

## ACCESSORIES & EQUIPMENT

### Object Detection - Corvette

## SCHEMATIC WIRING DIAGRAMS

### OBJECT DETECTION WIRING SCHEMATICS

#### Rearview Camera Wiring Schematics

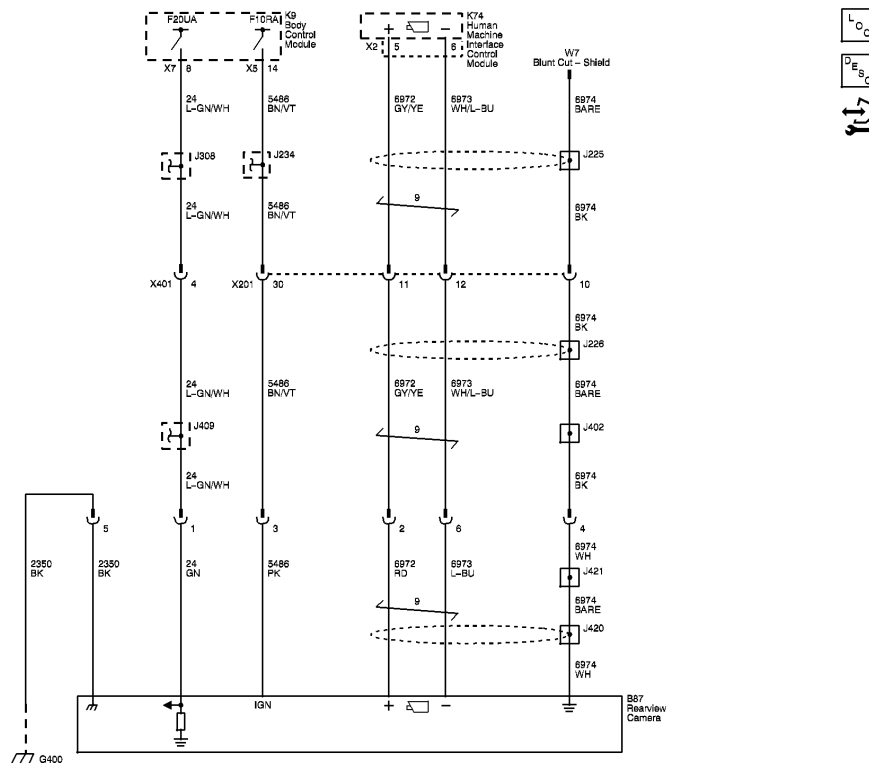


**Fig. 1: Rearview Camera Wiring Schematic**  
Courtesy of GENERAL MOTORS COMPANY

## DIAGNOSTIC INFORMATION AND PROCEDURES

### DIAGNOSTIC CODE INDEX

#### DIAGNOSTIC CODE INDEX

| DTC              | Description                                                     |
|------------------|-----------------------------------------------------------------|
| <b>DTC B127B</b> | B127B 2B Rearview Camera Input Signal Circuit Missing Reference |

## 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

### B127B 2B

Rearview Camera Input Signal Circuit Missing Reference

## Diagnostic Fault Information

| Circuit                                                                                                    | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|------------------------------------------------------------------------------------------------------------|-----------------|----------------------|------------------|--------------------|
| Ignition                                                                                                   | 1               | B127B 2B             | -                | -                  |
| Backup Signal                                                                                              | 1               | B127B 2B             | 2                | -                  |
| Camera Module signal +                                                                                     | 1               | 1                    | 1                | -                  |
| Camera Module signal -                                                                                     | 3               | B127B 2B             | 1                | -                  |
| Ground                                                                                                     | -               | B127B 2B             | -                | -                  |
| Shield                                                                                                     | 3               | B127B 2B             | 3                | -                  |
| 1. Rear Vision Camera Malfunction<br>2. Rear Vision Camera image always displayed<br>3. Poor Quality Image |                 |                      |                  |                    |

## Circuit/System Description

When the vehicle is placed in reverse with the engine running, a voltage signal is sent to the rearview camera to turn on and send a video signal to the Human Machine Interface Control Module. If the Human Machine Interface Control Module does not see a signal from the camera it will set B127B 2B and display "Service Rear Vision System".

## Conditions for Running the DTC

The vehicle must be in reverse with the engine running.

