

2018 ACCESSORIES & EQUIPMENT

Active Noise Cancellation - Equinox & Terrain

SPECIFICATIONS

FASTENER SPECIFICATIONS

Reusable Threaded Fastener Tightening Specifications

NOTE: <i>All fasteners listed in this table can be reused after removal.</i>	
Application	Specification
	Metric (English)
Radio Speaker Amplifier Bolt	2.5 N.m (22 lb in)
Radio Speaker Amplifier Nut	6 N.m (53 lb in)

SCHEMATIC WIRING DIAGRAMS

ACTIVE NOISE CANCELLATION WIRING SCHEMATICS

Active Noise Cancellation Module Power, Ground and Serial Data (NKC with UZ6 without IOR)

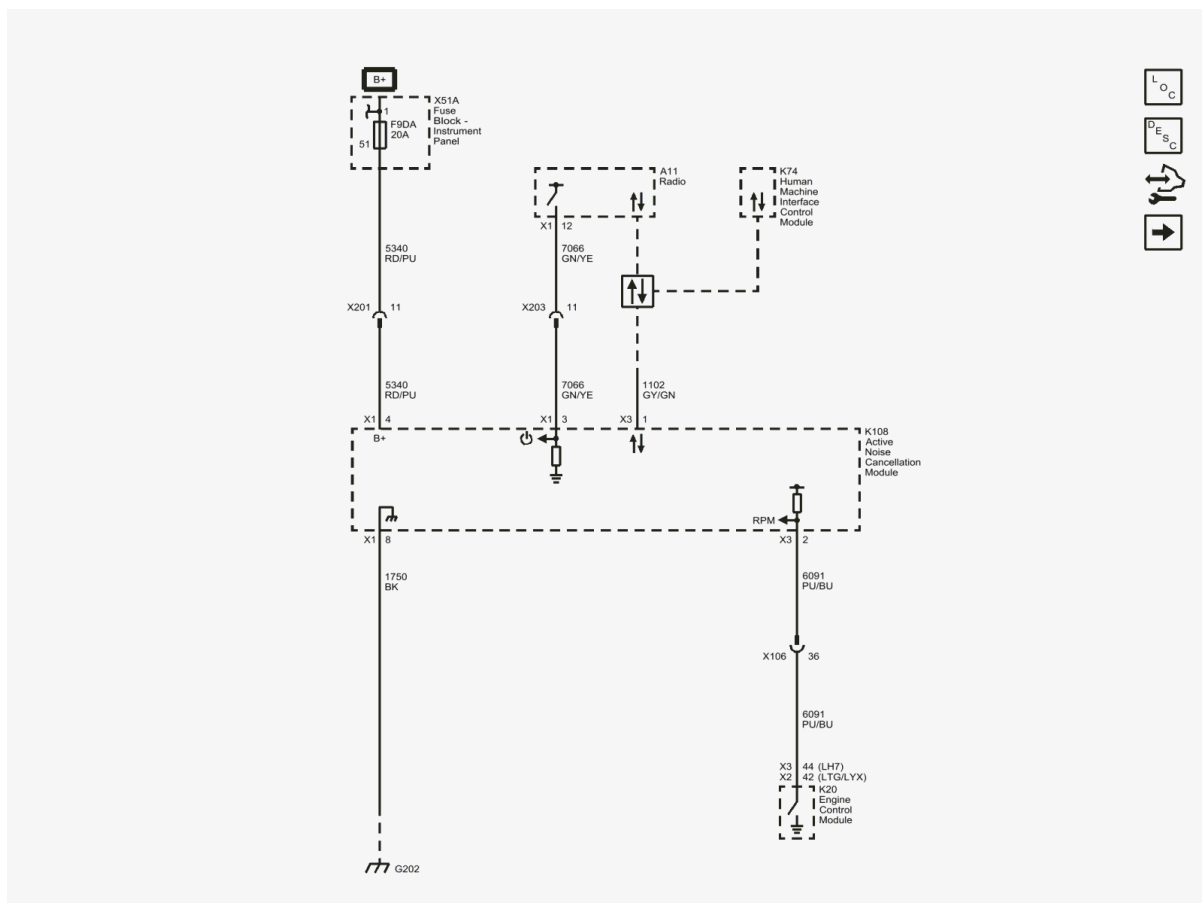


Fig. 1: Active Noise Cancellation Module Power, Ground and Serial Data (NKC with UZ6 without IOR)

Courtesy of GENERAL MOTORS COMPANY

Active Noise Cancellation Microphones (NKC with UZ6 without IOR)

