

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

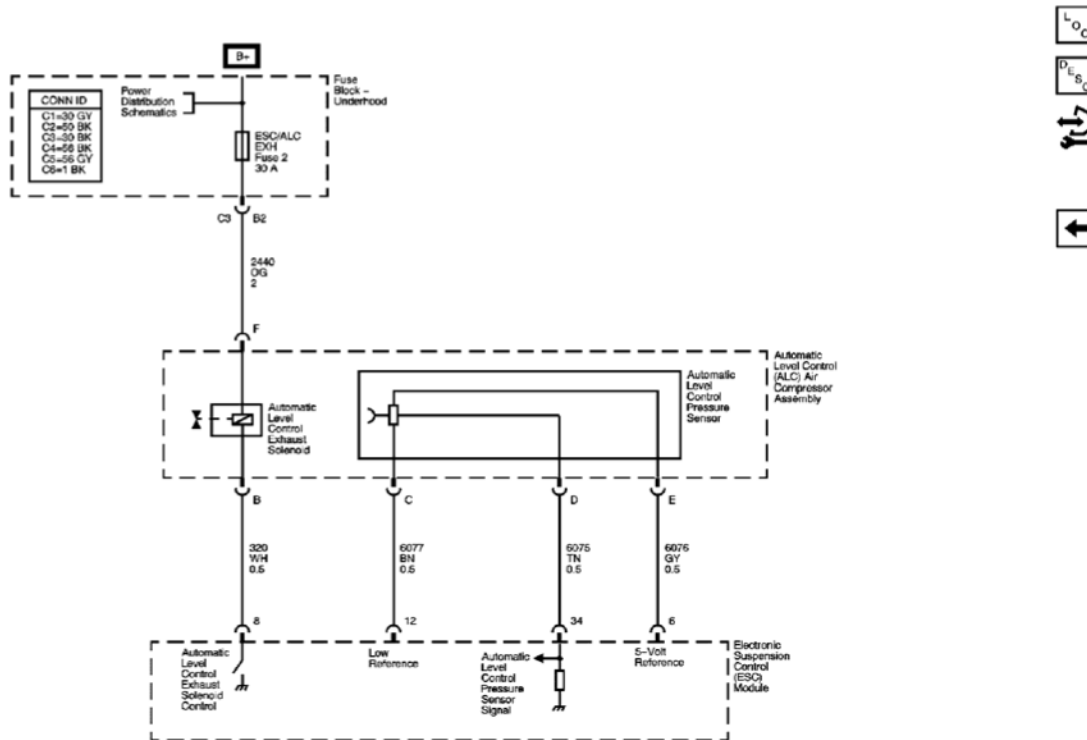


Fig. 2: Pressure Controls Schematic
Courtesy of GENERAL MOTORS CORP.

COMPONENT LOCATOR

AUTOMATIC LEVEL CONTROL COMPONENT VIEWS

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2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

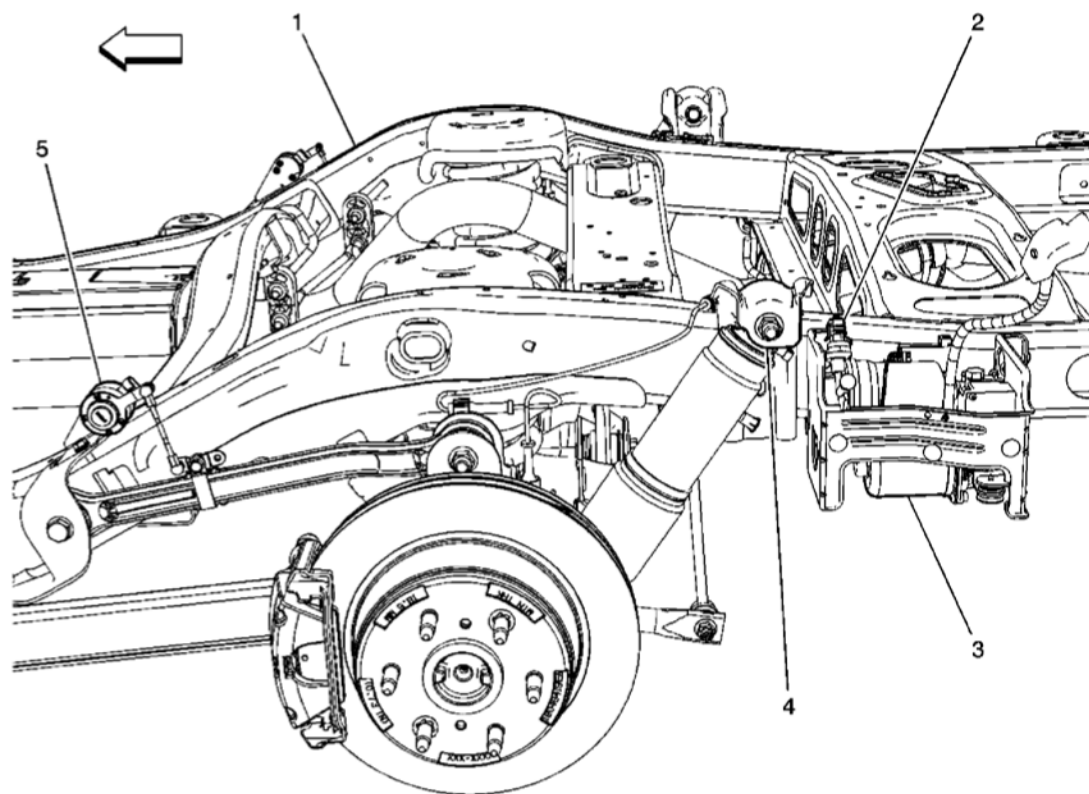


Fig. 3: LR Suspension Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 3

Callout	Component Name
1	Chassis
2	Automatic Level Control Pressure Sensor (Z55)
3	Automatic Level Control (ALC) Compressor Assembly (Z55)
4	Suspension Damper Solenoid - LR (Z55)
5	Suspension Position Sensor - LR (Z55)

