Rearview Camera System Always On.
3. Vehicle in REVERSE, engine running, verify backup lamps are on.
 - If the backup lamps are not illuminated, refer to **Backup Lamps Malfunction** .
4. Park brake ON, vehicle running and in REVERSE, verify a clear rear vision image is displayed on the radio.
 - If a clear image is not displayed, refer to Rearview Camera System Does Not Display.

Circuit/System Testing

Rearview Camera System Always On

1. Ignition OFF, disconnect the harness connector at the rearview camera.
2. Ignition ON, vehicle in PARK, verify a test lamp does not illuminate between the control circuit terminal 3 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage. If the circuit test normal, refer to **Backup Lamps Malfunction** .
3. If all circuits test normal, test or replace the rearview camera.

Rearview Camera System Does Not Display

1. Ignition OFF, disconnect the harness connector at the rearview camera.
2. Test for less than 10 ohms between the ground circuit terminal 5 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify a test lamp illuminates between the ignition circuit terminal 6 and ground.
 - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance.
4. Park brake applied, vehicle running, transmission in REVERSE, verify a test lamp illuminates between the control circuit terminal 3 and ground.
 - If the test lamp does not illuminate, test the ignition circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. Ignition OFF, disconnect the X4 harness connector at the radio.
6. Ignition ON, test for less than 1 V between the following signal circuit terminals at the rearview camera harness connector and ground:
 - Signal (+) circuit terminal 1
 - Signal (-) circuit terminal 4
 - If greater than the specified range, test the signal circuit for a short to voltage.
7. Test for infinite resistance between the following circuit terminals at the rearview camera harness connector and ground:
 - Signal (+) circuit terminal 1
 - Signal (-) circuit terminal 4
 - If not the specified value, test the circuit for a short to ground.
8. Test for less than 2 ohms between the signal (+) circuit terminal 1 at the rearview camera harness connector and the signal (+) circuit terminal 5 at the radio harness connector.
 - If greater than the specified range, test the signal circuit for an open/high resistance.
9. Test for less than 2 ohms between the signal (-) circuit terminal 4 at the rearview camera harness connector and the signal (-) circuit terminal 15 at the radio harness connector.
 - If greater than the specified range, test the signal circuit for an open/high resistance.
10. If all circuits test normal, test or replace the rearview camera.
11. Connect the harness connectors at the radio and the rearview camera.
12. Ignition ON, vehicle running, transmission in REVERSE, verify a clear rear vision image is displayed on

the radio.

- If a clear rear vision image is not displayed, replace the radio.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

- **Rearview Driver Information Camera Replacement (Wagon)**
- **Control Module References** for radio replacement, programming and setup

SIDE OBJECT SENSOR MALFUNCTION

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 Side Blind Zone Alert (SBZA) system uses side object sensors located behind the fascia at each of the vehicle's rear corners. Visual indicators located in the right and left outside rearview mirrors alert the driver to the presence of objects of interest within the corresponding blind spots, or zones, on each side of the vehicle. The system is controlled by the driver information center (DIC) which can also communicate its status.

Each sensor receives battery power, ground, as well as serial data communications. The left and right sensors are identical, however an additional ground circuit is required to configure the sensor for operation on the right side. Communication is via a serial data and each sensor shares the serial data circuit in parallel, allowing continuation of communication between the sensors. The scan tool is able to communicate with each sensor independently. The side object sensors control corresponding mirror icons by sending messages to the door modules which in turn switch power to the LED indicators.

Diagnostic Aids

- The side object sensors are capable of detecting when they are blocked by mud, snow, or ice build up on the fascia. When a sensor is blocked, the driver information center (DIC) will display SIDE BLIND ZONE SYSTEM UNAVAILABLE . The SBZA system transitions back to the normal operating state when the blockage is removed. Bumper sticks, labels, and heavy rain storms may also cause this condition.
- The SBZA system is designed to ignore stationary objects; however, the system may occasionally detect guard rails, signs, trees, shrubs, or other stationary objects as an object in the blind zone. This is normal system operation and does not require service.
- The SBZA system may indicate an object in the blind zone if a trailer is attached to the vehicle, or a bicycle or object is extending out to either side of the vehicle.
- The SBZA system is disabled if any of the following occurs:
 - The door modules determine that a malfunction exists in the side object indicator.

- There is a loss of serial data communication or a SBZA system DTC is set.
- The SBZA system is manually disabled by the driver through the DIC.
- Each side object sensor maintains a history buffer of the previous 16 SBZA events which can be accessed using the scan tool. These parameters may be used to help diagnose a system malfunction or an intermittent concern.
- Because the sensors are identical, they may be swapped from one side of the vehicle to the other in an attempt to isolate a concern. Sensors should NOT be swapped from one vehicle to another.

Reference Information

Schematic Reference

Object Detection Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Object Detection Description and Operation (Side Blind Zone Alert, UFT), Object Detection Description and Operation (Rearvision Camera, UVC), Object Detection Description and Operation (Rear Park Assist, UD7), Object Detection Description and Operation (Pedestrian Impact Detection System, B3T)

Electrical Information Reference

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

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition ON, verify the scan tool can communicate with right side object sensor.
 - If the scan tool can not communicate with the right side object sensor, refer to Right Side Object Sensor Malfunction
2. Verify the scan tool can communicate with left side object sensor.
 - If the scan tool can not communicate with the left side object sensor, refer to Left Side Object Sensor Malfunction
3. Ignition ON, verify that the side blind zone alert system indicators located in the outside rearview mirrors briefly turn ON and then turn OFF during the system self test.

- If both indicators do not briefly illuminate during the system self test, the side blind zone alert system has been disabled. Refer to Diagnostic Aids.
- If only one indicator does not briefly illuminate during the self test, refer to Side Object Indicator Malfunction.

Circuit/System Testing

Right Side Object Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the right side object sensor.
2. Test for less than 5 ohms between the ground circuit terminals listed below and ground:
 - Terminal 5
 - Terminal 6
 - If greater than the specified range, test the appropriate ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
4. If all circuits test normal, replace the right side object sensor.

Left Side Object Sensor Malfunction

1. Ignition OFF, disconnect the harness connector at the left side object sensor.
2. Test for less than 5 ohms between the ground circuit terminal 5 and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, verify that a test lamp illuminates between the B+ circuit terminal 2 and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance.
4. Ignition OFF, disconnect the harness connector at the right side object sensor.
5. Ignition ON, test for less than 1 V between the serial data circuit terminal 4 and ground.
 - If greater than the specified range, test the serial data circuit for a short to ground.
6. Test for infinite resistance between the serial data circuit terminal 4 and ground.
 - If not the specified value, test the serial data circuit for a short to ground.
7. Test for less than 2 ohms between the serial data circuit terminal 4 at the left side object sensor harness connector and the serial data circuit terminal 4 at the right side object sensor harness connector.
 - If greater than the specified range, test the serial data circuit for an open/high resistance.
8. If all circuits test normal, replace the left side object sensor.

Side Object Indicator Malfunction

1. Ignition OFF, disconnect the X2 harness connector at the outside rearview mirror.
2. Connect a test lamp between the control circuit terminal 4 and the low reference circuit terminal 1.
3. Ignition ON, verify the test lamp briefly illuminates during the system self test.

- If the test lamp does not illuminate or remains illuminated at all time, test the control circuit and the low reference circuit for a short to voltage, short to ground, or an open/high resistance. If the circuits test normal, replace the appropriate door module.
4. If all circuits test normal, test or replace the appropriate outside rearview mirror.

