

2008 Isuzu Ascender LS

2008 SUSPENSION Air Suspension - Ascender, Envoy & Trailblazer

2008 SUSPENSION

Air Suspension - Ascender, Envoy & Trailblazer

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Air Spring Compressor to Frame Mounting Bolts	20 N.m	15 lb ft
Air Spring Leveling Sensor to Frame Mounting Bolts	8 N.m	71 lb in
Air Supply Lines to Air Spring Compressor	2.25 N.m	20 lb in

SCHEMATIC & ROUTING DIAGRAMS

AIR SUSPENSION SCHEMATICS

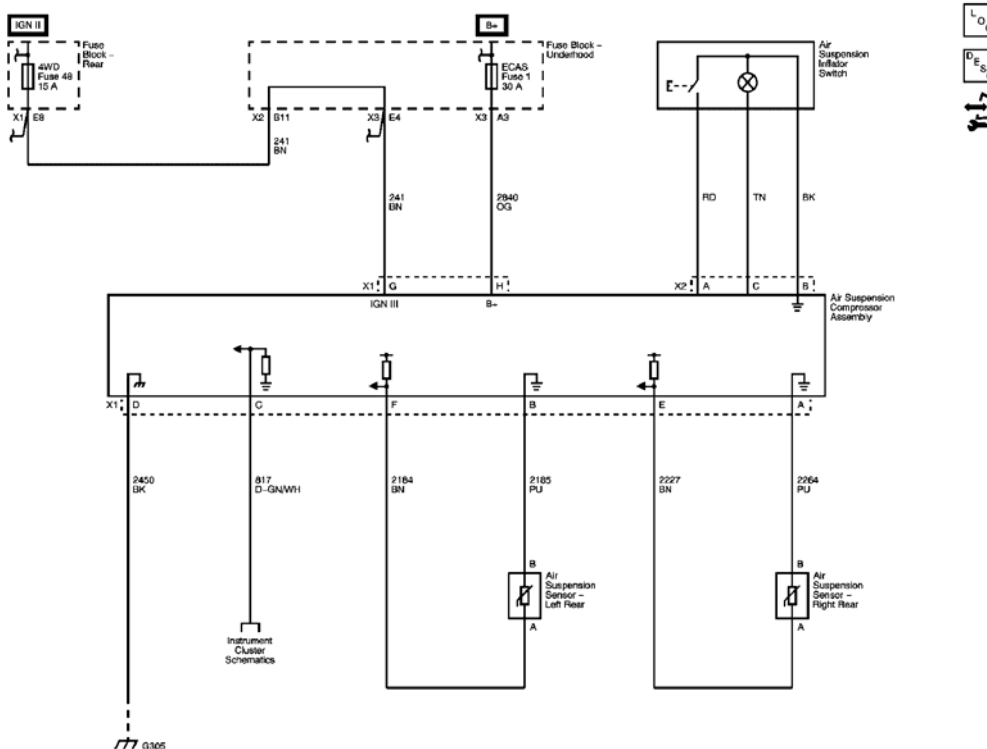


Fig. 1: Air Suspension Schematic
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION & PROCEDURES

DIAGNOSTIC STARTING POINT - AIR SUSPENSION

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

- The identification of the control modules which command the system. Refer to **Air Suspension Description and Operation**.
- The identification of any stored diagnostic trouble codes (DTCs) and their status. Refer to **Diagnostic Trouble Code (DTC) Displaying**.

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

DIAGNOSTIC TROUBLE CODE (DTC) DISPLAYING

The Air Suspension system has an internal clock to prevent overheating if the compressor assembly is running for a prolonged period of time. If the system overheats, all leveling function stops until the system cools down. During this time, the indicator LED on the air inflator switch will be quickly flashing at a constant rate.

The other three diagnostic trouble codes are displayed with a blink code on the inflator switch LED. The Air Suspension Compressor Assembly shall begin to indicate the code when the condition to cause the code becomes current.

The number of the fault code shall be represented by the number of flashing pulses on the inflator switch LED. The flashing pulses shall have a repetition rate of 0.5 seconds and each code shall be separated by a 3.0 second delay. All codes shall be flashed in the order of occurrence of the fault. The blink code shall take priority over other processes that have access to the inflator switch LED. Refer to the following:

- **DTC 001**
- **DTC 002**
- **DTC 003**

DIAGNOSTIC TROUBLE CODE (DTC) CLEARING

The Air Suspensions diagnostic trouble codes will clear when the ignition switch has been transitioned from off to on and the conditions that caused the code to set have been removed.

DTC 001

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** provide an overview of each diagnostic category.

DTC Descriptor**DTC C001**

System Disabled Information Stored

Circuit/System Description

The air suspension compressor assembly monitors the calibrations in the electrically erasable programmable read-only memory (EEPROM). The module also monitors the compressor, solenoids and internal wiring for faults.

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

The air suspension compressor assembly detects an invalid EPROM checksum or internal component failure.

Action Taken When the DTC Sets

Depending on the condition that set the DTC, some or all functions will be disabled.

Conditions for Clearing the DTC

The DTC will automatically clear when the condition for setting the DTC is removed and the ignition has cycled from ON to OFF to ON.

Circuit/System Verification

Verify that DTC 001 is not set.

- If the DTC is set, cycle the ignition OFF to ON. If the DTC resets, replace the air spring compressor.

Repair Procedures

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

Air Spring Compressor Replacement**DTC 002****Diagnostic Instructions**

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- 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 002

Left Rear Position Sensor Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Air Suspension Compressor Assembly Battery Positive Voltage Circuit	1, 2, 4, and 6	1, 2, 4, and 6	-	-
Air Suspension Compressor Assembly Ignition 3 Voltage Circuit	1, 2, 4, and 6	1, 2, 4, and 6	-	-
Air Suspension Compressor Assembly Ground Circuit	-	1, 2, 4, and 6	-	-
Air Suspension Inflator Switch Ground Circuit	-	4 and 6	-	-
Air Suspension Inflator Switch Indicator Control Circuit	4	4	3	-
Air Suspension Inflator Switch Signal Circuit	5	6	6	-
Left Rear Air Suspension Sensor Low Reference Circuit	-	DTC002	-	-
Left Rear Air Suspension Sensor Signal Circuit	DTC002	DTC002	DTC002	-
Right Rear Air Suspension Sensor Low Reference Circuit	-	DTC003	-	-
Right Rear Air Suspension Sensor Signal Circuit	DTC003	DTC003	DTC003	-
Vehicle Speed Signal Circuit	B0540	7	B0540	-

1. Air Springs Do Not Deflate
2. Air Springs Do Not Inflate
3. Air Suspension Inflator Switch Indicator Always ON
4. Air Suspension Inflator Switch Indicator Inoperative
5. Inflator Always ON
6. Inflator Inoperative
7. Inflator Will Operate While Vehicle is in Motion

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Circuit/System Description

The left rear air suspension sensor arm is attached to an armature that rotates inside a coil. The air suspension compressor assembly determines the angle of the sensor arm by measuring the voltage of the left rear air suspension sensor signal at 50 ms intervals via the left rear air suspension sensor signal circuit.

Conditions for Running the DTC

- Battery voltage is between 9-16 volts.
- The ignition is ON for 30 seconds.

Conditions for Setting the DTC

The air suspension compressor assembly detects a invalid height sensor signal.

Action Taken When the DTC Sets

- The air suspension compressor assembly shall disregard the left rear air suspension sensor input and use the right rear air suspension sensor to determine the vehicle height.
- If both air suspension sensor DTCs are set, the air suspension compressor assembly shall deactivate the compressor, corner solenoids, and exhaust solenoids. All leveling functions will be disabled. Inflator functions will not be disabled.

Conditions for Clearing the DTC

The DTC will automatically clear when the condition for setting the DTC is removed.

Reference Information

Schematic Reference

Air Suspension Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Air Suspension Description and Operation

Electrical Information Reference

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

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- **Wiring Repairs**

Circuit/System Verification

Ignition ON, load the vehicle with additional weight in the rear. The air suspension compressor should activate raising the vehicle to the calibrated vehicle level. Remove the additional load and the compressor will exhaust the necessary amount of air to return to the calibrated vehicle level.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the left rear air suspension sensor.
2. Test for less than 2.0 ohms between the low reference circuit terminal B and ground.
 - If greater than the specified value, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the air suspension compressor assembly.
3. Perform the component test on the left rear air suspension sensor.
 - If the sensor fails the component test, replace the sensor
4. Test the left rear air suspension signal circuit for an open/high resistance, short to ground, or short to voltage.
 - If the circuit tests normal, replace the air suspension compressor assembly.

Component Testing

1. Ignition OFF, disconnect the harness connector at the left rear air suspension sensor.
2. Test for 75-100 ohms between the signal circuit terminal and the low reference circuit terminal while sweeping the sensor arm through the entire range.
 - If not within the specified range or if the reading is erratic, replace the sensor.

Repair Procedures

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

- **Air Spring Leveling Sensor Replacement**
- **Air Spring Compressor Replacement**
- **Air Spring Sensor Calibration**

DTC 003

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

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DTC 003

Right Rear Position Sensor Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Air Suspension Compressor Assembly Battery Positive Voltage Circuit	1, 2, 4, and 6	1, 2, 4, and 6	-	-
Air Suspension Compressor Assembly Ignition 3 Voltage Circuit	1, 2, 4, and 6	1, 2, 4, and 6	-	-
Air Suspension Compressor Assembly Ground Circuit	-	1, 2, 4, and 6	-	-
Air Suspension Inflator Switch Ground Circuit	-	4 and 6	-	-
Air Suspension Inflator Switch Indicator Control Circuit	4	4	3	-
Air Suspension Inflator Switch Signal Circuit	5	6	6	-
Left Rear Air Suspension Sensor Low Reference Circuit	-	DTC002	-	-
Left Rear Air Suspension Sensor Signal Circuit	DTC002	DTC002	DTC002	-
Right Rear Air Suspension Sensor Low Reference Circuit	-	DTC003	-	-
Right Rear Air Suspension Sensor Signal Circuit	DTC003	DTC003	DTC003	-
Vehicle Speed Signal Circuit	B0540	7	B0540	-
<ol style="list-style-type: none"> 1. Air Springs Do Not Deflate 2. Air Springs Do Not Inflate 3. Air Suspension Inflator Switch Indicator Always ON 4. Air Suspension Inflator Switch Indicator Inoperative 5. Inflator Always ON 6. Inflator Inoperative 7. Inflator Will Operate While Vehicle is in Motion 				

Circuit/System Description

The right rear air suspension sensor arm is attached to an armature that rotates inside a coil. The air suspension compressor assembly determines the angle of the sensor arm by measuring the voltage of the right rear air suspension sensor signal at 50 ms intervals via the right rear air suspension sensor signal circuit.

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Conditions for Running the DTC

- Battery voltage is between 9-16 volts.
- The ignition is ON for 30 seconds.

Conditions for Setting the DTC

The air suspension compressor assembly detects a invalid height sensor signal.

Action Taken When the DTC Sets

- The air suspension compressor assembly shall disregard the right rear air suspension sensor input and use the left rear air suspension sensor to determine the vehicle height.
- If both air suspension sensor DTCs are set, the air suspension compressor assembly shall deactivate the compressor, corner solenoids, and exhaust solenoids. All leveling functions will be disabled. Inflator functions will not be disabled.

Conditions for Clearing the DTC

The DTC will automatically clear when the condition for setting the DTC is removed.

Reference Information

Schematic Reference

Air Suspension Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Air Suspension Description and Operation

Electrical Information Reference

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

Circuit/System Verification

Ignition ON, load the vehicle with additional weight in the rear. The air suspension compressor should activate raising the vehicle to the calibrated vehicle level. Remove the additional load and the compressor will exhaust

the necessary amount of air to return to the calibrated vehicle level.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the right rear air suspension sensor.
2. Test for less than 2.0 ohms between the low reference circuit terminal B and ground.
 - If greater than the specified value, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the air suspension compressor assembly.
3. Perform the component test on the right rear air suspension sensor.
 - If the sensor fails the component test, replace the sensor
4. Test the right rear air suspension signal circuit for an open/high resistance, short to ground, or short to voltage.
 - If the circuit tests normal, replace the air suspension compressor assembly.

Component Testing

1. Ignition OFF, disconnect the harness connector at the right rear air suspension sensor.
2. Test for 75-100 ohms between the signal circuit terminal and the low reference circuit terminal while sweeping the sensor arm through the entire range.
 - If not within the specified range or if the reading is erratic, replace the sensor.

Repair Procedures

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

- **Air Spring Leveling Sensor Replacement**
- **Air Spring Compressor Replacement**
- **Air Spring Sensor Calibration**

SYMPTOMS - AIR SUSPENSION

IMPORTANT: 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 there are no DTCs set.
2. Review the system description and operation in order to familiarize yourself with the system functions. Refer to **Air Suspension Description and Operation**.

Visual/Physical Inspection

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

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- Inspect D height using **Trim Height Inspection** .
- Inspect for air leaks using **Air Suspension Air Leak Diagnosis**.
- Inspect the height sensors and sensor links for any damage or disconnected components.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Electrical Intermittents** .

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Rear Air Springs Do Not Inflate**
- **Rear Air Springs Do Not Deflate**
- **Inflator Malfunction**
- **Trim Height Uneven or Low**

AIR SUSPENSION AIR LEAK DIAGNOSIS

Air Suspension Leak Diagnosis

Step	Action	Yes	No
1	Did you review the Air Suspension Description and Operation and perform the necessary inspections?	Go to Step 2	Go to <u>Air Suspension Description and Operation</u>
2	With the suspension loaded on the ground or drive-on hoist, perform a visual inspection checking for the following disconnected or damaged components: <ul style="list-style-type: none">• Air lines• Air line fittings• Air springs• Air compressor• Inflator line Did you find and correct the condition?	Go to Step 15	Go to Step 3
	<ol style="list-style-type: none">1. Position the vehicle on the ground or on a drive-on hoist in order to load the suspension.2. Remove the wheelhouse panel, deflated air spring side. Refer to <u>Rear Outer Wheelhouse Replacement - Back</u> .		

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3	<p>3. Using soapy water, look for air bubbles in the following locations:</p> <ul style="list-style-type: none"> • The top of the air spring collar to air line area • The compressor to air line connection • The air lines • Inflator air lines <p>4. Repair as necessary.</p>		
	Did you find and correct the condition?	Go to Step 15	Go to Step 4
4	<p>IMPORTANT: Each air line has a bubble 18-22 mm (0.7-0.8 in) from the end of the line, acts as a stop. With the air line fully seated, the bubble will set next to the ferrule.</p> <p>Inspect the air lines at the ECAS compressor ferrule nuts for proper installation. Did you find and correct the condition?</p>		
		Go to Step 6	Go to Step 5
5	<p>1. Loosen the ferrule nut and push the line in until the line stops or the bubble is within 2 mm (0.08 in) from the ferrule nut.</p> <p>IMPORTANT: Do not over tighten the ferrule nut.</p> <p>2. Tighten the ferrule nut to 2.5 N.m (22 lb in).</p>		
	Did you find and correct the condition?	Go to Step 15	Go to Step 6
6	<p>Inspect the ECAS air lines for any kinked, pinched, or damaged air line from the compressor to the air springs. Did you find and correct the condition?</p>		
		Go to Step 12	Go to Step 7
7	<p>IMPORTANT: Each air line has a bubble 18-22 mm (0.7- 0.8 in) from the end of the line acts as a stop. The bubble should be seated against the collet on the top of the air spring.</p> <p>1. Inspect the air lines at the air springs for proper installation.</p> <p>2. Push in and pull outward on the air line.</p>		
	Did the air line remain seated in the air spring?	Go to Step 8	Go to Step 11
	1. Disconnect the air lines from the air springs.		

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8	<p>2. Inspect for very fine scratches in the line to collet mating surfaces.</p> <p>Are scratches on the mating surfaces?</p>	Go to Step 14	Go to Step 9
9	<p>Reinstall the air lines to the air springs. Inspect the ferrule nut threads on the compressor.</p> <p>Are the threads stripped or cross threaded?</p>	Go to Step 13	Go to Step 10
10	<p>Check the compressor output pressure using the following steps:</p> <p style="text-align: center;">IMPORTANT: The ECAS fuse is a 30 AMP fuse.</p> <ol style="list-style-type: none"> 1. Install the ECAS fuse into the underhood electrical center. 2. Open the rear hatch and locate the accessory inflator outlet in the right rear quarter panel. 3. Turn ON the ignition, engine OFF. 4. Install the accessory inflator tool assembly provided with the vehicle. 5. Turn the accessory inflator switch to the ON position. <p>Does the compressor output measure 138-724 kPa (20-105 psi)?</p>	System OK	Go to <u>Rear Air Springs Do Not Deflate</u>
11	<p>Replace the air spring. Refer to <u>Air Spring Replacement</u>.</p> <p>Did you complete the repair?</p>	Go to Step 15	-
12	<p>Replace the air suspension air line. Refer to <u>Air Spring Replacement</u>.</p> <p>Did you complete the repair?</p>	Go to Step 15	-
13	<p>Replace the air spring compressor. Refer to <u>Air Spring Compressor Replacement</u>.</p> <p>Did you complete the repair?</p>	Go to Step 15	-
14	<p>Replace the air spring and air line. Refer to <u>Air Spring Replacement</u> and <u>Air Spring Replacement</u>.</p> <p>Did you complete the repair?</p>	Go to Step 15	-
15	<ol style="list-style-type: none"> 1. Turn ON the ignition, engine OFF. 2. Allow the vehicle to rise until the compressor shuts OFF and curb height is achieved. 3. Operate the system in order to verify the repair. 		