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

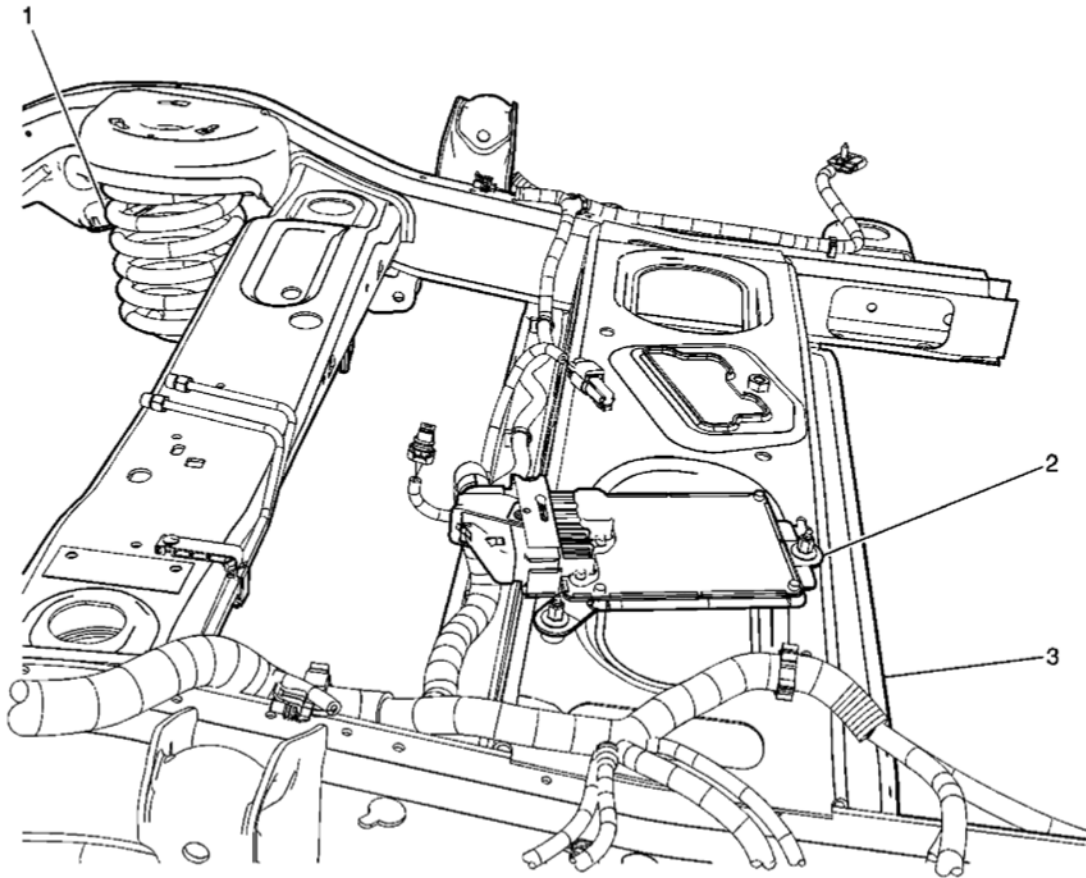


Fig. 4: Above the Spare Tire
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 4

Callout	Component Name
1	RR Coil Spring
2	Electrical Suspension Control (ESC) Module (Z55)
3	Chassis

AUTOMATIC LEVEL CONTROL CONNECTOR END VIEWS

Automatic Level Control (ALC) Air Compressor Assembly

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

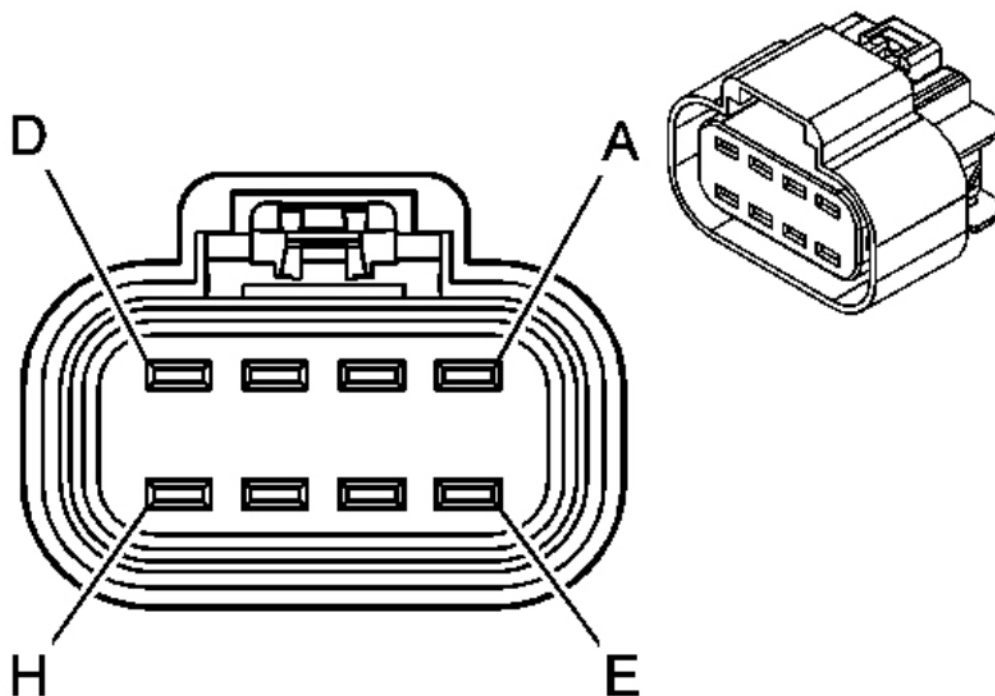


Fig. 5: Automatic Level Control (ALC) Air Compressor Assembly Connector End View
Courtesy of GENERAL MOTORS CORP.

Automatic Level Control (ALC) Air Compressor Assembly Connector Parts Information

Connector Part Information

- OEM: 15326654
- Service: 88986254
- Description: 8-Way F Metri-Pack 280 Series, Sealed (BK)

Terminal Part Information

- Terminal/Tray: TBD
- Core/Insulation Crimp: TBD
- Release Tool/Test Probe: TBD

Automatic Level Control (ALC) Air Compressor Assembly Connector Terminal Identification

Pin	Wire Color	Circuit No.	Function
A	GY	6076	5-Volt Reference

B	OG	2440	Battery Positive Voltage
C	WH	320	Automatic Level Control Exhaust Solenoid Control
D	-	-	Not Used
E	L-BU	2248	Automatic Level Control Air Compressor Supply Voltage
F	BN	6077	Low Reference
G	BK	1750	Ground
H	TN	6075	Automatic Level Control Pressure Sensor Signal