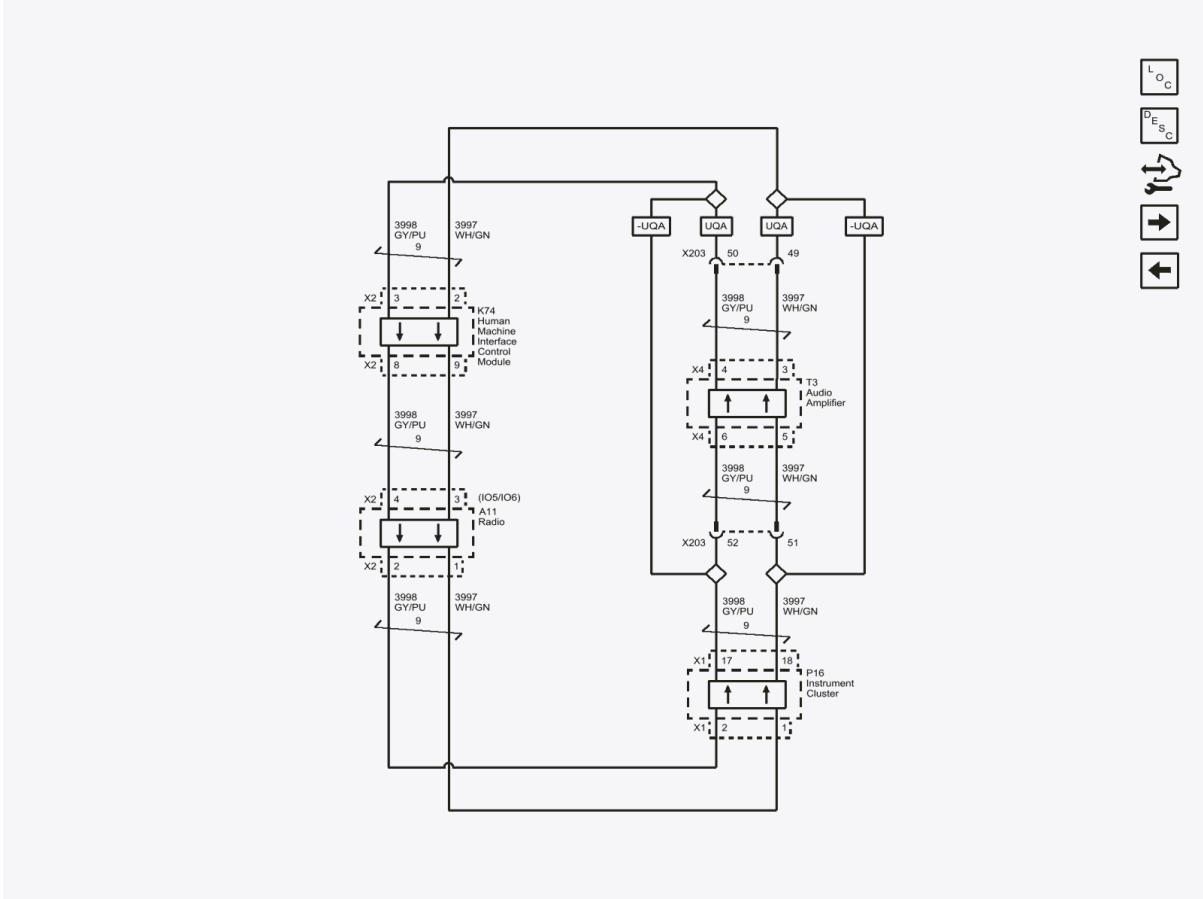


Fig. 16: MOST Communication Bus
 Courtesy of GENERAL MOTORS COMPANY

Linear Interconnect Network (LIN) (1 of 3)

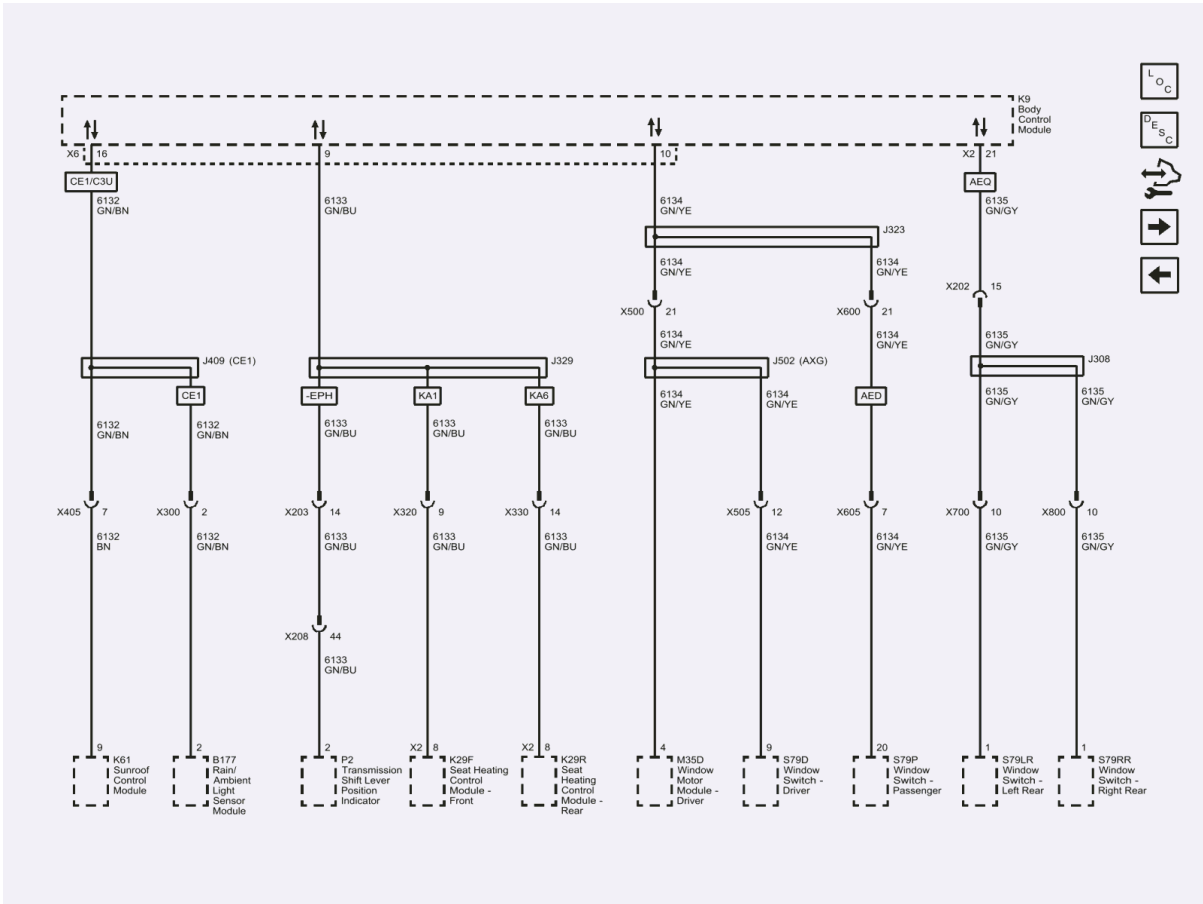


Fig. 17: Linear Interconnect Network (LIN) (1 of 3)
 Courtesy of GENERAL MOTORS COMPANY

Linear Interconnect Network (LIN) (2 of 3)

- If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K157 Video Processing Control Module.
- **Go to next step: If between 4.8 - 7.2 V**
5. Ignition ON.
 6. Test for less than 10 V between the signal circuit terminals listed below and ground:
 - Vision Signal + signal circuit terminal 1
 - Vision Signal - signal circuit terminal 4
 - **If 10 V or greater**
 1. Ignition OFF, disconnect the X1 harness connector at the K157 Video Processing Control Module, ignition ON.
 2. Test for less than 1 V between the signal circuit and ground.
 - If 1 V or greater, repair the short to voltage on the circuit.
 - If less than 1 V, replace the K157 Video Processing Control Module.
 - **Go to next step: If less than 10 V**
 7. Ignition OFF.
 8. Test for greater than 100 Ω between the signal circuit terminals listed below and ground:
 - Vision Signal + signal circuit terminal 1
 - Vision Signal - signal circuit terminal 4
 - **If less than 100 Ω**
 1. Disconnect the X1 harness connector at the K157 Video Processing Control Module.
 2. Test for infinite between the signal circuit and ground.
 - If less than infinite resistance, repair the short to ground on the circuit.
 - If infinite resistance, replace the K157 Video Processing Control Module.
 - **Go to next step: If greater than 100 Ω**
 9. Test for less than 2 Ω between the video signal circuit terminals listed below:
 - B225R Sideview Camera - Right video signal (+) circuit terminal 1 and the K157 Video Processing Control Module video signal (+) circuit terminal 8 X1
 - B225R Sideview Camera - Right video signal (+) circuit terminal 4 and the K157 Video Processing Control Module video signal (+) circuit terminal 18 X1
 - **If 2 Ω or greater**

Repair the open/high resistance in the circuit.