Repair Instructions

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

- **Power Mirror Replacement (Wagon) , Power Mirror Replacement (Coupe)**
- **Control Module References** for the driver door module, front passenger door module, side object sensor replacement, setup, and programming

REPAIR INSTRUCTIONS

PEDESTRIAN IMPACT DETECTION SENSOR REPLACEMENT - FRONT UPPER BEAM

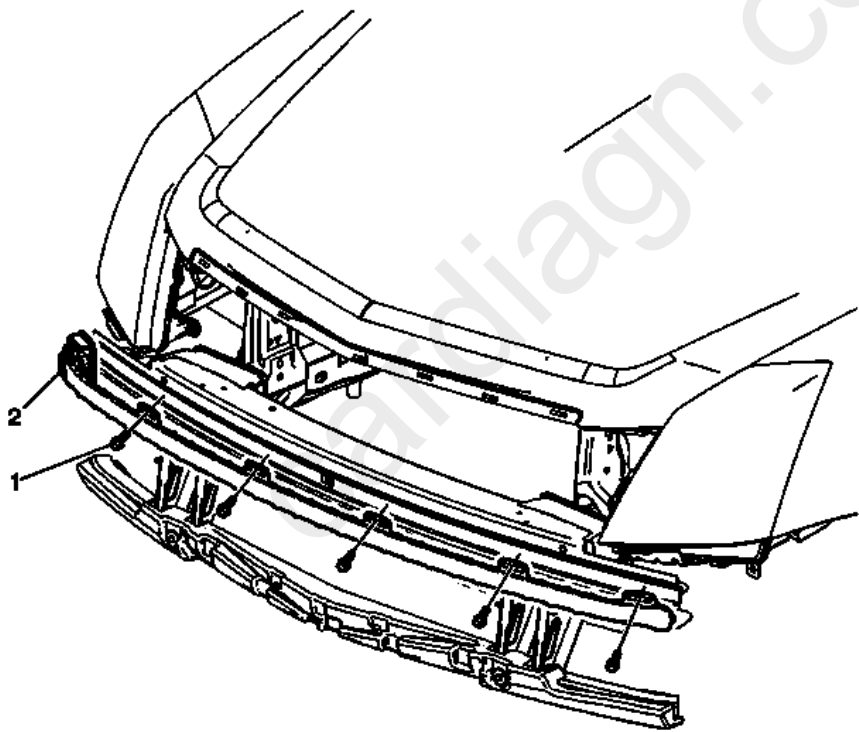


Fig. 5: Pedestrian Impact Detection Sensor - Front Upper Beam
 Courtesy of GENERAL MOTORS COMPANY

Pedestrian Impact Detection Sensor Replacement - Front Upper Beam

Callout	Component Name
Preliminary Procedures	
1.	Disable the pedestrian impact detection system. Refer to <u>Pedestrian Impact Detection System</u>

Disabling and Enabling.

2. Remove the front fascia. Refer to Front Bumper Fascia Replacement .
3. Remove the front fascia absorber. Refer to Front Bumper Fascia Energy Absorber Replacement (BRT) , Front Bumper Fascia Energy Absorber Replacement (Standard) .

1	Pedestrian Impact Detection Sensor Bolt (Qty: 5) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 3 N.m (27 lb in)
2	Pedestrian Impact Detection Sensor Procedure Disconnect the electrical connector.

PEDESTRIAN IMPACT DETECTION SENSOR REPLACEMENT - REAR UPPER BEAM

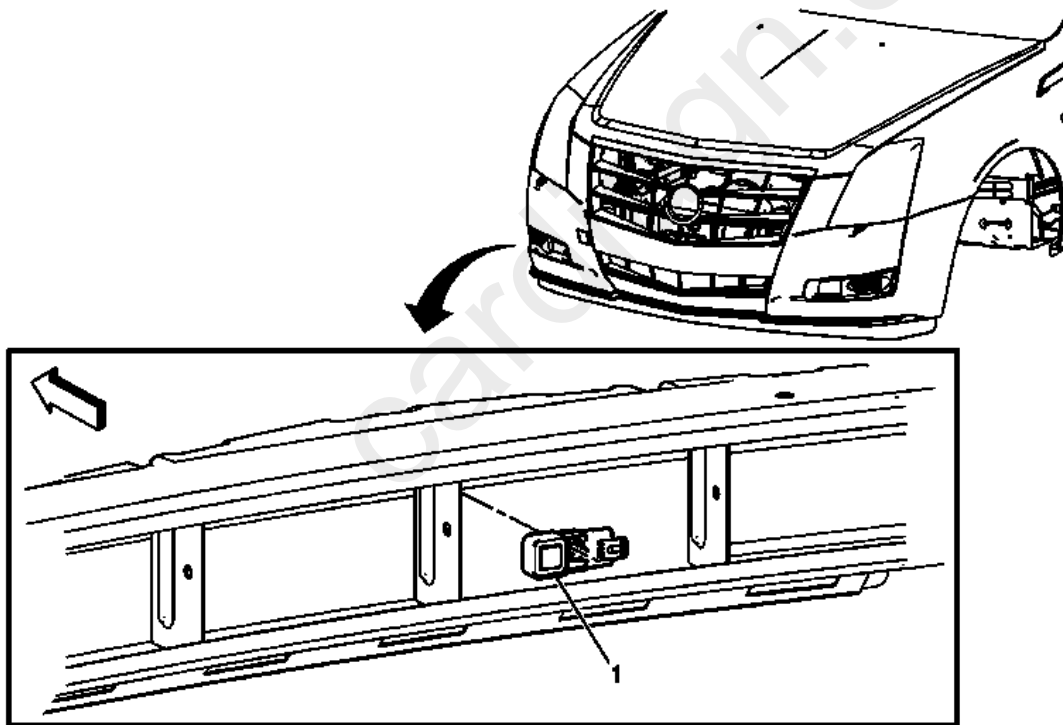


Fig. 6: Pedestrian Impact Detection Sensor - Rear Upper Beam
Courtesy of GENERAL MOTORS COMPANY

Pedestrian Impact Detection Sensor Replacement - Rear Upper Beam

Callout	Component Name
Preliminary Procedures	

1. Disable the pedestrian impact detection system. Refer to **Pedestrian Impact Detection System Disabling and Enabling.**
2. Remove the front air deflector. Refer to **Front Air Deflector Replacement .**

Pedestrian Impact Detection Sensor

CAUTION:
Refer to **Fastener Caution .**

Procedure

1

1. Disconnect the electrical connector.
2. Loosen the sensor integral bolt.

TIP: The bolt is an integral part of the sensor and should remain with the sensor.
Tighten
10 N.m (89 lb in)

ACTIVE HOOD HINGE ACTUATOR REPLACEMENT

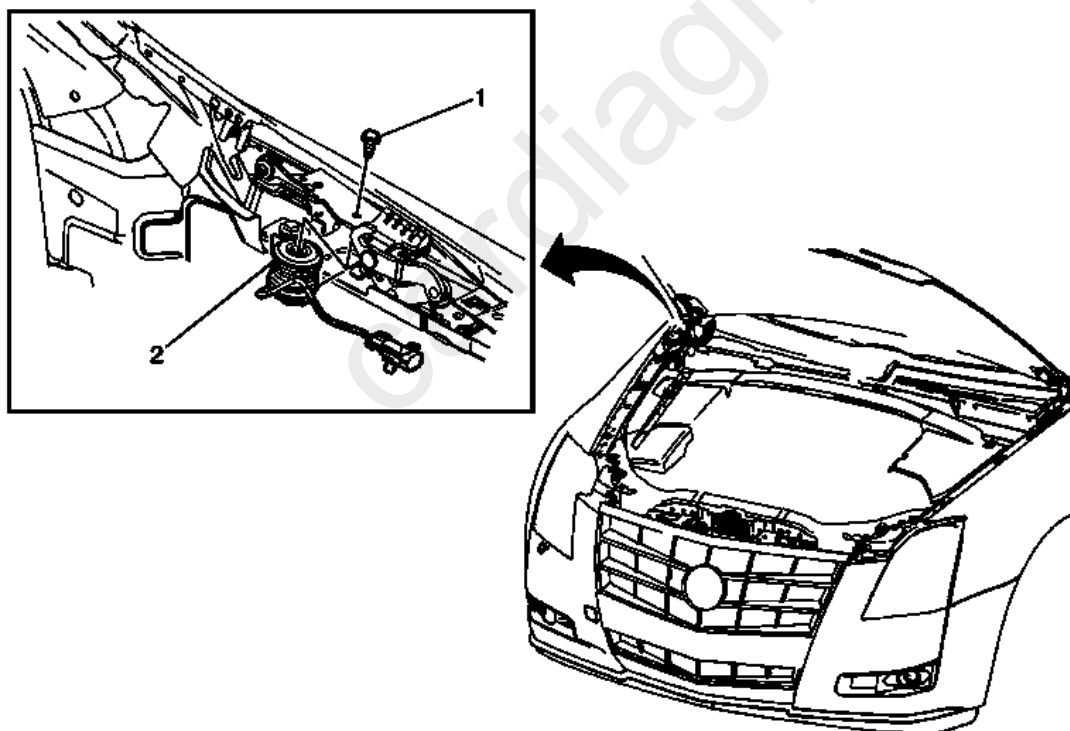


Fig. 7: Active Hood Hinge Actuator
Courtesy of GENERAL MOTORS COMPANY

Active Hood Hinge Actuator Replacement

Callout	Component Name
Preliminary Procedure Disable the SIR system. Refer to <u>Pedestrian Impact Detection System Disabling and Enabling.</u>	
1	Active Hood Hinge Actuator Bolt CAUTION: Refer to <u>Fastener Caution</u> . Tighten 22 N.m (16 lb ft)
2	Active Hood Hinge Actuator Procedure 1. Disconnect any electrical connectors. 2. If deployed, replace the following parts: • Left and right actuator • Left and right hinge - hood side • Left and right hinge - body side • Hood • Inspection hood latch and subsequent replacement if functionality or appearance is compromised