Automatic Level Control (ALC) Relay

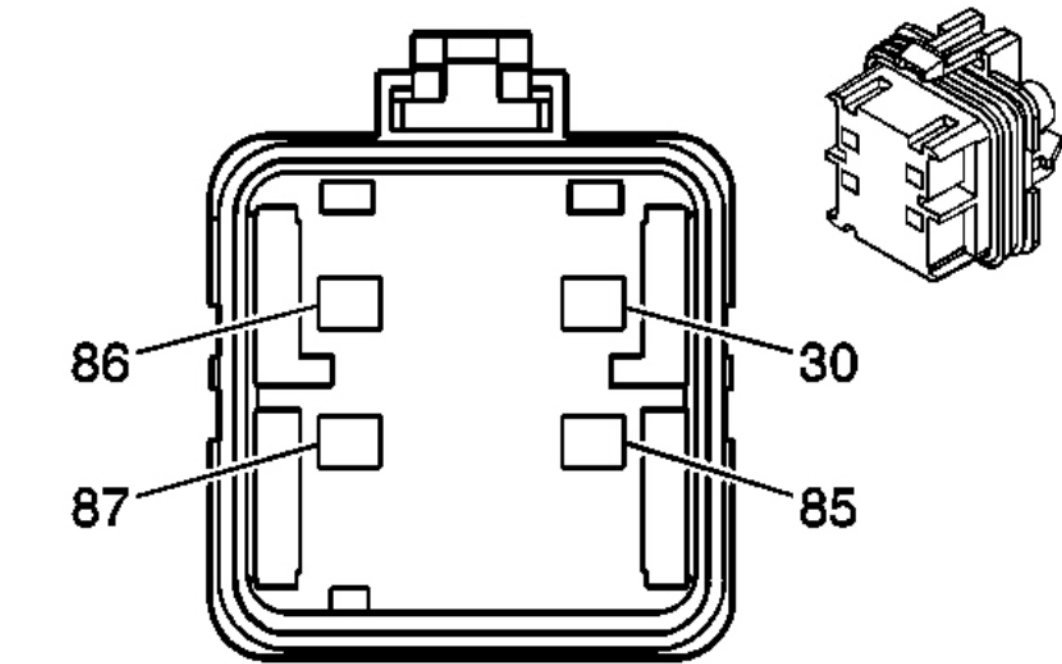


Fig. 6: Automatic Level Control (ALC) Relay Connector End View
 Courtesy of GENERAL MOTORS CORP.

Automatic Level Control (ALC) Relay Connector Parts Information

Connector Part Information

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

- OEM: 12129716
- Service: 15306045
- Description: 4-Way F Metri-Pack 280 Series, Flexlock (M-GY)

Terminal Part Information

- Pins: 30, 87
- Terminal/Tray: 12110853/4
- Core/Insulation Crimp: F/5
- Release Tool/Test Probe: 15315247/J-35616-4A (PU)
- Pins: 85, 86
- Terminal/Tray: 12110847/4
- Core/Insulation Crimp: C/5
- Release Tool/Test Probe: 15315247/J-35616-4A (PU)

Automatic Level Control (ALC) Relay Connector Terminal Identification

Pin	Wire Color	Circuit No.	Function
30	RD	1842	Battery Positive Voltage
85	PK	739	Ignition 1 Voltage
86	L-BU/WH	1112	Damping Relay Coil Control
87	L-BU	2248	Automatic Level Control Compressor Relay Control

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC C0660</u>	DTC C0660 01 Level Control Exhaust Valve Circuit Short to Voltage DTC C0660 06 Level Control Exhaust Valve Circuit Short to ground or open
<u>DTC C0711</u>	Level Control Air Pressure Sensor Circuit
<u>DTC C0712</u>	DTC C0712 01 Level Control Compressor Relay Circuit Short to Voltage DTC C0712 06 Level Control Compressor Relay Circuit Short to Ground or Open

DIAGNOSTIC STARTING POINT - AUTOMATIC LEVEL CONTROL

Begin the system diagnosis with **Diagnostic System Check - Vehicle** . The Diagnostic System Check will provide the following information:

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

- The identification of the control module which command the system
- The ability of the control module to communicate through the serial data circuit
- The identification of any stored DTCs and their status

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

SCAN TOOL OUTPUT CONTROLS

Scan Tool Output Controls

Scan Tool Output Control	Additional Menu Selections	Description
Compressor Relay	ESCM	Commands the compressor relay ON and OFF.
Exhaust Valve	ESCM	Commands the exhaust valve ON and OFF.
Suspension Position Calibration	ESCM	Commands the calibration of the suspension control module for ride height.

SCAN TOOL DATA LIST

Scan Tool Data List

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Park brake set with ignition switch ON			
Battery Voltage	Data Display	Volts	12-14.7
Compressor Signal	Data Display	ON/OFF	OFF
Exhaust Signal	Data Display	ON/OFF	OFF
Left Rear Position Sensor Signal	Data Display	Volts	0.5-4.85
Position Sensor Supply Voltage	Data Display	Volts	4.85
Pressure Sensor Supply	Data Display	Volts	4.85
Pressure Sensor Signal	Data Display	Volts	0.15-4.85
Right Rear Position Sensor Signal	Data Display	Volts	0.5-4.85
System Air Pressure	Data Display	KPA/PSI	Varies

SCAN TOOL DATA DEFINITIONS

Compressor Relay Command

Indicates when the compressor relay is activated.

Controller Battery Volts

Range 10.0-16.0 V. This data refers to the battery system voltage as measured by the suspension control module.

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

Exhaust Valve Command

Indicates when the exhaust valve is active.

Left Rear Position Sensor

Range 0.5-4.85 V. This data refers to vehicle height measured in volts.

Rear Leveling Air Press

Indicates the system pressure in psi.

Rear Leveling Air Press

Indicates the system pressure in volts.

Right Rear Position Sensor

Range 0.5-4.85 V. This data refers to vehicle height measured in volts.

Sensor Supply Voltage

Indicates if the 5-volt reference circuit for the suspension position sensor is active.

Vehicle speed

Indicates speed of vehicle.

DTC C0660

DTC Descriptor

DTC C0660 01

Level Control Exhaust Valve Circuit Short to Voltage.

DTC C0660 06

Level Control Exhaust Valve Circuit Short to ground or open.

Diagnostic Fault Information

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

Circuit/System Description

The Automatic Level Control (ALC) system uses an exhaust valve to release air from the rear shocks to lower

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2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

to trim height, or during a compressor head pressure relief cycle. Battery voltage is supplied to the valve. The electronic suspension control module (ESCM) controls the ground to activate the valve and monitors the voltage level to ensure it agrees with its command state.