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Did you correct the condition?

-

Go to **Step 2**

REAR AIR SPRINGS DO NOT INFLATE

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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Air Suspension Compressor Assembly Battery Positive Voltage Circuit	1, 2, 4, 6	1, 2, 4, 6	-	-
Air Suspension Compressor Assembly Ignition 3 Voltage Circuit	1, 2, 4, 6	1, 2, 4, 6	-	-
Air Suspension Compressor Assembly Ground Circuit	-	1, 2, 4, 6	-	-
Air Suspension Inflator Switch Ground Circuit	-	4, 6	-	-
Air Suspension Inflator Switch Indicator Control Circuit	4	4	3	-
Air Suspension Inflator Switch Signal Circuit	5	6	6	-
Left Rear Air Suspension Sensor Low Reference Circuit	-	DTC 002	-	-
Left Rear Air Suspension Sensor Signal Circuit	DTC 002	DTC 002	DTC 002	-
Right Rear Air Suspension Sensor Low Reference Circuit	-	DTC 003	-	-
Right Rear Air Suspension Sensor Signal Circuit	DTC 003	DTC 003	DTC 003	-
Vehicle Speed Signal Circuit	B0540	7	B0540	-
1. Air Springs Do Not Deflate 2. Air Springs Do Not Inflate 3. Air Suspension Inflator Switch Indicator Always ON 4. Air Suspension Inflator Switch Indicator Inoperative 5. Inflator Always ON 6. Inflator Inoperative 7. Inflator Will Operate While Vehicle is in Motion				

Circuit/System Description

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The air suspension system utilizes left and right rear air suspension sensors to determine the calibrated level of the vehicle. As weight is added to the rear of the vehicle, the sensors signal to the air suspension compressor change which activates the compressor to raise the vehicle to the proper height. Upon removal of the additional weight, the sensor signals the compressor to exhaust enough air to lower the vehicle back down to maintain the calibrated rear trim height.

Reference Information

Schematic Reference

Air Suspension Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Air Suspension Description and Operation

Electrical Information Reference

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

Circuit/System Verification

Ignition ON, load the vehicle with additional weight in the rear. The air suspension compressor should activate raising the vehicle to the calibrated vehicle level. Remove the additional load and the compressor will exhaust the necessary amount of air to return to the calibrated vehicle level.

Circuit/System Testing

1. Inspect the air delivery system for damaged air springs or supply lines.
 - If any damage is found, perform the Air Suspension Air Leak Diagnosis and repair or replace any leaking component as necessary.
2. Ignition OFF, disconnect the harness connector at the air suspension compressor assembly.
3. Test for less than 2.0 ohms between the low reference circuit connector X1, terminal D and ground.
 - If greater than the specified value, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the air suspension compressor assembly.
4. Ignition ON, verify that a test lamp illuminates between the compressor B+ circuit connector X1, terminal H and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high

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resistance. If the circuit tests normal, test or replace the air suspension compressor assembly.

5. Ignition ON, verify that a test lamp illuminates between the compressor IGN 3 circuit connector X1, terminal G and ground.
 - If the test lamp does not illuminate, test the IGN 3 circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the air suspension compressor assembly.
 - If the circuit tests normal, replace the air suspension compressor assembly.

Repair Procedures

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

- **Air Suspension Depressurization**
- **Air Spring Replacement**
- **Air Suspension Air Line Replacement**
- **Air Spring Compressor Replacement**
- **Air Spring Sensor Calibration**

REAR AIR SPRINGS DO NOT DEFLATE

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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Air Suspension Compressor Assembly Battery Positive Voltage Circuit	1, 2, 4, 6	1, 2, 4, 6	-	-
Air Suspension Compressor Assembly Ignition 3 Voltage Circuit	1, 2, 4, 6	1, 2, 4, 6	-	-
Air Suspension Compressor Assembly Ground Circuit	-	1, 2, 4, 6	-	-
Air Suspension Inflator Switch Ground Circuit	-	4, 6	-	-
Air Suspension Inflator Switch Indicator Control Circuit	4	4	3	-
Air Suspension Inflator Switch Signal Circuit	5	6	6	-
Left Rear Air Suspension Sensor Low Reference Circuit	-	DTC 002	-	-

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Left Rear Air Suspension Sensor Signal Circuit	DTC 002	DTC 002	DTC 002	-
Right Rear Air Suspension Sensor Low Reference Circuit	-	DTC 003	-	-
Right Rear Air Suspension Sensor Signal Circuit	DTC 003	DTC 003	DTC 003	-
Vehicle Speed Signal Circuit	B0540	7	B0540	-
1. Air Springs Do Not Deflate 2. Air Springs Do Not Inflate 3. Air Suspension Inflator Switch Indicator Always ON 4. Air Suspension Inflator Switch Indicator Inoperative 5. Inflator Always ON 6. Inflator Inoperative 7. Inflator Will Operate While Vehicle is in Motion				

Circuit/System Description

The air suspension system utilizes left and right rear air suspension sensors to determine the calibrated level of the vehicle. As weight is added to the rear of the vehicle, the sensors signal to the air suspension compressor change which activates the compressor to raise the vehicle to the proper height. Upon removal of the additional weight, the sensor signals the compressor to exhaust enough air to lower the vehicle back down to maintain the calibrated rear trim height.

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- Wiring Repairs

Circuit/System Verification

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Ignition ON, load the vehicle with additional weight in the rear. The air suspension compressor should activate raising the vehicle to the calibrated vehicle level. Remove the additional load and the compressor will exhaust the necessary amount of air to return to the calibrated vehicle level.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the air suspension compressor assembly.
2. Test for less than 2.0 ohms between the low reference circuit connector X1, terminal D and ground.
 - If greater than the specified value, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the air suspension compressor assembly.
3. Ignition ON, verify that a test lamp illuminates between the compressor B+ circuit connector X1, terminal H and ground.
 - If the test lamp does not illuminate, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the air suspension compressor assembly.
4. Ignition ON, verify that a test lamp illuminates between the compressor IGN 3 circuit connector X1, terminal G and ground.
 - If the test lamp does not illuminate, test the IGN 3 circuit for a short to ground or an open/high resistance. If the circuit tests normal, test or replace the air suspension compressor assembly.
 - If the circuit tests normal, replace the air suspension compressor assembly.

Repair Procedures

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

- **Air Suspension Depressurization**
- **Air Spring Compressor Replacement**
- **Air Spring Sensor Calibration**

INFLATOR 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

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Air Suspension Compressor Assembly Battery Positive Voltage Circuit	1, 2, 4, and 6	1, 2, 4, and 6	-	-
Air Suspension Compressor				

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Assembly Ignition 3 Voltage Circuit	1, 2, 4, and 6	1, 2, 4, and 6	-	-
Air Suspension Compressor Assembly Ground Circuit	-	1, 2, 4, and 6	-	-
Air Suspension Inflator Switch Ground Circuit	-	4 and 6	-	-
Air Suspension Inflator Switch Indicator Control Circuit	4	4	3	-
Air Suspension Inflator Switch Signal Circuit	5	6	6	-
Left Rear Air Suspension Sensor Low Reference Circuit	-	DTC002	-	-
Left Rear Air Suspension Sensor Signal Circuit	DTC002	DTC002	DTC002	-
Right Rear Air Suspension Sensor Low Reference Circuit	-	DTC003	-	-
Right Rear Air Suspension Sensor Signal Circuit	DTC003	DTC003	DTC003	-
Vehicle Speed Signal Circuit	B0540	7	B0540	-
<ol style="list-style-type: none"> 1. Air Springs Do Not Deflate 2. Air Springs Do Not Inflate 3. Air Suspension Inflator Switch Indicator Always ON 4. Air Suspension Inflator Switch Indicator Inoperative 5. Inflator Always ON 6. Inflator Inoperative 7. Inflator Will Operate While Vehicle is in Motion 				

Circuit/System Description

The air suspension system has the feature to utilize the air compressor as a compressed air source. When the air suspension inflator switch is activated the compressor receives a ground signal requesting compressor activation. The compressor then applies voltage to the indicator control circuit illuminating the indicator. Upon compressor activation, supplied air pressure is then diverted from the air suspension to the air supply access port.

Reference Information

Schematic Reference

Air Suspension Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Air Suspension Description and Operation

Electrical Information Reference

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

Circuit/System Verification

Ignition ON, activate the air suspension inflator switch. The switch indicator should illuminate and the air compressor should activate supplying air pressure to the air accessory port.

Circuit/System Testing

1. Ignition OFF, disconnect the air suspension inflator switch harness connector X2 at the air suspension compressor assembly.
 - If the compressor continues to run, test or replace the air suspension compressor assembly.
 2. Test for less than 2.0 ohms between the ground circuit connector X2, terminal B and ground.
 - If greater than the specified value, test the air suspension compressor assembly ground circuit for an open/high resistance. If the circuit tests normal, replace the air suspension compressor assembly.
 3. Perform the air suspension inflator switch component test.
 - If the air suspension inflator switch fails the component test, replace the switch.
 4. Ignition ON, connect a fused jumper between terminal A at the air suspension compressor assembly and ground. Verify that the compressor operates.
 - If the compressor does not operate, test the IGN 3 and B+ circuits for an open/high resistance or short to ground. If all circuits test normal, test or replace the air suspension compressor assembly.
 5. Ignition ON and the fused jumper still connected, verify that a test lamp illuminates between the switch indicator control circuit terminal C and ground.
 - If the test lamp does not illuminate, test or replace the air suspension compressor assembly.
- If the test lamp illuminates, test the indicator control circuit for an open/high resistance, short to ground, or a short to voltage. If the circuit tests normal, replace the air suspension inflator switch.

Component Testing

Air Suspension Inflator Switch

1. Ignition OFF, disconnect the harness connector X2 at the air suspension compressor assembly.
2. Test for infinite resistance between the signal terminal A and the ground terminal B with the switch in the OFF position.

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- If not the specified value, replace the air suspension inflator switch.
- 3. Test for less than 2 ohms between the signal terminal A and the ground terminal B with the switch in the ON position.
 - If greater than the specified value, replace the air suspension inflator switch.

Repair Procedures

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

- **Inflator Air Switch Replacement**
- **Air Spring Compressor Replacement**
- **Air Spring Sensor Calibration**

TRIM HEIGHT UNEVEN OR LOW

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	Did you review the Air Suspension Description and Operation?	Go to Step 3	Go to <u>Air Suspension Description and Operation</u>
3	Perform a visual inspection checking for the following: <ul style="list-style-type: none"> • Disconnected or damaged air lines. • Disconnected or damaged air sensor link. • Disconnected or damaged electrical harness. Did you find and correct the condition?	Go to Step 10	Go to Step 4
4	Cycle the rear compartment inflator switch. Does the compressor operate?	Go to Step 5	Go to <u>Inflator Malfunction</u>
5	Check the vehicle D-height. Refer to <u>Trim Height Specifications</u> and <u>Trim Height Inspection</u> . Are the measurements within the specified values?	Go to Step 6	Go to Step 7
6	Perform the air suspension air leak diagnosis. Refer to <u>Air Suspension Air Leak Diagnosis</u> . Did you find and correct the condition?	Go to Step 10	System OK
7	Recalibrate the air suspension level sensors. Refer to <u>Air Spring Sensor Calibration</u> . Did you find and correct the condition?	Go to Step 10	Go to Step 8
8	Replace the air spring sensor. Refer to <u>Air Spring Leveling Sensor Replacement</u> .		

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	Did you find and correct the condition?	Go to Step 10	Go to Step 9
9	<ol style="list-style-type: none">1. Subtract the Service Preferred Trim Height specification from the value obtained in step 14 of the Air Spring Leveling Sensor replacement procedure.2. Add the value to the Service Preferred Trim Height specification. This is the adjusted D-Height measurement.3. Repeat the Air Spring Calibration procedure using this value in place of the D-Height specification in step 7 of the Air Spring Calibration procedure.		
	Did you find and correct the condition?	Go to Step 10	-
10	Operate the system in order to verify the repair. Did you correct the condition?	System OK	-

REPAIR INSTRUCTIONS

AIR SPRING SENSOR CALIBRATION

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the rear tire and wheels. Refer to **Tire and Wheel Removal and Installation** .
3. Lower the vehicle with the rear axle supported by the jackstands.

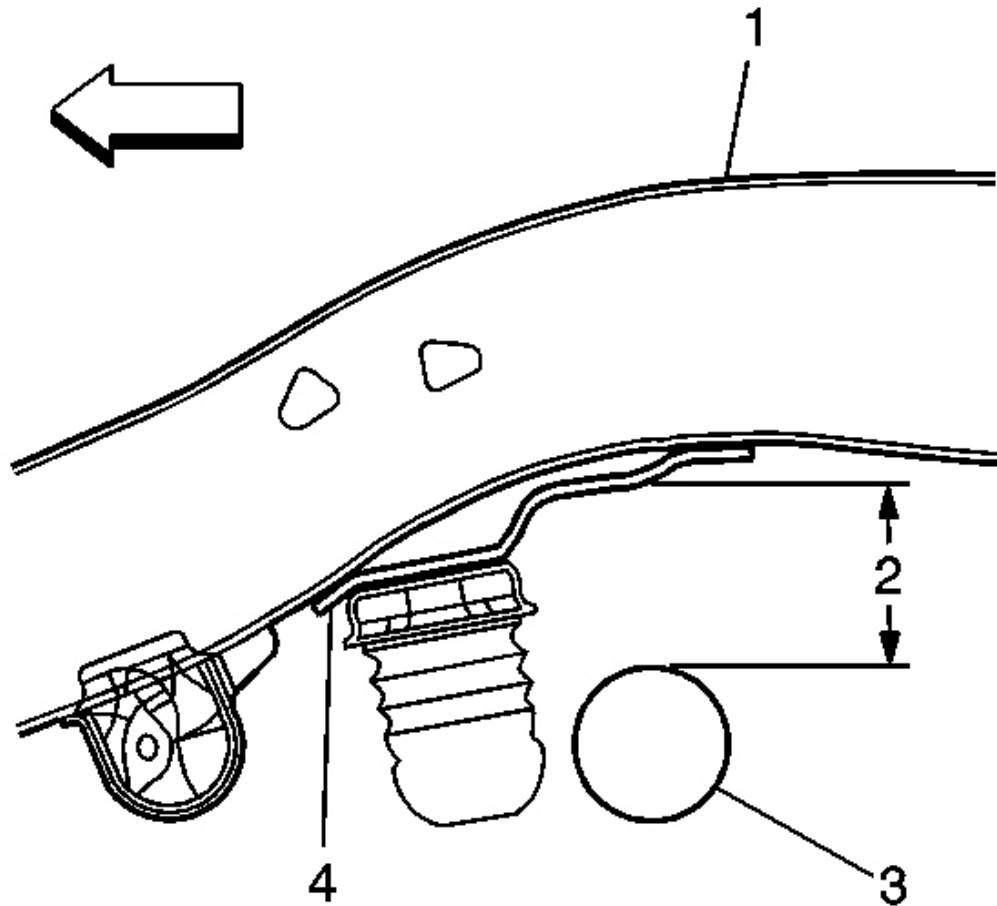


Fig. 2: Measuring Rear Ride Height (D Height)
Courtesy of GENERAL MOTORS CORP.

4. Raise or lower the vehicle until the D-height measurement is 25 mm (1 in) above the published D-height specification, 135 mm (5.33 in) for the Trailblazer SS or 160 mm (6.33 in) for all other vehicles.
5. Turn the ignition key to the ON position. This will partially deflate the air spring.
6. After two minutes, turn the ignition key to the OFF position and remove the air suspension fuse. Refer to **Electrical Center Identification Views** .

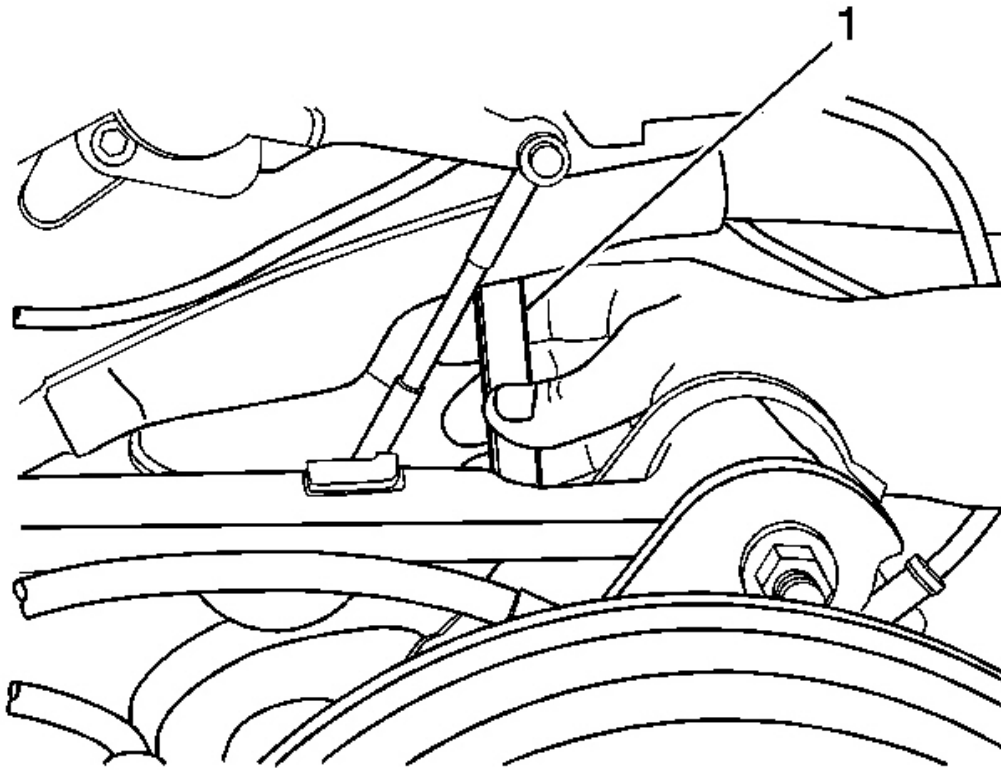


Fig. 3: View Of D-Height Gage Block
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: A D-height gage block (1) can be used to determine the D-height position. Create a D-height gage block using metal stock to 20 mm X 30 mm X the published D-height specification, (110 mm (4.33 in) for the Trailblazer SS or 135 mm (5.33 in) for all other vehicles). Use the block (1) as a measuring device only.