 - **Go to next step: If less than 2 Ω**
 10. Ignition OFF, connect the harness connector at the B225R Sideview Camera - Right.
 11. Ignition ON, clear DTCs. Operate the vehicle within the Conditions for Running the DTC.
 12. Verify DTC B395C is not set.
 - **If DTC B395C is set**

Replace the B225R Sideview Camera - Right.

 - **Go to next step: If DTC B395C is not set**
 13. All OK.

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the repair.

- [Side View Driver Information Camera Replacement](#)
- [Control Module References](#) for control module replacement, programming, and setup.

DTC B399A: FRONTVIEW CAMERA SUPPLY CIRCUIT SHORT TO BATTERY/GROUND

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.

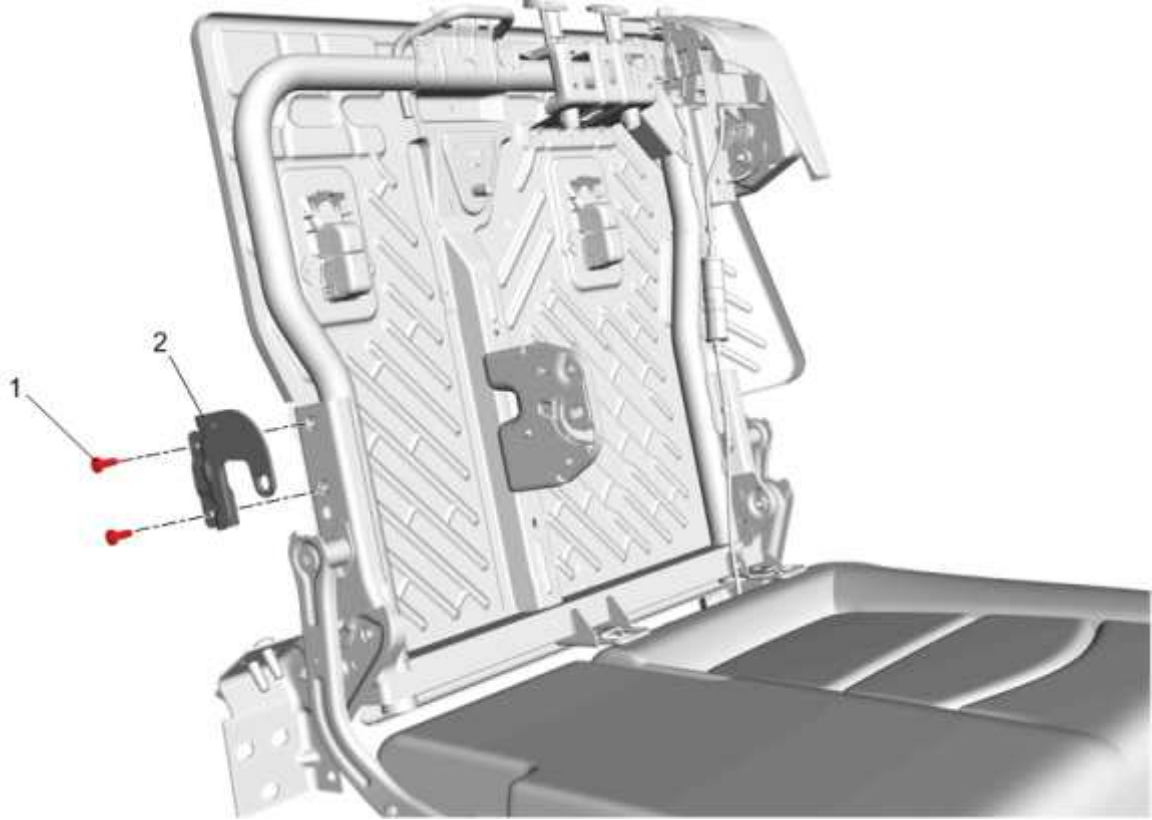


Fig. 44: Rear Seat Armrest Bracket (Outer)
 Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure	
Rear Seat Back Cushion Cover and Pad Replacement (60%)	
Rear Seat Back Cushion Cover and Pad Replacement (40%)	
1	Rear Seat Armrest Bracket Fastener (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 3 N.m (27 lb in)
2	Rear Seat Armrest Bracket

REAR SEAT ARMREST BRACKET REPLACEMENT (INNER)

DTC C0050 06

Right Rear Wheel Speed Sensor Circuit Low Voltage/Open

DTC C0050 08

Right Rear Wheel Speed Sensor Circuit Performance - Signal Invalid

DTC C0050 0E

Right Rear Wheel Speed Sensor Circuit Low Resistance

DTC C0050 0F

Right Rear Wheel Speed Sensor Circuit Signal Erratic

DTC C0050 18

Right Rear Wheel Speed Sensor Circuit Low Signal Amplitude

DTC C0050 3A

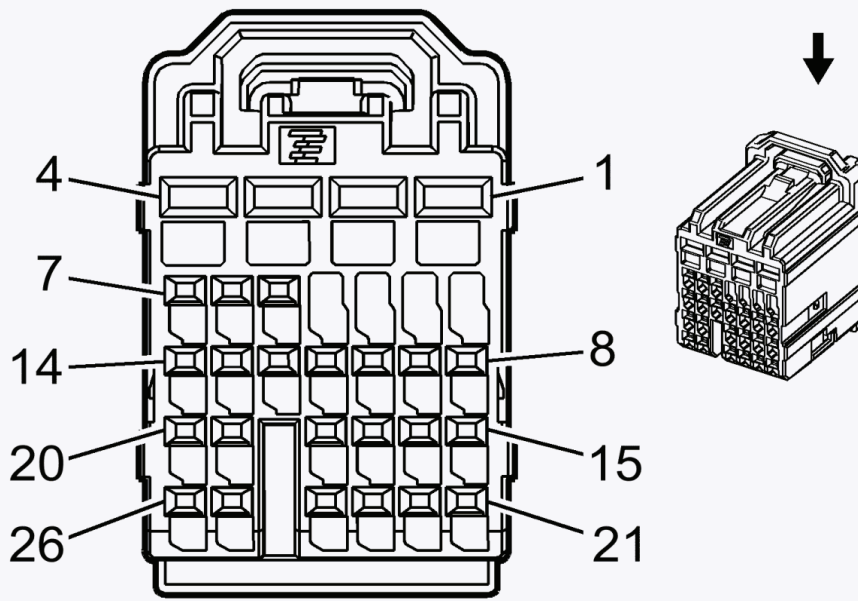
Right Rear Wheel Speed Sensor Circuit Incorrect Component Installed