Conditions for Running the DTC

C0660 01,

- The ignition is ON.
- The exhaust valve is commanded ON.

C0660 06

- The ignition is ON.
- The exhaust valve is commanded OFF.

Conditions for Setting the DTC

C0660 01

The exhaust valve or the circuits to the valve are shorted to voltage.

C0660 06

The exhaust valve or the circuits to the valve are shorted to ground, or open.

Action Taken When the DTC Sets

C0660 01,06

- DTC C0660 is stored in memory.
- The driver information center (DIC) displays the SERVICE SUSPENSION SYSTEM message after 3 consecutive ignition ON cycles.
- The ALC system is disabled.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Automatic Level Control Schematics

Connector End View Reference

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

Automatic Level Control Connector End Views

Description and Operation

Automatic Level Control Description and Operation

Electrical Information Reference

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

Scan Tool Reference

- Scan Tool Data List
- Scan Tool Data Definitions
- Scan Tool Output Controls

Circuit/System Verification

Ignition ON, command the exhaust valve solenoid ON and OFF with a scan tool. Observe the data display commands of the exhaust signal and listen for the solenoid clicks.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the ALC compressor.
2. Ignition ON, verify that a test lamp illuminates between ignition circuit terminal F 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 and the ignition circuit fuse is open, test or replace the air compressor.
3. Connect a test lamp between the control circuit terminal B and the ignition circuit terminal F.
4. Command the exhaust valve solenoid ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the ESCM.
 - If the test lamp is always OFF, test the control circuit for an open/high resistance. If the circuit tests normal, replace the ESCM.
5. If all circuits test normal, replace the air compressor.

Component Testing

1. Ignition OFF, disconnect the air compressor harness connector.
2. Test the exhaust valve for 18-45 ohms of resistance between the control terminal and the battery positive

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

terminal.

- If resistance is not within the specified range, replace the air compressor.
3. Test for infinite resistance between the control terminal and ground.
- If less than infinite resistance, replace the air compressor.

Repair Procedures

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

Air Compressor Replacement

Control Module References for ESCM replacement, setup, and programming

DTC C0711

DTC Descriptor

DTC C0711

Level Control Air Pressure Sensor Circuit

Diagnostic Fault Information

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

Circuit/System Description

The electronic suspension control module (ESCM) supplies 5 volts to the air pressure sensor and monitors the signal voltage to determine the amount of air pressure in the system.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The air pressure sensor signal voltage is below 0.15 volt or above 4.85 volts.

Action Taken When the DTC Sets

- DTC C0711 is stored in memory.
- The automatic level control (ALC) system pressure is set to a default value.
- The ALC system is disabled.
- The driver information center (DIC) displays the SERVICE SUSPENSION SYSTEM message after 3 consecutive ignition ON cycles.

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

Conditions for Clearing the DTC

- A current DTC will clear when the malfunction is no longer present.
- The history DTC will clear after 100 fault-free ignition cycles.
- The air pressure sensor signal voltage is between 0.15 volt and 4.85 volts.

Diagnostic Aids

- Spraying soapy water can aid in identifying leaks.
- A leak in the air line at the air pressure sensor may cause a faulty sensor voltage reading.

Reference Information

Schematic Reference

Automatic Level Control Schematics

Connector End View Reference

Automatic Level Control Connector End Views

Description and Operation

Automatic Level Control Description and Operation

Electrical Information Reference

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

Scan Tool Reference

- Scan Tool Data List
- Scan Tool Data Definitions

Circuit/System Verification

Ignition ON, observe the scan tool ESC/ALC air pressure sensor voltage. The sensor has a valid range of 0.15-4.85 volts, and varies as the system pumps up when the vehicle is loaded or vents to trim height when unloaded.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the pressure sensor.
2. Ignition OFF, test for less than 1 ohm of resistance between the low reference circuit terminal C and

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

ground.

- If greater than 1 ohm, test the low reference circuit for a short to voltage or an open/high resistance. If circuit tests normal, replace the ESC module.
- 3. Ignition ON, test for 4.8-5.2 volts between the 5-volt reference circuit terminal E and ground.
 - If less than 4.8 volts, test the 5-volt reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the ESC module.
 - If greater than 5.2 volts, test the 5-volt reference circuit for a short to voltage. If the circuit tests normal, replace the ESC module.
- 4. Install a 3-amp fused jumper wire at the signal circuit terminal D. Toggle the jumper wire between the low reference circuit terminal C and the 5-volt reference circuit terminal E. Verify the scan tool pressure sensor voltage toggles between 0.15-4.85 volts.
 - If the pressure sensor voltage does not toggle between the min and max values test the signal circuit for a short to voltage, short to ground or an open/high resistance. If the circuit tests normal, replace the ESC module.
- 5. If all circuits test normal, replace the air pressure sensor.

Repair Procedures

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

- **Automatic Level Control Air Dryer and Pressure Sensor Replacement**
- **Control Module References** for ESCM replacement, setup, and programming

DTC C0712

DTC Descriptors

DTC C0712 01

Level Control Compressor Relay Circuit Short to Voltage.

DTC C0712 06

Level Control Compressor Relay Circuit Short to Ground or Open.

Diagnostic Fault Information

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

Circuit/System Description

The Automatic Level Control (ALC) system uses a compressor relay to switch 12 volts to the compressor motor. The electronic suspension control module (ESCM) receives inputs from the suspension position sensors and air pressure sensor to determine when to raise the rear of the vehicle by grounding the relay coil circuit, and monitoring to ensure it agrees with the command.

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

Conditions for Running the DTC

C0712 01

- The ignition is ON.
- The relay is commanded ON.

C0712 06

- The ignition is ON.
- The relay is commanded OFF.

Conditions for Setting the DTC

C0712 01

Upon detection of the compressor relay control circuit is shorted to battery.

C0712 06

Upon detection of the compressor relay control circuit shorted to ground, or open.

Action Taken When the DTC Sets

C0712 01 06

- DTC C0712 is stored in memory.
- The driver information center (DIC) displays the SERVICE SUSPENSION SYSTEM message after detection for 3 consecutive ignition ON cycles.
- The ALC system is disabled.