## Conditions for Setting the DTC

### B127B 2B

Signal from the rearview camera not received by the Human Interface Machine Control Module for 2.5s.

## Action Taken When the DTC Sets

- The Human Interface Machine Control Module commands the driver information center to display "Service Rear Vision System".
- The Human Interface Machine Control Module stores the 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 .**

##### Description and Operation

#### **Object Detection Description and Operation (with Rearview Camera, UVC)**

##### 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.
2. Verify that DTC B2545 is not set.
  - **If the DTC is set**  
  
Refer to **DTC B2545** .
  - **If the DTC is not set**
3. Verify the rearview camera has no debris on the lens and that the bezel and bezel seal are not damaged.

- **If debris is found on the lens**

Clean the lens. If the lens, bezel or bezel seal are damaged, replace as necessary.

- **If no debris on the lens**

4. Ignition ON, transmission in R.
5. Verify the backup lamps are illuminated.

- **If the backup lamps are not illuminated**

Refer to **Backup Lamps Malfunction (Automatic Transmission)** , **Backup Lamps Malfunction (Manual Transmission)** .

- **If the backup lamps are illuminated**

6. Engine running, transmission in R.
7. Verify a clear rear vision image is displayed on the P17 Info Display Module.

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

Refer to Circuit/System Testing.

- **If a clear image is displayed**

8. All OK.

#### Circuit/System Testing

#### NOTE:

- **Circuit/System Verification must be performed before Circuit/System Testing.**
- **Under normal operating conditions the Human Interface Machine Control Module will become very hot. The module should be allowed to cool down prior to removal for any service procedure.**

1. Ignition OFF, disconnect the harness connector at the B87 Rearview Camera.
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**
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**

1. Ignition OFF.
2. Test for less than 2 ohms in the ignition circuit end to end.
  - If 2 ohms or greater, repair the open/high resistance in the circuit.
  - If less than 2 ohms, verify the fuse is OK and there is voltage at the fuse. Refer to **Power Mode Mismatch** .
  - **If the test lamp does not illuminate and the circuit fuse is open**
1. Ignition OFF.
2. Test for infinite resistance between the ignition circuit and ground.
  - If less than infinite resistance, repair the short to ground on the circuit.
  - If infinite resistance, replace the B87 Rearview Camera.
  - **If the test lamp illuminates**
5. Engine running, park brake applied, transmission in R.
6. Test for greater than 11 V between the control circuit terminal 3 and ground.
  - **If less than 11 V**
  - 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
  - 2. Test for infinite resistance between the control circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
  - 3. Test for less than 2 ohms in the control circuit end to end.
    - If 2 ohms or greater, repair the open/high resistance in the circuit.
    - If less than 2 ohms, replace the K9 Body Control Module.
  - **If greater than 11 V**
7. Ignition OFF, disconnect the X2 harness connector at the K74 Human Interface Control Module, ignition ON.
8. Test for less than 1 V between the signal circuit terminal listed below and ground:
  - B87 Rearview Camera signal (+) circuit terminal 1
  - B87 Rearview Camera signal (-) circuit terminal 4
  - **If 1 V or greater**

Repair the short to voltage on the circuit.

  - **If less than 1 V**
9. Test for infinite resistance between the signal circuit terminal listed below and ground:
  - B87 Rearview Camera signal (+) circuit terminal 1
  - B87 Rearview Camera signal (-) circuit terminal 4
  - **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

10. Test for less than 2 ohms in the signal (+) circuit end to end.

- **If 2 ohms or greater**

Repair the open/high resistance in the circuit.

- **If less than 2 ohms**

11. Test for less than 2 ohms in the signal (-) circuit end to end.

- **If 2 ohms or greater**

Test the signal circuit for an open/high resistance.

- **If less than 2 ohms**

12. Replace the B87 Rearview Camera.

13. Engine running, transmission in R, verify a clear rear vision image is displayed on the P17 Info Display Module.

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

Replace the K74 Human Interface Control Module.

- **If a clear rear vision image is displayed**

14. All OK.

#### Repair Instructions

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

- **Rearview Driver Information Camera Replacement**
- **Control Module References** for Body Control Module and Human Interface Control Module replacement, programming and setup.

#### 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.

Note: The rear vision camera does not communicate on the serial data bus.