7. Raise or lower the vehicle so that the left side D-height is at a published specification, (110 mm (4.33 in) for the Trailblazer SS or 135 mm (5.33 in) for all other vehicles).

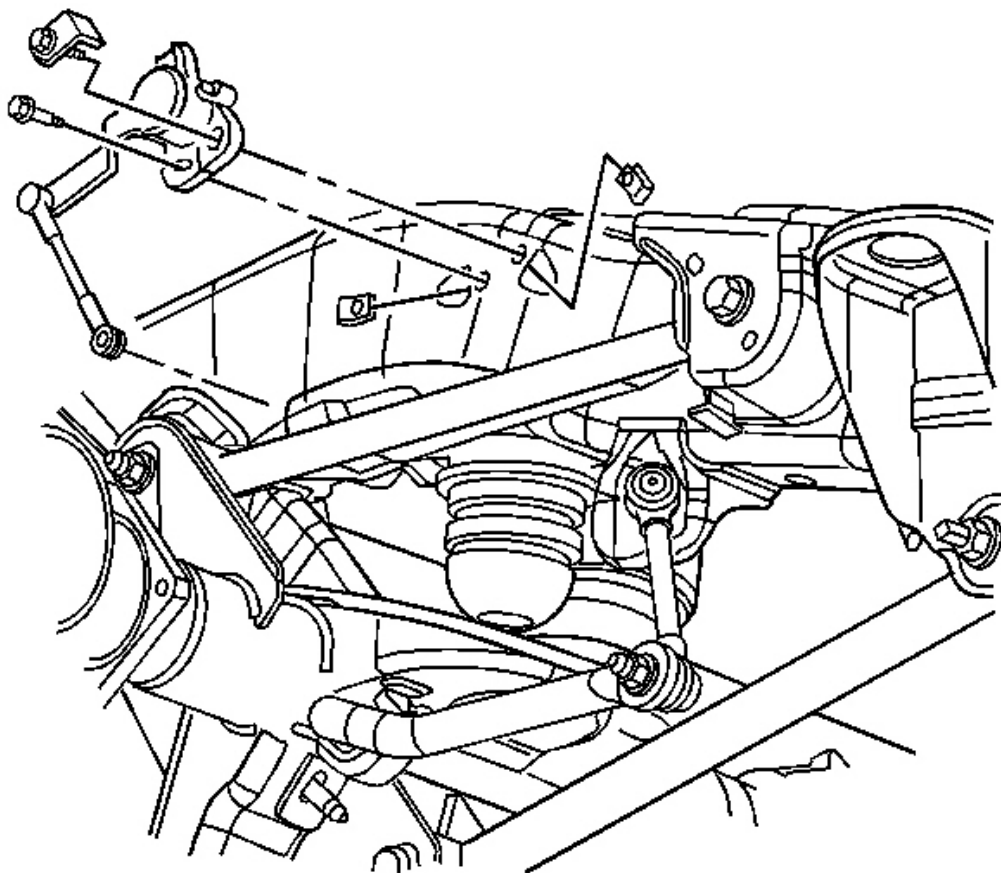


Fig. 4: View Of Air Spring Level Sensor
Courtesy of GENERAL MOTORS CORP.

8. Loosen the air spring level sensor to the frame mounting bolts.

IMPORTANT: If not equipped, use a new anti-rotation bolt (P/N 11569736).

9. Loosely install the sensor mounting bolts with the anti-rotation bolt in the right hand mounting hole.

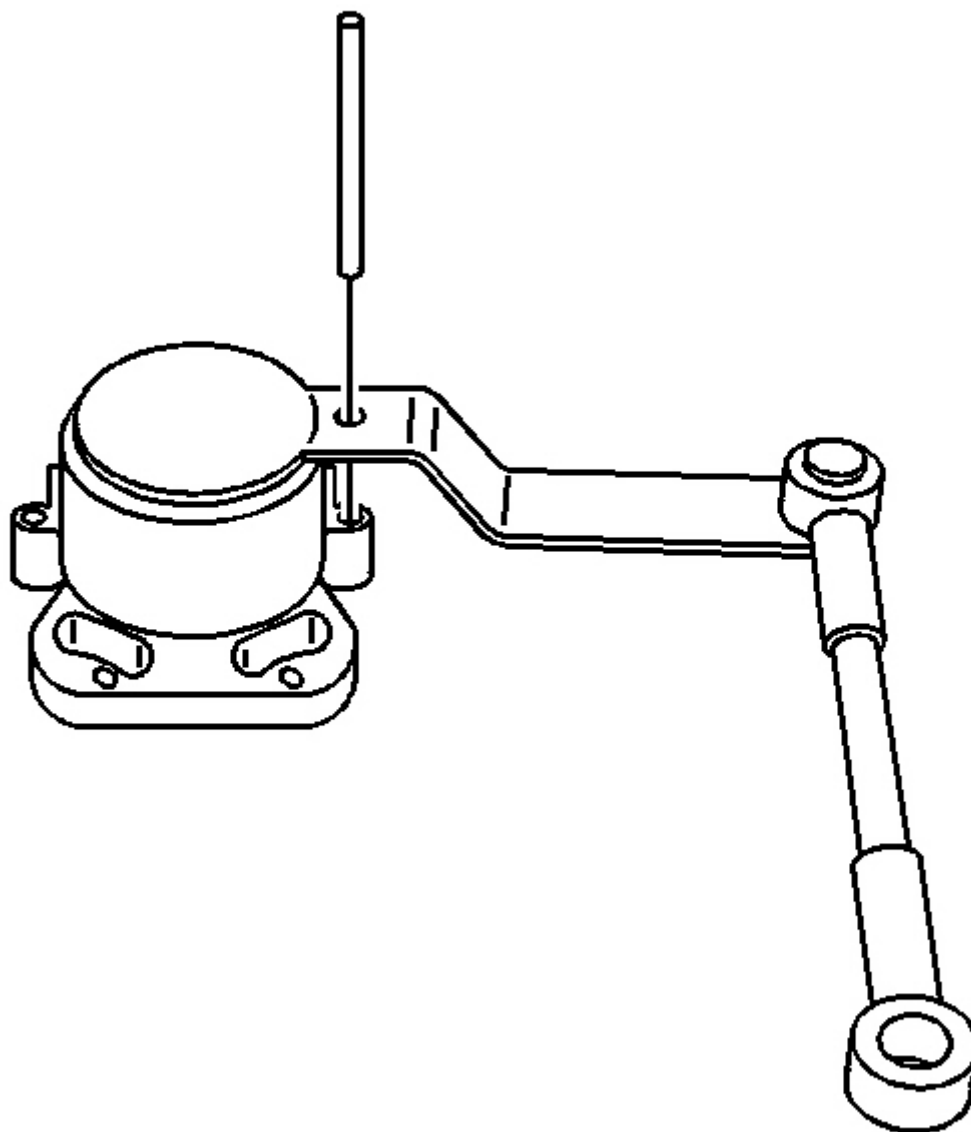


Fig. 5: View Of Air Spring Level Sensor Locating Pin
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: Do not remove the air spring level sensor locating pin until the air spring level sensor has been properly mounted and aligned.

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10. Install the air spring sensor level locating pin.

A 4 mm drill bit or equivalent can be substituted.

Tighten:

1. While holding the body of the sensor, tighten the anti-rotation bolt first.
 2. Tighten the air spring level sensor frame mounting bolts to 8 N.m (71 lb in).
11. Verify the pin can be removed and installed with ease to ensure the correct sensor installation. If the pin cannot be inserted with ease, loosen the sensor fasteners, adjust the sensor, and retighten the sensor fasteners until the pin can be removed and installed with ease.
 12. Remove the air spring level sensor locating pin.
 13. Perform the sensor calibration for the right side, beginning with step 7.
 14. Raise the vehicle off the jackstands and remove the jackstands from under the vehicle.
 15. Install the rear tires and wheels. Refer to **Tire and Wheel Removal and Installation** .
 16. Lower the vehicle.
 17. Install the air suspension fuse.
 18. Turn the ignition key to the ON position to inflate the rear air springs.
 19. After two minutes, turn the ignition key to the OFF position.
 20. Recycle the ignition, if needed.
 21. Verify and record the D-height. Refer to **Trim Height Specifications** .

AIR SUSPENSION DEPRESSURIZATION

Removal Procedure

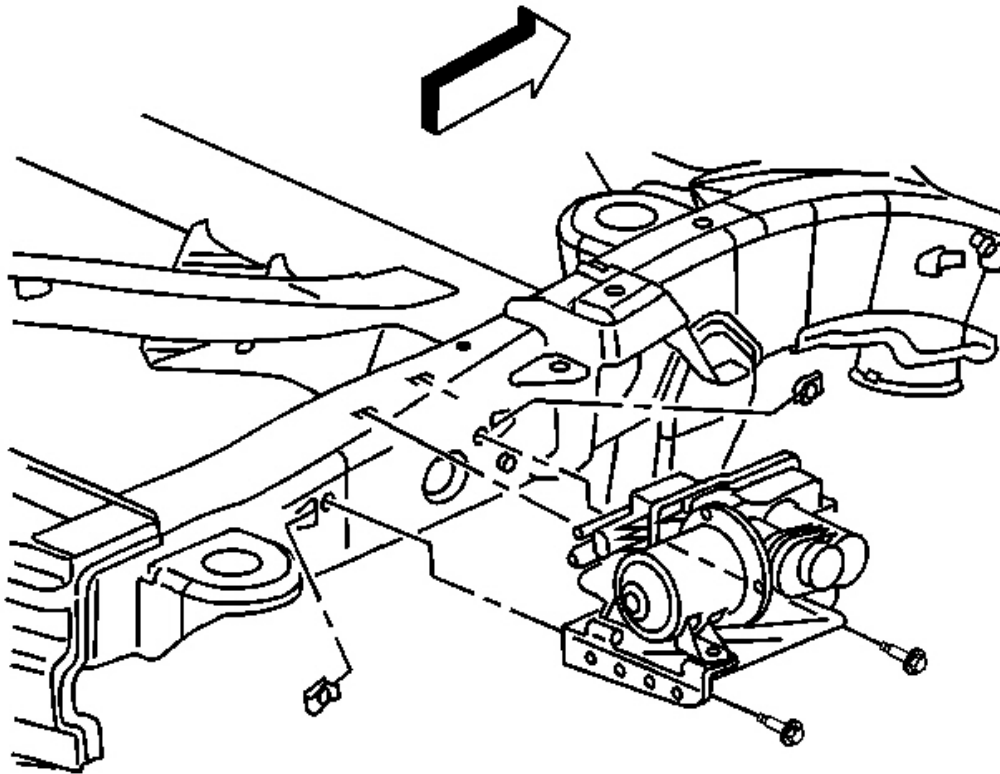


Fig. 6: Identifying Air Compressor & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

CAUTION: A sudden release of pressure may cause personal injury or damage to the vehicle. The air suspension system is under pressure until the air supply lines are disconnected. Use the following precautions when servicing the air suspension system:

- Wear gloves, ear protection, and eye protection.
- Wrap a clean cloth around the air supply lines.

NOTE: Depressurize the air suspension system only after the rear axle is supported and is set between D- Height and Full Jounce.

IMPORTANT: Remove the air suspension system fuse before working on the rear suspension components or the rear axle. Failure to remove the air suspension system fuse could cause the calibration of the air suspension

leveling sensor to change and the air suspension system not to function properly.

1. Remove the air suspension system fuse.
2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Raise and support the rear axle at the designed D-height. Refer to **Trim Height Specifications** .
4. Remove the air compressor mounting bolts from the frame and support air compressor.
5. Loosen both of the air supply line connections at the air compressor in order to depressurize the air springs.

Installation Procedure

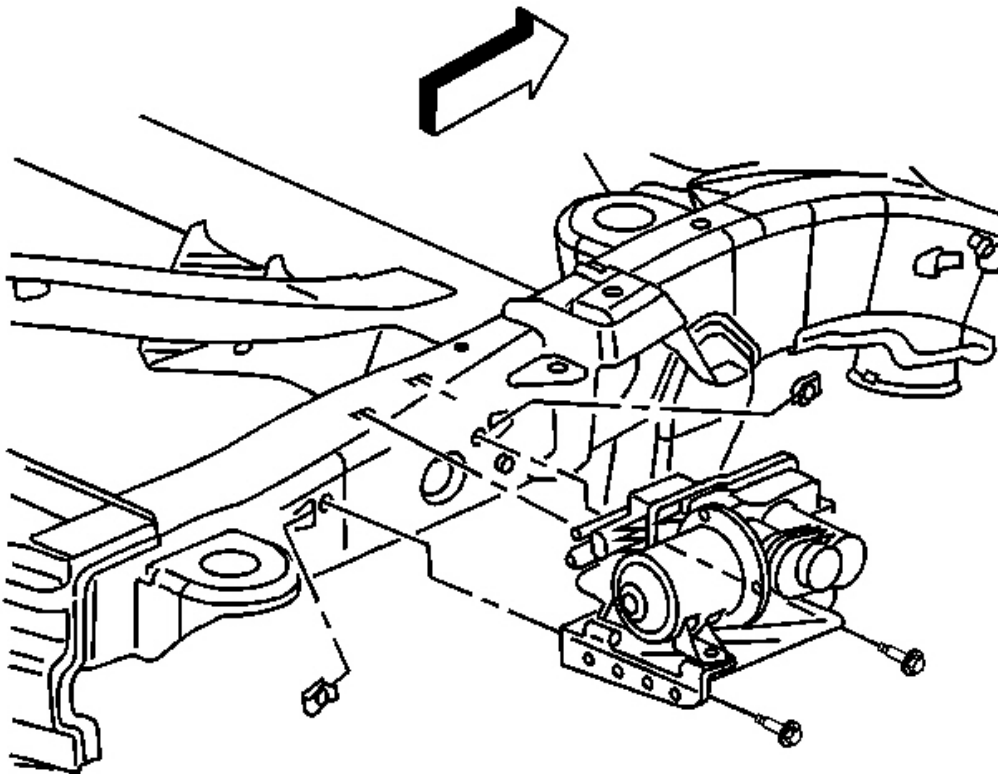


Fig. 7: Identifying Air Compressor & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **Fastener Notice** .

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IMPORTANT: Check the air supply lines for deep scores or cuts. If the air supply lines are damaged, the lines must be replaced. Refer to [Air Suspension Air Line Replacement](#).

1. Tighten the air supply lines to the air compressor. Do not over tighten.

Tighten: Tighten the air supply lines to the air compressor to 2.25 N.m (20 lb in).

2. Install the air compressor to frame mounting bolts.

Tighten: Tighten the air compressor mounting bolts to the frame to 20 N.m (15 lb ft).

AIR SPRING LEVELING SENSOR REPLACEMENT

Removal Procedure

CAUTION: A sudden release of pressure may cause personal injury or damage to the vehicle. The air suspension is under pressure until the air supply lines are disconnected.

IMPORTANT: Use the following precautions when servicing the air suspension system:

- Wear gloves, ear protection, eye protection.
- Wrap a clean cloth around the air supply lines

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the rear wheels. Refer to [Tire and Wheel Removal and Installation](#) .
3. Lower the vehicle with the rear axle supported by jackstands.