Conditions for Clearing the DTC

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

Reference Information

Schematic Reference

Automatic Level Control Schematics

Connector End View Reference

Automatic Level Control Connector End Views

Description and Operation

Automatic Level Control Description and Operation**Electrical Information Reference**

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

Scan Tool Reference

- **Scan Tool Data List**
- **Scan Tool Data Definitions**
- **Scan Tool Output Controls**

Circuit/System Verification

Ignition ON, command the compressor relay ON and OFF with a scan tool. Listen for the compressor running or relay clicks.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the compressor relay.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 86 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
3. Verify that a test lamp illuminates between the ignition circuit terminal 85 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 and the ignition circuit fuse is open, test or replace the compressor relay.
4. Verify that a test lamp illuminates between the ignition circuit terminal 30 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 and the ignition circuit fuse is open, test the control circuit at terminal 87 for a short to ground.
5. Disconnect the harness connector at the air compressor.
6. Test for less than 1 ohm of resistance between the air compressor ground circuit terminal G and ground.
 - If greater than 1 ohm, test the ground circuit for an open/high resistance.
7. Connect the harness connector at the air compressor.
8. Connect a 40-A used jumper wire between the ignition circuit terminal 30 and the control circuit terminal 87. Verify the air compressor is activated.
 - If the air compressor does not activate, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the air compressor.

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

9. Connect a test lamp between the ignition circuit terminal 85 and the control circuit terminal 86.
10. Command the compressor relay ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the ESC module.
 - If the test lamp is always OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the ESC module.
11. If all circuits test normal, test or replace the compressor relay.

Repair Procedures

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

- **Air Compressor Replacement**
- **Control Module References** for ESCM replacement, setup, and programming

SYMPTOMS - AUTOMATIC LEVEL CONTROL

- IMPORTANT:**
1. Perform the **Diagnostic System Check - Vehicle** , before using the Symptom Tables in order to verify that all of the following conditions 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 **Automatic Level Control Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices which may affect the operation of the Steering Wheel Controls System. Refer to **Checking Aftermarket Accessories** .
- Inspect for easily accessible or visible system components for obvious damage or conditions which may cause the symptom.

Intermittent

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

Symptom List

Refer to **Rear of Vehicle Low** in order to diagnose the symptom.

REAR OF VEHICLE LOW

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

Diagnostic Fault Information

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

Circuit/System Description

The Automatic Level Control (ALC) is integrated with the electronic suspension control module (ESCM). Inputs from the suspension position sensors and air pressure sensor is used determine when to raise the rear of the vehicle by grounding the relay and switching 12 volts to the compressor motor to pump air to the rear shocks.

Diagnostic Aids

Inspect for:

- Damaged rear suspension position sensors.
- Leaks using soapy water.
- Kinked or pinched lines.

Reference Information

Schematic Reference

Automatic Level Control Schematics

Connector End View Reference

Automatic Level Control Connector End Views

Description and Operation

Automatic Level Control Description and Operation

Electrical Information Reference

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

Scan Tool Reference

- Scan Tool Data List
- Scan Tool Data Definitions
- Scan Tool Output Controls

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

Circuit/System Verification

Ignition ON, command the compressor relay ON and OFF with a scan tool. Listen for the compressor running or relay clicks.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the compressor relay.
2. Ignition ON, verify that a test lamp does not illuminate between the control circuit terminal 86 and ground.
 - If the test lamp illuminates, test the control circuit for a short to voltage.
3. Verify that a test lamp illuminates between the ignition circuit terminal 85 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 and the ignition circuit fuse is open, test or replace the compressor relay.
4. Verify that a test lamp illuminates between the ignition circuit terminal 30 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 and the ignition circuit fuse is open, test the control circuit at terminal 87 for a short to ground.
5. Disconnect the harness connector at the air compressor.
6. Test for less than 1 ohm of resistance between the air compressor ground circuit terminal G and ground.
 - If greater than 1 ohm, test the ground circuit for an open/high resistance.
7. Connect the harness connector at the air compressor.
8. Connect a 40-A used jumper wire between the ignition circuit terminal 30 and the control circuit terminal 87. Verify the air compressor is activated.
 - If the air compressor does not activate, test the control circuit for an open/high resistance. If the circuit tests normal, test or replace the air compressor.
9. Connect a test lamp between the ignition circuit terminal 85 and the control circuit terminal 86.
10. Command the compressor relay ON and OFF with a scan tool. The test lamp should turn ON and OFF when changing between the commanded states.
 - If the test lamp is always ON, test the control circuit for a short to ground. If the circuit tests normal, replace the ESC module.
 - If the test lamp is always OFF, test the control circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the ESC module.
11. If all circuits test normal, test or replace the compressor relay.

Repair Procedures

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

- **Air Compressor Replacement**
- **Control Module References** for ESCM replacement, setup, and programming.

REPAIR INSTRUCTIONS

SUSPENSION POSITION CALIBRATION

ESCM Programming (ESC)

If the electronic suspension control module (ESCM) has been replaced, it needs to be programmed. Refer to **Electronic Suspension Control Module Programming and Setup** .

AUTOMATIC LEVEL CONTROL AIR DRYER AND PRESSURE SENSOR REPLACEMENT

Removal Procedure

1. Remove the automatic level control air compressor from the vehicle. Refer to **Air Compressor Replacement**.
2. Clean the area around the connection of the automatic level control air dryer to the automatic level control air compressor body.
3. Disconnect the electrical connector from the pressure sensor.
4. Remove the air dryer/pressure sensor assembly retaining screw.
5. Push the air dryer/pressure sensor assembly in while rotating the air dryer/pressure sensor assembly clockwise until the assembly detaches from the automatic level control air compressor body.
6. Remove the automatic level control air dryer from the automatic level control air compressor.

Installation Procedure

1. Install the automatic level control air dryer to the automatic level control air compressor.
2. Push the air dryer/pressure sensor assembly in while rotating the air dryer/pressure sensor assembly counterclockwise until the assembly attaches to the automatic level control air compressor body.
3. Install the air dryer/pressure sensor assembly retaining screw.
4. Connect the electrical connector to the pressure sensor.
5. Install the automatic level control air compressor to the vehicle. Refer to **Air Compressor Replacement**.