2. Review the system operation in order to familiarize yourself with the system functions. Refer to

## 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.
- This system uses a camera and needs to be clean in order to function properly. Make sure to check the rear vision camera lens for obstructions:

## Intermittent

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

## Symptom List

### **Rear Vision Camera System Malfunction**

#### **REAR VISION CAMERA 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.

#### **Diagnostic Fault Information**

| <b>Circuit</b>                                                                                             | <b>Short to Ground</b> | <b>Open/High Resistance</b> | <b>Short to Voltage</b> | <b>Signal Performance</b> |
|------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------|-------------------------|---------------------------|
| Ignition                                                                                                   | 1                      | B127B 2B                    | -                       | -                         |
| Backup Signal                                                                                              | 1                      | B127B 2B                    | 2                       | -                         |
| Camera Module signal +                                                                                     | 1                      | 1                           | 1                       | -                         |
| Camera Module signal -                                                                                     | 3                      | B127B 2B                    | 1                       | -                         |
| Ground                                                                                                     | -                      | B127B 2B                    | -                       | -                         |
| Shield                                                                                                     | 3                      | B127B 2B                    | 3                       | -                         |
| 1. Rear Vision Camera Malfunction<br>2. Rear Vision Camera image always displayed<br>3. Poor Quality Image |                        |                             |                         |                           |

#### **Circuit/System Description**

When the transmission is placed into REVERSE, a 12 V signal is sent to the B87 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 K74 Human Interface Control

Module 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. An open in the shield of the video signal circuit can also cause a distorted screen.

#### **Reference Information**

Schematic Reference

#### **Object Detection Schematics**

Connector End View Reference

#### **COMPONENT CONNECTOR END VIEWS - INDEX**

Description and Operation

#### **Object Detection Description and Operation (with Rearview Camera, UVC)**

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.
2. Verify that DTC B2545 is not set.
  - **If the DTC is set**  
  
Refer to **DTC B2545** .
  - **If the DTC is not set**

damaged.

- **If debris is found on the lens**

Clean the lens. If the lens, bezel or bezel seal are damaged, replace as necessary.

- **If no debris on the lens**

4. Ignition ON, transmission in R.
5. Verify the backup lamps are illuminated.
  - **If the backup lamps are not illuminated**

Refer to **Backup Lamps Malfunction (Automatic Transmission)** , **Backup Lamps Malfunction (Manual Transmission)** .

- **If the backup lamps are illuminated**

6. Engine running, transmission in R.
7. Verify a clear rear vision image is displayed on the P17 Info Display Module.
  - **If a clear image is not displayed**

Refer to Circuit/System Testing.

- **If a clear image is displayed**

8. All OK.

#### Circuit/System Testing

#### NOTE:

- **Circuit/System Verification must be performed before Circuit/System Testing.**
- **Under normal operating conditions the Human Interface Machine Control Module will become very hot. The module should be allowed to cool down prior to removal for any service procedure.**

1. Ignition OFF, disconnect the harness connector at the B87 Rearview Camera.
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**
3. Ignition ON.
4. Verify a test lamp illuminates between the ignition circuit terminal 6 and ground.

1. Ignition OFF.
2. Test for less than 2 ohms in the ignition circuit end to end.
  - If 2 ohms or greater, repair the open/high resistance in the circuit.
  - If less than 2 ohms, verify the fuse is OK and there is voltage at the fuse. Refer to **Power Mode Mismatch** .
  - **If the test lamp does not illuminate and the circuit fuse is open**
1. Ignition OFF.
2. Test for infinite resistance between the ignition circuit and ground.
  - If less than infinite resistance, repair the short to ground on the circuit.
  - If infinite resistance, replace the B87 Rearview Camera.
  - **If the test lamp illuminates**
5. Engine running, park brake applied, transmission in R.
6. Test for greater than 11 V between the control circuit terminal 3 and ground.
  - **If less than 11 V**
  - 1. Ignition OFF, disconnect the X7 harness connector at the K9 Body Control Module.
  - 2. Test for infinite resistance between the control circuit and ground.
    - If less than infinite resistance, repair the short to ground on the circuit.
    - If infinite resistance
  - 3. Test for less than 2 ohms in the control circuit end to end.
    - If 2 ohms or greater, repair the open/high resistance in the circuit.
    - If less than 2 ohms, replace the K9 Body Control Module.
  - **If greater than 11 V**
7. Ignition OFF, disconnect the X2 harness connector at the K74 Human Interface Control Module, ignition ON.
8. Test for less than 1 V between the signal circuit terminal listed below and ground:
  - B87 Rearview Camera signal (+) circuit terminal 1
  - B87 Rearview Camera signal (-) circuit terminal 4
  - **If 1 V or greater**

Repair the short to voltage on the circuit.