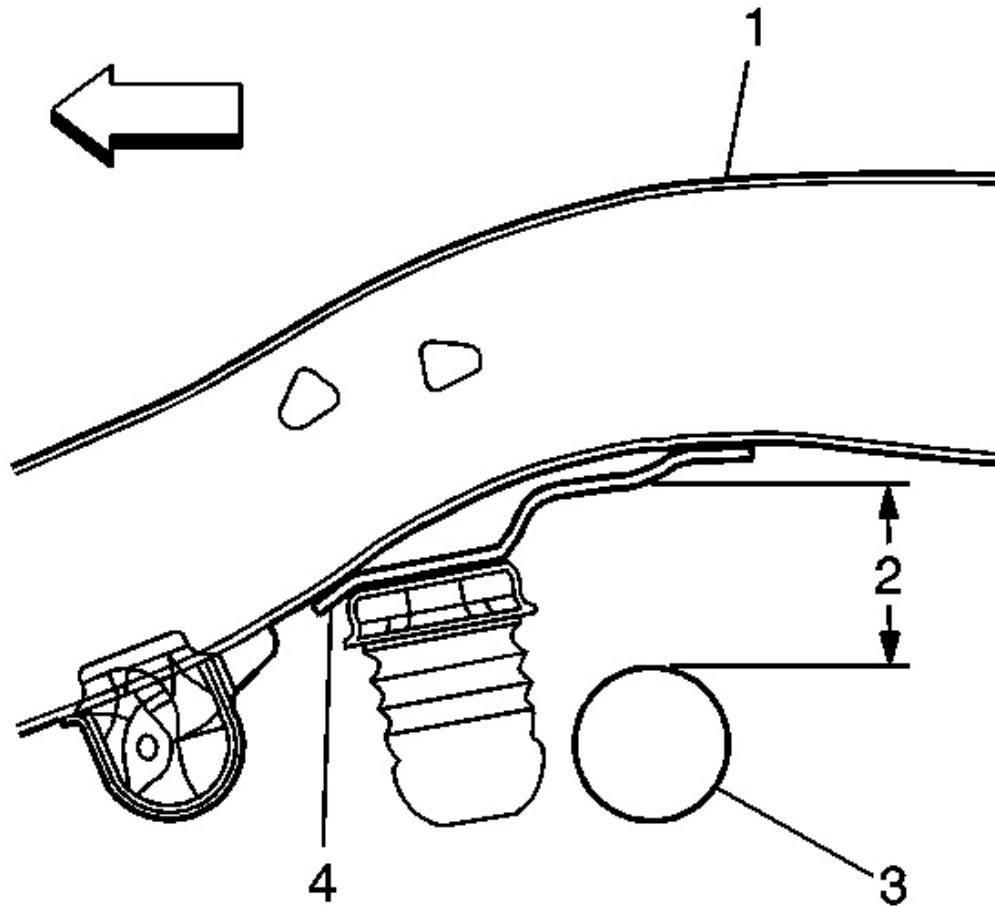


Fig. 8: Measuring Rear Ride Height (D Height)
Courtesy of GENERAL MOTORS CORP.

4. Raise or lower the vehicle until the D-height measurement is 25 mm (1 in) above the published D-height specification, 135 mm (5.33 in) for Trailblazer SS or 160 mm (6.33 in) for all other vehicles.
5. Turn the ignition key to the ON position. This will partially deflate the air spring.
6. After two minutes, turn the ignition key to the OFF position and remove the air suspension fuse. Refer to **Electrical Center Identification Views** .

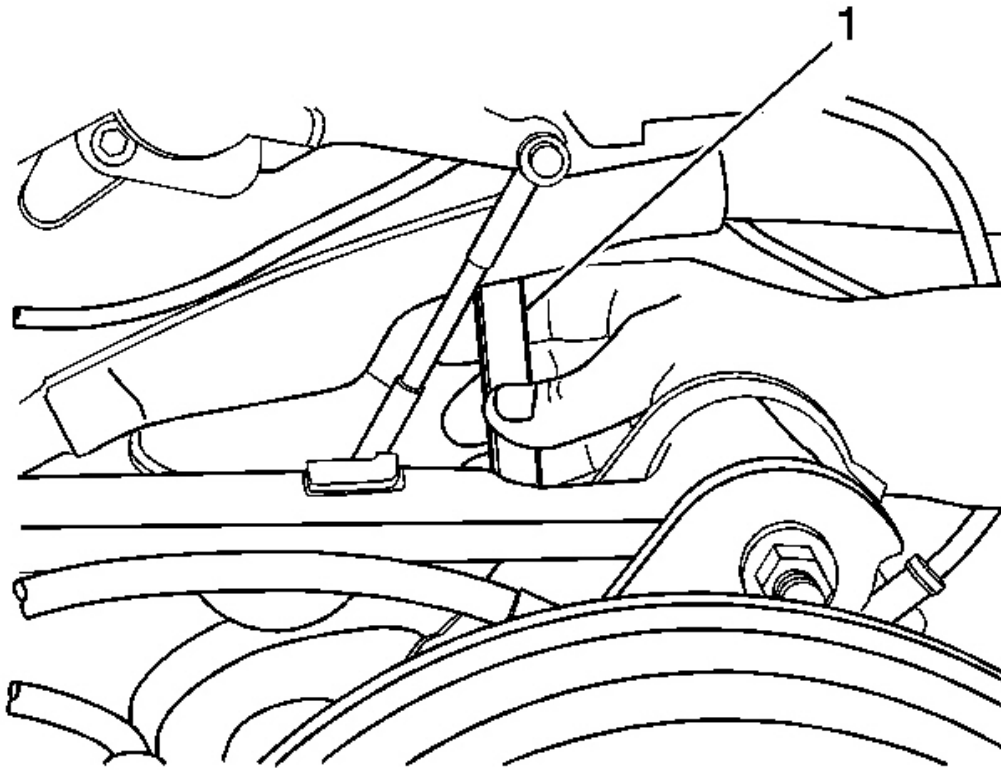


Fig. 9: View Of D-Height Gage Block
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: A D-height gage block (1) can be used to determine the D-height position. Create a D-height gage block using metal stock cut to 20 mm X 30 mm X the published D-height specification 110 mm (4.33 in) for Trailblazer SS and 135 mm (5.33 in) for all other vehicles. Use the block (1) as a measuring device only.

7. Raise or lower the vehicle so that the D-height is at published specification 110 mm (4.33 in) for Trailblazer SS or 135 mm (5.33 in) for all other vehicles.

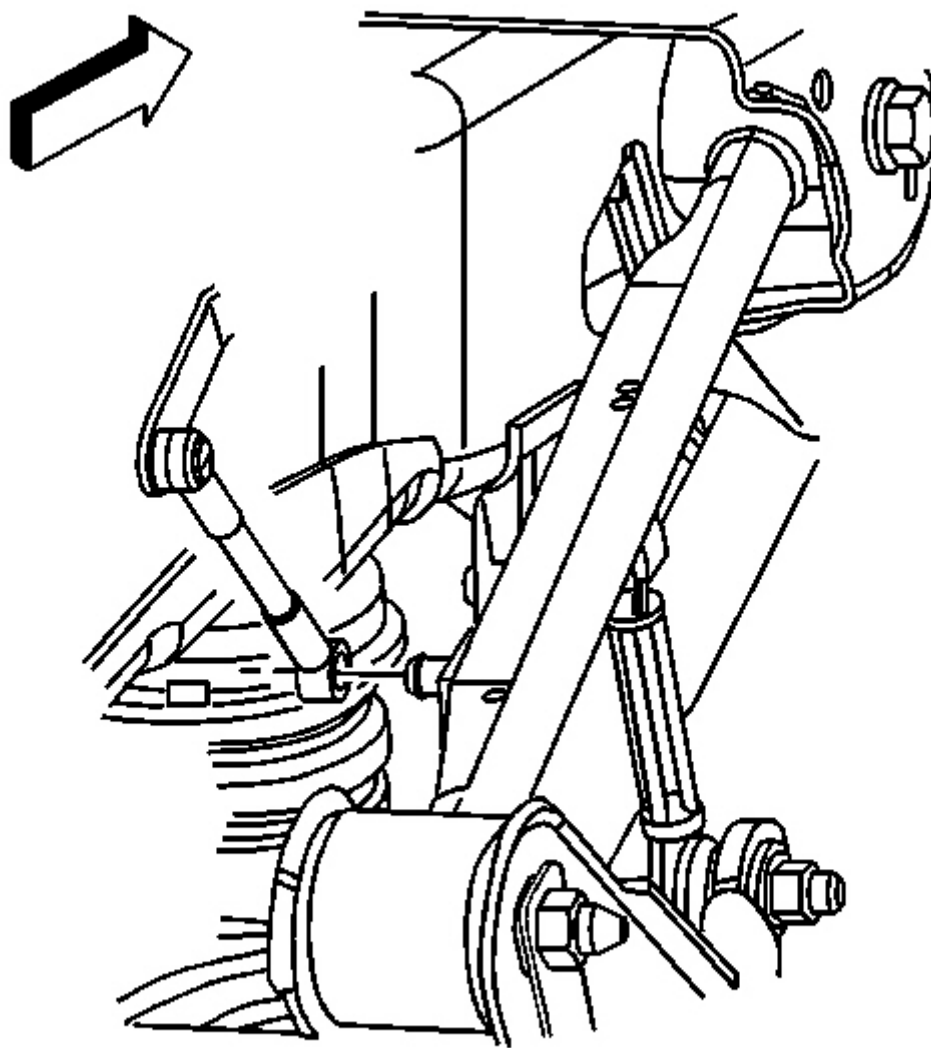


Fig. 10: View Of Rear Axle Upper Control Arm
Courtesy of GENERAL MOTORS CORP.

8. Disconnect the air spring level sensor link from the upper control arm.

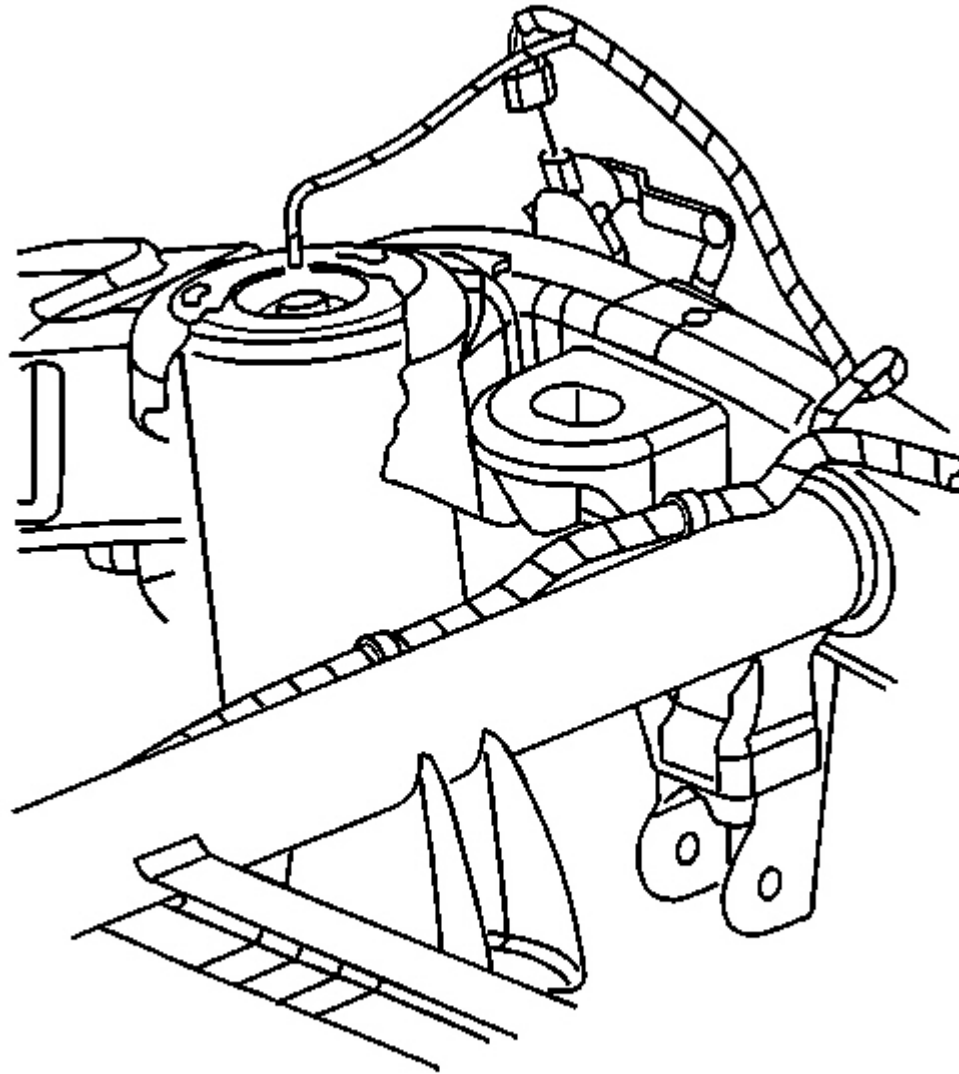


Fig. 11: View Of Air Spring Level Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

9. Disconnect the air spring level sensor electrical connector.

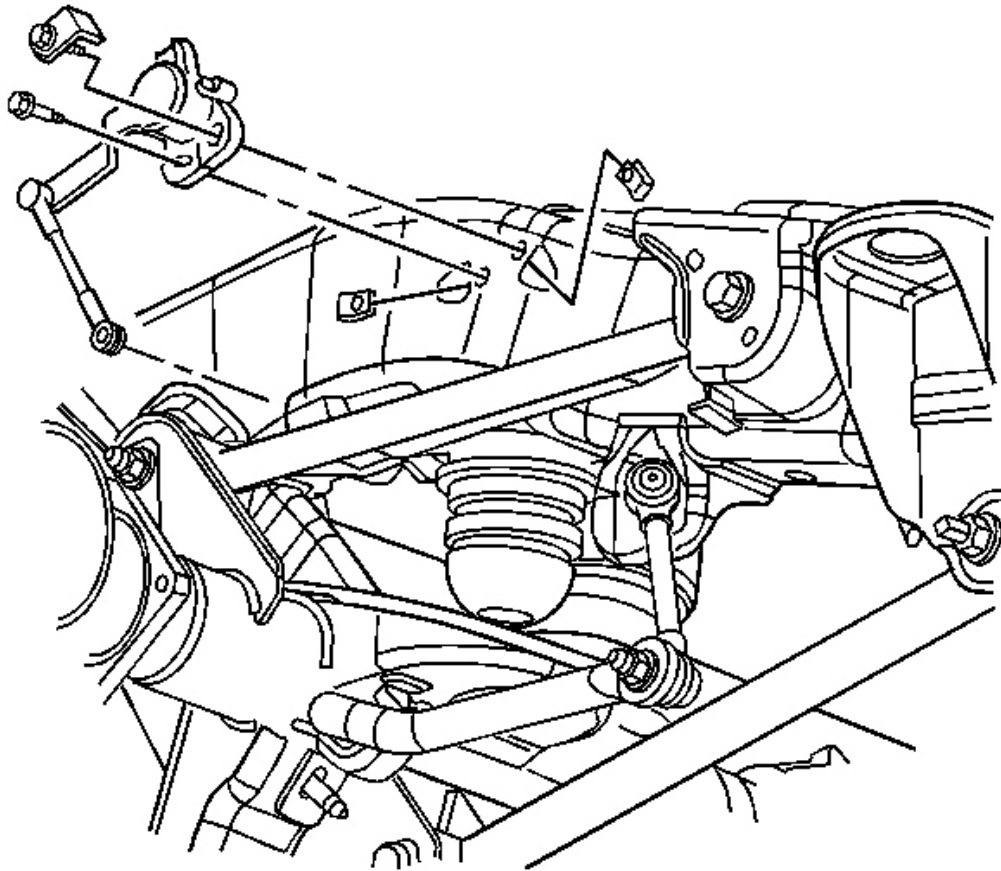


Fig. 12: View Of Air Spring Level Sensor
Courtesy of GENERAL MOTORS CORP.

10. Remove the air spring level sensor-to-frame mounting bolts.
11. Remove the air spring level sensor from the vehicle.

Installation Procedure

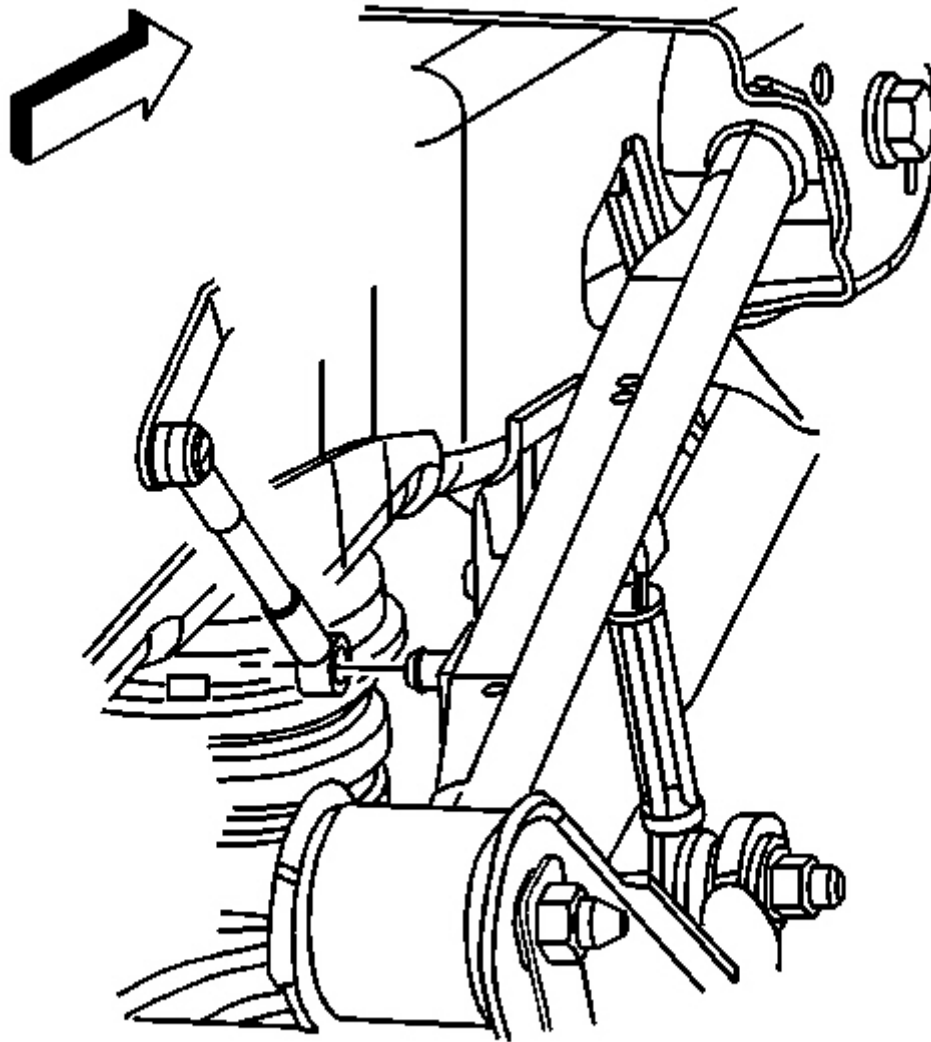


Fig. 13: View Of Rear Axle Upper Control Arm
Courtesy of GENERAL MOTORS CORP.