DTC C0050 5A

Right Rear Wheel Speed Sensor Circuit Not Plausible

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Wheel Speed Sensor Signal	C0035 06	C0035 06	C0035 06	C0035 0E, C0035 0F, C0035 08, C0035 18, C0035 3A, C0035 5A
Left Front Wheel Speed Sensor Low Reference	-	C0035 06	C0035 06	C0035 0E, C0035 0F, C0035 08, C0035 18, C0035 3A, C0035 5A
Right Front Wheel Speed Sensor Signal	C0040 06	C0040 06	C0040 06	C0040 0E, C0040 0F, C0040 08, C0040 18, C0040 3A, C0040 5A
Right Front Wheel Speed Sensor Low Reference	-	C0040 06	C0040 06	C0040 0E, C0040 0F, C0040 08, C0040 18, C0040 3A, C0040 5A
Left Rear Wheel Speed Sensor Signal	C0045 06	C0045 06	C0045 06	C0045 0E, C0045 0F, C0045 08, C0045 18, C0045 3A, C0045 5A
Left Rear Wheel Speed Sensor Low Reference	-	C0045 06	C0045 06	C0045 0E, C0045 0F, C0045 08, C0045 18, C0045 3A, C0045 5A
Right Rear Wheel Speed Sensor Signal	C0050 06	C0050 06	C0050 06	C0050 0E, C0050 0F, C0050 08, C0050 18, C0050 3A, C0050 5A



Connector Part Information

- Harness Type: Instrument Panel
- OEM Connector: 13576031
- Service Connector: 13576031
- Description: 26-Way F 0.64, 2.8 Series (NA)

Terminal Part Information

Terminal Type ID	Terminated Lead	Diagnostic Test Probe	Terminal Removal Tool	Service Terminal	Tray Name	Core Crimp	Insulation Crimp
I	13575578	J-35616-35 (VT)	J-38125-553	8100-4445	Sumitomo 22	F	D
II	13582297	J-35616-64B (LT BU)	J-38125-22	Not Available	Not Available	Not Available	Not Available
III	13582326	J-35616-35 (VT)	J-38125-553	8100-4444	Sumitomo 22	2	A

Pin	Size	Color	Circuit	Function	Terminal Type ID	Option
1	2.5	BK	2250	Ground	I	-
2	1	RD/BU	4540	Battery Positive Voltage	III	-
3	1	RD/GN	4440	Battery Positive Voltage	III	-
4	2.5 0.75	RD/GN RD/YE	2173	12V Regulated Supply	I	KL9 -KL9
			4340	Battery Positive Voltage	III	
5	0.35	WH	6816	Indicator Dimming Control	II	-
6	-	-	-	Not Occupied	-	-
7	0.35	BK/YE	5005	Instrument Panel Lamp Dimmer Switch Low Reference	II	-
8	0.35	BN/BK	5720	Ignition Mode Switch Accessory LED Signal	II	-
9	-	-	-	Not Occupied	-	-