PEDESTRIAN IMPACT DETECTION MODULE REPLACEMENT

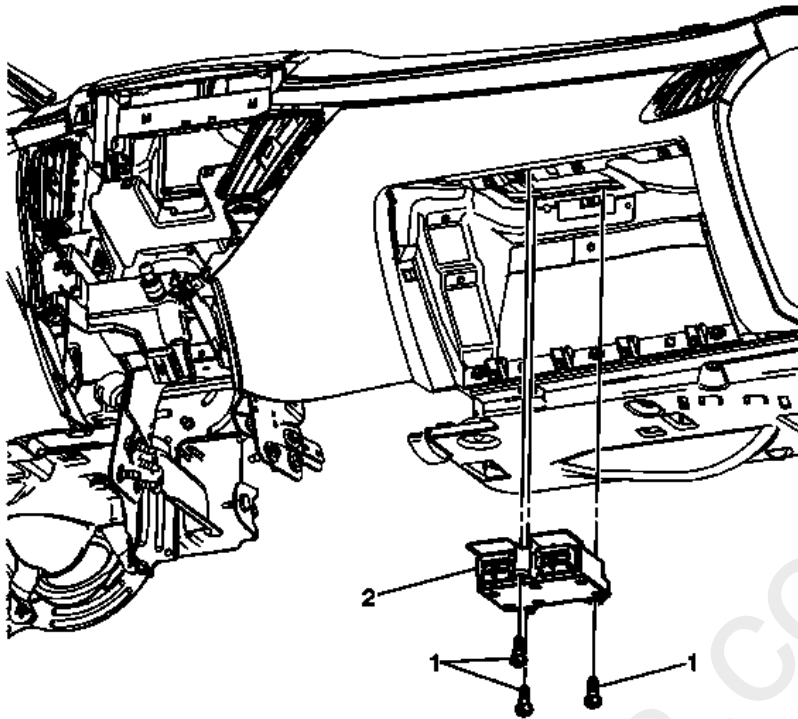


Fig. 8: Pedestrian Impact Detection Module
 Courtesy of GENERAL MOTORS COMPANY

Pedestrian Impact Detection Module Replacement

Callout	Component Name
Preliminary Procedure Remove the instrument panel (I/P) compartment assembly. Refer to <u>Instrument Panel Compartment Replacement (Right Hand Drive)</u> , <u>Instrument Panel Compartment Replacement (Left Hand Drive)</u> .	
1	Pedestrian Impact Detection Module Bolt/Screw (Qty: 3) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 10 N.m (89 lb in)
2	Pedestrian Impact Detection Module Procedure 1. Disconnect the electrical connectors. 2. Refer to <u>Control Module References</u> for programming and set up procedures.

PEDESTRIAN IMPACT DETECTION SYSTEM HANDLING AND SCRAPPING

Special Tools

- **J38826-1** SIR Deployment Harness
- **J38826-45** PIDS Actuator Adapter

For equivalent regional tools, refer to **Special Tools** .

Live and Undeployed Pedestrian Impact Detection System Actuator

Take special care when handling or storing an undeployed Pedestrian Detection Impact System (PIDS) Actuator. A PIDS Actuator deployment produces a rapid generation of gas. This may cause the PIDS Actuator, or an object in front of the PIDS Actuator, to project through the air in the event of an unlikely deployment.

Scrapping Procedure

During the course of a vehicle's useful life, certain situations may arise which will require the disposal of a live and undeployed PIDS Actuator. Do NOT dispose a live and undeployed PIDS Actuator through normal disposal channels until the PIDS Actuator has been deployed.

Do not deploy the PIDS Actuator in the following situations:

1. After replacement of a PIDS Actuator under warranty the PIDS Actuator may need to be returned undeployed to the manufacturer.
2. If the vehicle is the subject of a Product Liability report, GM-1241, or Special Field Investigation (SFI), related to the PIDS system and is subject to a preliminary investigation do NOT alter the PIDS Actuator system in any manner.
3. If the vehicle is involved in a campaign affecting the PIDS Actuator follow the instructions in the Campaign Service Bulletin for proper PIDS Actuator handling procedures.

Deployment Procedures

Deploy the PIDS Actuators outside of the vehicle.

Deployment Outside Vehicle

Deploy the PIDS Actuator outside of the vehicle when the vehicle will be returned to service. Situations that require deployment outside of the vehicle include the following:

- Using the PIDS diagnostics, you determine that the PIDS Actuator is malfunctioning.
- The PIDS Actuator is cosmetically damaged, scratched, or broken.
- The PIDS Actuator pigtail is damaged.
- The PIDS Actuator connector is damaged.
- The PIDS Actuator connector terminals are damaged.

Deployment and disposal of a malfunctioning PIDS Actuator is subject to any required retention period.

WARNING: In order to prevent accidental deployment and the risk of personal injury, do not dispose of an undeployed Pedestrian Impact Detection System (PIDS) Actuator as normal shop waste. Undeployed PIDS Actuators contain substances that could cause severe illness or personal injury if their sealed containers are damaged during disposal. Use the following deployment procedures to safely dispose of an undeployed PIDS Actuators. Failure to observe the following disposal methods may be a violation of Federal law.

1. Turn OFF the ignition.
2. Remove the ignition key.
3. Put on safety glasses.
4. Remove the PIDS Actuator.
5. Place the PIDS Actuator on a work bench, with connector side facing up and away from the surface.
6. Clear a space on the ground about 1.85 m (6 ft) in diameter for deployment of the PIDS Actuator. If possible, use a paved, outdoor location free of activity. Otherwise, use a space free of activity on the shop floor. Ensure you have sufficient ventilation.
7. Clear the area of loose or flammable objects.
8. Place PIDS Actuator in the center.
9. Inspect the SIR deployment harness and the PIDS Actuator adapter for damage. Replace as needed.
10. Short the 2 SIR deployment harness leads together using one banana plug seated into the other.
11. Connect the appropriate pigtail adapter to the SIR deployment harness.
12. Extend the SIR deployment harness and adapter to the full length of 5 m from the deployment area.
13. Connect the PIDS actuator to the adapter on the SIR deployment harness.
14. Place a 12 volt minimum/4 amp minimum power source, such as a vehicle battery, near the shorted end of the harness.

NOTE: The rapid expansion of gas involved with deploying a PIDS Actuator is very loud. Notify all the people in the immediate area that you intend to deploy the PIDS Actuator.

15. Clear the area of people.
16. Separate the 2 banana plugs on the PIDS deployment harness that were shorted together earlier in the procedure.
17. Connect the SIR deployment harness wires to the power source. Deployment of the PIDS Actuator will occur when contact is made.
18. Disconnect the SIR deployment harness from the power source after the PIDS Actuator deploys.
19. If the PIDS Actuator did not deploy, disconnect the adapter and discontinue the procedure and contact the Technical Assistance Group. If deployment was successful, proceed to the following steps.
20. Seat one banana plug into the other in order to short the deployment harness leads.
21. Put on a pair of shop gloves.
22. Disconnect the pigtail adapter from the PIDS actuator as soon as possible.

23. . Inspect the pigtail adapter and the SIR deployment harness. Replace as needed.
24. Dispose of the deployed PIDS Actuator through normal refuse channels.
25. Wash your hands with a mild soap.

