

2008 Isuzu Ascender LS

2008 ENGINE Engine Exhaust - Ascender, Envoy & Trailblazer

2008 ENGINE

Engine Exhaust - Ascender, Envoy & Trailblazer

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Catalytic Converter to Exhaust Manifold Nut	50 N.m	37 lb ft
Catalytic Converter to Muffler Nut	45 N.m	33 lb ft
Catalytic Converter Heat Shield Bolts	7 N.m	62 lb in
Exhaust Manifold Bolts (LL8)		
• First Pass	20 N.m	15 lb ft
• Second Pass	20 N.m	15 lb ft
• Final Pass	20 N.m	15 lb ft
Exhaust Manifold Bolt (LH6/LS2)		
• First Pass	15 N.m	11 lb ft
• Final Pass	20 N.m	18 lb ft
Exhaust Manifold Heat Shield Bolt (LH6/LS2)	9 N.m	80 lb in
Exhaust Manifold Heat Shield Nut (LL8)	5 N.m	44 lb in
Exhaust Muffler Heat Shield Bolt/Nut	7 N.m	62 lb in
Exhaust Pipe Heat Shield Bolt (LH6/LS2)	7 N.m	62 lb in
Transmission Filler Tube Bracket Nut (LL8)	10 N.m	89 lb in

DIAGNOSTIC INFORMATION & PROCEDURES

DIAGNOSTIC STARTING POINT - ENGINE EXHAUST

Begin the system diagnosis by reviewing the system Description and Operation. Reviewing the information will help you determine the correct symptom diagnostic procedure when a malfunction exists. It will also help you determine if the condition described by the customer is normal operation. Refer to **Symptoms - Engine Exhaust** in order to identify the correct procedure for diagnosing the system.

SYMPTOMS - ENGINE EXHAUST

- Review the Exhaust System Description and Operation in order to familiarize yourself with the system functions. Refer to **Exhaust System Description**.
- All diagnostics on a vehicle should follow a logical process. Strategy based diagnostics is a uniform approach for repairing all systems. The diagnostic flow is the place to start when repairs are necessary and may always be used in order to resolve a system problem. For a detailed explanation, refer to

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Strategy Based Diagnosis .

Visual/Physical Inspection

- Inspect for aftermarket or non-original equipment manufacturer (OEM) devices such as, but not including; tailpipe extensions, headers, and exhaust cutouts. This could affect the operation and proper performance of the exhaust system.
- Verify the exact operating conditions under which the concern exists. Note factors such as engine RPM, engine temperature, engine load, and frequency of concern.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause any symptom.

Intermittent

Test the vehicle under the same conditions that the customer reported in order to verify the system is operating as designed.

Symptom List

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

- Loss of power-Refer to **Restricted Exhaust**.
- Poor acceleration-Refer to **Restricted Exhaust**.
- Poor fuel economy-Refer to **Restricted Exhaust**.
- Excessive smoke (diesel)-Refer to **Restricted Exhaust**.
- Exhaust hissing noise-Refer to **Exhaust Leakage**.
- Exhaust popping noise-Refer to **Exhaust Leakage**.
- Exhaust rattle noise-Refer to **Exhaust Noise**.
- Loud exhaust noise-Refer to **Exhaust Noise**.
- Exhaust buzz, groan, hum noise-Refer to **Exhaust Noise**.

RESTRICTED EXHAUST

Diagnostic Aids

CAUTION: While engine is operating, the exhaust system will become extremely hot. To prevent burns avoid contacting a hot exhaust system.

For dual exhaust systems a quick check of exhaust flow will help determine which side of the exhaust system is restricted. The side that has less exhaust flow is the side that will be suspect, and diagnosis should begin there.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

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4: The exhaust system has very low back pressure under normal conditions. If the exhaust system is restricted, a significant increase in the exhaust pressure is noticed on the **J 35314-A** Exhaust Back Pressure Gage. See **Special Tools**. Removing the AIR check valve or HO2S sensor may set a DTC. When finishing this diagnostic table, be sure to clear all codes.

5: If high back pressure is not found at idle, increasing the engine speed may help find a restriction. Perform operational check before returning vehicle to customer.

6: This step will isolate the catalytic converter from the remainder of the exhaust system.

9: Confirming that the condition has been fixed is essential. If the symptom still exists and the vehicle has a dual exhaust system, proceed to Step 2 and repeat diagnostic procedure on the opposite exhaust pipe.

Restricted Exhaust

Step	Action	Value(s)	Yes	No
1	Did you verify the customers complaint?	-	Go to Step 2	-
2	Did you review the exhaust symptoms diagnostic information and perform the necessary inspections?	-	Go to Step 3	Go to Symptoms - Engine Exhaust
3	Is the system equipped with dual exhaust?	-	Go to Diagnostic Aids	Go to Step 4
4	<ol style="list-style-type: none"> 1. Remove the AIR check valve or the HO2S that is in front of and closest to the catalytic converter. 2. Install the J 35314-A Exhaust Back Pressure Gage in place of the AIR check valve or HO2S sensor. See Special Tools. 3. Start and run the vehicle. 4. With the engine idling at normal operating temperature, record the exhaust system back pressure reading on the gauge. 	8.6 kPa (1.25 psi)		
	Does the reading exceed the specified value?		Go to Step 6	Go to Step 5
5	<ol style="list-style-type: none"> 1. With the J 35314-A still installed increase and monitor engine speed to 2000 RPM. See Special Tools. 2. Observe the exhaust system back pressure reading on the gage. 	20.7 kPa (3 psi)		
	Does the reading exceed the specified value?		Go to Step 6	Go to Step 9
	<ol style="list-style-type: none"> 1. Turn the engine off and place the ignition in the lock position. 2. Remove the J 35314-A . See Special Tools. 			

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6	<p>3. Re-install the AIR check valve/HO2S sensor.</p> <p>4. Remove the post-catalyst HO2S sensor.</p> <p>5. Install the J 35314-A in place of the post HO2S sensor. See Special Tools.</p> <p>6. Start and idle the engine and monitor the engine speed to 2000 RPM.</p> <p>7. Observe the exhaust system back pressure reading on the gauge.</p>	20.7 kPa (3 psi)		
	Does the reading exceed the specified value?		Go to Step 7	Go to Step 8
7	<p>Inspect the exhaust system for the following conditions:</p> <ul style="list-style-type: none"> • Damage in the exhaust pipe • Debris in the exhaust pipe • Muffler or resonator internal failure • Two-layer exhaust pipe separation 	-		
	Did you find and correct the condition?		Go to Step 9	-
8	<p>Replace the catalytic converter. Refer to Catalytic Converter Replacement (LL8) or Catalytic Converter Replacement (LH6/LS2).</p>	-		
	Did you find and correct the condition?		Go to Step 9	-
9	<p>1. Remove the J 35314-A and reinstall the AIR check valve or the HO2S sensor. See Special Tools.</p> <p>2. Clear any codes.</p> <p>3. Road test the vehicle in order to verify the repair.</p>	-		
	Did you correct the condition?		System OK	Go to Step 2

EXHAUST LEAKAGE

Problem	Action
<p>CAUTION: While engine is operating, the exhaust system will become extremely hot. To prevent burns avoid contacting a hot exhaust system.</p>	
<p>DEFINITION: An exhaust leak may show stains at the area of the leak. The leak may be felt by holding a</p>	

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hand close to the suspected areas or using a smoke pencil. The leak may make a popping or hissing noise. Refer to **Symptoms - Engine Exhaust** prior to beginning this table.

Misaligned or improperly installed exhaust system components	<p>NOTE: Refer to Fastener Notice.</p> <p>Align and tighten the components to the specifications. Refer to <u>Fastener Tightening Specifications</u>.</p>
<p>Exhaust leaks at the following connections:</p> <ul style="list-style-type: none"> • Exhaust manifold to pipe • Flanges • Pipe clamps 	Tighten the components to the specifications. Refer to <u>Fastener Tightening Specifications</u> .
<p>Seals or gaskets leaking</p> <ul style="list-style-type: none"> • Exhaust manifold to cylinder head • Exhaust pipes to exhaust manifold • Catalytic converter connection • EGR connections • AIR connections to the exhaust manifold or cylinder head 	Replace the leaking seal or gasket. Refer to the affected components procedure for service.
Exhaust manifold cracked or broken	<p>Replace the exhaust manifold. Refer to one of the following:</p> <ul style="list-style-type: none"> • <u>Exhaust Manifold Replacement (LL8)</u> for the 4.2L engine. • <u>Exhaust Manifold Replacement - Left Side (LH6/LS2)</u> for the 5.3L and 6.0L engines. • <u>Exhaust Manifold Replacement - Right Side (LH6/LS2)</u> for the 5.3L and 6.0L engines.
Exhaust system component connection welds leaking	Replace the leaking component. Refer to the affected component's procedure for service.
Muffler or resonator, if equipped, damaged or leaking at the seams	Replace the affected muffler or resonator. Refer to <u>Muffler Replacement</u> .

EXHAUST NOISE

Condition	Action
<p>CAUTION: While engine is operating, the exhaust system will become extremely hot. To prevent burns avoid contacting a hot exhaust system.</p>	

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DEFINITION: An audible or physical noise due to a faulty component or damaged components causing a loose or misaligned exhaust system resulting in a rattle or vibration noise (buzz, groan, hum). Refer to **Symptoms - Engine Exhaust** prior to beginning this table.