1. Install the air spring level sensor link to the upper control arm.

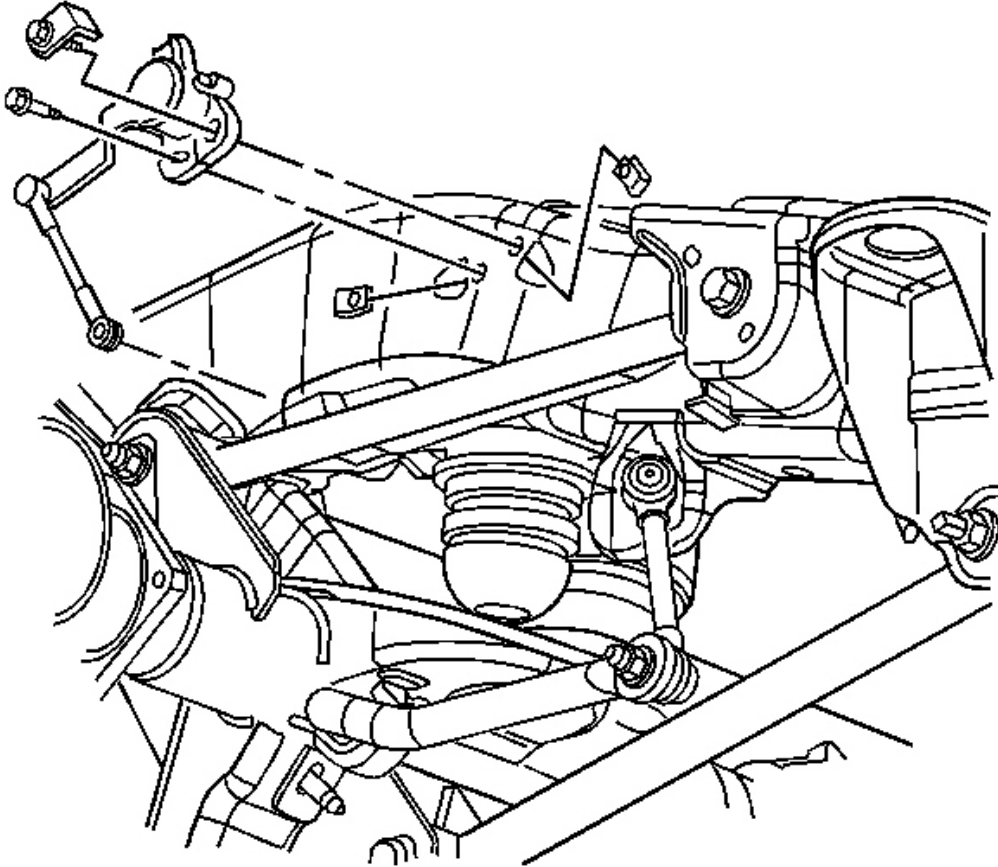


Fig. 14: View Of Air Spring Level Sensor
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If not equipped, use a **NEW** anti-rotation bolt P/N 11569736.

2. Loosely install sensor mounting bolts with the anti-rotation bolt in the right hand mounting hole.

NOTE: Refer to **Fastener Notice** .

IMPORTANT: Do not remove the air spring level sensor locating pin until the air spring level sensor has been properly mounted and aligned.

3. While holding the body of the sensor, tighten the anti-rotation bolt first.

Tighten: Tighten the air spring level sensor frame mounting bolts to 8 N.m (71 lb in).

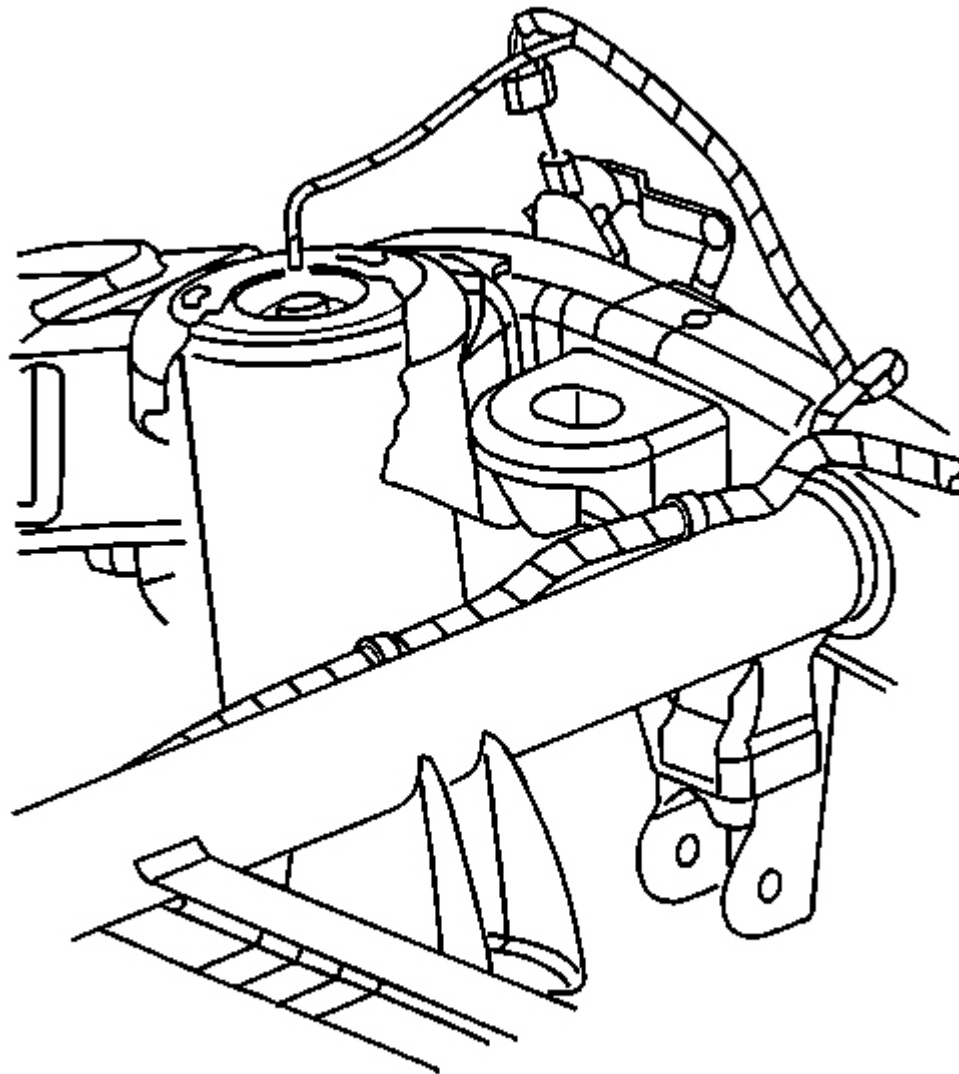


Fig. 15: View Of Air Spring Level Sensor Electrical Connector
Courtesy of GENERAL MOTORS CORP.

4. Connect the air spring level sensor electrical connector.

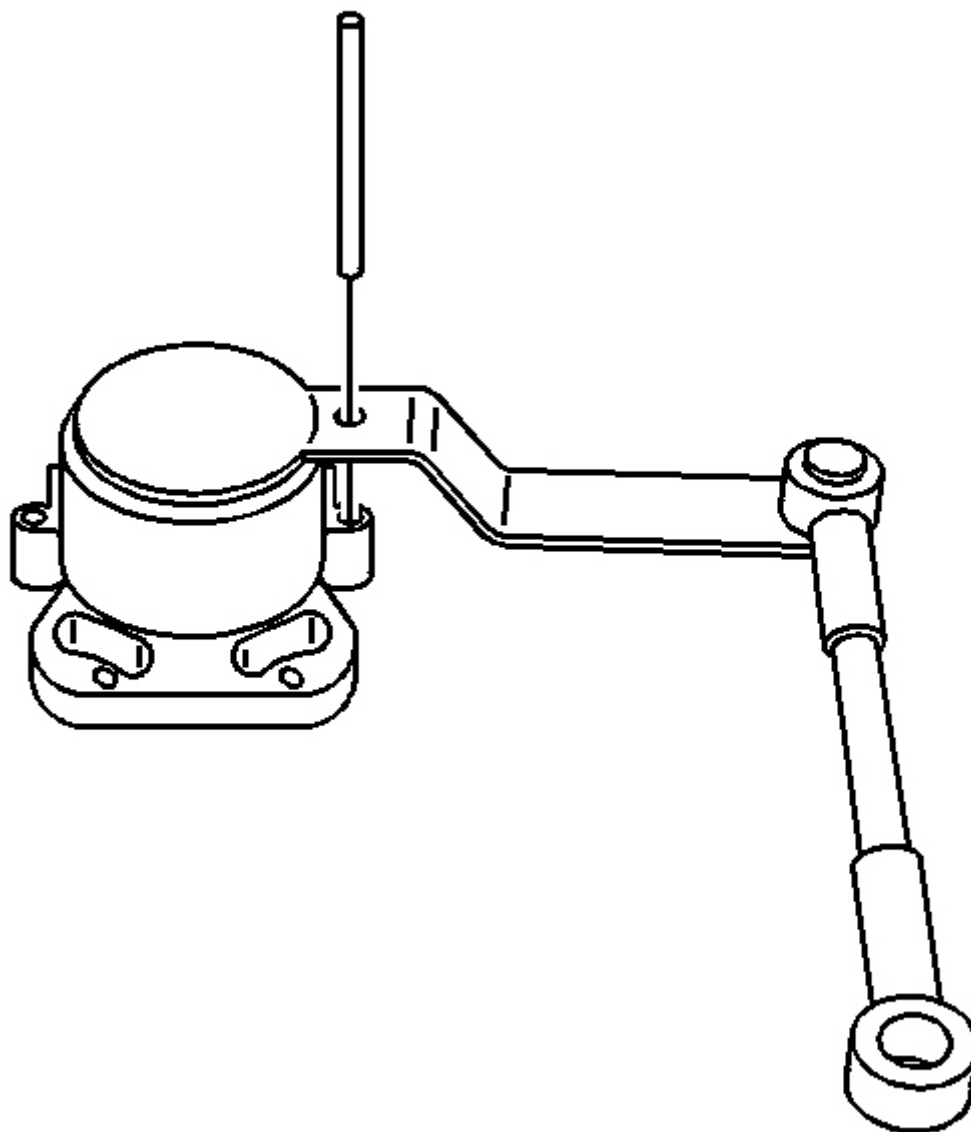


Fig. 16: View Of Air Spring Level Sensor Locating Pin
Courtesy of GENERAL MOTORS CORP.

5. Verify the pin can be removed and installed with ease to ensure the correct sensor installation.

If the pin cannot be inserted with ease, loosen the sensor fasteners, adjust the sensor, and retighten the sensor fasteners so that the pin can be removed and installed with ease.

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NOTE: **Failure to remove the air suspension auto level control sensor locating pin will cause damage to the air suspension auto level control sensor.**

6. Remove the air spring level sensor locating pin.
7. Raise the vehicle off the jackstands and remove the jackstands from under the vehicle.
8. Install the rear wheels. Refer to **Tire and Wheel Removal and Installation** .
9. Lower the vehicle.
10. Install the air suspension fuse.
11. Turn the ignition key to the ON position to inflate the rear air springs.
12. After two minutes, turn the ignition key to the OFF position.
13. Recycle the ignition, if needed.
14. Verify and record the D-height. Refer to **Trim Height Specifications** .

AIR SPRING COMPRESSOR REPLACEMENT

Removal Procedure

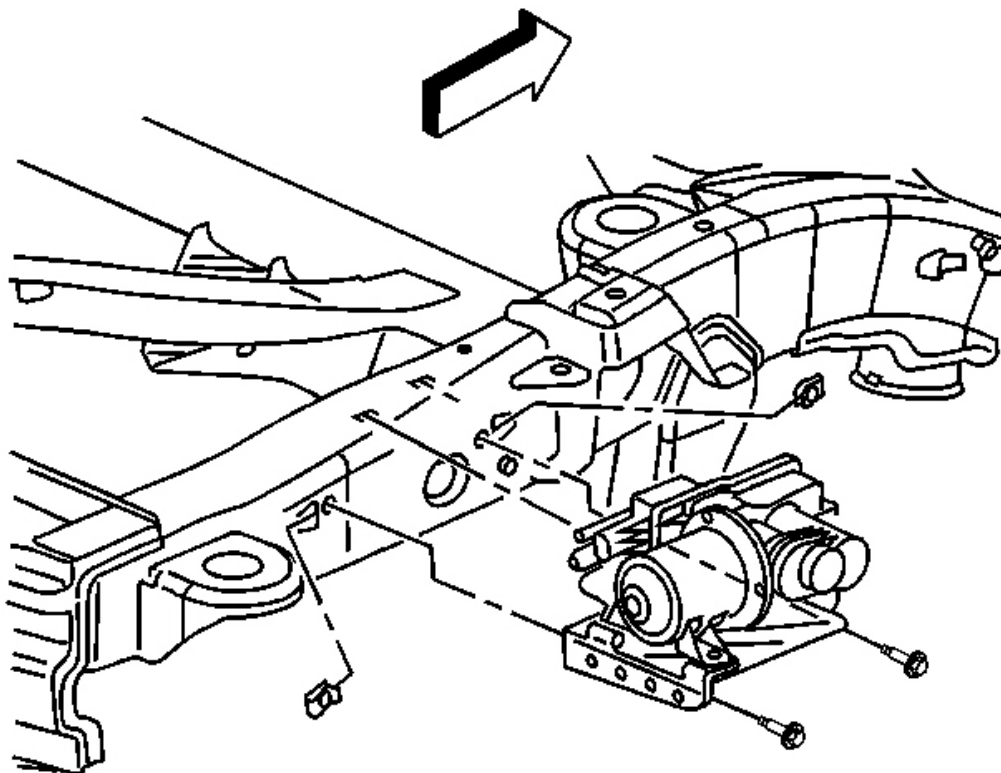


Fig. 17: Identifying Air Compressor & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

CAUTION: A sudden release of pressure may cause personal injury or damage to the vehicle. The air suspension system is under pressure until the air supply lines are disconnected. Use the following precautions when servicing the air suspension system:

- Wear gloves, ear protection, and eye protection.
- Wrap a clean cloth around the air supply lines.

NOTE: Depressurize the air suspension system only after the rear axle is supported and is set between D- Height and Full Jounce.

IMPORTANT: Remove the air suspension system fuse before working on the rear suspension components or the rear axle. Failure to remove the air suspension system fuse could cause the calibration of the air suspension

leveling sensor to change and the air suspension system not to function properly.

1. Remove the air suspension system fuse.
2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Remove the air spring compressor to the frame mounting bolts.

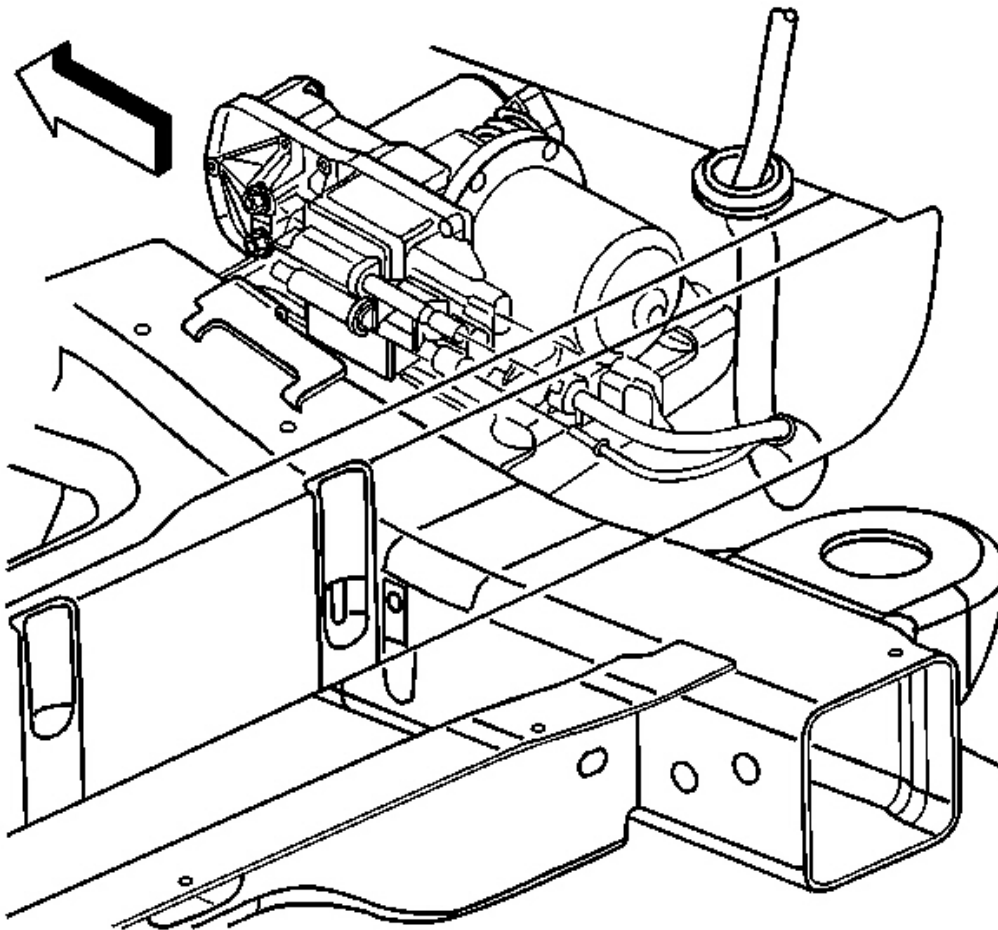


Fig. 18: Locating Air Spring Compressor
Courtesy of GENERAL MOTORS CORP.