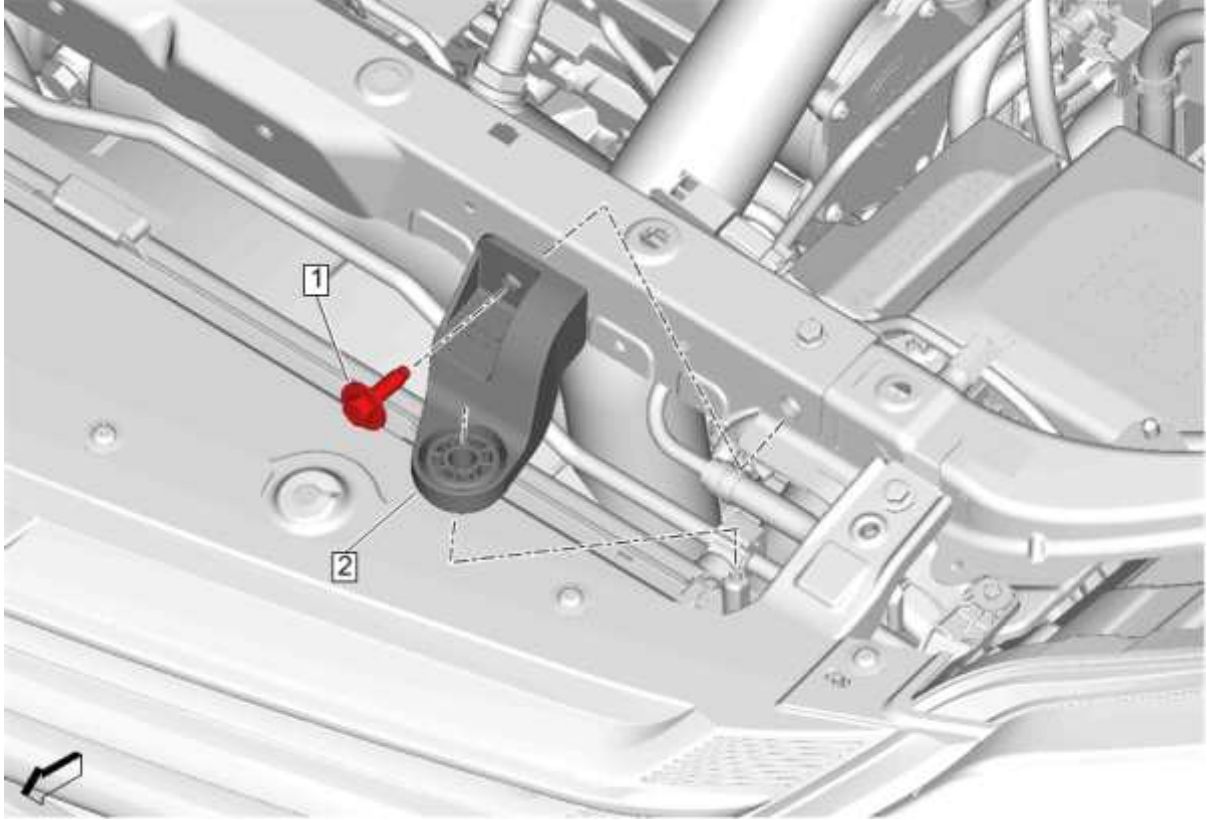


Fig. 137: Radiator Upper Bracket-Left Side
 Courtesy of GENERAL MOTORS COMPANY

1. Remove Radiator Upper Bracket-Left Side (2) - [Radiator Upper Bracket Replacement - Left Side](#)

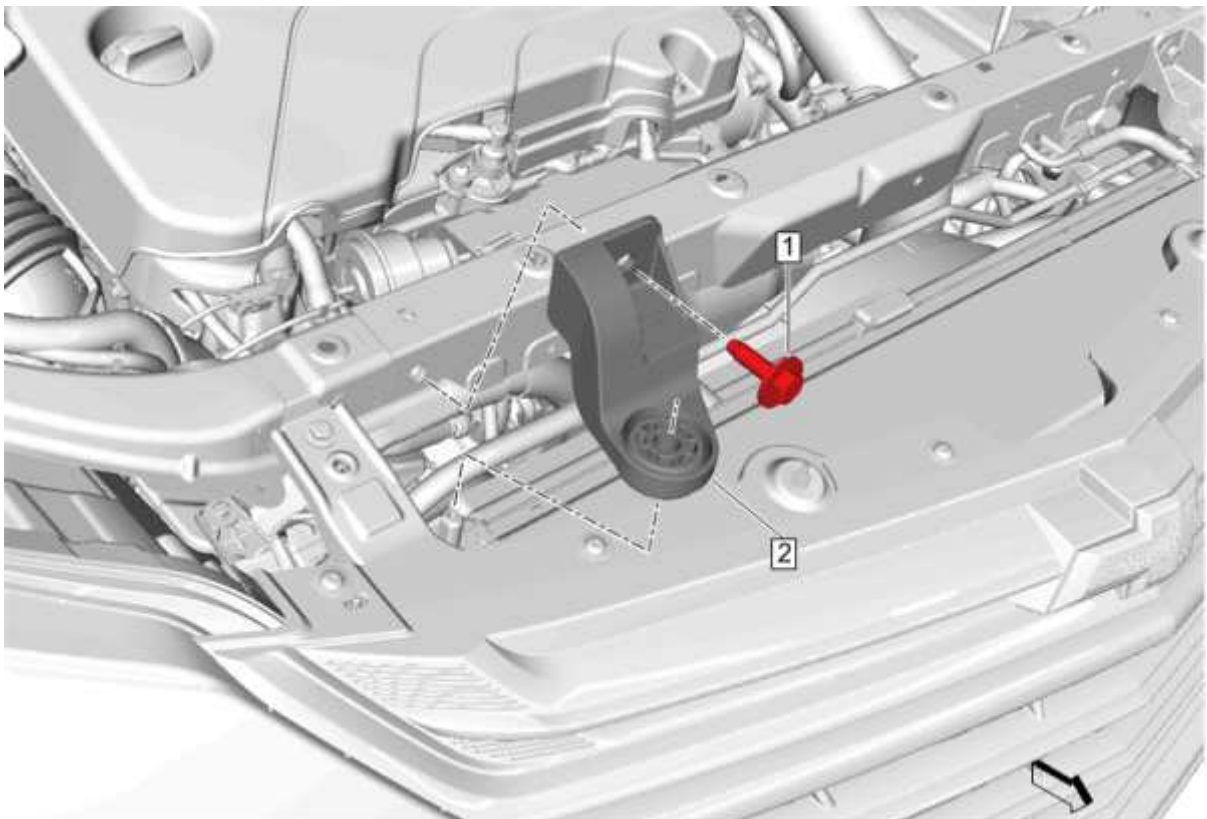


Fig. 138: Radiator Upper Bracket-Right Side
 Courtesy of GENERAL MOTORS COMPANY

2. Remove Radiator Upper Bracket-Right Side (2) - [Radiator Upper Bracket Replacement - Right Side](#)
3. Remove Front End Upper Tie Bar - [Front End Upper Tie Bar Replacement \(Equinox\)](#) [Front End Upper Tie Bar Replacement \(Terrain\)](#)
4. Remove Front Bumper Fascia - [Front Bumper Fascia Replacement \(Equinox\)](#) [Front Bumper Fascia Replacement \(Terrain\)](#)

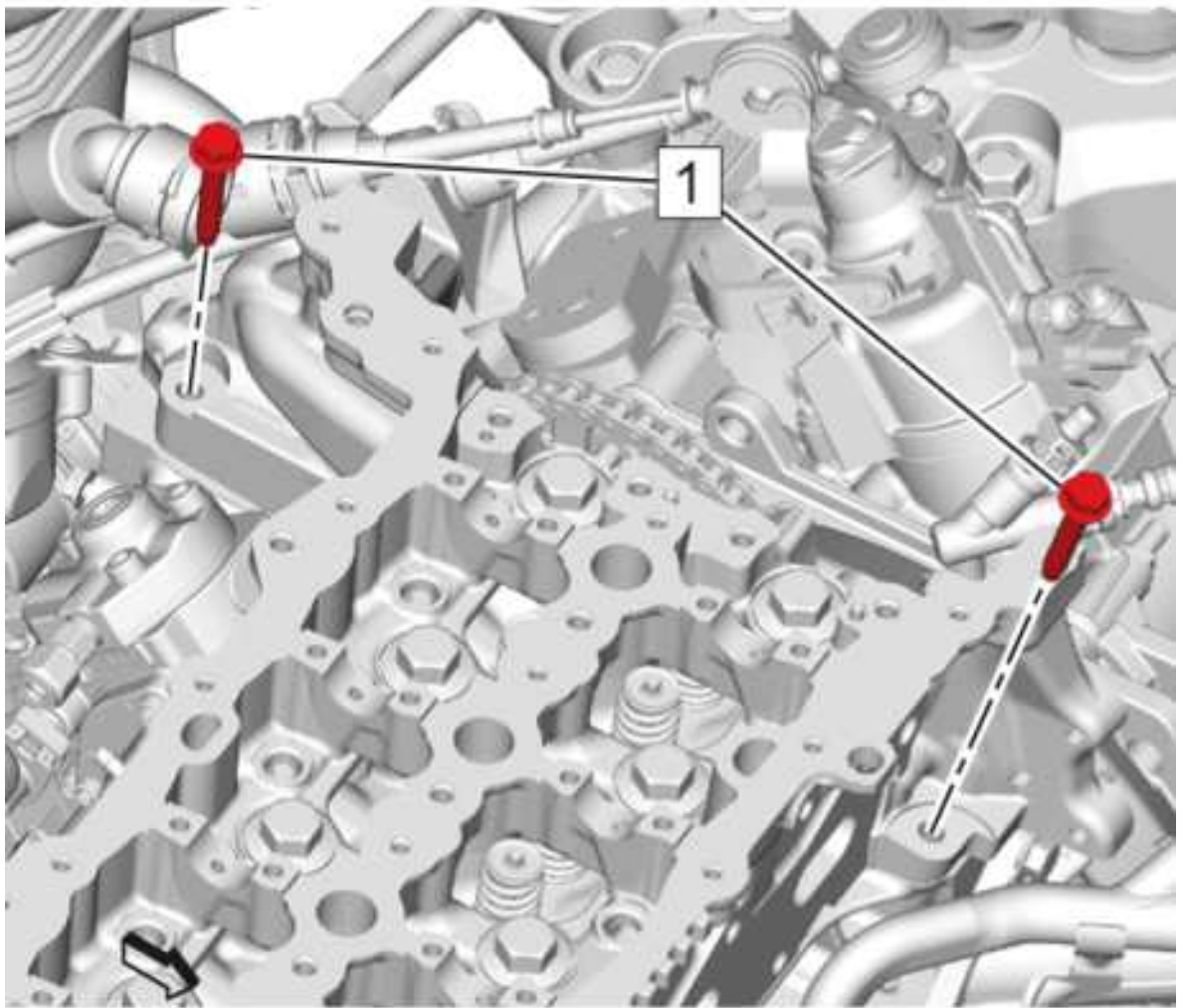


Fig. 335: Outer Cylinder Head Bolts
Courtesy of GENERAL MOTORS COMPANY

25. Remove and DISCARD the 2 outer cylinder head bolts (1).

An automobile engine is a combination of many machined, honed, polished, and lapped surfaces with tolerances that are measured in ten thousandths of an inch. When any internal engine parts are serviced, care and cleanliness are important. A liberal coating of engine oil should be applied to friction areas during assembly to protect and lubricate the surfaces during initial operation. Throughout this section, it should be understood that proper cleaning and protection of machined surfaces and friction areas are part of the repair procedure. This is considered standard shop practice even if not specifically stated.