Popping or hissing noise	Exhaust leak Refer to <u>Exhaust Leakage</u>
Loud exhaust	<ol style="list-style-type: none">1. Compare to a known good vehicle.2. Inspect for a damaged or failed muffler or resonator.3. Replace the faulty muffler or resonator. Refer to <u>Muffler Replacement</u>.
External rattle or vibration noise	<ol style="list-style-type: none">1. Inspect for a bent or loose hanger, loose heat shield, or loose clamp.2. Inspect for a exhaust pipe causing interference.3. Repair or replace the affected component. Refer to the affected component's service procedure.
Internal rattle	<ol style="list-style-type: none">1. Test the components by tapping with a rubber mallet to confirm a rattle.2. Replace the faulty catalytic converter, resonator, or muffler. Refer to one of the following procedures:<ul style="list-style-type: none">• <u>Catalytic Converter Replacement (LL8)Catalytic Converter Replacement (LH6/LS2)</u>• <u>Muffler Replacement</u>

REPAIR INSTRUCTIONS

EXHAUST MANIFOLD REPLACEMENT (LL8)

Removal Procedure

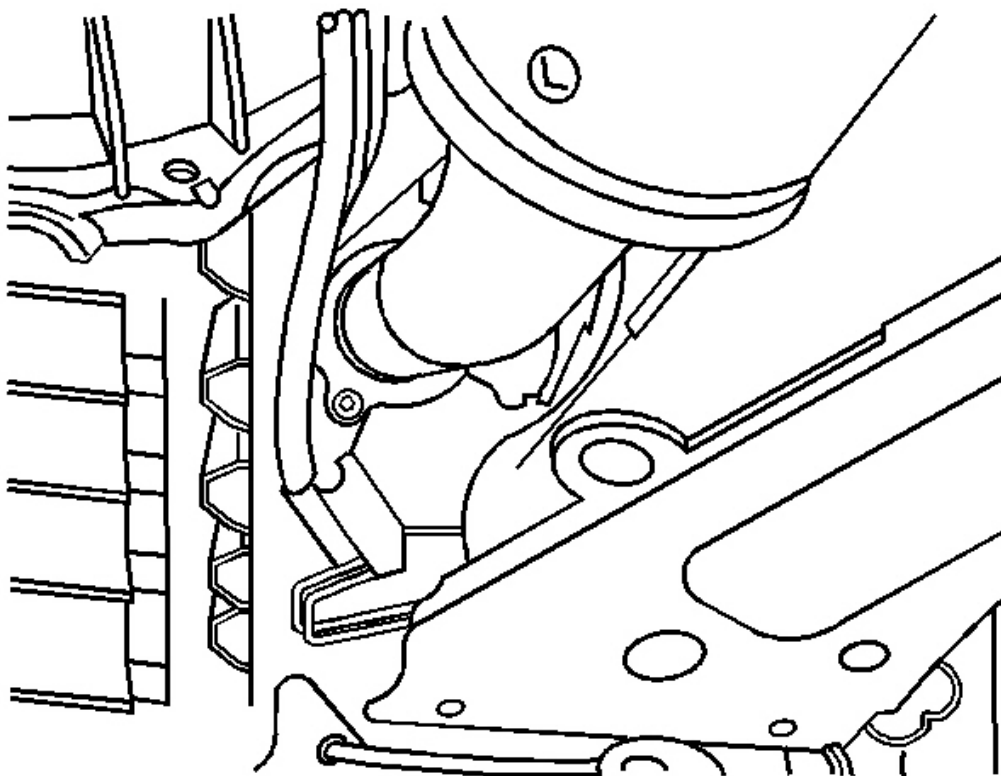


Fig. 1: View Of Exhaust Pipe At Exhaust Manifold
Courtesy of GENERAL MOTORS CORP.

1. Raise and suitably support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the catalytic converter to exhaust manifold nuts (2).
3. Lower the vehicle.
4. Remove the exhaust manifold heat shield. Refer to **Exhaust Manifold Heat Shield Replacement (LL8)**.

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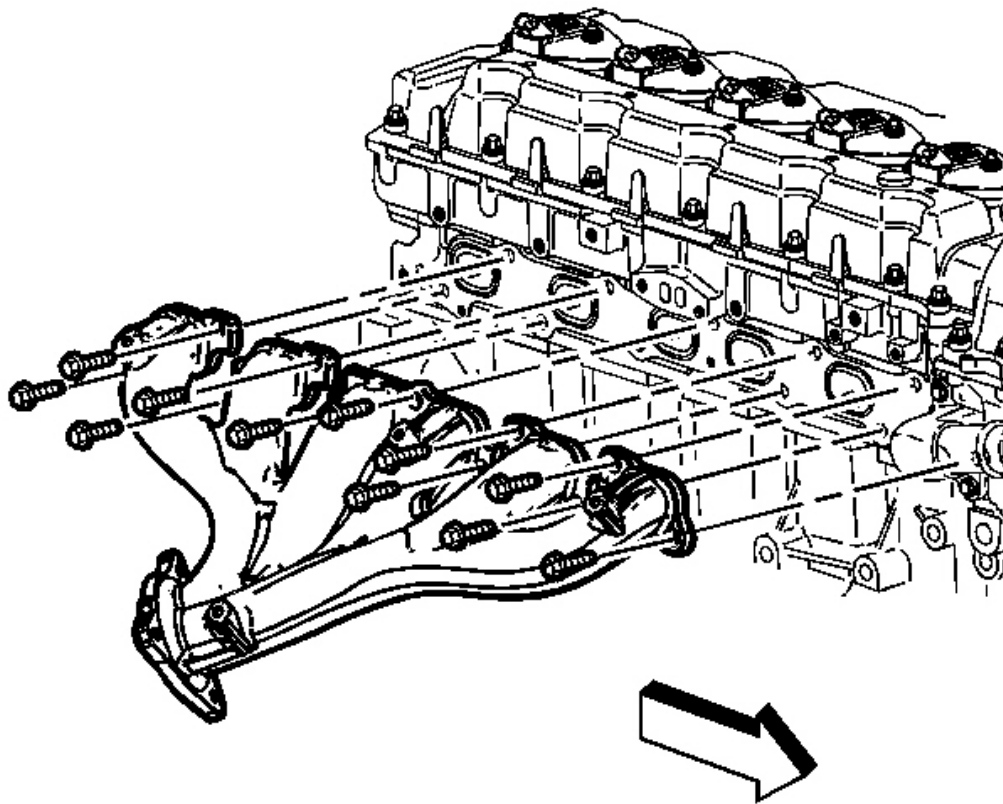


Fig. 2: View Of Exhaust Manifold & Bolts
Courtesy of GENERAL MOTORS CORP.

5. Remove the exhaust manifold bolts.
6. Remove the exhaust manifold.

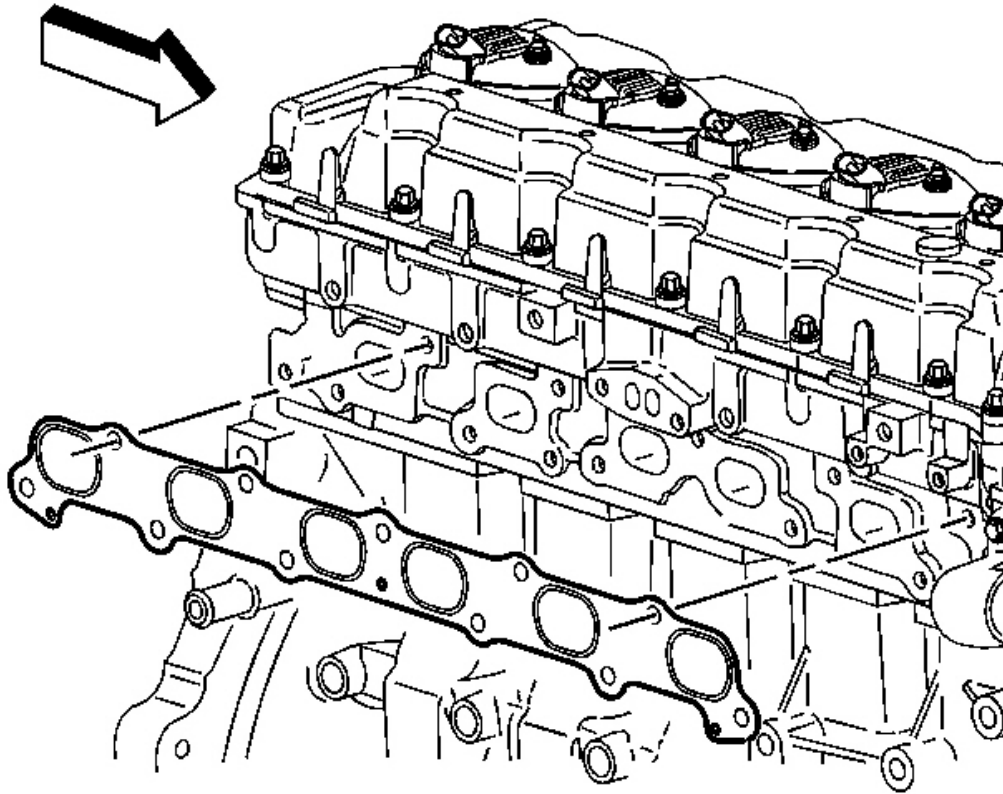


Fig. 3: View Of Exhaust Manifold Gasket
Courtesy of GENERAL MOTORS CORP.