REAR OBJECT ALARM CONTROL MODULE REPLACEMENT (WAGON)

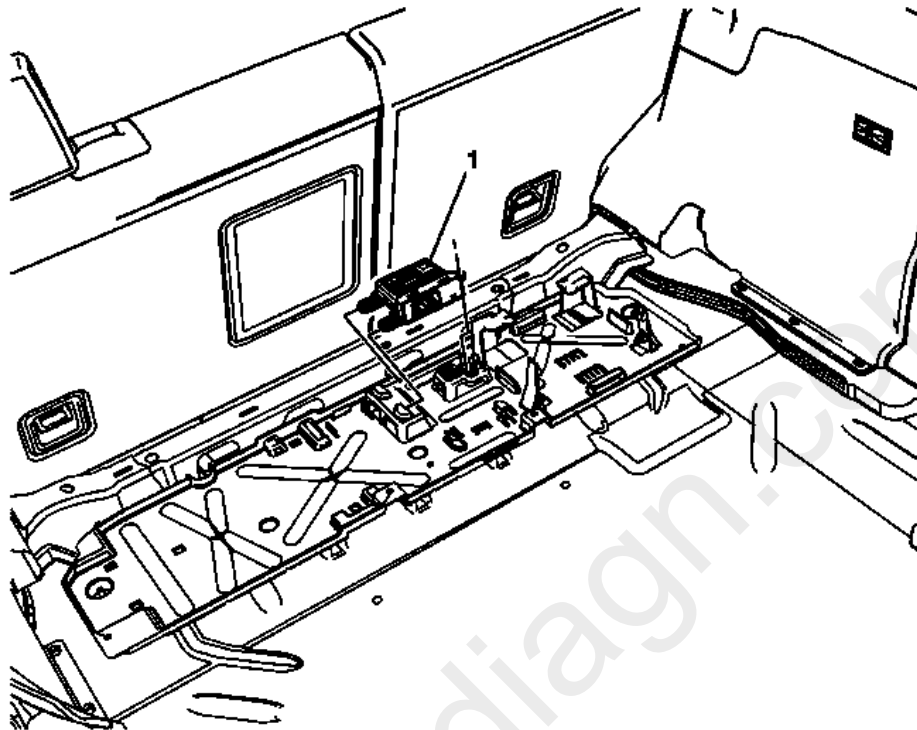


Fig. 9: Rear Object Alarm Module (Wagon)
Courtesy of GENERAL MOTORS COMPANY

Rear Object Alarm Control Module Replacement (Wagon)

Callout	Component Name
Preliminary Procedure Remove the rear compartment floor stowage compartment cover. Refer to <u>Rear Compartment Floor Stowage Compartment Cover Replacement (Wagon)</u> .	
1	Rear Object Alarm Module Procedure 1. Disconnect the electrical connectors. 2. For programming and set up, refer to <u>Control Module References</u>

REAR OBJECT ALARM CONTROL MODULE REPLACEMENT (COUPE)

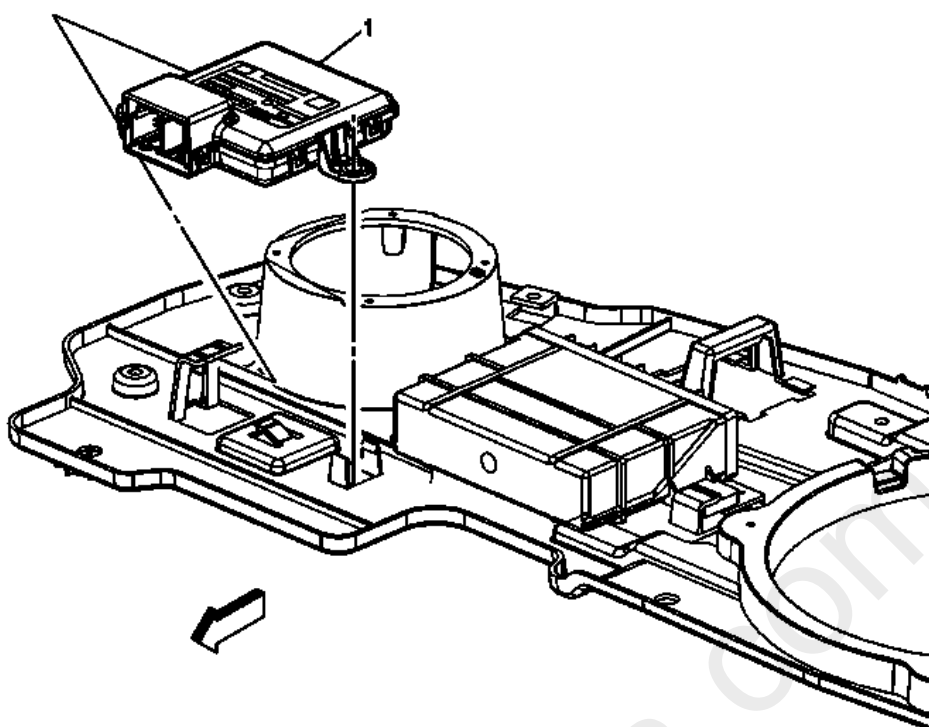


Fig. 10: Identifying Rear Object Alarm Module (Coupe)

Courtesy of GENERAL MOTORS COMPANY

Rear Object Alarm Control Module Replacement (Coupe)

Callout	Component Name
Preliminary Procedure	
Remove the rear window shelf trim panel. Refer to <u>Rear Window Panel Trim Replacement (Coupe)</u> .	
1	Rear Object Alarm Module Procedure 1. Disconnect the electrical connectors. 2. Unsnap the receiver from the panel. 3. For programming and set up, refer to <u>Control Module References</u>

REAR PARKING ASSIST ALARM SENSOR REPLACEMENT

Removal Procedure

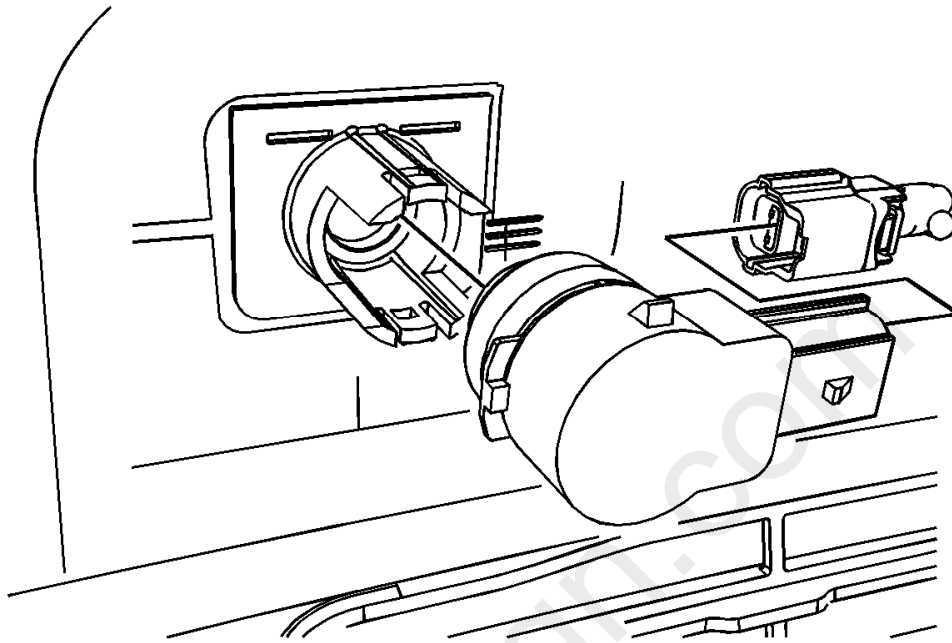


Fig. 11: Identifying Rear Object Sensor Housing
Courtesy of GENERAL MOTORS COMPANY

1. Remove rear bumper fascia. Refer to **Rear Bumper Fascia Replacement (Coupe)** , **Rear Bumper Fascia Replacement (Wagon)** .
2. Disconnect electrical from the rear object sensor.

NOTE: The rear object sensor is a one piece design. Do NOT twist the sensor cap to try and remove the painted cap. Replacement sensor requires painting to match fascia/bumper body color.

3. Lift the locking tabs on the housing and remove the rear object sensor.

Installation Procedure

NOTE: Do not refinish previously painted sensors. Excess paint build up will cause the sensor to be inoperative.