CAUTION: Engine damage may result if an abrasive paper, pad, or motorized wire brush is used to clean any engine gasket surfaces.

When valve train components are removed for service, they should be retained in order. At the time of installation, they should be installed in the same locations and with the same mating surfaces as when removed.

WARNING: Unless directed otherwise, the ignition must be OFF with the key removed, and all electrical loads must be OFF before servicing any electrical component. Disconnect the negative battery cable to prevent an electrical spark should a tool or equipment come in contact with an exposed electrical terminal. Failure to follow these precautions may result in personal injury and/or damage to the vehicle or its components.

For Vehicles equipped with OnStar® (UE1) with Back Up Battery:

The Back Up Battery is a redundant power supply to allow limited OnStar® functionality in the event of a main vehicle battery power disruption to the VCIM (OnStar® module). Do not disconnect the main vehicle battery or remove the OnStar® fuse with the ignition key in any position other than OFF. Retained accessory power should be allowed to time out or be disabled (simply opening the driver door should disable retained accessory power) before disconnecting power. Disconnecting power to the OnStar® module in any way while the ignition is On or with retained accessory power activated may cause activation of the OnStar® Back-Up Battery system and will discharge and permanently damage the back-up battery. Once the Back-Up Battery is activated it will stay on until it has completely discharged. The back-up battery is not rechargeable and once activated the back-up battery must be replaced.

Disconnect the negative battery cables before you perform any major work on the engine. For more information on the disconnection of the battery, refer to [Battery Negative Cable Disconnection and Connection \(KL9\)](#).

SEPARATING PARTS

NOTE:

- Disassembly of the piston, press fit design piston pin, and connecting rod may create scoring or damage to the piston pin and piston pin bore. If the piston, pin, and connecting rod have been disassembled, replace the components as an assembly.
- Many internal engine components will develop specific wear patterns on their friction surfaces.
- When disassembling the engine, internal components **MUST** be separated, marked, or organized in a way to ensure installation to their original location and position.

Separate, mark, or organize the following components:

- Piston and the piston pin
- Piston to the specific cylinder bore
- Piston rings to the piston
- Connecting rod to the crankshaft journal
- Connecting rod to the bearing cap - A paint stick or etching/engraving type tool are recommended. Stamping the connecting rod or cap near the bearing bore may affect component geometry.
- Crankshaft main and connecting rod bearings

4. Verify the parameters listed below do not display Malfunction when commanding the Malfunction Indicator Lamp On and Off with a scan tool.
 - The MIL Control Circuit Low Voltage Test Status
 - The MIL Control Circuit Open Test Status
 - The MIL Control Circuit High Voltage Test Status
 - **If Malfunction is displayed**

Refer to Circuit/System Testing.
 - **Go to next step: If Malfunction is not displayed**
5. Verify the malfunction indicator lamp turns ON and OFF when commanding the Malfunction Indicator Lamp On and Off with a scan tool.
 - **If the malfunction indicator lamp does not turn ON and OFF**

Refer to Circuit/System Testing.
 - **Go to next step: If the malfunction indicator lamp turns ON and OFF**
6. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records data.
 - **If the DTC sets**

Refer to [Diagnostic Trouble Code \(DTC\) List - Vehicle](#) for further diagnosis.
 - **Go to next step: If the DTC does not set**
7. All OK.

Circuit/System Testing

1. Ignition OFF.
2. Disconnect the X1 harness connector at the K20 Engine Control Module.
3. Ignition ON, verify the malfunction indicator lamp does not illuminate.
 - **If the malfunction indicator lamp illuminates**
 1. Test for infinite resistance between the control circuit terminal X1 71 and ground.
 - If less than infinite resistance, repair the short to ground in the circuit.
 - If infinite resistance, replace the P16 Instrument Cluster.
 - **Go to next step: If the malfunction indicator lamp does not illuminate**
4. Connect a 3 A fused jumper wire between the control circuit terminal X1 71 and ground.
5. Verify the malfunction indicator lamp illuminates.
 - **If the malfunction indicator lamp illuminates**

Replace the K20 Engine Control Module.
 - **If the malfunction indicator lamp does not illuminate**
 1. Test for less than 1 V between the control circuit terminal X1 71 and ground.
 - If 1 V or greater, repair the short to voltage in the circuit.
 - If less than 1 V
 2. Ignition OFF.
 3. Test for less than 2 Ω in the control circuit end to end.
 - If 2 Ω or greater, repair the open/high resistance in the circuit.
 - If less than 2 Ω .
6. Ignition OFF, disconnect the harness connector at the instrument cluster.
7. Ignition ON, verify a test lamp illuminates between the ignition voltage circuit terminal 8 and ground.
 - **If the test lamp does not illuminate and the circuit fuse is open**
 1. Ignition OFF.

Action Taken When the DTC Sets

DTC P203C is a Type A DTC.

DTC P203D is a Type B DTC.

Conditions for Clearing the DTC

DTC P203C is a Type A DTC.

DTC P203D is a Type B DTC.

Reference Information

Schematic Reference

Engine Controls Wiring Schematics 1.6L (LH7)

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX

Electrical Information Reference

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

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Ignition On.
2. Verify that DTC P203C or P203D is not set.
 - **If a DTC Is set**
Refer to Circuit/System Testing.
 - **Go to next step: If no DTC is set**
3. Operate the vehicle within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records data.
4. Verify DTC P203C or P203D does not set.
 - **If a DTC sets**
Refer to Circuit/System Testing
 - **Go to next step: If no DTC sets**
5. All OK.

Circuit/System Testing

1. Ignition Off, and all vehicle systems Off, it may take up to 2 minutes for all vehicle systems to power down, disconnect the harness connector at the A38 Reductant Pump and Sensor Assembly.
2. Test for less than 5 Ω between the low reference circuit terminal 6 and ground.
 - **If 5 Ω or greater**

Perform the [Diagnostic Repair Verification](#) after completing the repair.