7. Remove the exhaust manifold gasket.

Installation Procedure

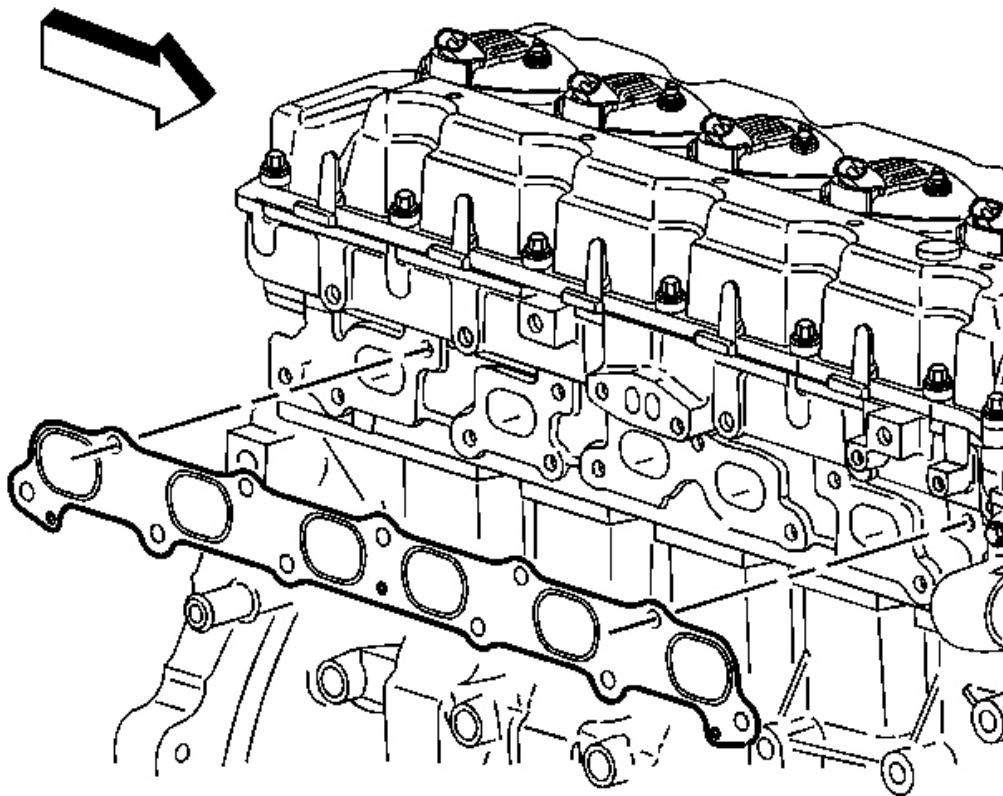


Fig. 4: View Of Exhaust Manifold Gasket
Courtesy of GENERAL MOTORS CORP.

1. Position a NEW exhaust manifold gasket to the cylinder head.

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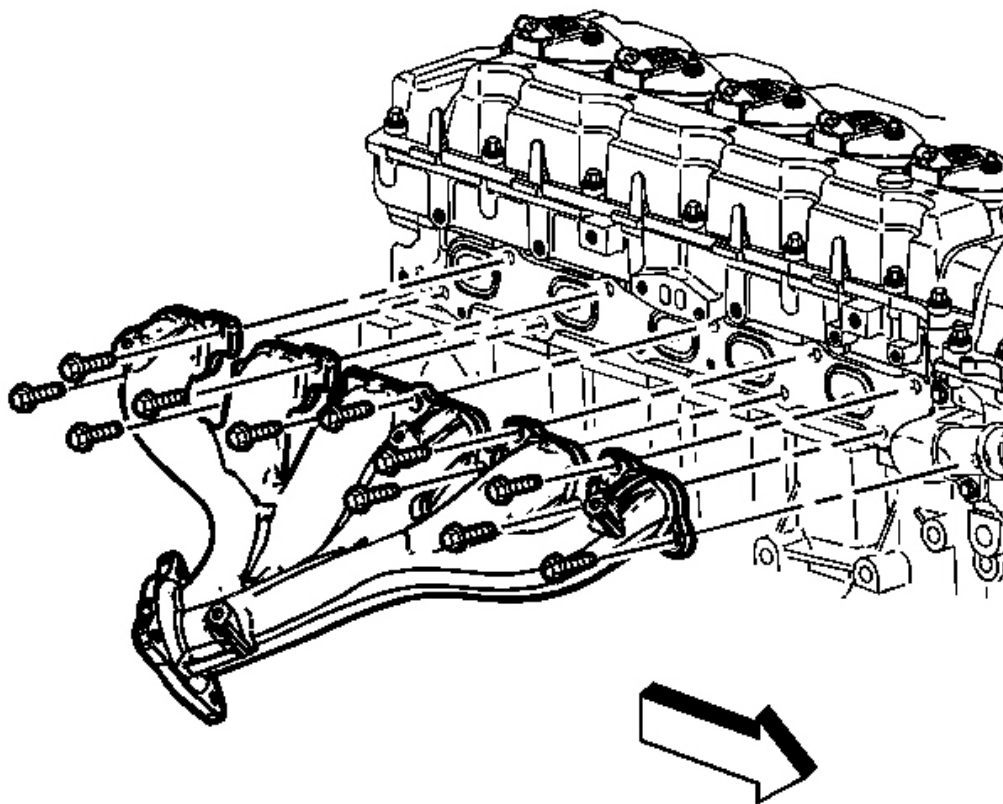


Fig. 5: View Of Exhaust Manifold & Bolts
Courtesy of GENERAL MOTORS CORP.

2. Position the exhaust manifold to the cylinder head and install the studs to the catalytic converter.
3. Apply threadlock GM P/N 12345493 (Canadian P/N 10953488) to the exhaust manifold bolt threads.
4. Install the exhaust manifold bolts.

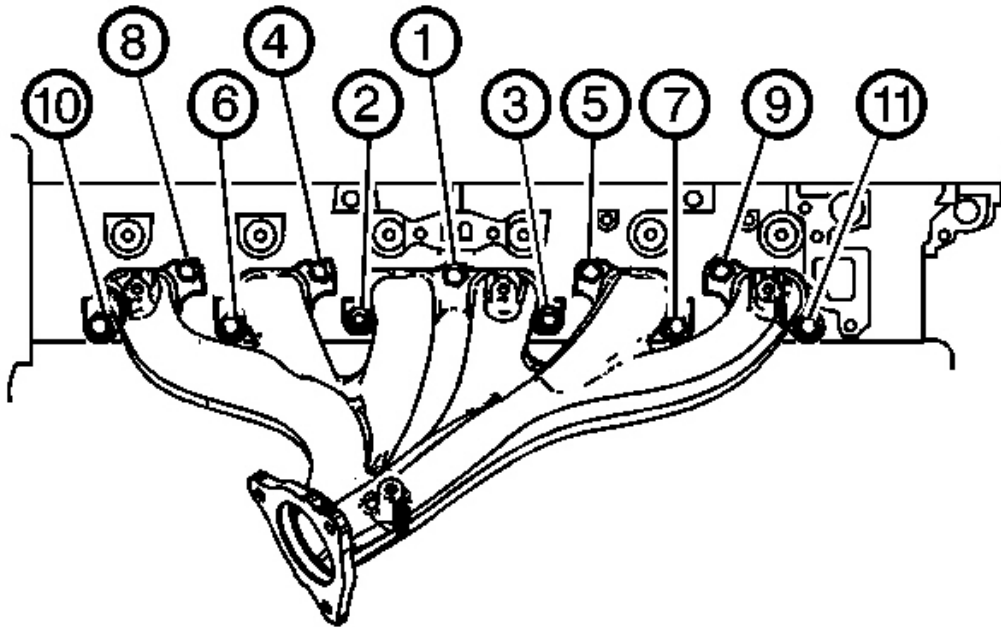


Fig. 6: Exhaust Manifold Bolt Tightening Sequence
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

5. Tighten the exhaust manifold bolts in the sequence shown.

Tighten:

1. Tighten the bolts first pass in sequence to 20 N.m (15 lb ft).
2. Tighten the bolts second pass in sequence to 20 N.m (15 lb ft).
3. Tighten the bolts final pass in sequence to 20 N.m (15 lb ft).

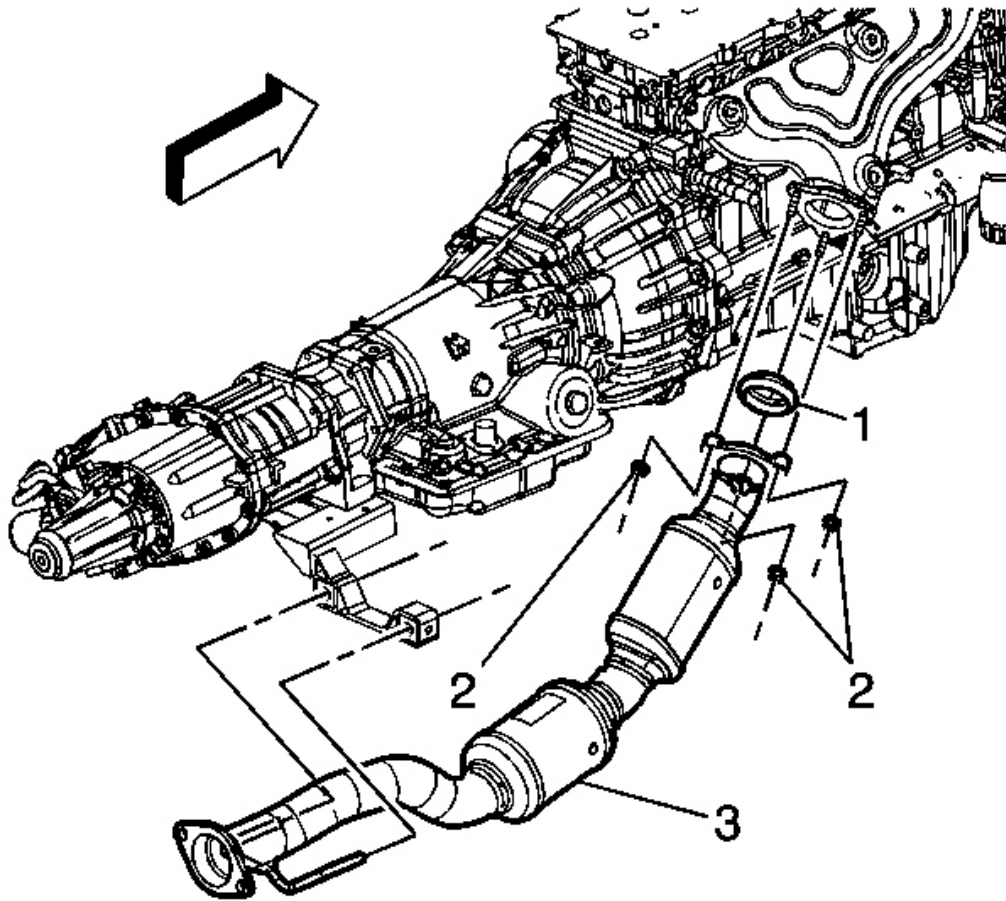


Fig. 7: View Of Exhaust Components
Courtesy of GENERAL MOTORS CORP.