AIR LINE TUBING REPAIR

1. Locate the leaking area with soap and water or a stethoscope.

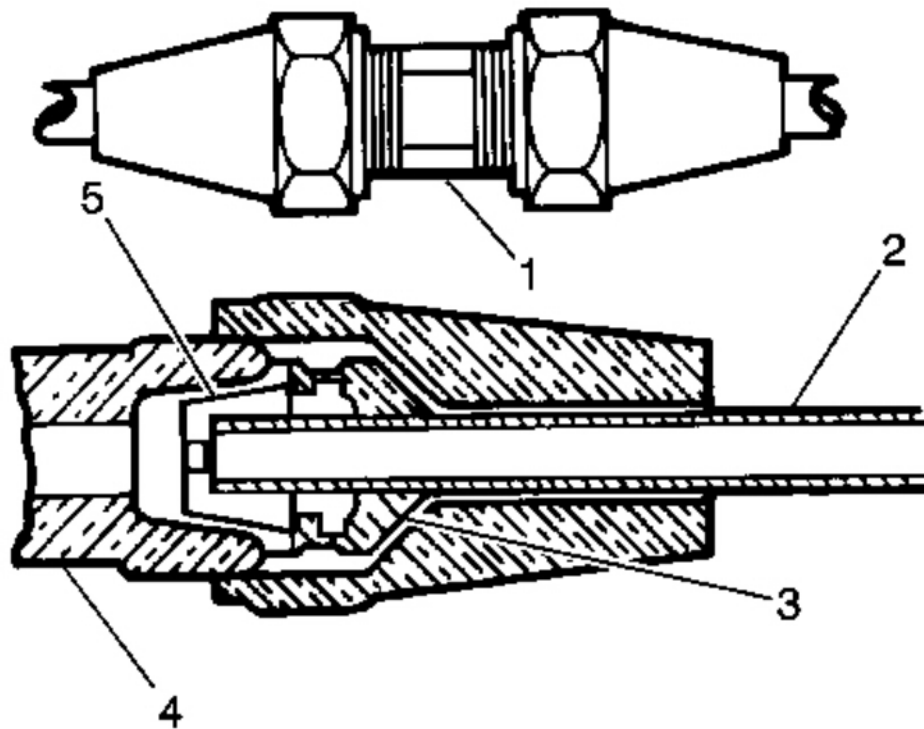


Fig. 7: Cross Section Of Air Line Tubing
Courtesy of GENERAL MOTORS CORP.

2. Cut and remove the leaking line (2) section.
3. Remove the plastic retainer pin from one of the nuts.
4. Slide the air line tube onto the nut until the line bottoms in the rubber seal (5).

NOTE: Refer to Fastener Notice in Cautions and Notices.

5. Hold the air line tube in position.

Tighten: Tighten the air line tube repair nut to 8 N.m (70 lb in).

6. Install the air line tube to the other end of the coupling.
7. Repeat Steps 3 through 5.

IMPORTANT: Ensure that the repaired air line tube is secured in a location where the

line is not pinched, or kinked, and will not contact the exhaust system.

8. Install the air line tube to the vehicle.
9. Inflate the real time damping level control system and inspect for leaks.

AIR COMPRESSOR REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle in General Information.

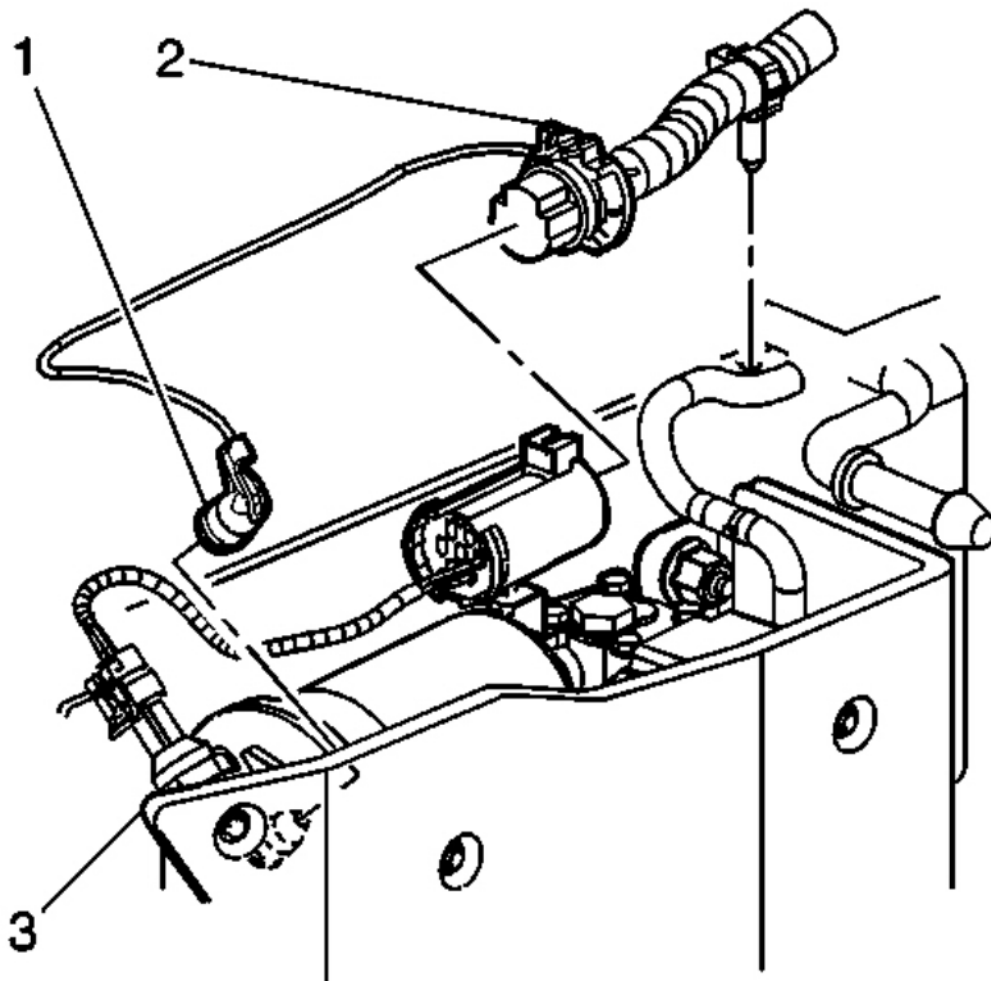


Fig. 8: Air Tube At Air Dryer & Electrical Connection

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Clean the components and the surrounding area to prevent dirt from entering the air system before disconnecting the air hose from the air compressor.