  - **If less than 1 V**
9. Test for infinite resistance between the signal circuit terminal listed below and ground:
  - B87 Rearview Camera signal (+) circuit terminal 1
  - B87 Rearview Camera signal (-) circuit terminal 4
  - **If less than infinite resistance**

Repair the short to ground on the circuit.

- **If infinite resistance**

10. Test for less than 2 ohms in the signal (+) circuit end to end.

- **If 2 ohms or greater**

Repair the open/high resistance in the circuit.

- **If less than 2 ohms**

11. Test for less than 2 ohms in the signal (-) circuit end to end.

- **If 2 ohms or greater**

Test the signal circuit for an open/high resistance.

- **If less than 2 ohms**

12. Replace the B87 Rearview Camera.

13. Engine running, transmission in R, verify a clear rear vision image is displayed on the P17 Info Display Module.

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

Replace the K74 Human Interface Control Module.

- **If a clear rear vision image is displayed**

14. All OK.

#### **Repair Instructions**

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

- **Rearview Driver Information Camera Replacement**
- **Control Module References** for Body Control Module and Human Interface Control Module replacement, programming and setup

## **REPAIR INSTRUCTIONS**

### **VEHICLE PERFORMANCE CAMERA REPLACEMENT**

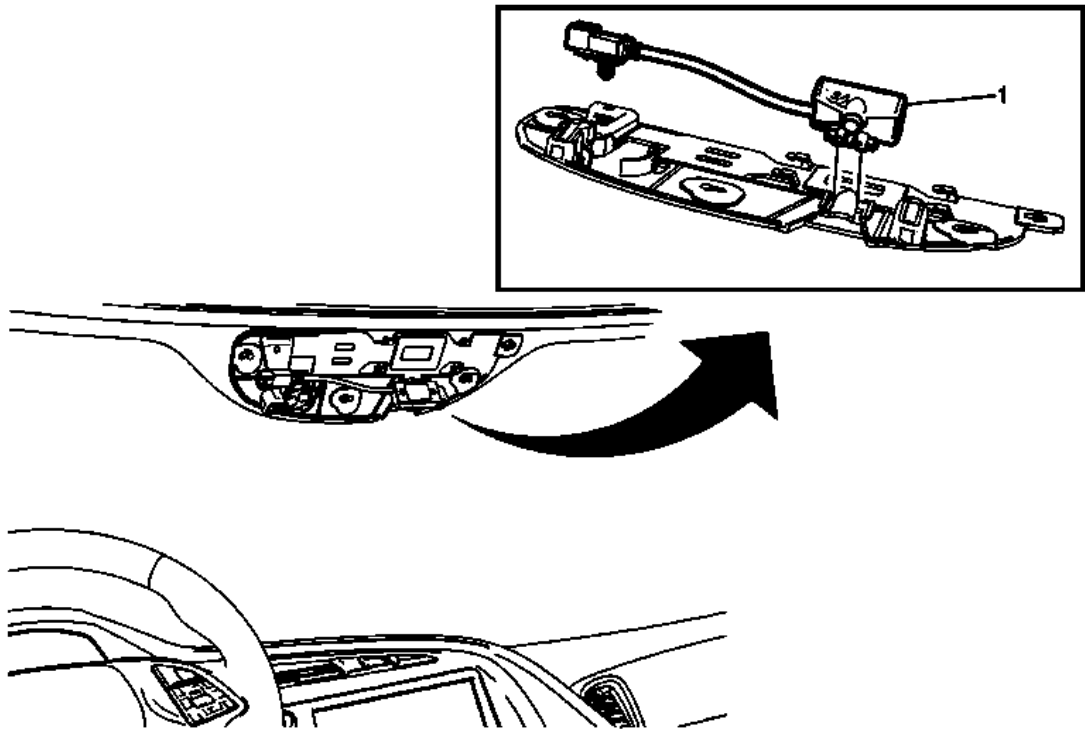


**Fig. 2: Vehicle Performance Camera**  
 Courtesy of GENERAL MOTORS COMPANY

**Vehicle Performance Camera Replacement**

| Callout                                                                                                                                     | Component Name                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preliminary Procedure</b><br>Remove the windshield upper garnish molding. Refer to <u>Windshield Upper Garnish Molding Replacement</u> . |                                                                                                                                                                                               |