4. Disconnect the air inflator switch electrical connection, air supply lines, and air spring compressor vent hose from the air spring compressor.

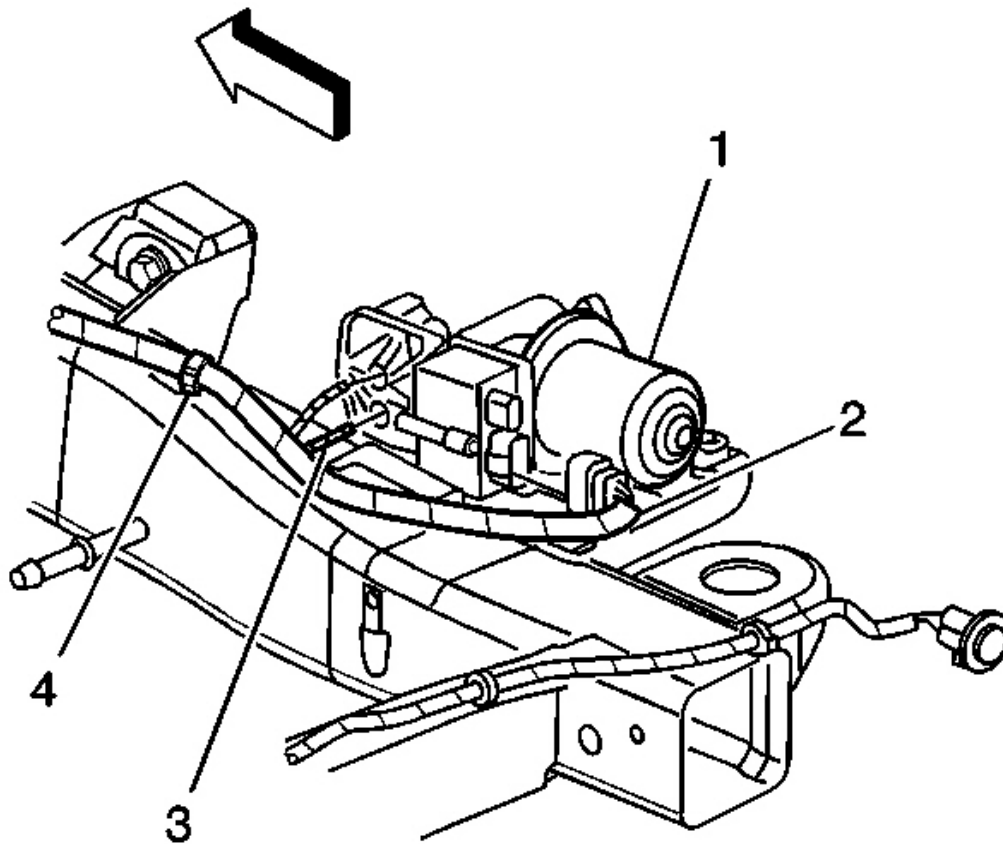


Fig. 19: View Of Air Spring Compressor Components
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the air spring compressor electrical connection (2).

IMPORTANT: Ensure the color on air supply lines match the color on the air spring compressor for reassembly.

6. Disconnect the air supply lines (3) from the air spring compressor (1).
7. Remove the air spring compressor from the vehicle.

Installation Procedure

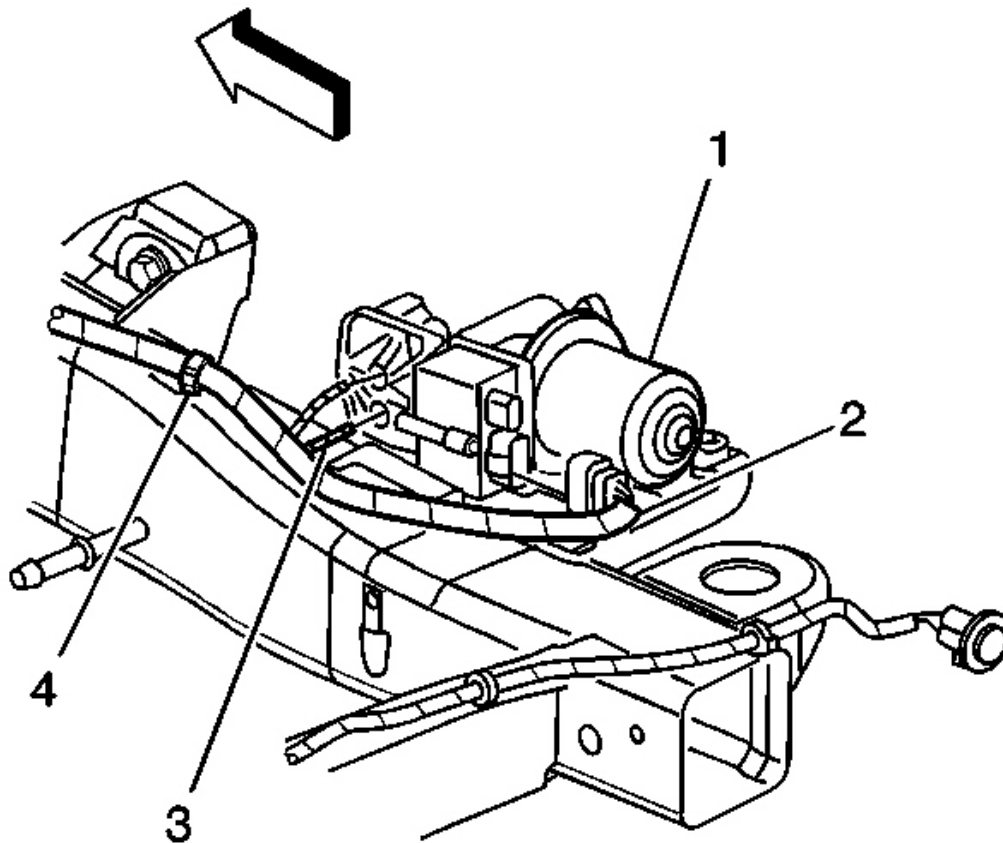


Fig. 20: View Of Air Spring Compressor Components
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT:

- Inspect the air supply lines for deep scores or cuts. If the air supply lines are damaged, the lines must be replaced.
- Ensure the color on the air supply lines match the color on the air spring compressor for reassembly.

1. If no damage to the air supply pipes is evident, then remove the fittings from the new compressor and use existing fittings that are already attached to air supply lines. Install the air supply lines with existing fittings to the air spring compressor.

Tighten: Tighten the air supply line fittings to 2.25 N.m (20 lb in).

2. If damage is evident to the air supply lines, then replace the air supply lines. Refer to **Air Suspension Air Line Replacement**.
3. Connect the air spring compressor electrical connection (2).

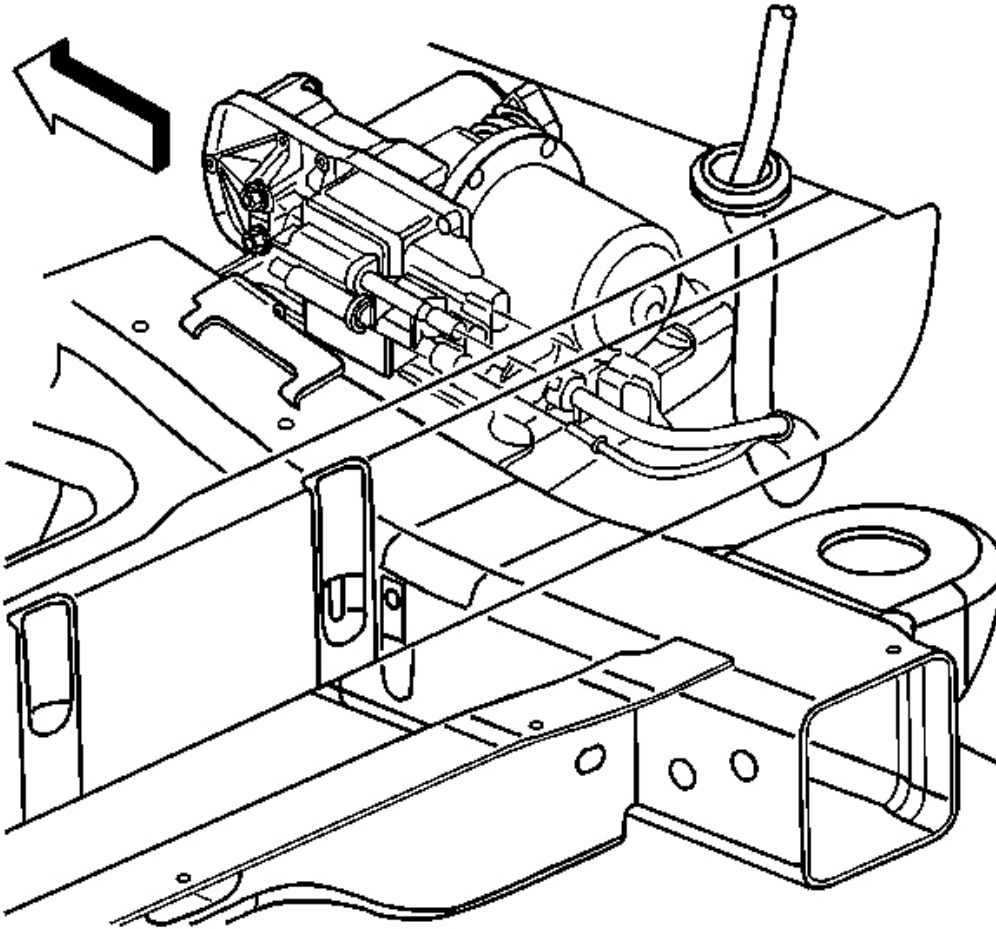


Fig. 21: Locating Air Spring Compressor
Courtesy of GENERAL MOTORS CORP.

4. Connect the air inflator switch electrical connection, air supply line, and air spring compressor vent hose to the air spring compressor.

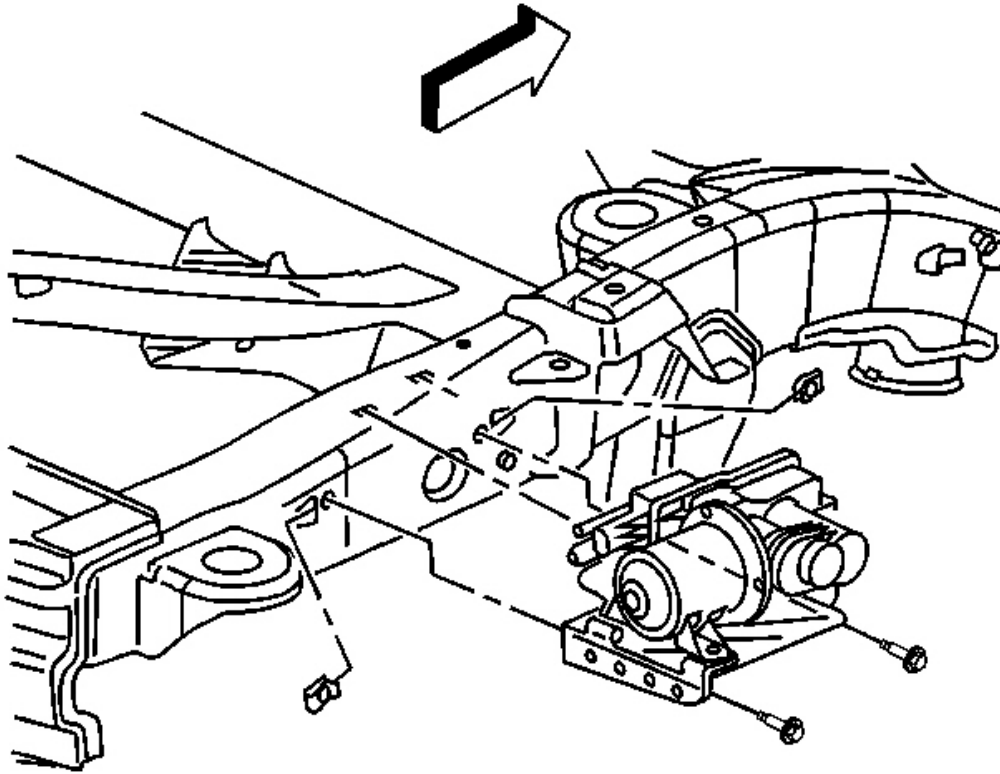


Fig. 22: Identifying Air Compressor & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

5. Install the air spring compressor to the frame mounting bolts.

Tighten: Tighten the bolts to 20 N.m (15 lb ft).

6. Lower the vehicle.
7. Install the air suspension system fuse.
8. Start the vehicle and run for approximately 1 minute to ensure that the air spring leveling system is functioning properly.
9. Inspect D-height. Refer to **Trim Height Inspection** .
10. Inspect for leaks. If a leak is found at the air supply lines connections at the air spring compressor, replace the air supply lines. Refer to **Air Suspension Air Line Replacement**.

INFLATOR AIR SWITCH REPLACEMENT

Removal Procedure

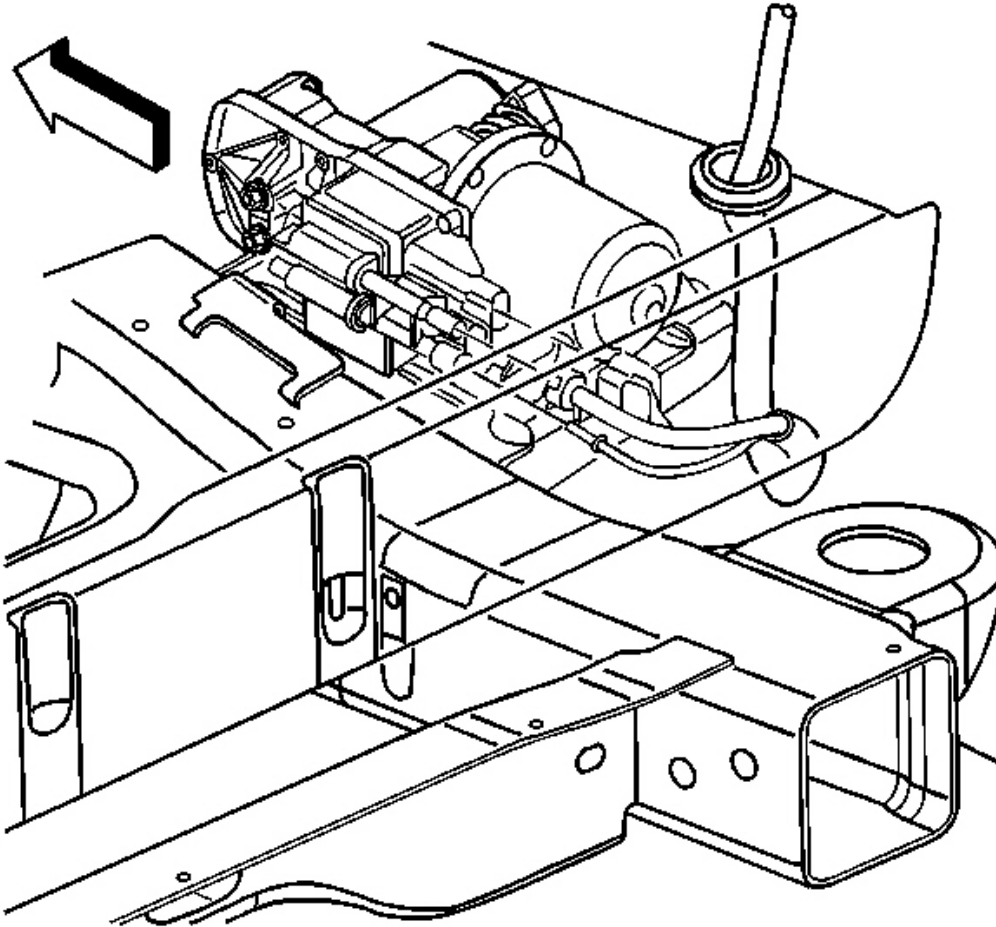


Fig. 23: Locating Air Spring Compressor
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Disconnect the inflator air switch harness from the air compressor.
3. Lower the vehicle.
4. Remove the rear quarter lower trim panel. Refer to **Rear Quarter Trim Panel Replacement - Left Side** or to **Rear Quarter Trim Panel Replacement - Right Side** .
5. Remove the inflator air switch from the vehicle.