2. Disconnect the air tube (1) from the air dryer.
3. Disconnect the electrical connection (2).

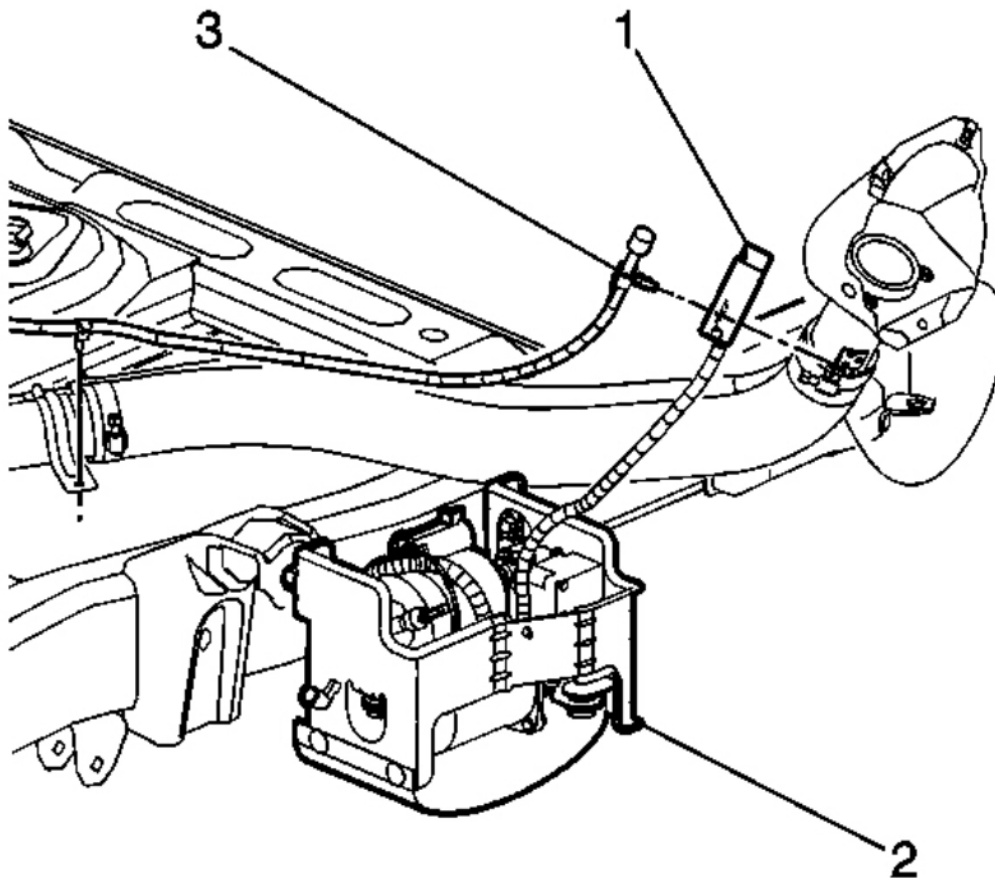


Fig. 9: Air Compressor & Air Inlet Hose

Courtesy of GENERAL MOTORS CORP.

4. Remove the air inlet and hose (1) from the fuel filler neck bracket.

5. Loosen the mounting nuts.
6. Slide the air compressor (2) rearward to clear the frame slots.
7. Remove the air compressor from the vehicle.

Installation Procedure

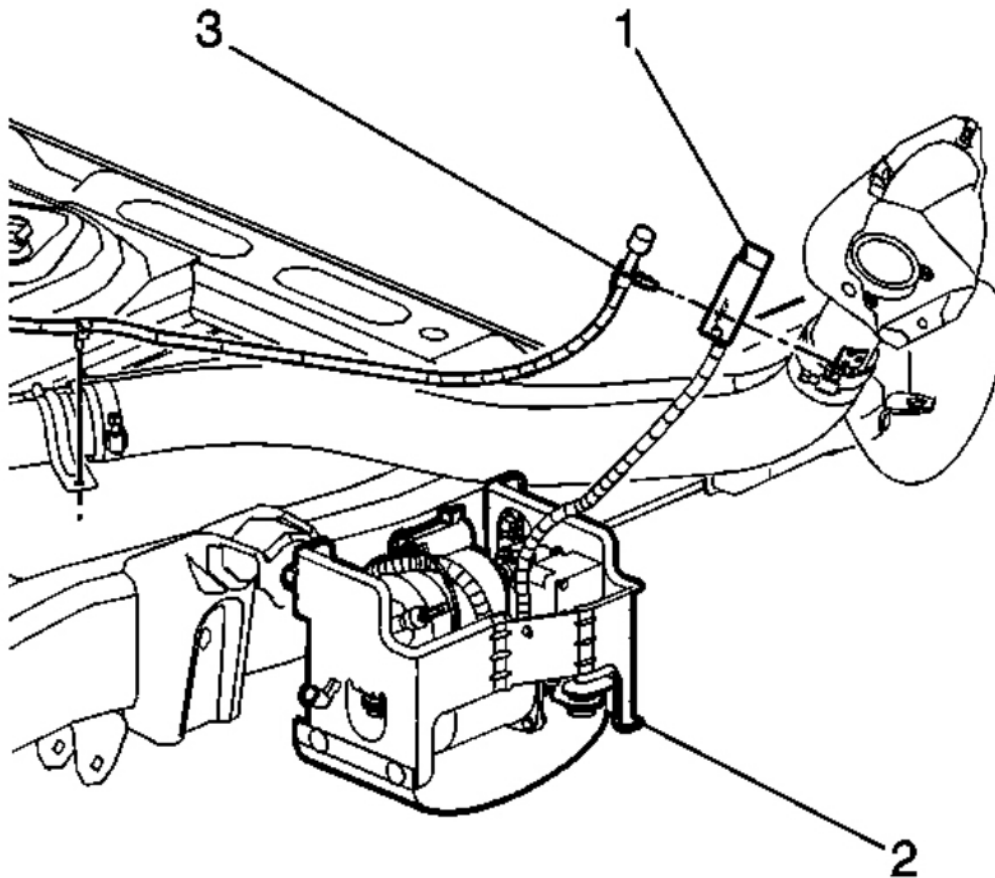


Fig. 10: Air Compressor & Air Inlet Hose
Courtesy of GENERAL MOTORS CORP.

1. Install the air compressor (2) to the vehicle.

NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Slide the air compressor forward to secure the fasteners into the frame slots and tighten the mounting

nuts.

Tighten: Tighten the nuts to 15 N.m (11 lb ft).