| 1                                                                                                                                           | Vehicle Performance Camera<br><br><b>Procedure</b> <ol style="list-style-type: none"> <li>Slide camera upward on bracket to release.</li> <li>Disconnect the electrical connector.</li> </ol> |

**FRONT VIEW DRIVER INFORMATION CAMERA BRACKET REPLACEMENT**

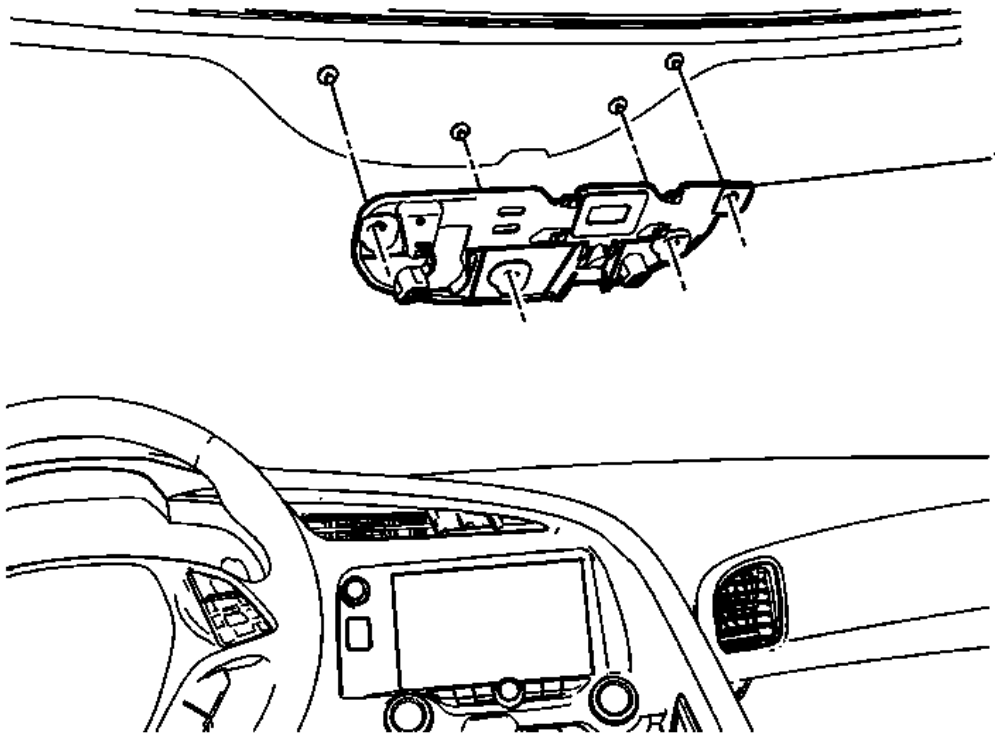


**Fig. 3: Front View Driver Information Camera Bracket**  
**Courtesy of GENERAL MOTORS COMPANY**

#### **Front View Driver Information Camera Bracket Replacement**

| <b>Callout</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Component Name</b>                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preliminary Procedures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                       |
| <ol style="list-style-type: none"> <li>1. Remove the vehicle performance camera. Refer to <b><u>Vehicle Performance Camera Replacement</u></b>.</li> <li>2. Remove the mobile telephone and vehicle location antenna. Refer to <b><u>Mobile Telephone and Vehicle Location Antenna Replacement</u></b>.</li> <li>3. Remove the inside air moisture and windshield temperature sensor. Refer to <b><u>Inside Air Moisture and Windshield Temperature Sensor Replacement</u></b>.</li> </ol> |                                                                                                                                                                       |
| <b>1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Front View Driver Information Camera Bracket</b><br><b>Procedure</b><br>Slide the bracket towards the drivers side to disengage tabs, gently pull from windshield. |