Installation Procedure

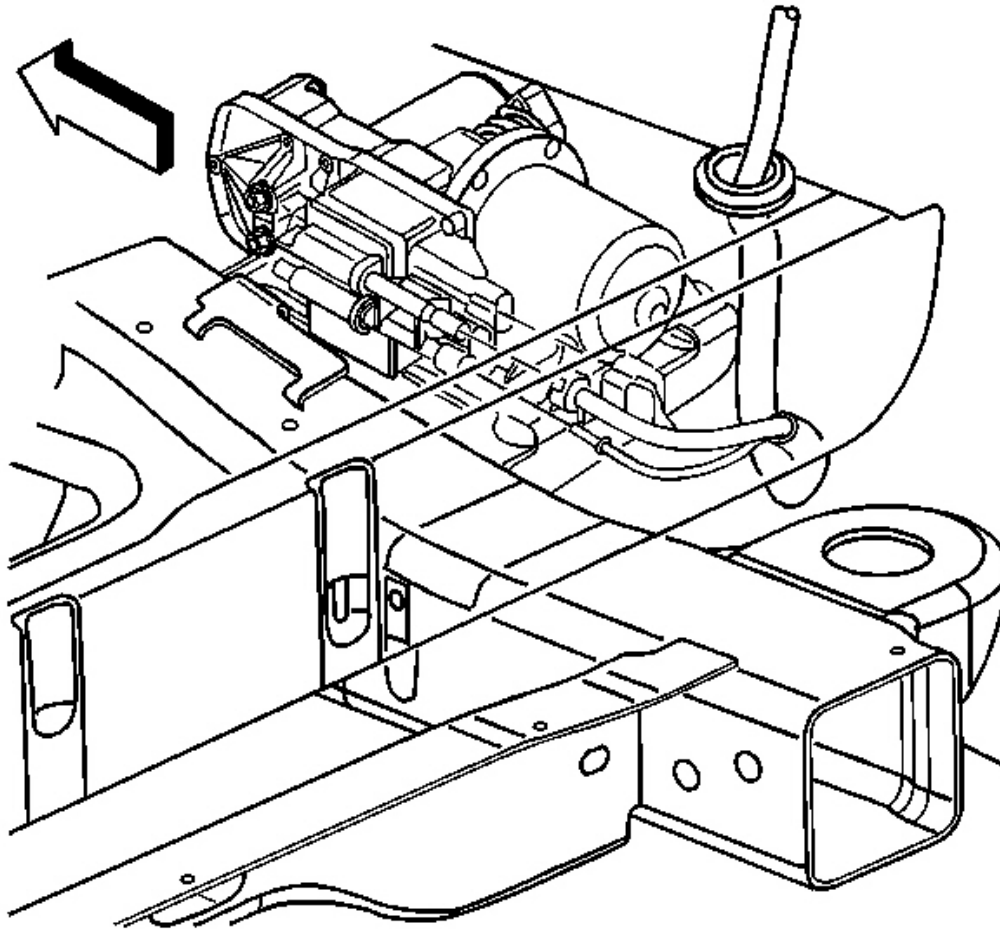


Fig. 24: Locating Air Spring Compressor
Courtesy of GENERAL MOTORS CORP.

1. Install the inflator air switch to the vehicle.
2. Install the rear quarter lower trim panel. Refer to **Rear Quarter Trim Panel Replacement - Left Side** or to **Rear Quarter Trim Panel Replacement - Right Side** .
3. Raise the vehicle.
4. Connect the inflator air switch harness to the air compressor.
5. Lower the vehicle.

AIR SPRING REPLACEMENT

Removal Procedure

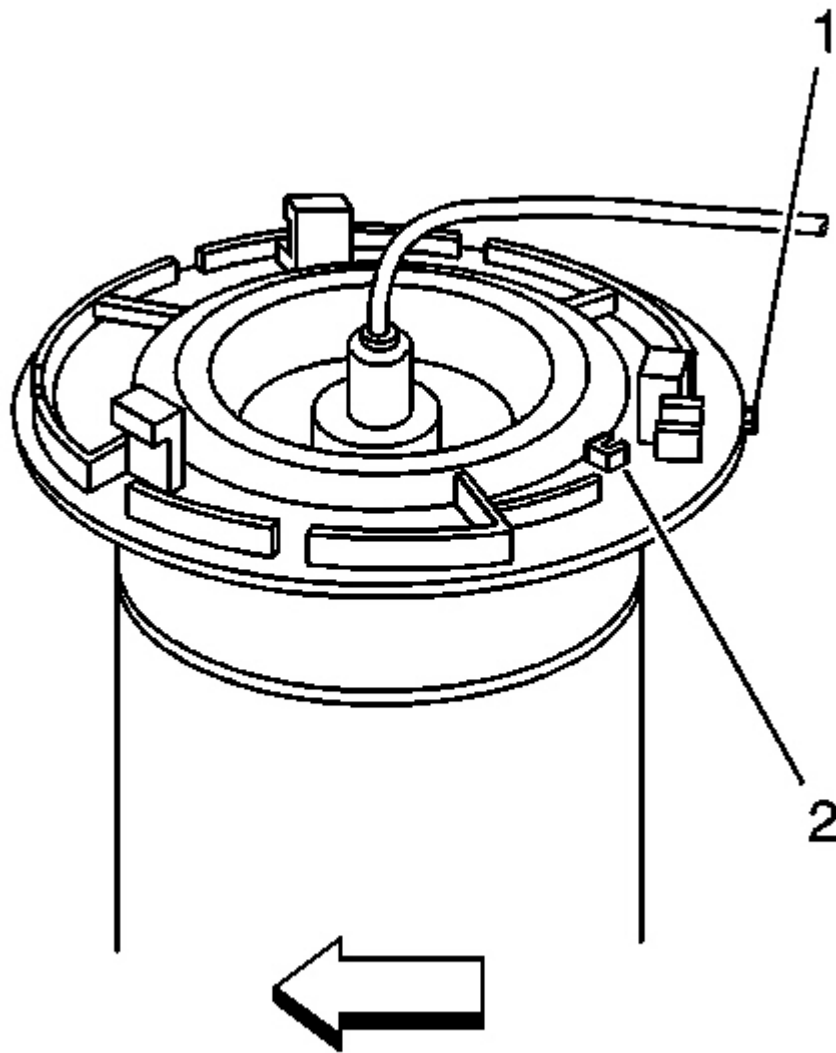


Fig. 25: Locating Anti-rotation Peg In Air Spring Top Plate
Courtesy of GENERAL MOTORS CORP.

CAUTION: A sudden release of pressure may cause personal injury or damage to the vehicle. The air suspension system is under pressure until the air supply lines are disconnected. Use the following precautions when servicing the air suspension system:

- Wear gloves, ear protection, and eye protection.

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- **Wrap a clean cloth around the air supply lines.**

1. Depressurize the air suspension system. Refer to [Air Suspension Depressurization](#).

IMPORTANT: Remove the air suspension system fuse before working on the rear suspension components or the rear axle. Failure to remove the air suspension system fuse could cause the calibration of the air suspension leveling sensor to change and the air suspension system not to function properly.

2. Remove the air suspension system fuse.

IMPORTANT: There is a raised feature on the outer rim of the air spring top plate that denotes the anti rotation peg position.

3. Depress the anti rotation peg (2) in the air spring top plate located in the upper spring seat.
4. With the anti rotation peg (2) depressed, rotate the air spring counterclockwise and remove the air spring from the upper spring seat.

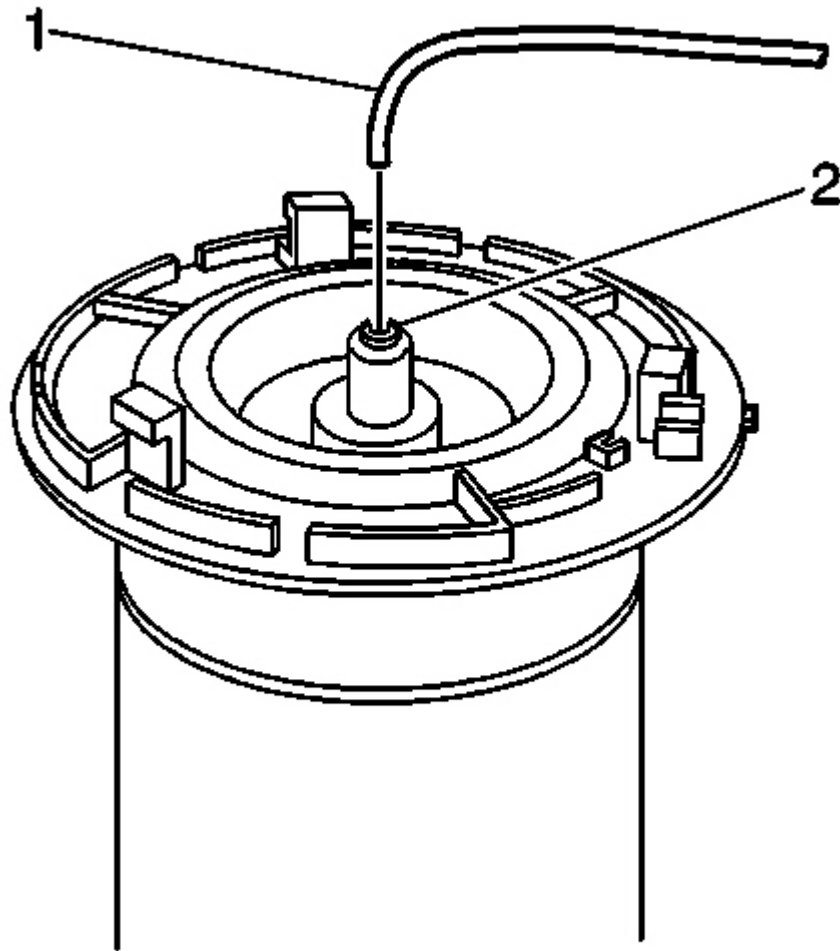


Fig. 26: Identifying Air Supply Line
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the air supply line from the air spring in the following way:
 - Push the air supply line into the air spring connection and hold in place.
 - Depress and hold the air supply line collet (2) down.
 - Remove the air supply line (1) from the air spring.

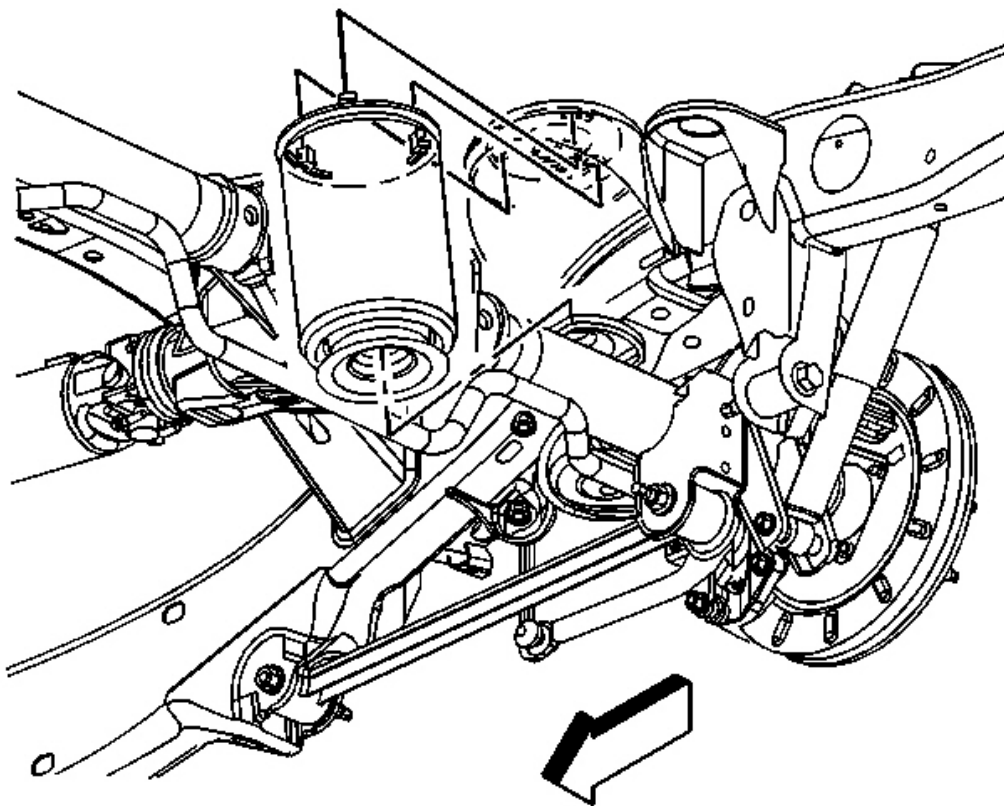


Fig. 27: Identifying Air Spring
Courtesy of GENERAL MOTORS CORP.

6. Remove the air spring from the vehicle.

Installation Procedure

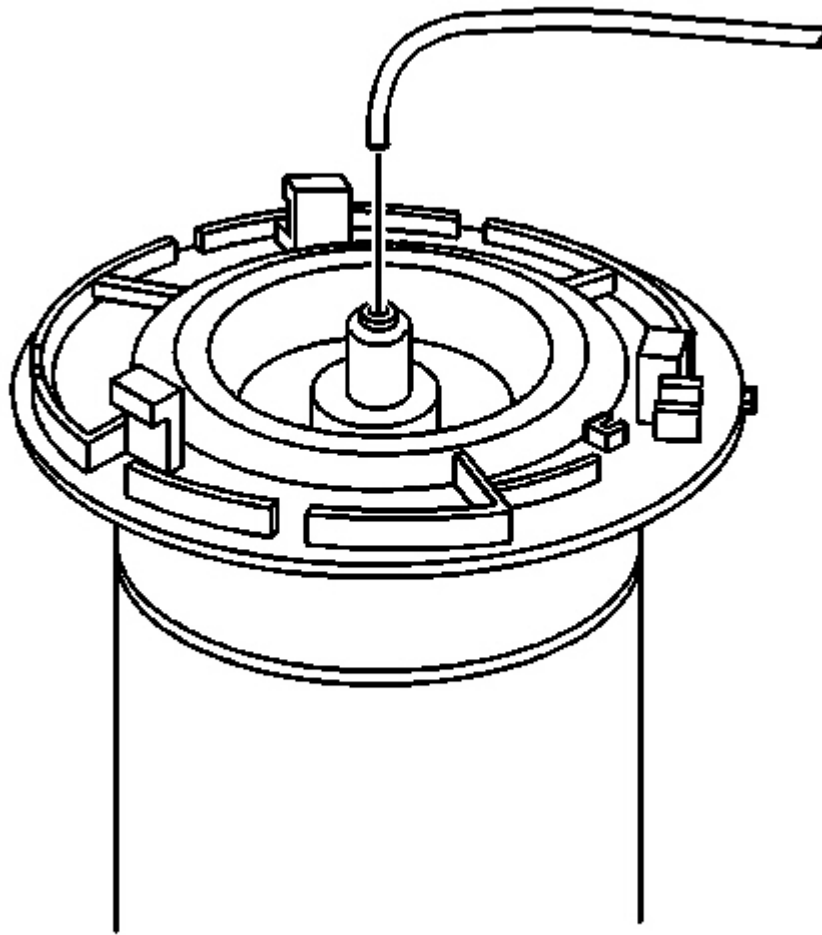


Fig. 28: Installing Air Supply Line
Courtesy of GENERAL MOTORS CORP.

1. Install the air supply line to the air spring. Ensure the air supply line is fully seated.

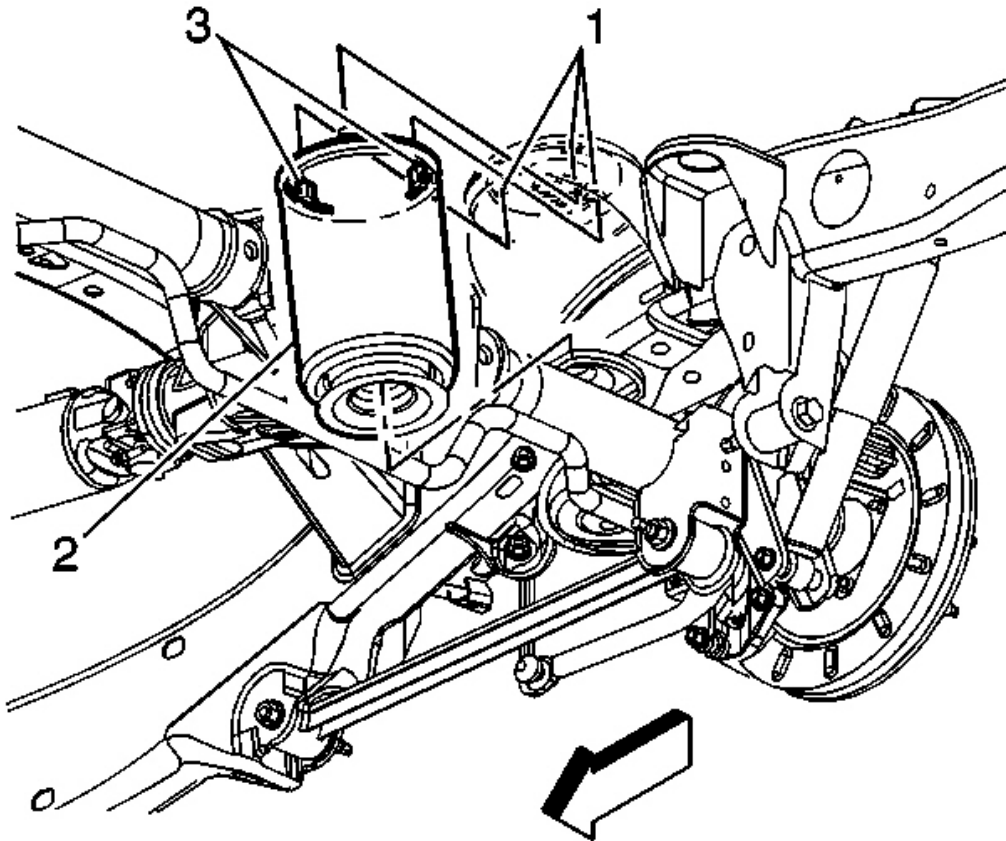


Fig. 29: View Of Air Spring Installation Components
Courtesy of GENERAL MOTORS CORP.