3. Install the air inlet hose (1) to the fuel filler neck bracket.

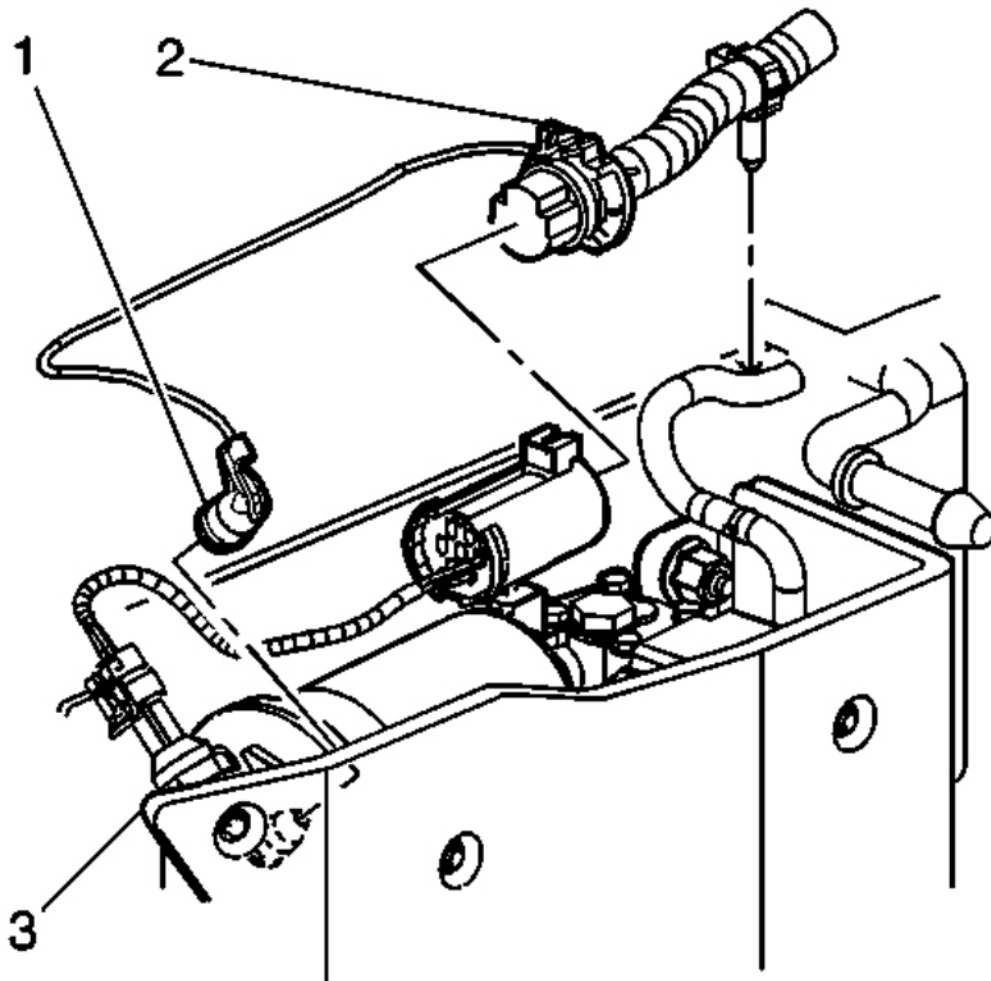


Fig. 11: Air Tube At Air Dryer & Electrical Connection
Courtesy of GENERAL MOTORS CORP.

4. Connect the air tube (1) to the air dryer.
5. Connect the electrical connection (5).

2007 Cadillac Escalade

2007 SUSPENSION Automatic Level Control - Avalanche, Escalade, Suburban, Tahoe & Yukon

IMPORTANT: Before driving the vehicle, turn the ignition on and wait approximately 45 seconds. This will ensure that the air adjustable shock absorbers are filled with residual pressure.

6. Lower the vehicle.

DESCRIPTION AND OPERATION

AUTOMATIC LEVEL CONTROL DESCRIPTION AND OPERATION

The automatic level control (ALC) system maintains a desired rear suspension position under all types of towing, hauling and loading conditions. The following components are involved in the operation of the ALC system:

- Air line tubing-Pressurized air from the ALC compressor is pumped to each of the rear shocks via air line tubing.
- Air drier-Pressurized air from the compressor is run through a drier containing a moisture absorbing chemical preventing water accumulation in the rear shocks.
- Compressor-Supplies pressurized air to the rear shocks
- Compressor motor relay-The relay supplies battery positive voltage to the ALC compressor motor.
- Pressure sensor-The electronic suspension control module (ESCM) module provides a 5-volt reference and low reference to the ALC pressure sensor. The module receives the signal voltage that is relative to the air pressure applied to the rear shocks.
- ESCM-Controls the ALC system and electronic suspension control (ESC) system and detects failures in both. The module monitors inputs from the position sensors, and pressure sensor to determine when to raise and lower the vehicle to trim height as the vehicle is loaded or unloaded. The module limits pump activation to 255 seconds to prevent thermal damage.
- Exhaust valve-An electric solenoid activated by the ESCM to vent air pressure from the rear shocks.
- Left and right rear suspension position sensors-The module provides a 5-volt reference and low reference to all 4 of the body-to-wheel suspension position sensors. The sensors send the ESCM a signal voltage that is relative to the rear suspension ride height
- Left and right rear shock absorbers with internal air chambers and dampers-Dampens the rear suspension and maintains trim height depending on the air pressure applied.

Automatic Level Control (ALC) System Operation

The following are functions of the automatic level control (ALC) system:

Ride Height Increase

The ESCM detects a voltage signal from the rear suspension position sensors indicating the suspension height is low. The module grounds the control circuit of the compressor motor relay which in turn supplies battery voltage to the compressor. The exhaust valve is open for 1.5 seconds during compressor pump start up in order to reduce current draw and pump motor wear. Air pressure from the compressor is pumped to the rear shocks through small flexible tubing. The increased pressure inside the rear shocks raises the suspension to trim height.

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Ride Height Decrease

The ESCM detects a voltage signal from the rear suspension position sensors indicating the suspension height is high. The module opens the exhaust valve by supplying ground. Air pressure from the rear shocks vent, lowering the suspension to trim height.

Self Pressure Test

Each time the ignition is turned ON the ESCM commands on the ALC relay, activating the compressor for 4 seconds. The ESCM then monitors the air pressure sensor's signal voltage to verify the compressor is functioning and the system is holding air pressure.