6. Install the exhaust manifold heat shield. Refer to [Exhaust Manifold Heat Shield Replacement \(LL8\)](#).
7. Raise the suitably support the vehicle.
8. Install the catalytic converter to exhaust manifold nuts (2).

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

9. Lower the vehicle.

EXHAUST MANIFOLD REPLACEMENT - LEFT SIDE (LH6/LS2)

Removal Procedure

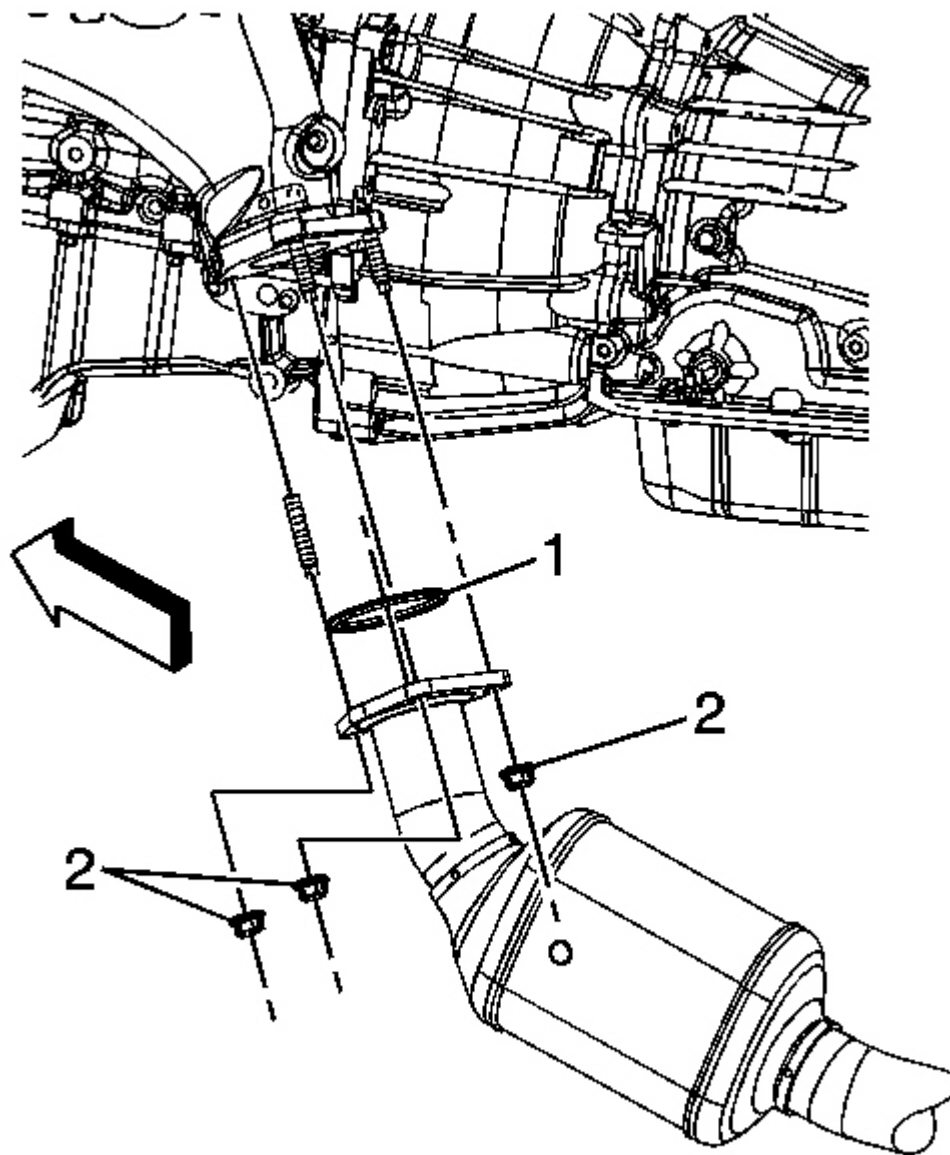


Fig. 8: View Of Exhaust Manifold, Catalytic Converter, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Raise and suitably support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the catalytic converter to exhaust manifold nuts (2).
3. Lower the vehicle.

4. Remove the spark plugs. Refer to Spark Plug Replacement .

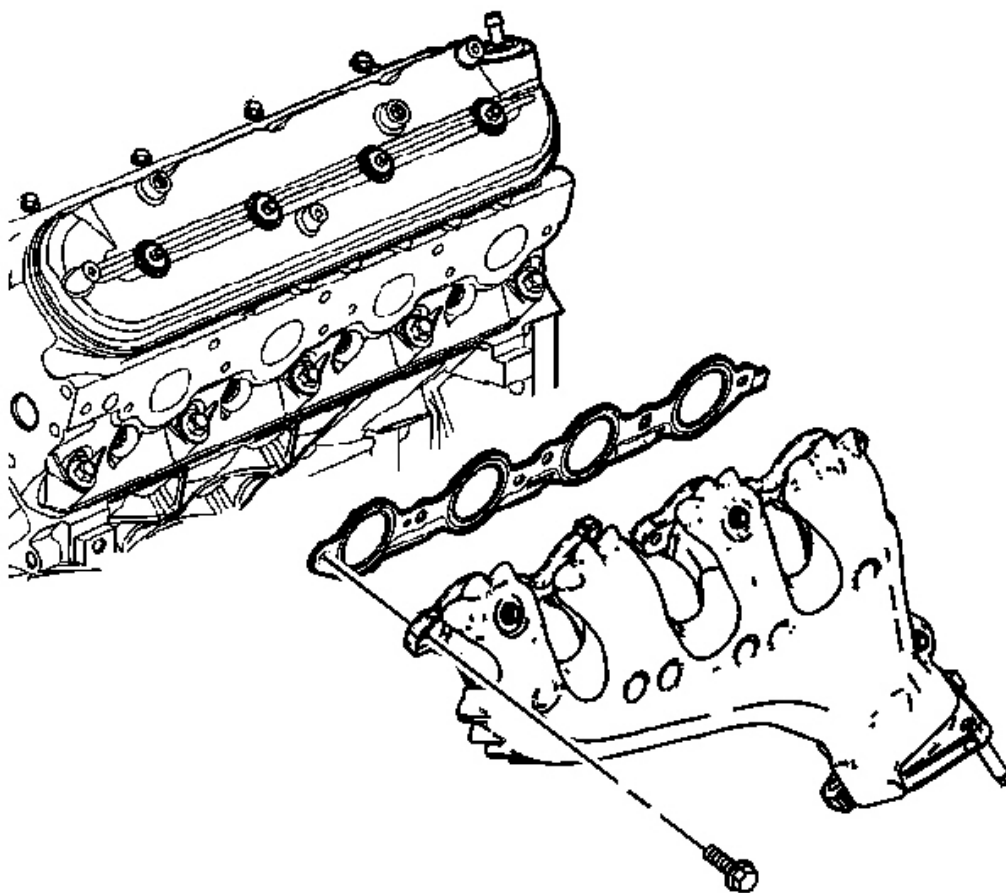


Fig. 9: View Of Left Exhaust Manifold & Gasket
Courtesy of GENERAL MOTORS CORP.

5. Remove the exhaust manifold bolts.
6. Remove the exhaust manifold.
7. Remove and discard the exhaust manifold gasket.

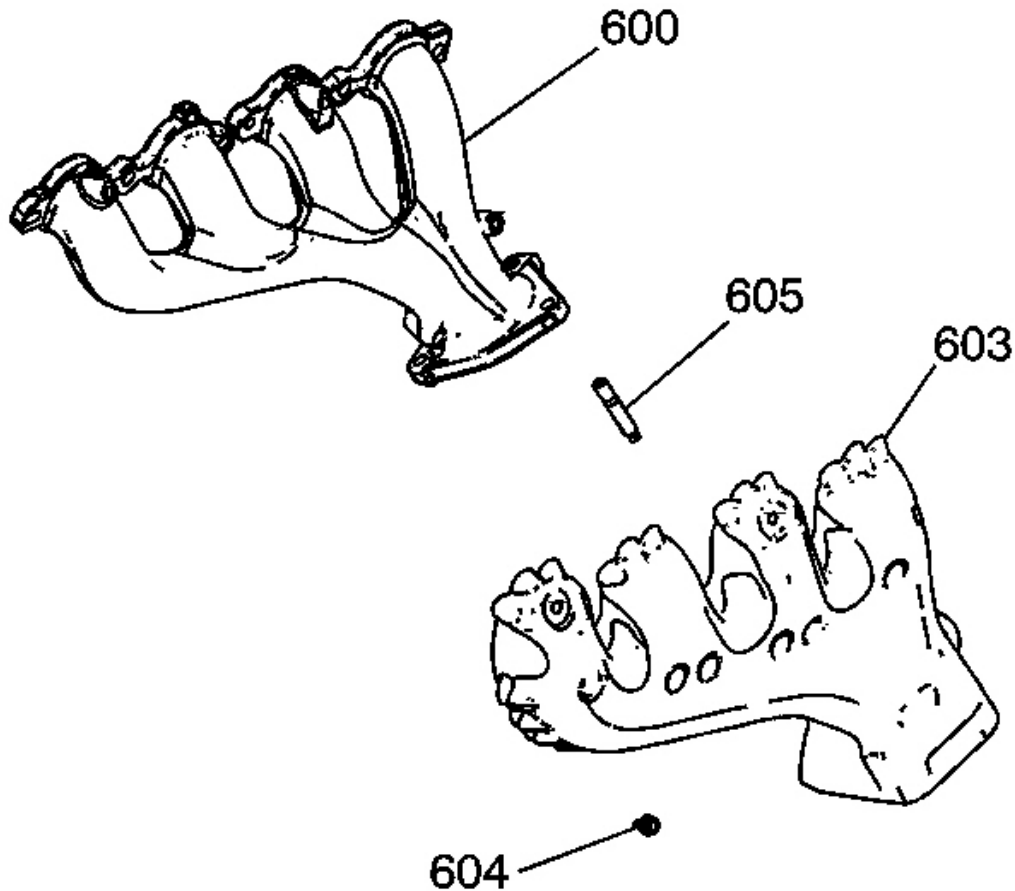


Fig. 10: View Of Left Exhaust Manifold & Heat Shield
Courtesy of GENERAL MOTORS CORP.