DTC C1201, P1000, P1001, P1003, P1008, P1009, P100A, P100E, P103D, P103E, P10B6, P10B7, P10B8, P10B9, P10BF, P10C6, P10C7, P10C8, P10F5, P1100, P1103, P117A, P11FF, P1200, P128C, P128D, P128E, P128F, P129E, P12A8, P130F, P135C, P135D, P135E, P135F, P1436, P143A, P143B, P1472, P14A0, P14B6, P14BD, P14CD, P14CE, P14D4, P14D5, P14D6, P150C, P151A, P151D, P153C, P153D, P155D, P1591, P15E2, P15F2, P15F9, P15FA, P15FB, P165C, P167F, P16E8, P16FF, P175F, P1761, P1762, P1775, P179B, P189C, P2544, P308D, P30B4, P30B5, P30BC, P30BD, P30D5, P30DE, P3168, P3169 OR P316B: MESSAGE COUNTER INCORRECT

Diagnostic Instructions

- Perform the Diagnostic System Check prior to using this diagnostic procedure: [Diagnostic System Check - Vehicle](#)
- Review the description of Strategy Based Diagnosis: [Strategy Based Diagnosis](#)
- An overview of each diagnostic category can be found here: [Diagnostic Procedure Instructions](#)

DTC Descriptor

DTC C1201

Transmission Range Redundant Command Message Counter Incorrect

DTC P1000

Fuel Pump Driver Control Module Reset Count Message Counter Incorrect

DTC P1001

Evaporative Emission (EVAP) System Signals Message Counter Incorrect

DTC P1003

Fuel Composition Signals Message Counter Incorrect

DTC P1008

Engine Coolant Bypass Valve Command Signal Message Counter Incorrect

DTC P1009

Fuel Pump Driver Control Module Temperature High Signal Message Counter Incorrect

DTC P100A

Turbocharger Boost Control Signal Message Counter Incorrect

DTC P100E

Accelerator Pedal Position Signal Message Counter Incorrect

DTC P103D

Engine Coolant Pump Control Signal Message Counter Incorrect

DTC P103E

Auxiliary Coolant Pump Control Signal Message Counter Incorrect

DTC P10B6

Mass Air Flow Sensor Intake Air Signals Message Counter Incorrect Bank 1

DTC P10B7

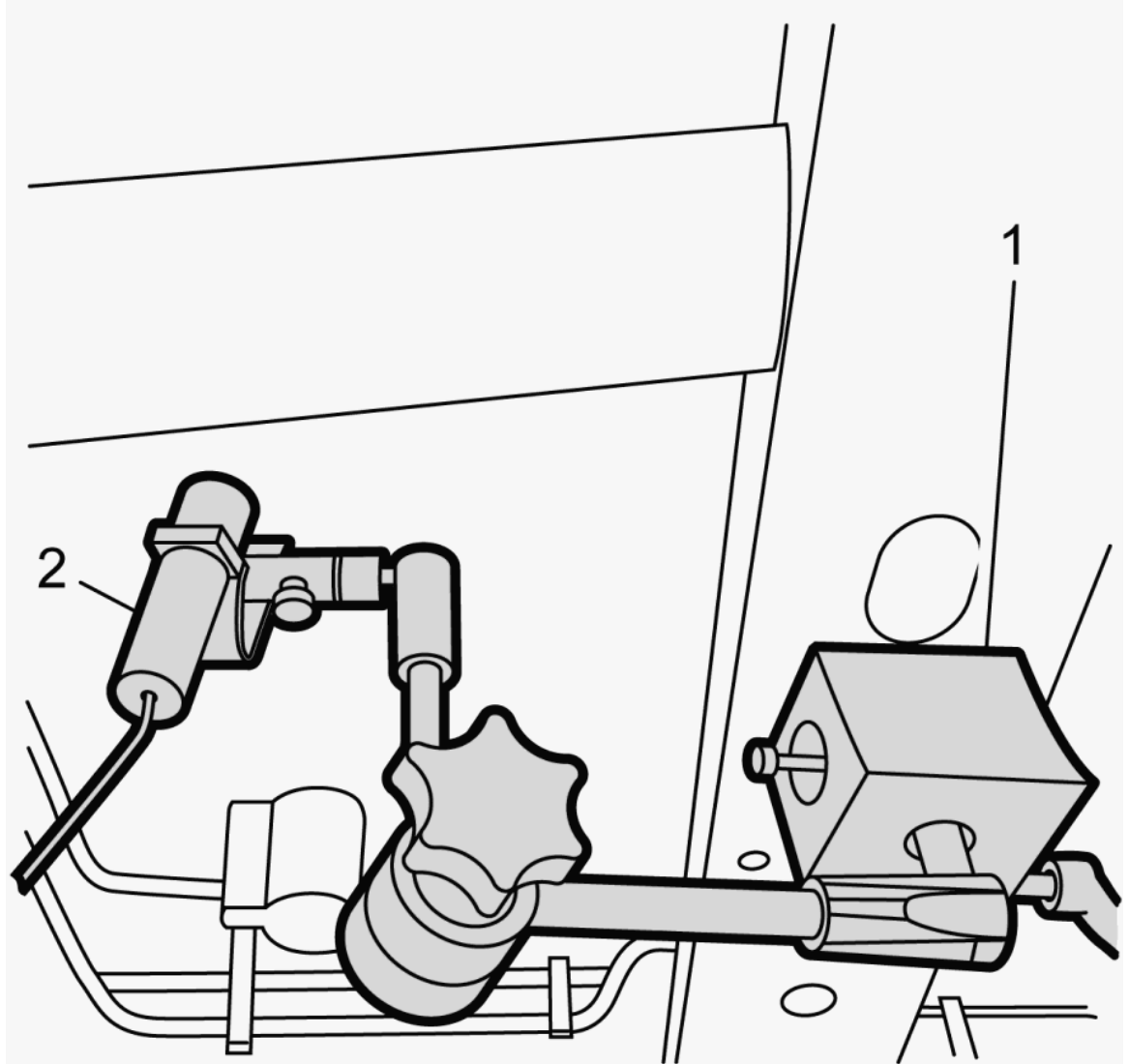


Fig. 45: Magnetic Mounting Fixture
 Courtesy of GENERAL MOTORS COMPANY

8. Mount the Magnetic Mounting Fixture **CH-51450-TA187** (1) to a suitable surface on the vehicle underbody.
9. Place a 1/2 inch strip of reflective tape to the propeller shaft.
10. Focus the laser (2) on the reflective tape.
11. Install 2 hose clamps side by side to the propeller shaft near the differential, on an area clear of any factory balance weights.
12. Mark the excess band on the hose clamps.
13. Remove the hose clamps and trim the excess from the hose clamp bands.
14. Enter the weight of the hose clamp, in grams, into the balancing software.
15. To determine the weight of the hose clamp, use the following:
 - Cut the screw body off of the clamp, even with end of the screw.
 - Weigh the screw body on a gram scale (14 g is typical).
16. Measure the circumference of the propeller shaft near the hose clamps using the supplied ruler and enter that figure, in millimeters, into the balancing software.
17. Alternatively, enter the diameter, in millimeters, of the propeller shaft into the balancing software.
18. Before beginning the test, inspect for the following:
 - The vehicle is properly supported. Refer to [Lifting and Jacking the Vehicle](#) .
 - Remove any rocks or debris embedded in the tire treads.
 - Secure all test leads clear of rotating components.
 - Disable the ABS and traction control, if equipped.
 - Turn OFF the A/C, and any other accessories.
19. Determine a suitable propeller shaft speed.
 - Start the engine.
 - Place the transmission in the highest forward gear.