1. Paint the rear object sensor. Refer to **Basecoat/Clearcoat Paint Systems** .
2. Ensure the paint does not exceed 6 mils. Use a paint thickness gauge suitable for non-ferrous metals. Refer to **Paint Gauges** .

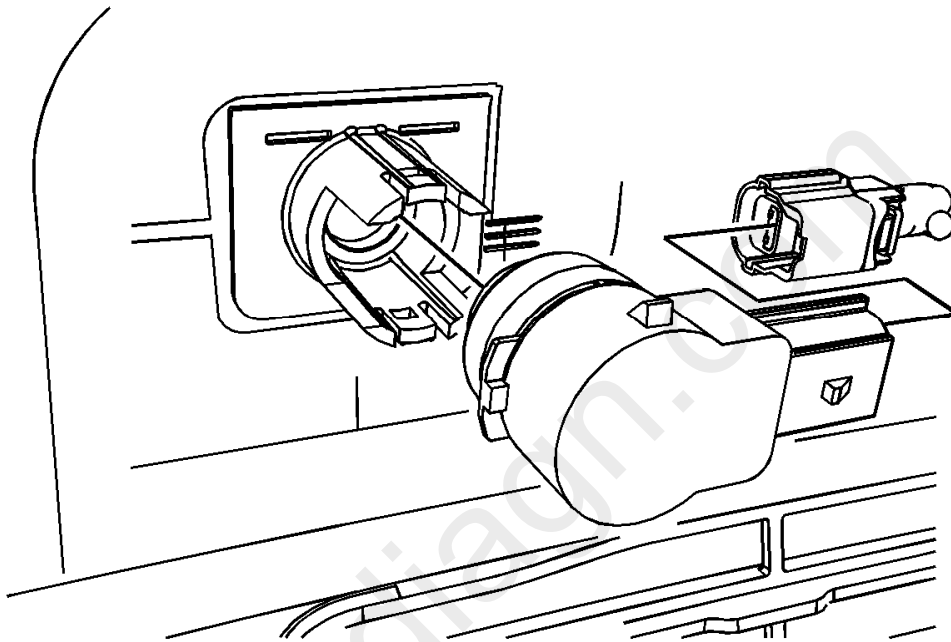


Fig. 12: Identifying Rear Object Sensor Housing
Courtesy of GENERAL MOTORS COMPANY

NOTE: Ensure the silicone decoupling ring is installed on the sensor to avoid sensor failure.

3. Insert the sensor into the housing.
4. Connect the electrical connector to the rear object sensor.
5. Install the rear bumper fascia. Refer to **Rear Bumper Fascia Replacement (Coupe)** , **Rear Bumper Fascia Replacement (Wagon)** .

REAR OBJECT SENSOR HOUSING REPLACEMENT

1. Remove the rear fascia. Refer to **Rear Bumper Fascia Replacement (Coupe)** , **Rear Bumper Fascia**

Replacement (Wagon) .

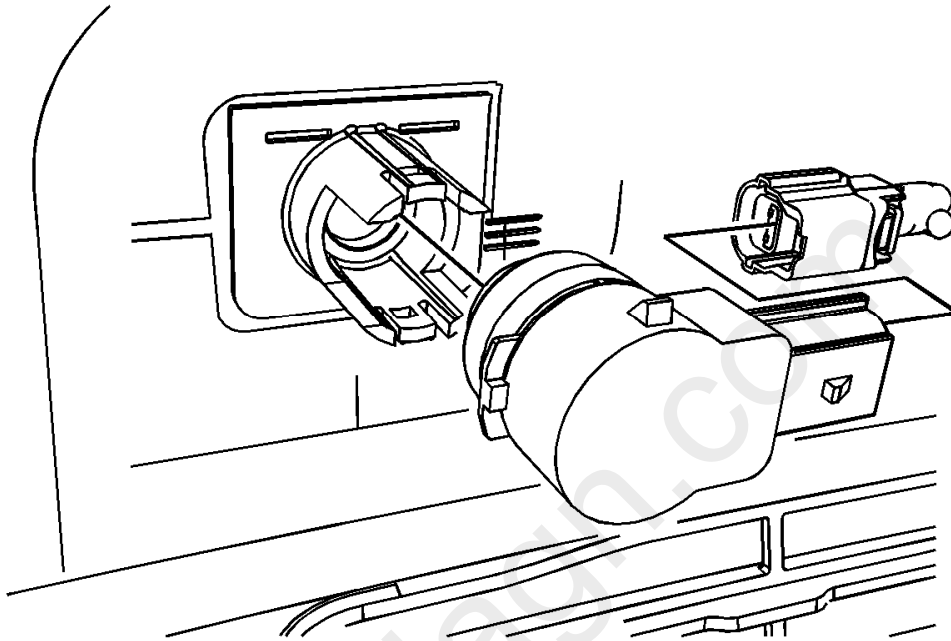


Fig. 13: Identifying Rear Object Sensor Housing
Courtesy of GENERAL MOTORS COMPANY

2. Disconnect the sensor harness.
3. Remove the sensor from the sensor housing.

The sensor housing must be painted if replaced. If reinstalled, painting will not be necessary.

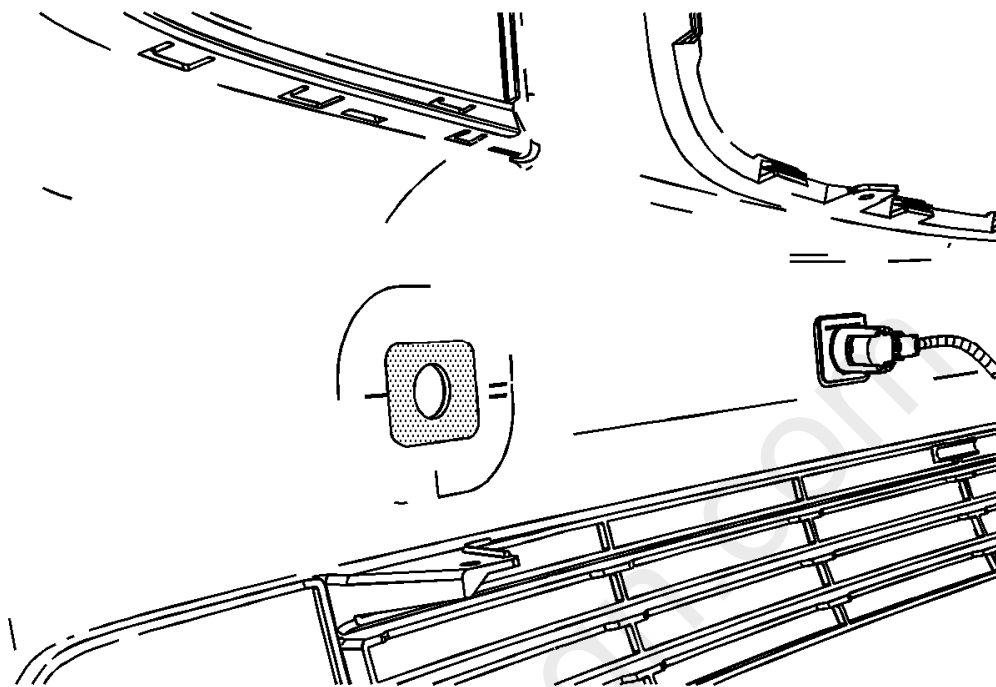


Fig. 14: Sanding/Grinding Sonic Weld Plastic Residue From Fascia
Courtesy of GENERAL MOTORS COMPANY

IMPORTANT: Do Not grind off alignment tabs.