8. Remove the exhaust manifold heat shield bolts (604) and shield (603), if required.

Installation Procedure

IMPORTANT:

- Tighten the exhaust manifold bolts as specified in the service procedure. Improperly installed and/or leaking exhaust manifold gaskets may affect vehicle emissions and/or On-Board Diagnostics (OBD) II system performance.
- The cylinder head exhaust manifold bolt hole threads must be clean and free of debris or threadlocking material.
- Do not apply sealant to the first 3 threads of the bolt.

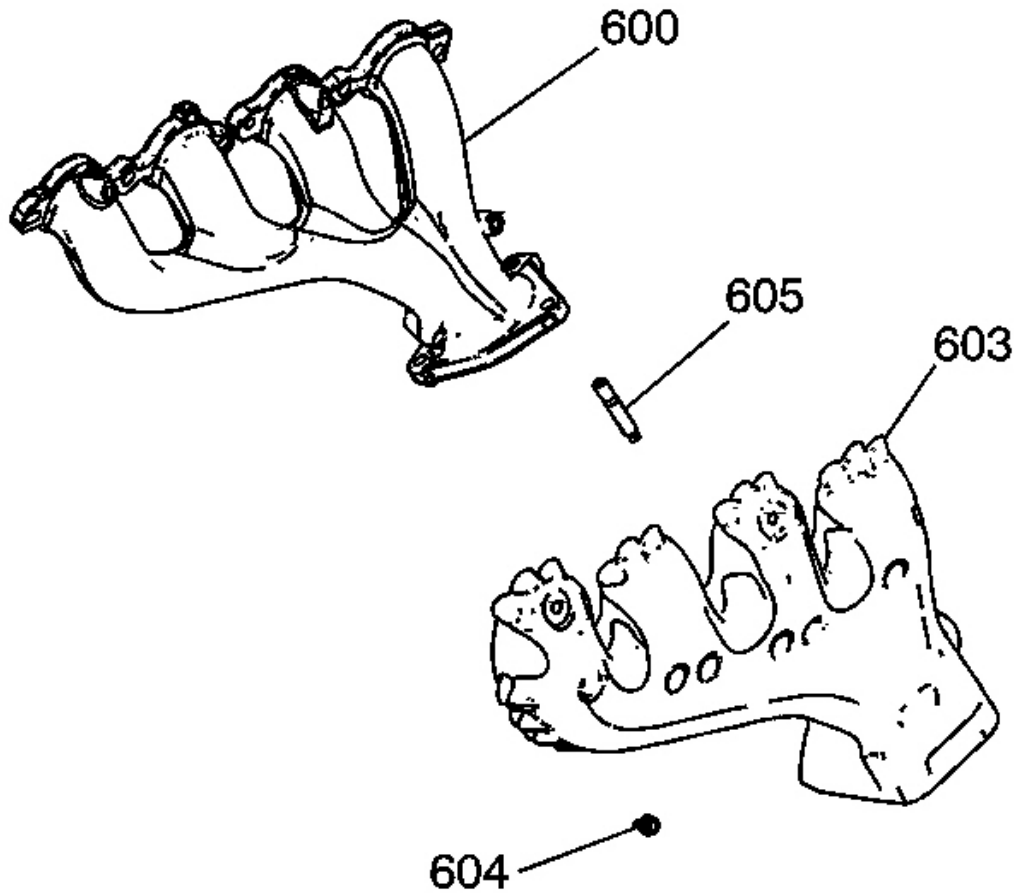


Fig. 11: View Of Left Exhaust Manifold & Heat Shield
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Position the exhaust manifold heat shield (603) onto the manifold and install the bolts (604), if required.

Tighten: Tighten the bolts to 9 N.m (80 lb in).

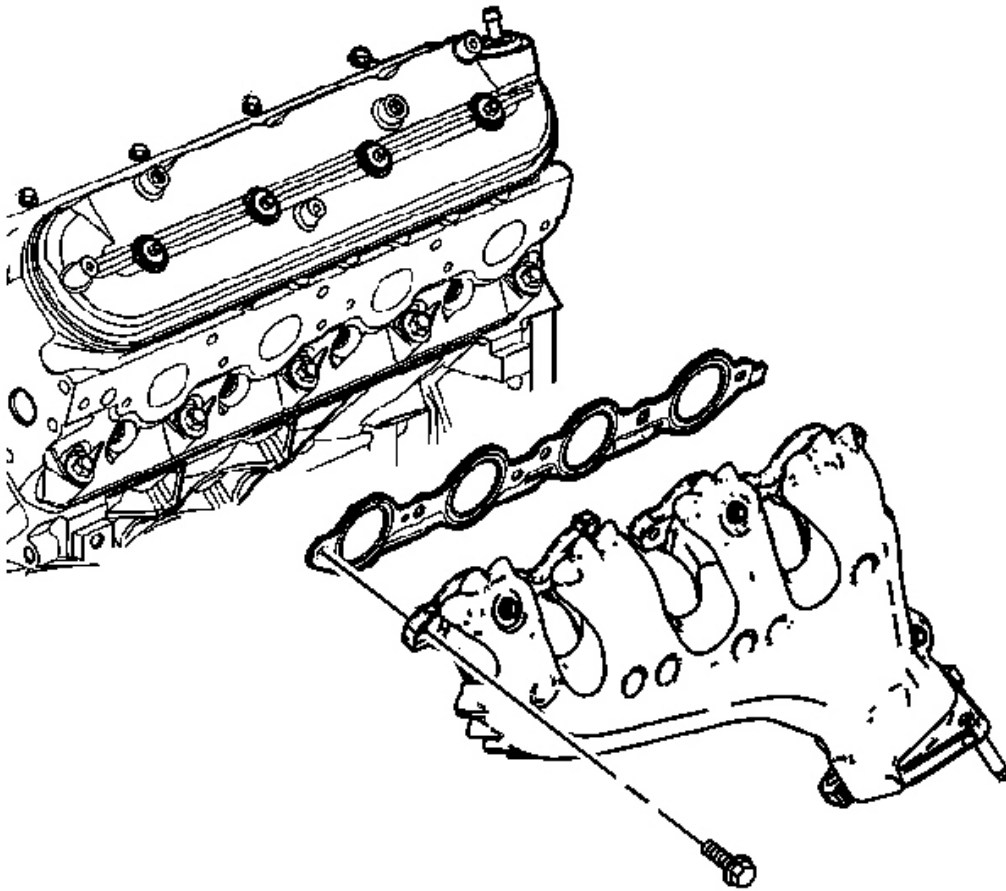


Fig. 12: View Of Left Exhaust Manifold & Gasket
Courtesy of GENERAL MOTORS CORP.

2. Apply a 5 mm (0.2 in) wide band of threadlock to the threads of the exhaust manifold bolts. Refer to Sealers, Adhesives, and Lubricants .
3. Position a NEW exhaust manifold gasket to the cylinder head.
4. Position the exhaust manifold to the cylinder head and install the studs to the catalytic converter.
5. Install the exhaust manifold bolts.

Tighten:

1. Tighten the bolts a first pass to 15 N.m (11 lb ft). Tighten the bolts beginning with the center 2 bolts. Alternate from side-to-side, and work toward the outside bolts.
2. Tighten the bolts a final pass to 20 N.m (15 lb ft). Tighten the bolts beginning with the center 2 bolts. Alternate from side-to-side, and work toward the outside bolts.

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6. Using a flat punch, bend over the exposed edge of the exhaust manifold gasket at the rear of the left cylinder head.
7. Install the spark plugs. Refer to Spark Plug Replacement .
8. Raise and suitably support the vehicle.