CAUTION: Ensure that the air spring is fully seated and properly positioned on the axle pilot. Failure to properly position the air spring may cause the air spring to break apart, possibly resulting in personal injury or damage to the vehicle.

2. Install the air spring (2) to the frame by aligning the mounting tabs (3) with the keyhole slots (1) in the upper spring seat.
3. Apply upward pressure to the air spring (2) and rotate clockwise until the anti rotation peg snaps into place.

IMPORTANT: After the air suspension has been depressurized, **DO NOT** allow the vehicle to be completely lowered onto the rear jounce bumpers.

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4. Lower the vehicle slightly below the correct D-height position.
5. Install the air suspension system fuse.
6. Turn ON the ignition, engine OFF. Allow the air suspension compressor to run for approximately 1 minute to ensure that the air suspension is functioning properly.

IMPORTANT: When the air springs are completely deflated, an additional ignition cycle may be required to allow the compressor to completely inflate the air springs.

7. Inspect the D height. Refer to Trim Height Inspection .

AIR SUSPENSION AIR LINE REPLACEMENT

Removal Procedure

CAUTION: A sudden release of pressure may cause personal injury or damage to the vehicle. The air suspension system is under pressure until the air supply lines are disconnected. Use the following precautions when servicing the air suspension system:

- Wear gloves, ear protection, and eye protection.
- Wrap a clean cloth around the air supply lines.

IMPORTANT: Remove the air suspension system fuse before working on the rear suspension components or the rear axle. Failure to remove the air suspension system fuse could cause the calibration of the air suspension leveling sensors to change and the air suspension system not to function properly.

1. Remove the air suspension system fuse.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .

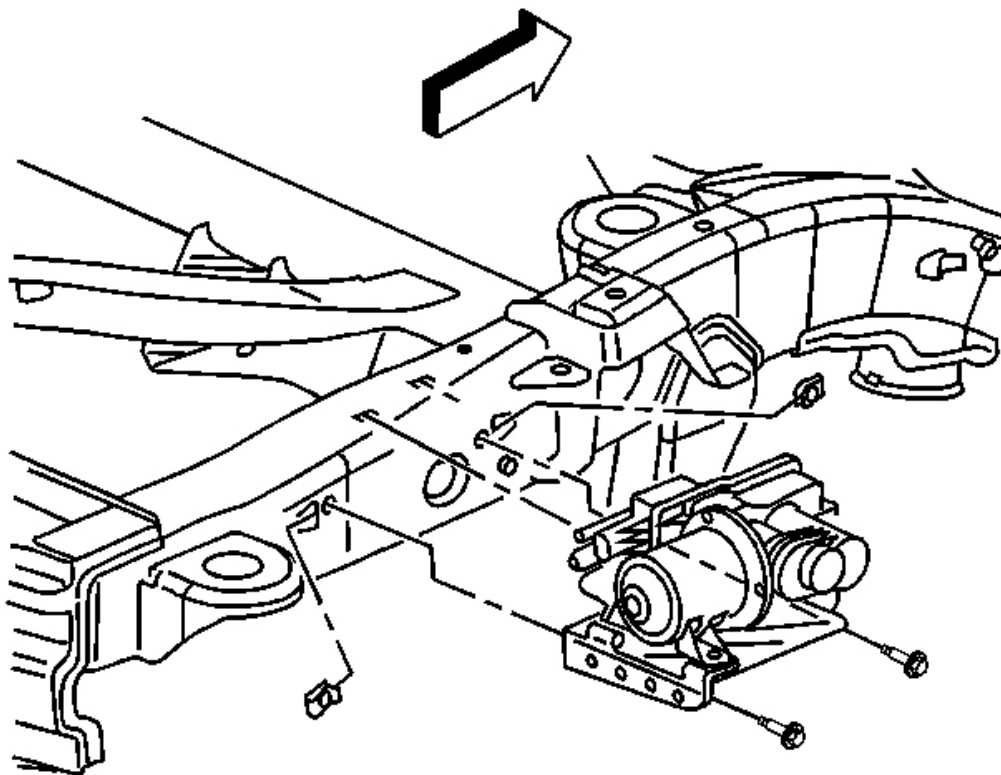


Fig. 30: Identifying Air Compressor & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

3. Remove the air spring compressor to frame mounting bolts.
4. Support the compressor.

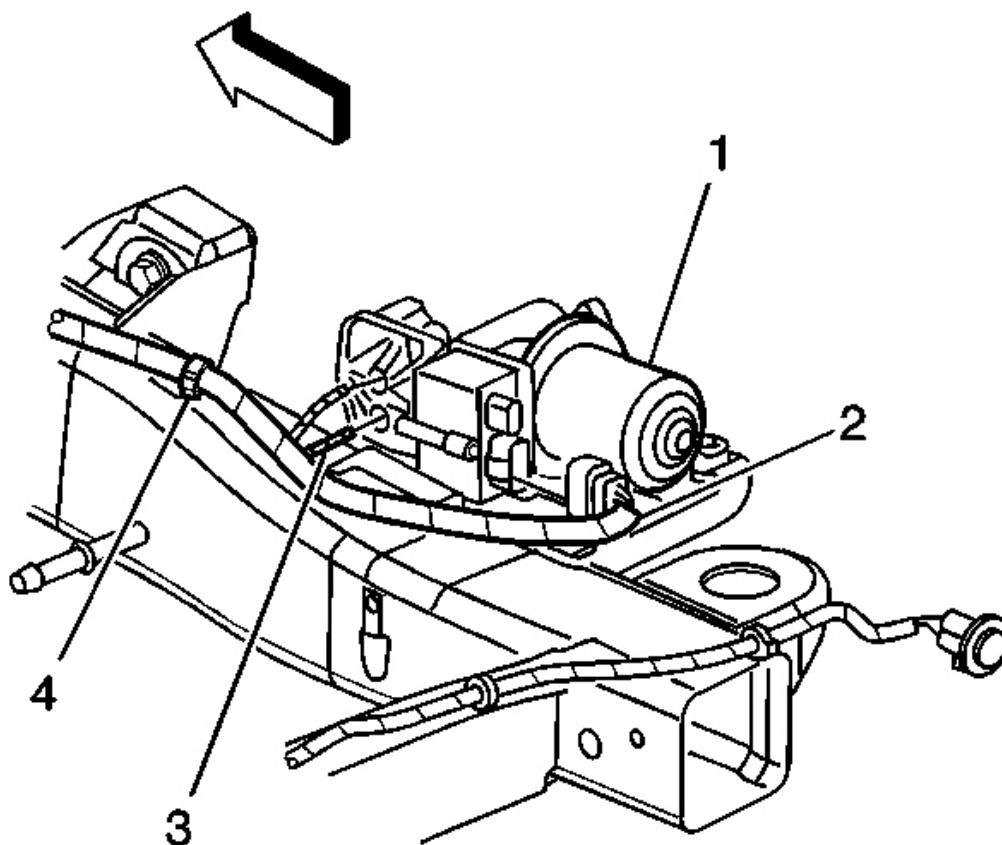


Fig. 31: View Of Air Spring Compressor Components
Courtesy of GENERAL MOTORS CORP.

5. Disconnect the air lines (3) from the air compressor (1).
6. Trim off the air line at the electrical harness with a sharp cutting tool. Leave the remaining air line in the wiring harness.

Installation Procedure

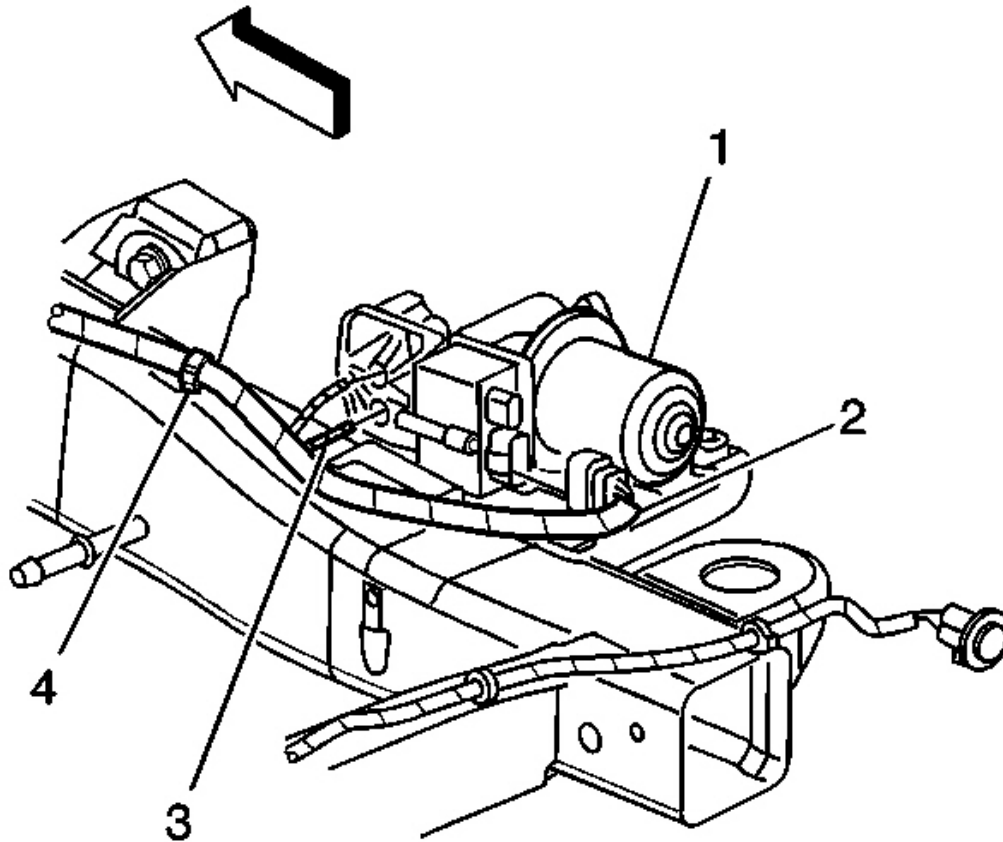


Fig. 32: View Of Air Spring Compressor Components
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: Ensure the color on the air supply lines match the color on the air spring compressor for reassembly.

1. Install air line to the air compressor (1) using a new fitting.

Tighten: Tighten the air supply line fitting to 2.25 N.m (20 lb in).

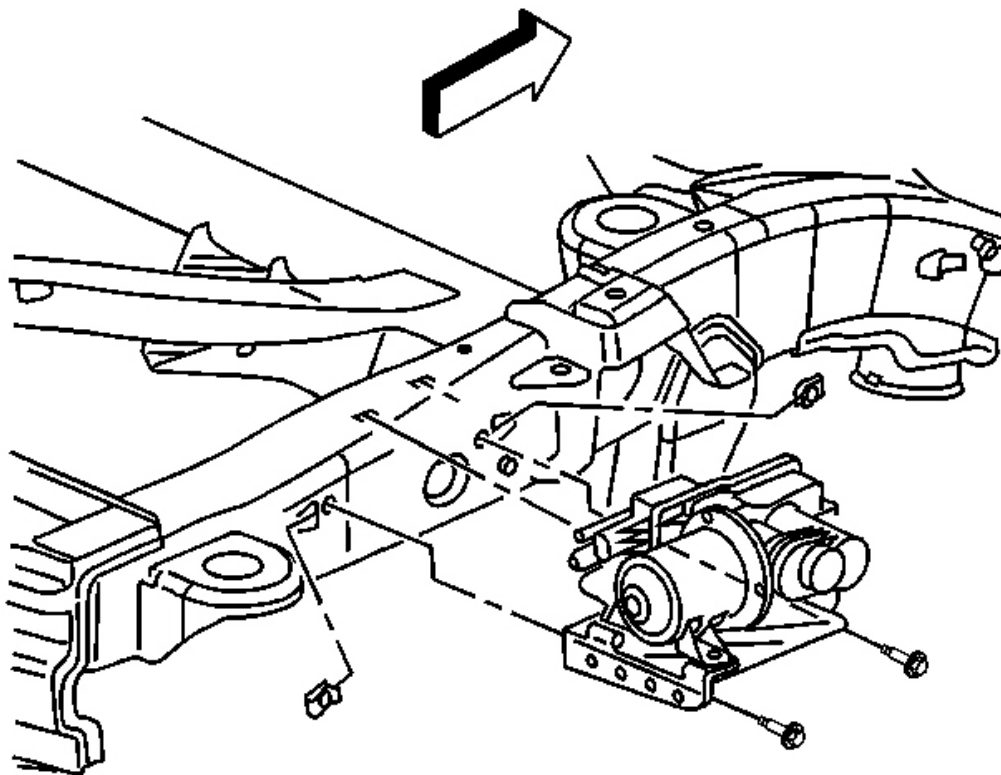


Fig. 33: Identifying Air Compressor & Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

2. Install the air spring compressor to frame mounting bolts.

Tighten: Tighten the bolts to 20 N.m (15 lb ft).

3. Install the air line to the air spring.
4. Attach the air line to the outside of the wiring harness using wire ties.
5. Lower the vehicle.
6. Install the air suspension system fuse.

IMPORTANT: When the air springs are completely deflated, an additional ignition cycle may be required to allow the compressor to completely inflate the air springs.

7. Start the vehicle and run for approximately 1 minute to ensure that the air spring leveling system is

functioning properly.

8. Inspect D-height. Refer to **Trim Height Inspection** .
9. Inspect for leaks. If a leak is found at the air supply lines connections at the air spring compressor, replace the air supply lines. Refer to **Air Suspension Air Line Replacement**.

DESCRIPTION & OPERATION

AIR SUSPENSION DESCRIPTION & OPERATION

Air Suspension

The primary mission of the Air Suspension System is the following for the rear suspension under loaded and unloaded conditions:

- Keep the vehicle visually level
- Provide optimal headlight aiming
- Maintain optimal ride height

The Air Suspension System consists of the following items:

- Air suspension compressor assembly
- Air suspension sensors
- Rear air springs

IMPORTANT: The Air Suspension System must have a voltage supply of at least 12.6V to operate properly.

The Air Suspension System will maintain the rear D height within 4 mm (0.15 in) in all loading conditions and the leveling function will deactivate if the vehicle is overloaded. The side to side D height variation is maintained within 8 mm (0.31 in). After ignition is turned off, the air suspension control module (ASCM) will remain active for between 30 minutes and 2 1/2 hours. The system will exhaust pressure within 30 minutes after the ignition is turned off to lower the vehicle after unloading. In a temperature-controlled environment, the leakage of the complete load leveling system will not result in more than 1.4 mm (0.05 in) drop of rear suspension height at GVWR during a 24 hour period. If the outdoor temperature drops from +20°C (+68°F) to -5°C (+23°F), the rear D height may drop as much as 25 mm (1 in). However, the Air Suspension System should return to the specified D height when the ignition is again cycled to ON.

Air Suspension Compressor Assembly

The air suspension compressor assembly houses the DC motor/air compressor, the air suspension control module (ASCM), an exhaust valve solenoid, and two air spring isolation valve solenoids. The ASCM sends a voltage signal to each height sensor and measures the inductance of the return signal to determine if one or both air springs need to be inflated or deflated. Before the compressor starts, the exhaust valve will be activated to provide compressor head relief. After this, the compressor relay will activate to start the compressor. When the trim height is achieved the relay will be deactivated. To prevent the compressor from overheating, the

2008 Isuzu Ascender LS

2008 SUSPENSION Air Suspension - Ascender, Envoy & Trailblazer

compressor operates on a duty cycle. If the compressor is requested to operate continually, the compressor duty cycle is limited to 300 seconds at maximum output for the first cycle. After this time, the compressor is automatically switched off for at least 92 seconds. Once this time has been met, the compressor will activate for 16 seconds and deactivate for 92 seconds. This 16 second/92 second duty cycle will continue until the compressor can remain off for more than 92 seconds. During this time, the indicator LED on the air inflator switch will be quickly flashing at a constant rate.

The air suspension compressor assembly has three different operating modes. Single Value Mode inflates and deflates the two air springs independently. This is the normal operating mode of the system. The system will enter Mean Value Mode when the sensor output indicates the difference between the D-height on each side is greater than 15.5 mm. In Mean Value Mode, the ASCM will average the signals from each height sensor to maintain an average trim height. If the measurement differential between the two D-heights reaches approximately 54 mm, the system will enter Lock Mode and no leveling will take place. This is to compensate for uneven loading of the vehicle or the vehicle being parked on an uneven surface. The air suspension compressor assembly also has a wheel change (jack) control that prevents the air springs from deflating completely. If the ASCM detects that one or both of the rear wheels has a D-height measurement of more than 235 mm, the system will enter Lock Mode and will suspend all leveling functions until the suspension is moved toward the frame.

The air suspension compressor assembly has the ability to detect faults and indicate the appropriate fault code via a blink code on the inflator switch LED. The air suspension compressor assembly will indicate the code when the condition that caused the code is current. In some instances the air suspension compressor assembly may set a flag that requires the ASCM to be reset. The ASCM will reset on its own after the ignition has been turned off for more than 2 1/2 hours or if the air suspension fuse has been removed with the ignition key turned off.

Air Suspension Sensors

The air suspension sensor arm is attached to an armature that rotates inside a coil. The inductance of the coil, not the resistance, changes dependent on the position of the armature in the coil. The air suspension module determines the angle of the sensor arm by sending an inductive voltage through the coil and measuring the response time. The sensors must be calibrated to the correct D height.

Rear Air Springs

The air springs are mounted in the frame in the same location where the coil spring is mounted for a vehicle without air suspension. Support pieces are affixed to the axle for the air springs.