4. Sand/grind sonic weld plastic residue from the fascia.

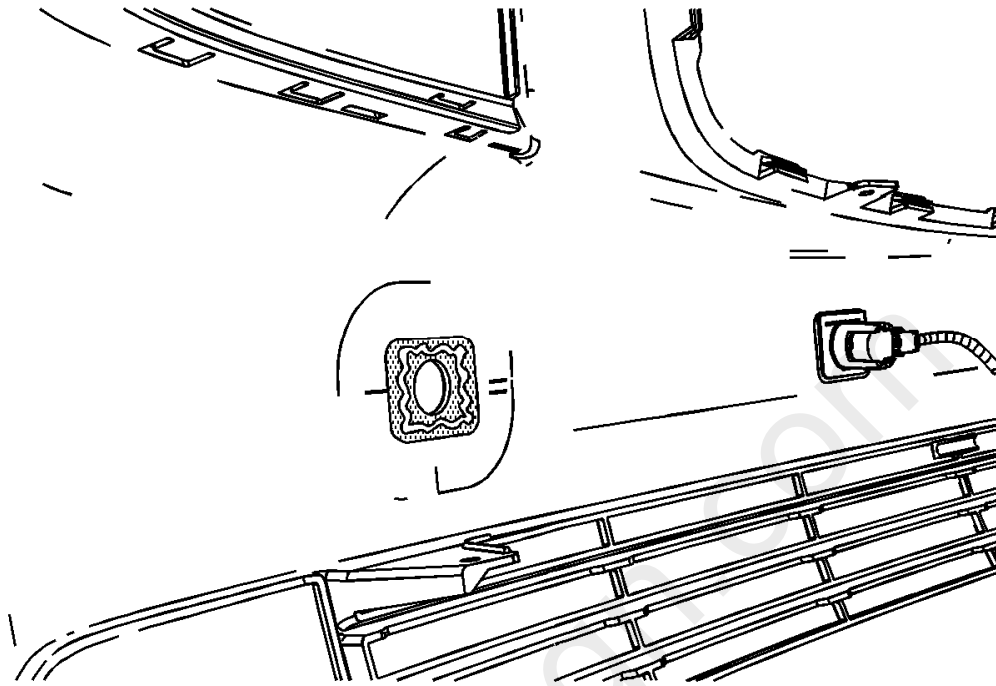


Fig. 15: Applying Structural Adhesive Epoxy To Fascia
Courtesy of GENERAL MOTORS COMPANY

5. Apply structural adhesive epoxy, Lord Fusor™ 127EZ or equivalent, to fascia at mating surface.

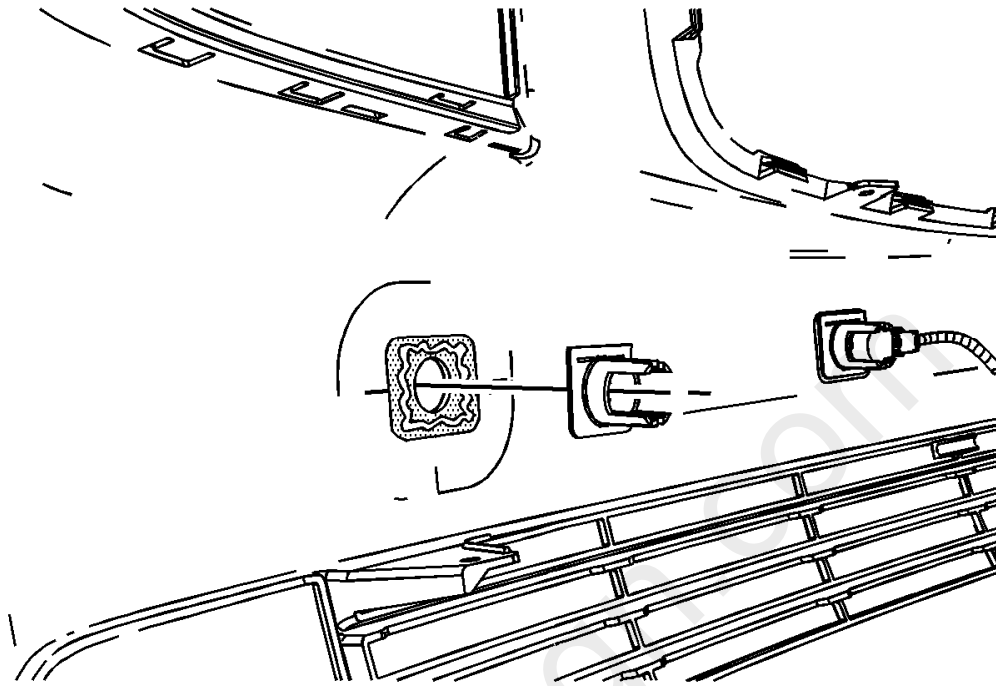


Fig. 16: Identifying Sensor Housing & Tabs
Courtesy of GENERAL MOTORS COMPANY

6. Using the alignment tabs, install the sensor housing to the fascia.
7. Allow adhesive to cure according to manufacturer's directions.

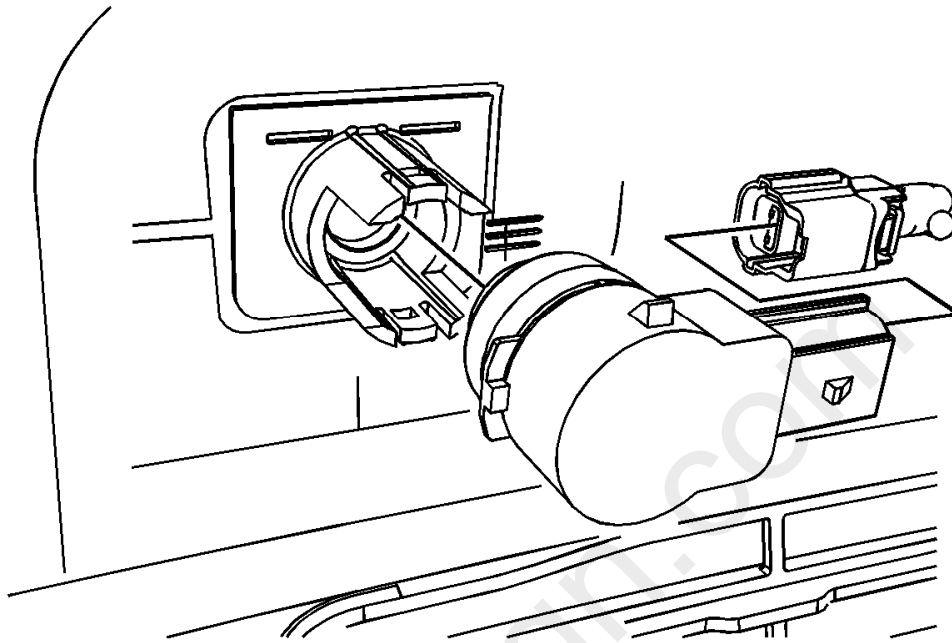


Fig. 17: Identifying Rear Object Sensor Housing
Courtesy of GENERAL MOTORS COMPANY

8. Install the sensor to the sensor housing.
9. Connect the electrical harness.
10. Install the rear fascia. Refer to **Rear Bumper Fascia Replacement (Coupe)** , **Rear Bumper Fascia Replacement (Wagon)** .

REARVIEW DRIVER INFORMATION CAMERA REPLACEMENT (WAGON)

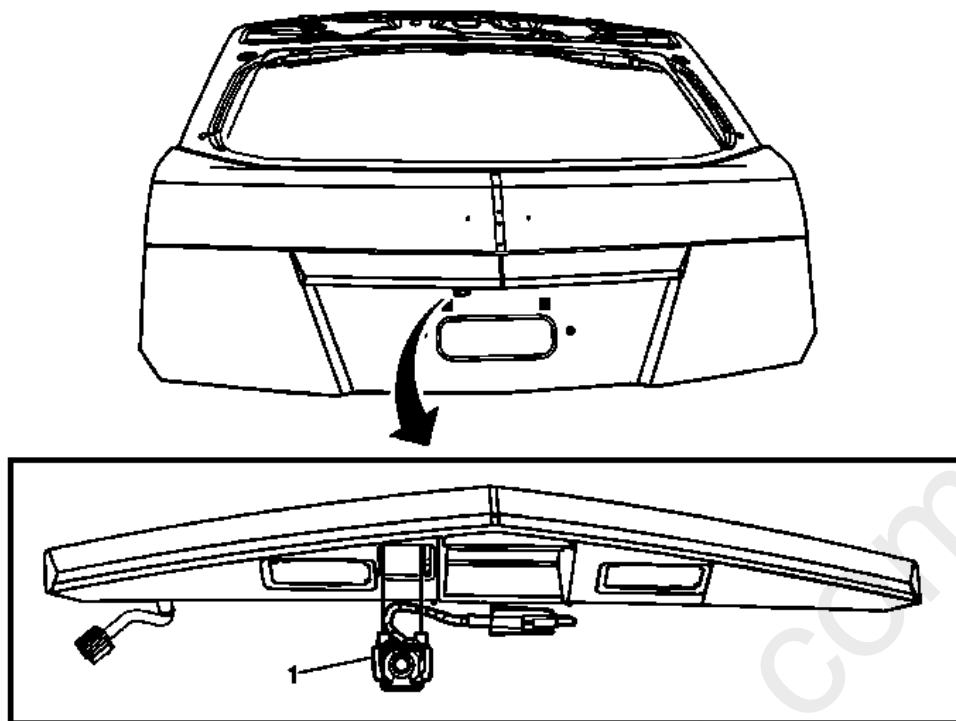


Fig. 18: Rearview Camera (Wagon)
 Courtesy of GENERAL MOTORS COMPANY

Rearview Driver Information Camera Replacement (Wagon)

Callout	Component Name
Preliminary Procedure	
Remove the liftgate center applique. Refer to <u>Liftgate Center Applique Replacement (Wagon)</u> .	
1	Rearview Camera Procedure 1. Disconnect the electrical connector. 2. Depress the clip fingers and push outward to remove the rearview camera from the applique.