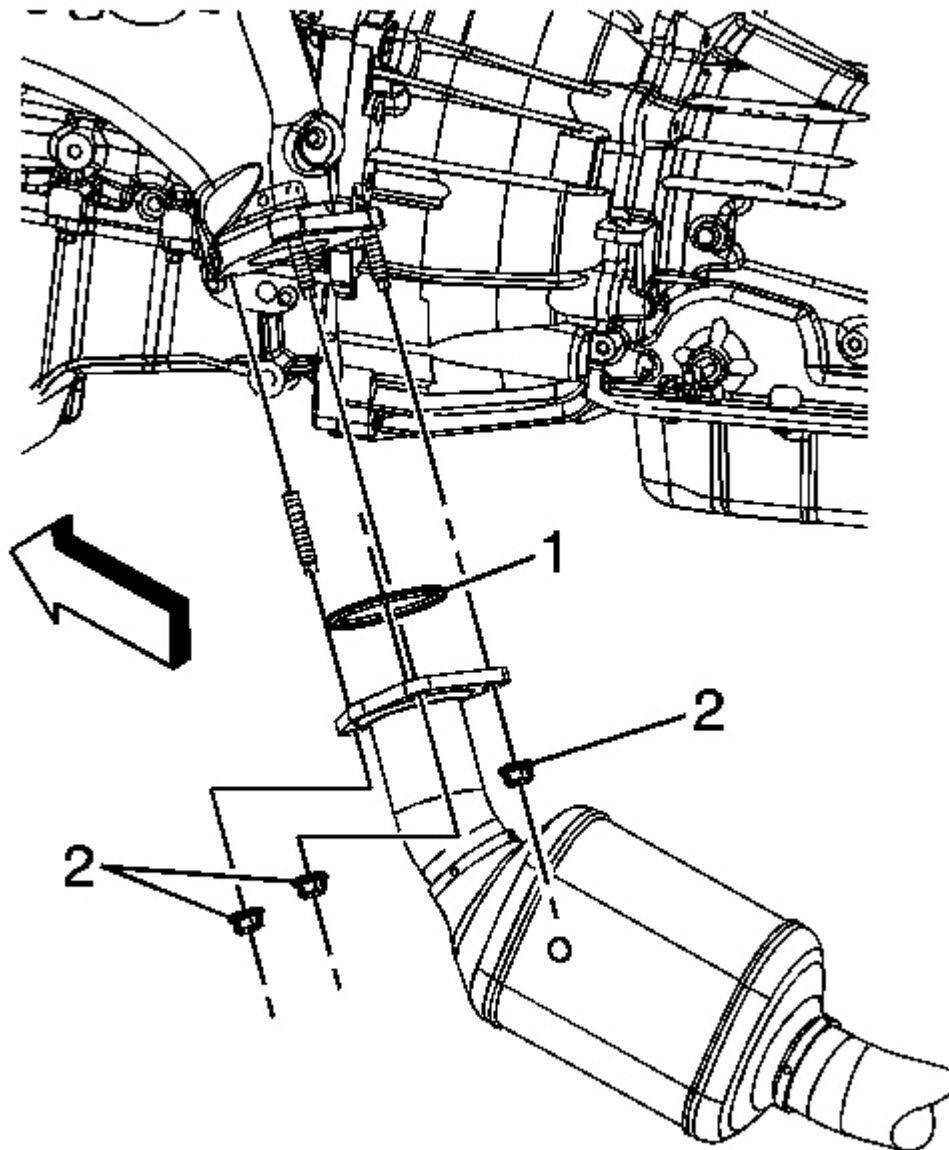


Fig. 13: View Of Exhaust Manifold, Catalytic Converter, Gasket & Nuts

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Courtesy of GENERAL MOTORS CORP.

9. Install the catalytic converter to exhaust manifold nuts.

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

10. Lower the vehicle.

EXHAUST MANIFOLD REPLACEMENT - RIGHT SIDE (LH6/LS2)

Removal Procedure

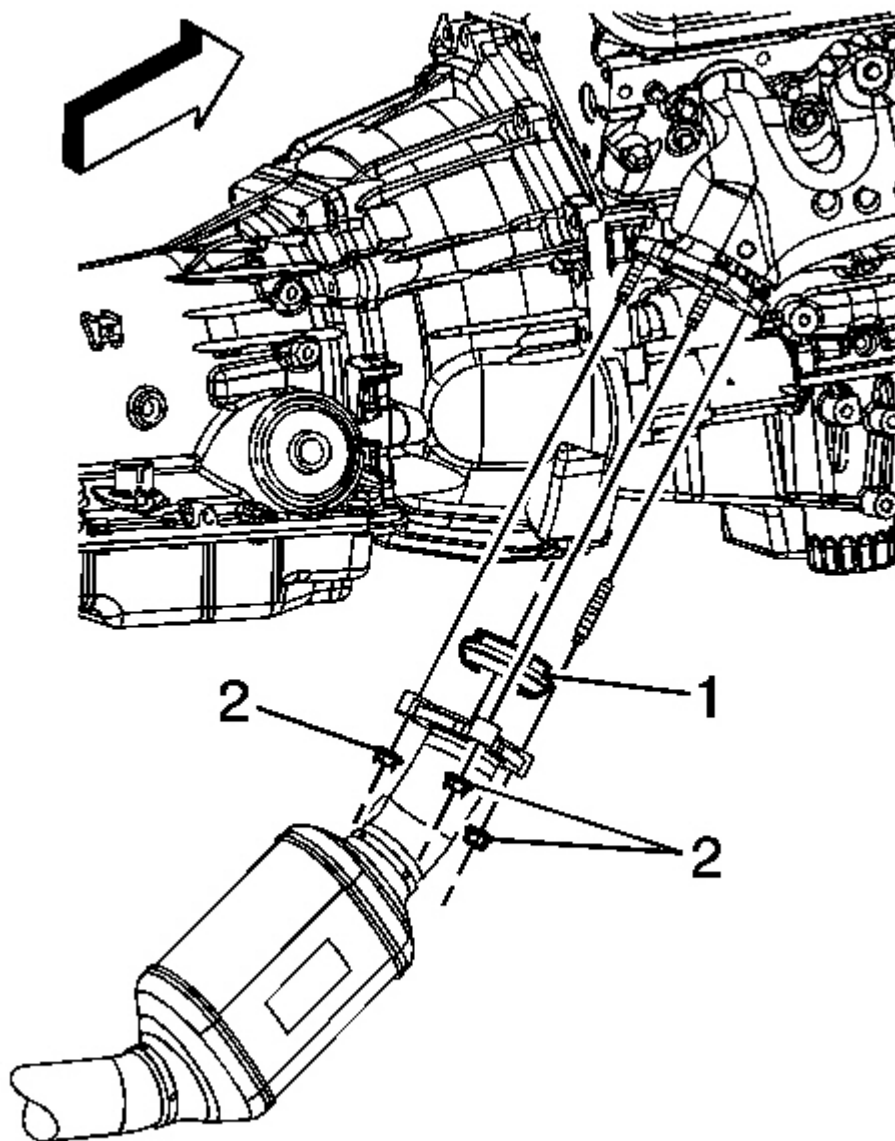


Fig. 14: View Of Exhaust Manifold, Catalytic Converter, Sealing Ring & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Raise and suitably support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the catalytic converter to exhaust manifold nuts (2).
3. Lower the vehicle.

4. Remove the spark plugs. Refer to Spark Plug Replacement .

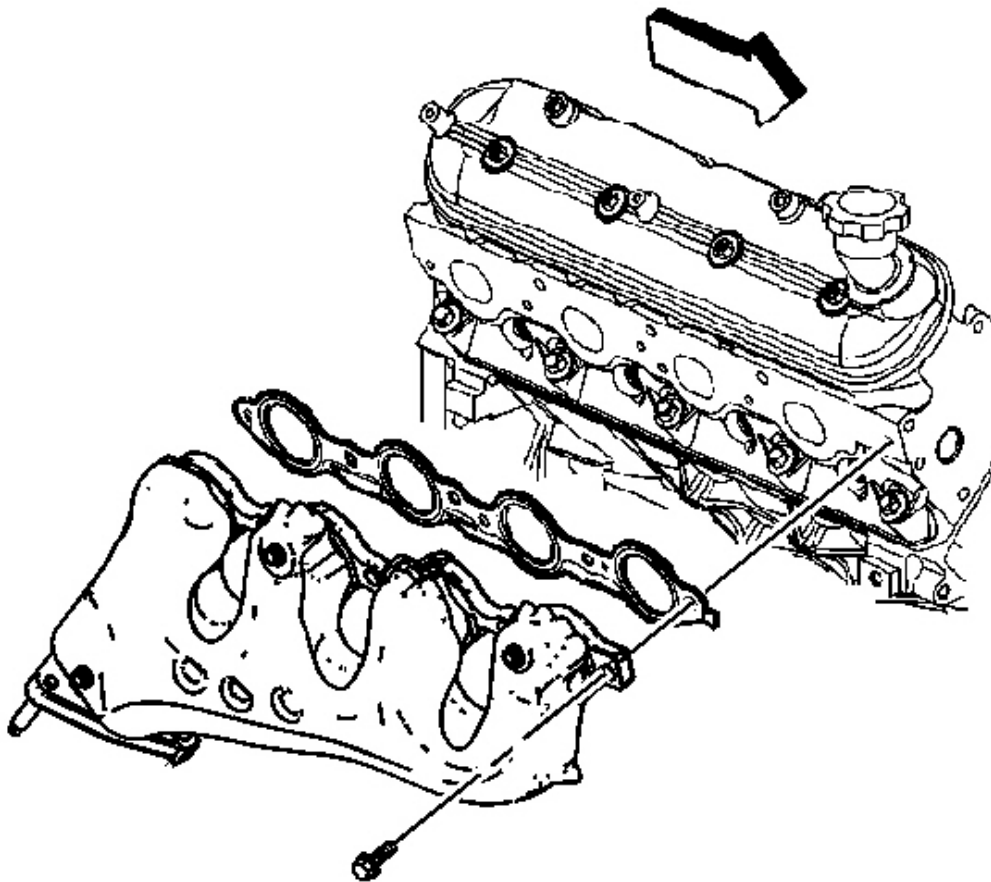


Fig. 15: View Of Right Exhaust Manifold & Gasket
Courtesy of GENERAL MOTORS CORP.