#### **REARVIEW DRIVER INFORMATION CAMERA REPLACEMENT**

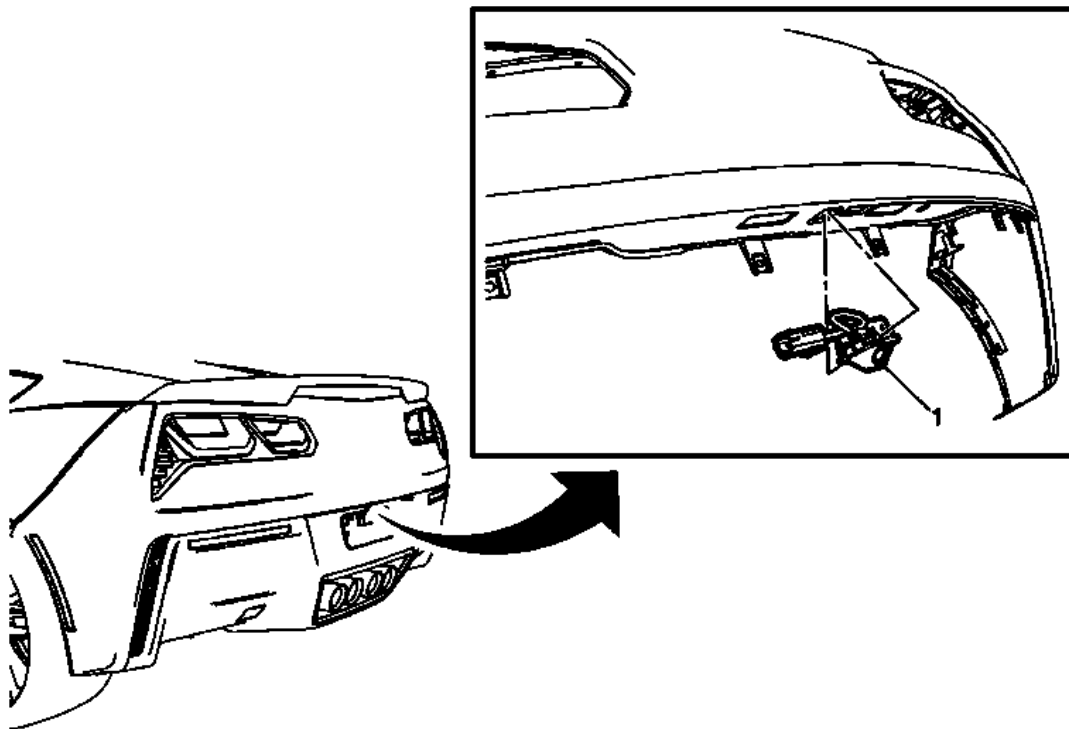


**Fig. 4: Rearview Driver Information Camera**  
 Courtesy of GENERAL MOTORS COMPANY

**Rearview Driver Information Camera Replacement**

| Callout                                                                         | Component Name                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Preliminary Procedure</b>                                                    |                                                                                                                                                                                                                 |
| Remove the rear bumper fascia. Refer to <b>Rear Bumper Fascia Replacement</b> . |                                                                                                                                                                                                                 |
| 1                                                                               | Rearview Driver Information Camera                                                                                                                                                                              |
|                                                                                 | <b>Procedure</b> <ol style="list-style-type: none"> <li>1. Disconnect the electrical connector.</li> <li>2. Depress the clip fingers and push outward to remove the rearview camera from the fascia.</li> </ol> |

**DESCRIPTION AND OPERATION**

**OBJECT DETECTION DESCRIPTION AND OPERATION (WITH REARVIEW CAMERA, UVC)**

**Rear Vision Camera System Operation**

The rear vision camera system consists of a video camera/module located at the rear of the vehicle and the infotainment display.

the body control module (BCM). This signal indicates to the camera that the vehicle is in reverse and image display is requested. The rear vision camera receives ignition voltage and a constant ground to power the camera. Video signal + and video signal - circuits carry the video image from the rear vision camera to the infotainment display. Additionally, the video signal circuits are shielded to prevent any interference which may lead to a loss of video signal resolution and a degraded video image. The shield is provided a ground path by the rear vision camera.

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 temperatures or extreme temperature changes

If a malfunction is detected in the system, Service Rear Vision Camera may be displayed on the infotainment display as an indicator to the customer that a problem exists that requires service.