17. Install Front Floor Console Transmission Shift Opening Bezel (1) - **Front Floor Console Transmission Shift Opening Bezel Replacement (Terrain)**

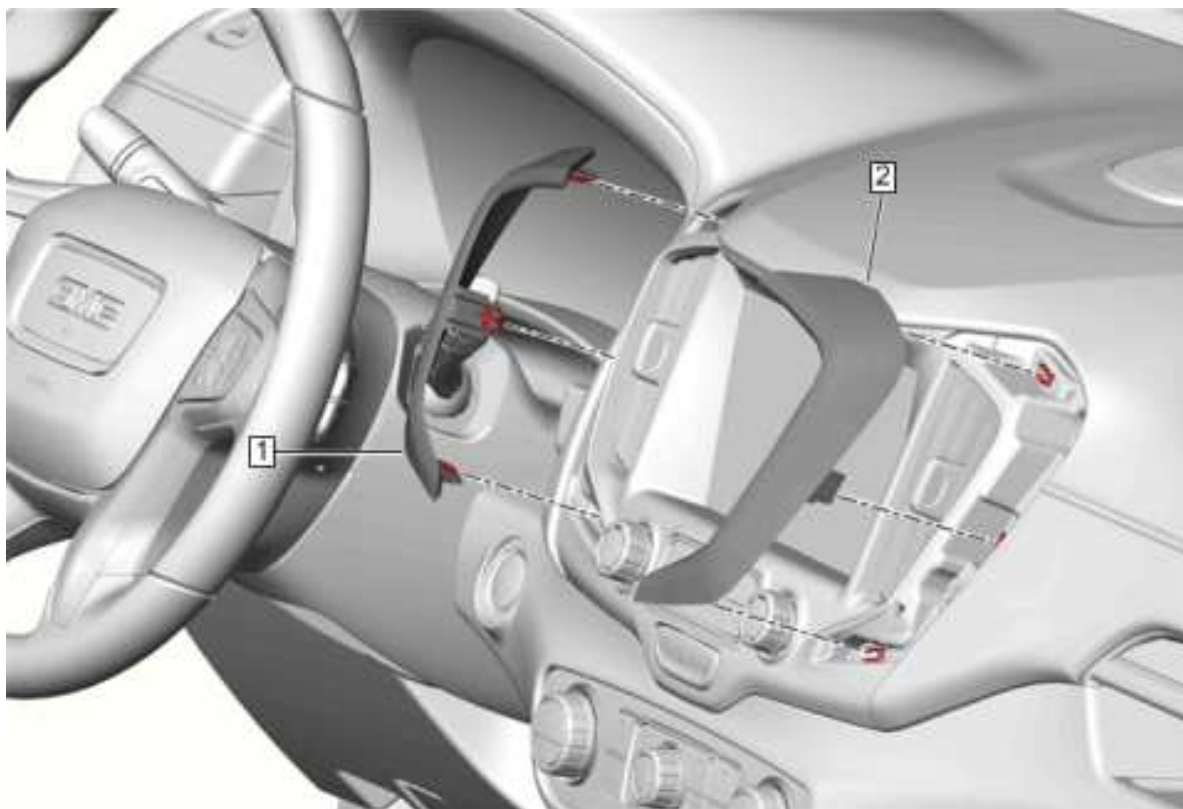


Fig. 1247: Instrument Panel Center Trim Plate Appliques
Courtesy of GENERAL MOTORS COMPANY

18. Install Instrument Panel Center Trim Plate Applique - Left Side (1) - **Instrument Panel Center Trim Plate Applique Replacement (Terrain)**
19. Install Instrument Panel Center Trim Plate Applique - Right Side (2) - **Instrument Panel Center Trim Plate Applique Replacement (Terrain)**



Fig. 1248: Left Side Instrument Panel Trim Pad
Courtesy of GENERAL MOTORS COMPANY

20. Install Instrument Panel Trim Pad - Left Side (1) - **Instrument Panel Trim Pad Replacement - Left Side (Terrain)**

- [Steering Wheel Kickback](#)
- [Steering Effort Hard or Too Easy in One or Both Directions](#)

RATTLE, CLUNK, POP OR SHUDDER NOISE FROM THE POWER STEERING SYSTEM

Step	Action	Yes	No
1	Did you review the Power Steering System Description and Operation and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Steering Wheel and Column
2	Verify a rattle noise is present by driving the vehicle on a rough road. Verify a clunk noise is present by turning the steering wheel to the left and to the right several times with the key in the ON position. Is a rattle or a clunk noise present?	Go to Step 3	System OK
3	Inspect the steering gear for the proper installation. Is the steering gear installation incorrect?	Go to Step 6	Go to Step 4
4	Inspect the intermediate steering shaft. Is the intermediate steering shaft worn?	Go to Step 8	Go to Step 5
5	Inspect the front suspension. Refer to Noise Diagnosis - Front Suspension . Is the front suspension worn?	Go to Step 7	Go to Step 3
6	Install the steering gear correctly. Refer to Electric Dual Pinion Rack and Pinion Steering Gear Replacement . Did you complete the repair?	Go to Step 9	-
7	Replace the worn front suspension component that is causing the noise. Did you complete the repair?	Go to Step 9	-
8	Replace the intermediate steering shaft. Refer to Intermediate Steering Shaft Replacement (Equinox) and Intermediate Steering Shaft Replacement (Terrain) . Did you complete the repair?	Go to Step 9	-
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 3

WHINE OR GROWL NOISE FROM THE POWER STEERING SYSTEM

Special Tools

CH-39570 Chassis Ear

For equivalent regional tools, refer to [Special Tools](#).

Step	Action	Yes	No
1	Did you review the Power Steering System Description and Operation and perform the necessary inspections?	Go to Step 2	Go to Symptoms - Power Steering System
2	Verify that a whine or growl noise is present. Is a whine or growl noise present?	Go to Step 3	System OK
3	Inspect the steering gear for looseness and/or worn bushings. Is the steering gear loose and/or bushings worn?	Go to Step 6	Go to Step 4
4	Inspect the power steering assist motor for a whine or growl noise using the CH-39570 chassis ear. Is the noise present at the power steering assist motor?	Go to Step 7	Go to Step 5
5	Inspect the steering gear for a whine or growl noise using the CH-39570 chassis ear. Is the noise present at the steering gear?	Go to Step 8	Go to Step 3