5. Remove the exhaust manifold bolts.
6. Remove the exhaust manifold.
7. Remove and discard the exhaust manifold gasket.

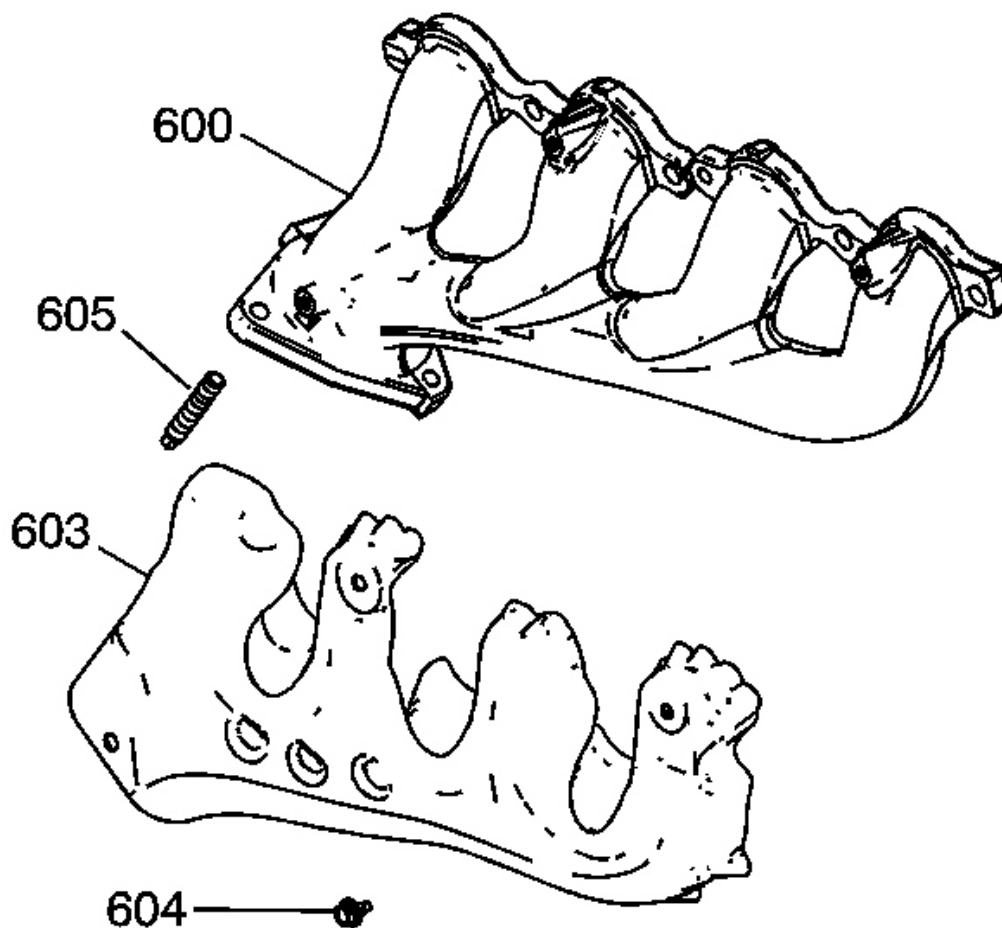


Fig. 16: View Of Right Exhaust Manifold & Heat Shield
Courtesy of GENERAL MOTORS CORP.

8. Remove the exhaust manifold heat shield bolts (604) and shield (603), if required.

Installation Procedure

IMPORTANT:

- Tighten the exhaust manifold bolts as specified in the service procedure. Improperly installed and/or leaking exhaust manifold gaskets may affect vehicle emissions and/or On-Board Diagnostics (OBD) II system performance.
- The cylinder head exhaust manifold bolt hole threads must be clean and free of debris or threadlocking material.

- Do not apply sealant to the first 3 threads of the bolt.

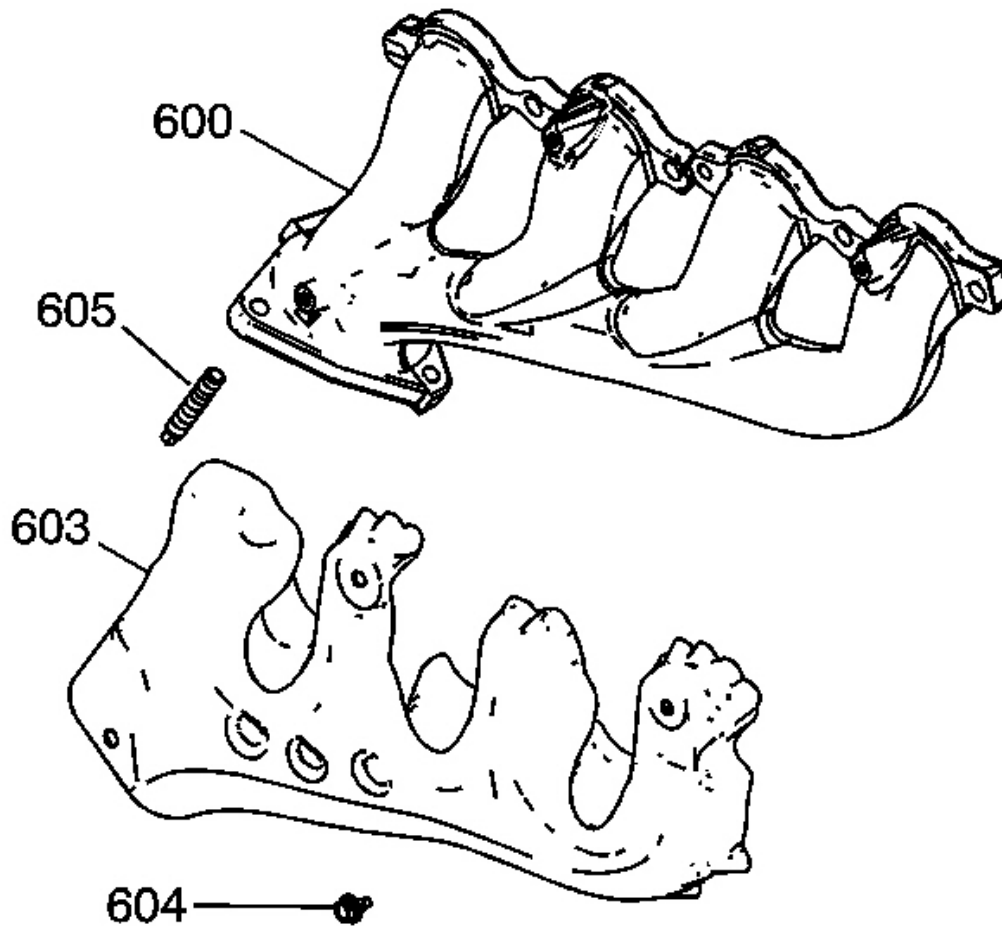


Fig. 17: View Of Right Exhaust Manifold & Heat Shield
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Position the exhaust manifold heat shield (603) to the manifold and install the bolts (604), if required.

Tighten: Tighten the bolts to 9 N.m (80 lb in).

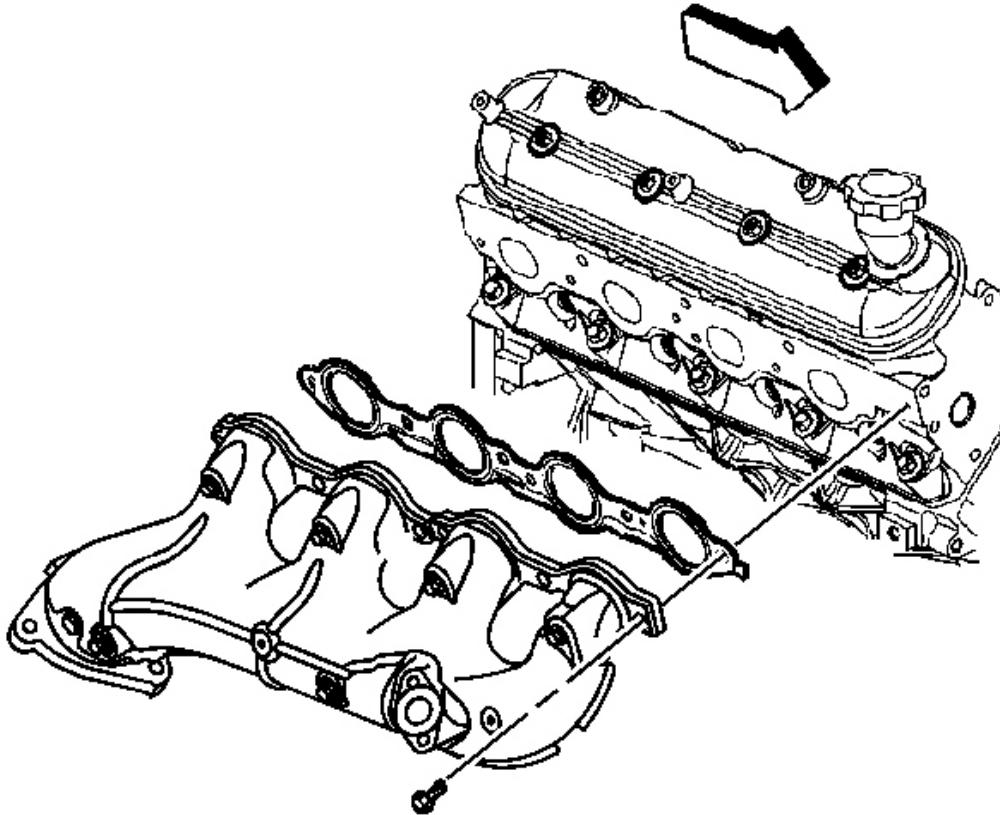


Fig. 18: View Of Right Exhaust Manifold (4.8L, 5.3L, 6.0L)
Courtesy of GENERAL MOTORS CORP.

2. Apply a 5 mm (0.2 in) wide band of threadlock to the threads of the exhaust manifold bolts.
3. Position a NEW exhaust manifold gasket to the cylinder head.
4. Position the exhaust manifold to the cylinder head and install the studs to the catalytic converter.
5. Install the exhaust manifold bolts.