REARVIEW CAMERA IMAGE DISPLAY MODULE REPLACEMENT (COUPE)

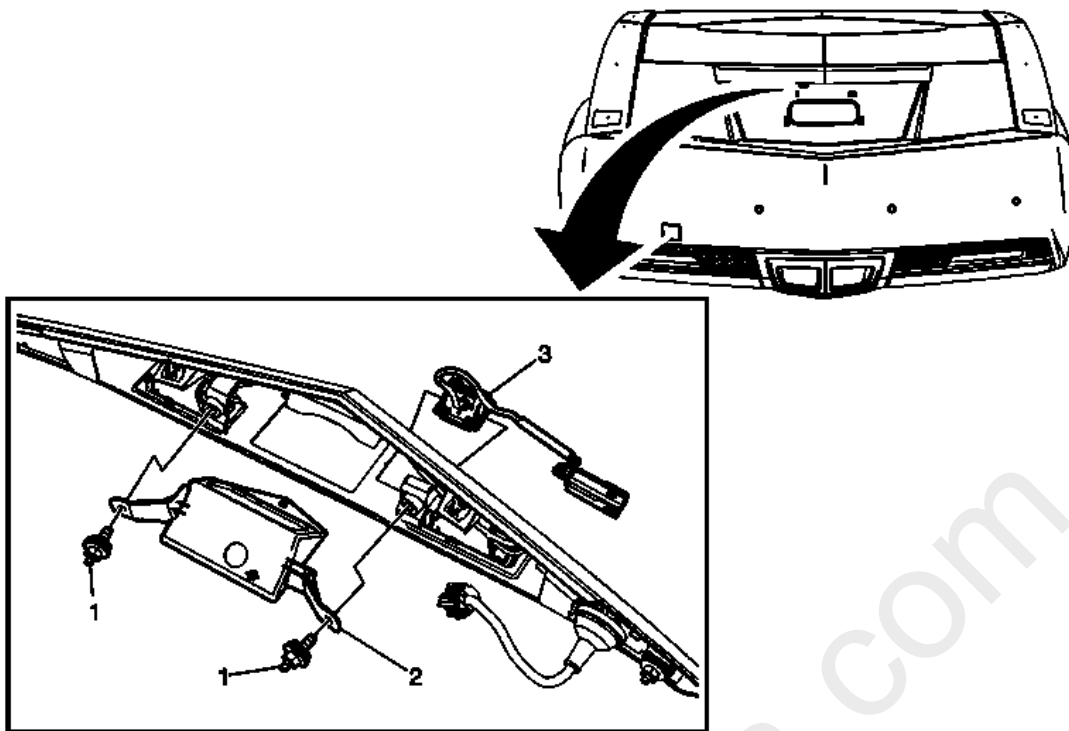


Fig. 19: Rearview Camera Image Display Module & Components (Coupe)
 Courtesy of GENERAL MOTORS COMPANY

Rearview Camera Image Display Module Replacement (Coupe)

Callout	Component Name
Preliminary Procedure Remove the rear compartment lid lower molding. Refer to <u>Rear Compartment Lid Lower Molding Replacement (Coupe)</u> .	
1	Rear Compartment Lid Applique Bracket Bolts (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 7 N.m (62 lb in)
2	Rear Compartment Lid Applique Bracket Procedure Remove the bracket to gain access to the camera.
3	Rearview Camera Procedure 1. Disconnect the electrical connector. 2. Depress the clip fingers and push outward to remove the rearview camera from the

DESCRIPTION AND OPERATION

OBJECT DETECTION DESCRIPTION AND OPERATION (PEDESTRIAN IMPACT DETECTION SYSTEM, B3T)

Pedestrian Impact Detection System Description and Operation

The pedestrian impact detection systems primary function is to provide supplemental protection to vulnerable road users involved in vehicle impacts. The pedestrian impact detection system is also known as the active pedestrian protection system. The pedestrian impact detection system is a functional system for raising the hood to provide sufficient vertical deformation space under the hood. In Europe and Japan an active pedestrian impact detection system is necessary for vehicles which do not provide the required deformation space under the hood. The pedestrian impact detection system includes the following components

- Pedestrian Impact Detection Module
- Discrimination Sensor (Front Upper Beam Sensor)
- Safing Sensor (Rear Upper Beam Sensor)
- Two Hood Hinge Actuators

The pedestrian impact detection system will sense and discriminate vulnerable road user impacts and deploy the hood hinge actuators in a timely manner to protect the pedestrian. The term "deployment" applies to the activation of the hood via the hood actuators. The pedestrian impact detection system is designed to sense and discriminate road user impacts (eg. pedestrian, cyclist) from other types of impacts in order to properly deploy the hood actuators. No actions or inputs are required from the driver or passenger to trigger this device. The pedestrian impact detection module uses the safing and discrimination sensor to get acceleration and force information needed for the deployment of the hood hinge actuators. The pedestrian impact detection module deploys the hood actuators using two deployment loops. The pedestrian impact detection system only operates at vehicles speeds between 27 km/h (16 mph) to 45 km/h (27 mph). The pedestrian impact detection module detects internal and interface faults and commands the Service Pedestrian Protection System message in the DIC to indicate a system fault.

After a deployment event, the vehicle operator is able to reset the hood to its normal driving position. After resetting the hood, the pedestrian impact detection system is not required to be fully functional. For full functionality, it is necessary to replace system component(s) at an approved service facility.

Safing Sensor

The safing sensor provides vehicle acceleration information to the pedestrian impact detection module. The safing sensor uses an independent electronic safing method acting through an independent logic circuit such that no single point failure can lead to an unwanted actuation of the hood. The pedestrian impact detection module provides a two wire current loop interface to the safing sensor. The pedestrian impact detection module also provides power and ground to the safing sensor over the same two wire discrete interface.

Discrimination Sensor

The discrimination sensor provides discrete force information to the pedestrian impact detection module. The pedestrian impact detection module uses measurable pedestrian impact data sent from the discrimination sensor to determine the severity of the impact. The pedestrian impact detection module provides a two wire current loop interface to the discrimination sensor. The pedestrian impact detection module also provides power and ground to the discrimination sensor over two separate discrete circuits.

Hood Hinge Actuators

The pedestrian hood actuators deploy only when a valid signal whose energy is capable of triggering deployment of the hood is present. The pedestrian hood actuators only deploy in those events where the activation of the hood is expected. The hood actuator is not expected to deploy in low severity event where the risk of injury is low or in a high severity event like car to car crash. During a frontal pedestrian impact of sufficient force, the pedestrian impact detection module will allow current to flow through the deployment loops in order to deploy the hood hinge actuators. The pedestrian impact detection module also performs continuous diagnostic tests on the deployment loops to check for proper circuit continuity, shorts to ground and shorts voltage. In order to prevent unwanted deployment of the actuator during service, the hood hinge actuator contains 2 shorting bars that will short both high and low circuit pins when disconnected. The pedestrian impact detection module only issues a deployment command when a valid safing signal or confirmation has been generated. No inadvertent deployments will occur in any deployment loop due to a single point fault.

OBJECT DETECTION DESCRIPTION AND OPERATION (REAR PARK ASSIST, UD7)

The parking assist system is designed to identify and notify the driver of an object in the vehicle's path when reversing at speeds less than 8 km/h (5 mph). The distance and location of the object is determined by four object alarm sensors located in the rear bumper. The parking assist system will notify the driver using an audible signal through the radio speakers. The audible signal will vary depending on the distance the object is from the vehicle.

The parking assist system is made up of the following components:

- Rear object sensor control module
- Object alarm sensors

Rear Object Sensor Control Module

The rear object sensor control module provides an 8 V reference and a low reference to the four object alarm sensors. The rear object sensor control module receives individual signals from each of the four sensors and determines the location and distance of an object based on these inputs. When an object is detected, the rear object sensor control module will send a serial data message requesting an audible alert.

Object Alarm Sensor

The object alarm sensors are located in the rear bumper of the vehicle. The sensors are used to determine the distance between an object and the rear bumper. Each sensor emits an ultrasonic frequency which is reflected off an object located behind the vehicle. These reflections are received by the sensors. The time difference between when the frequency was emitted and when the reflection is received, known as sensor echo, is used to determine the distance to the object. The sensors report this information to the rear object sensor control

module.

Rear Parking Assist Operation

When the vehicle is first placed into reverse, an audible beep will sound to indicate the system is working.

When backing up at speed less than 8 km/h (5 mph), the system is constantly monitoring for object of interest located behind the vehicle. The parking assist system can detect objects greater than 7.6 cm (3 in) wide and 25.4 cm (10 in) tall. The system cannot detect objects below the bumper or underneath the vehicle. If an object is detected within 2.5 m (8 ft) away from the rear bumper, there will be an audible beep out of the speakers. As the vehicle gets closer to an object, the time between the beeps becomes shorter. If the vehicle stops and there is an object within 2.5 m (8 ft) away from the rear bumper the beeping will stop after 5 seconds. When the distance between the object and the vehicle starts to decrease again the beeping will start again.

If the parking assist system detects a malfunction when the vehicle is placed into reverse there will be no audible beep and a DTC will be stored. The rear object sensor control module will send a serial data message to the instrument panel cluster (IPC) to display the SERVICE PARK ASSIST message on the driver information center (DIC).

Rear Parking Assist System DIC Messages

SERVICE PARK ASSIST

The driver information center (DIC) displays SERVICE PARK ASSIST when the rear object sensor control module detects a malfunction in the parking assist system and the system is disabled. The DIC also displays SERVICE PARK ASSIST when a loss of communication occurs with the rear object sensor control module.

PARK ASSIST OFF

The PARK ASSIST OFF message is displayed in the DIC when the parking assist system is disabled manually through the DTC.

PARK ASSIST BLOCKED SEE OWNERS MANUAL

The PARK ASSIST BLOCKED SEE OWNERS MANUAL message is displayed in the DIC when the parking assist system is disabled due to conditions that disable or inhibit the system.

OBJECT DETECTION DESCRIPTION AND OPERATION (REARVISION CAMERA, UVC)

Rear Vision Camera System Operation (Mirror Display)

The components used in the rear vision camera system are the camera, located at the rear of the vehicle, and the inside rearview mirror, which houses the LCD display.

When the vehicle is placed in REVERSE while engine is running, signal is sent to the inside rearview mirror and the rearview camera. This signal indicates that rear vision camera operation is required. Upon receipt of this signal, the mirror will begin the power up cycle for the LCD display and the camera will also power up. The rear vision camera transmits the video signal to the inside rearview mirror through discrete + and - signal

circuits. A metallic foil encases the video signal circuits and is tied to a shield ground circuit. This shield is designed to reduce electronic interference which may degrade the video signal and cause a distorted or otherwise degraded image.

The following conditions may cause a degraded rear vision camera image:

- Ice, snow, or mud has built up on the rear vision camera
- Dark conditions
- Extreme light conditions, such as glare from the sun or the headlights of another vehicle
- Damage to the rear of the vehicle
- Extreme high or low temperatures or extreme temperature changes

Rear Vision Camera System Operation (Radio Display)

The components used in the rear vision camera system are the camera, located at the rear of the vehicle, and the navigation radio.

When the vehicle is placed in REVERSE while engine is running, the body control module (BCM) sends a 12 V signal to the rearview camera. This signal indicates that rear vision camera operation is required. Upon receipt of this signal, the camera will begin the power up cycle. A serial data message is also received by the navigation radio indicating the vehicle is in REVERSE. Upon receipt of this message, the navigation radio will also begin a power up cycle for the display. The rear vision camera transmits the video signal to the navigation radio through discrete + and - signal circuits. A metallic foil encases the video signal circuits and is tied to a shield ground circuit. This shield is designed to reduce electronic interference which may degrade the video signal and cause a distorted or otherwise degraded image.

The following conditions may cause a degraded rear vision camera image:

- Ice, snow, or mud has built up on the rear vision camera
- Dark conditions
- Extreme light conditions, such as glare from the sun or the headlights of another vehicle
- Damage to the rear of the vehicle
- Extreme high or low temperatures or extreme temperature changes

OBJECT DETECTION DESCRIPTION AND OPERATION (SIDE BLIND ZONE ALERT, UFT)

The side blind zone alert (SBZA) system is designed to detect vehicles or other objects that may be located in the vehicles blind spots. This detection is performed by two side object sensors, located behind the rear fascia on each side of the vehicle. When an object is detected in a blind spot, an indicator in the outside rearview mirror will illuminate, notifying the driver that it is unsafe to change lanes.

The SBZA system is made up of the following components:

- Left side object sensor
- Right side object sensor

- Driver door module
- Front passenger door module
- Driver outside rearview mirror
- Passenger outside rearview mirror

Side Object Sensors

The side object sensors are each located behind the rear fascia, positioned so that the sensor is pointing out toward the opposite lane. Each sensor is supplied B+ and ground. The right sensor receives an additional ground. Both sensors communicate independently on the serial data line. The serial data enters the right sensor in a pass-thru configuration, that connects to the left sensor. The scan tool is able to individually communicate with each sensor.

When a vehicle or object is detected by a side object sensor, a serial data message is sent to the appropriate door module to illuminate the indicator located in the outside rearview mirror.

Door Modules

The driver and passenger door modules receive serial data messages from the side object sensors. When a message is received indicating that a vehicle or object is in the blind spot, the appropriate door module will apply voltage to the indicator located in the outside rearview mirror, illuminating the indicator. The door module provides a continuous low reference circuit for the indicator.

Outside Rearview Mirror

The outside rearview mirrors each contain an indicator that is controlled by the appropriate door module. This indicator is illuminated when a vehicle or object is positioned in the vehicle's blind spot.

Side Blind Zone Alert Operation

When the vehicle is started, the indicators located in the outside rearview mirror will briefly illuminate to indicate that the system is operating. The side object sensors cover a zone of approximately one lane over from both sides of the vehicle, 11 ft. or 3.5 m. This zone starts at each side mirror and goes back approximately 16 ft. (5.0 m). The height of the zone is approximately between 1.5 ft. (0.5 m) and 6 ft. (2.0 m) off the ground. When a vehicle or object is detected in this area, the appropriate indicator will be illuminated, indicating to the driver that it is unsafe to change lanes. If a turn signal is activated while the indicator is illuminated, the indicator will flash as a more urgent warning that a lane change may be unsafe.

Foul weather may affect the operation of the SBZA system. Occasional missed alerts can occur under normal circumstances and will increase in wet conditions. The number of missed alerts will increase with increased rainfall or road spray. Heavy rainfall, as well as mud, dirt, snow, ice, or slush build-up on the rear fascia, will completely disable the system.

If the vehicle is towing a trailer or has an object, such as a bicycle rack, attached to the rear of the vehicle, the SBZA system may not function properly and the indicators will remain illuminated at all time.

Side Blind Zone Alert DIC Messages

SIDE BLIND ZONE ALERT SYSTEM OFF

This message indicates that the system has been disabled through the DIC. Refer to the vehicle owners manual for instructions on how to set personalization options on the DIC.

SIDE BLIND ZONE SYSTEM UNAVAILABLE

This message indicates that the system has been disabled because the sensor is blocked or can otherwise not accurately detect vehicles or objects. Such instances may be mud, dirt, snow, ice, or slush build-up on the rear fascia, heavy rainfall, or excessive road spray.

SERVICE SIDE BLIND ZONE ALERT SYSTEM

This message indicates that the system requires service. When the message is displayed, the indicators will remain illuminated at all times, notifying the driver that the SBZA system should not be relied upon when changing lanes.

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