Tighten:

1. Tighten the bolts a first pass to 15 N.m (11 lb ft). Tighten the bolts beginning with the center 2 bolts. Alternate from side-to-side, and work toward the outside bolts.
 2. Tighten the bolts a final pass to 20 N.m (15 lb ft). Tighten the bolts beginning with the center 2 bolts. Alternate from side-to-side, and work toward the outside bolts.
6. Using a flat punch, bend over the exposed edge of the exhaust manifold gasket at the rear of the right cylinder head.

7. Install the spark plugs. Refer to Spark Plug Replacement .
8. Raise the and suitably support the vehicle.

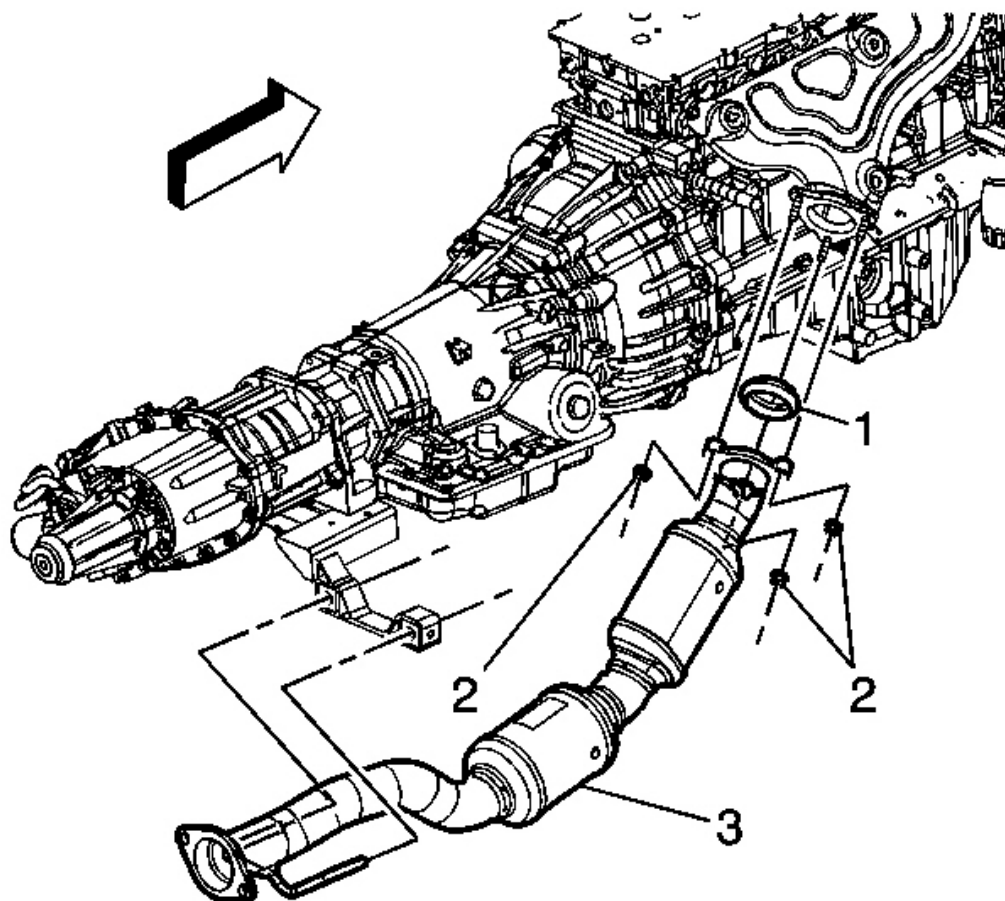


Fig. 19: View Of Exhaust Manifold, Catalytic Converter, Sealing Ring & Nuts
Courtesy of GENERAL MOTORS CORP.

9. Install the catalytic converter to exhaust manifold nuts (2).

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

10. Lower the vehicle.

CATALYTIC CONVERTER REPLACEMENT (LL8)

Removal Procedure

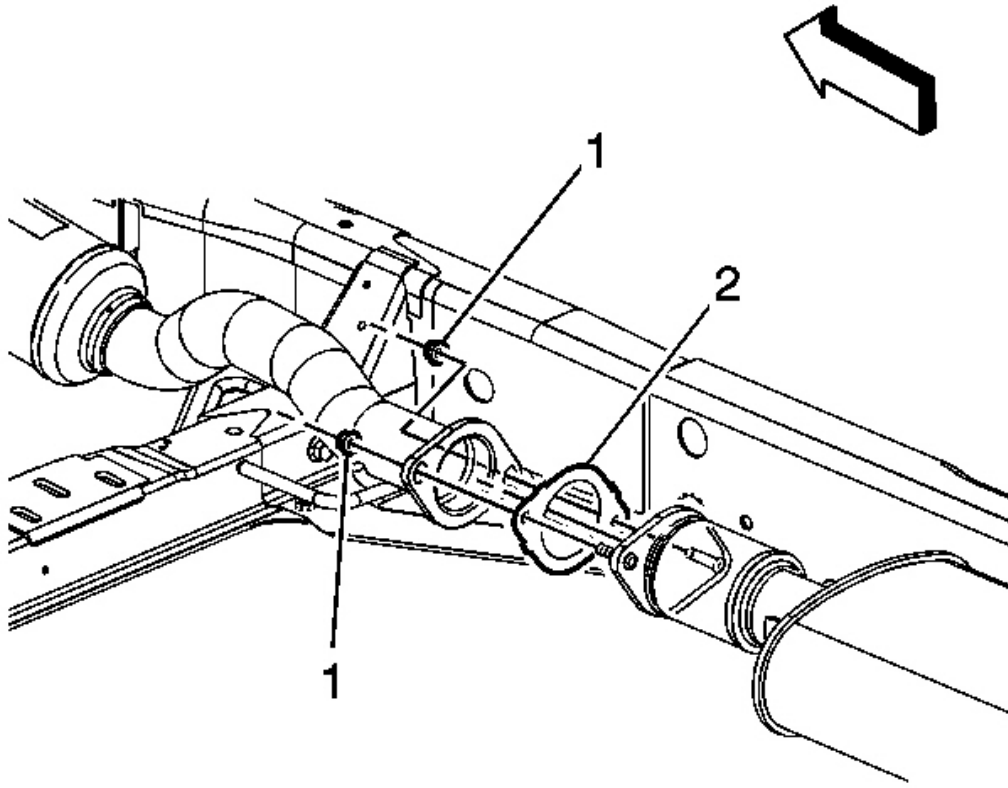


Fig. 20: View Of Catalytic Converter, Muffler, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Remove the heated oxygen sensors (H2OS). Refer to **Heated Oxygen Sensor 1 Replacement** and **Heated Oxygen Sensor 2 Replacement** .
2. Remove the transmission mount. Refer to **Transmission Mount Replacement (4.2L)** or **Transmission Mount Replacement (5.3L)** .
3. Remove the catalytic converter to muffler nuts (1).

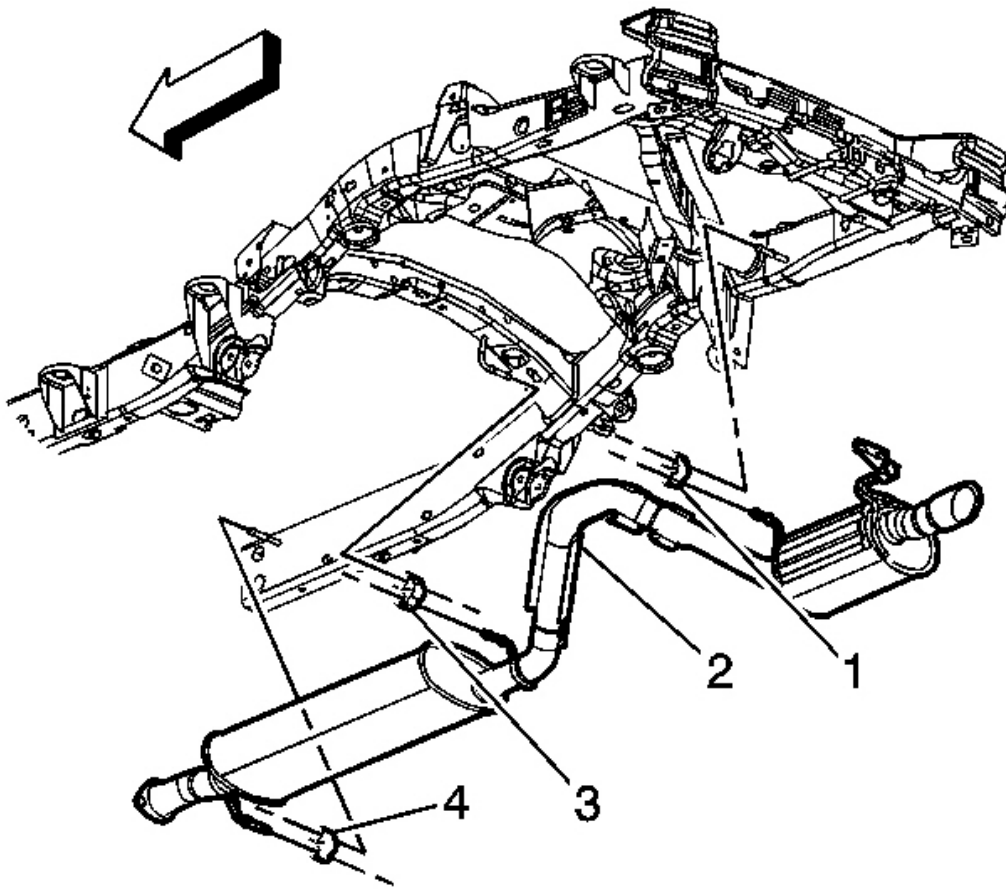


Fig. 21: Locating Exhaust Insulators
Courtesy of GENERAL MOTORS CORP.

4. Remove the front 2 muffler insulators (3 and 4) from the muffler hangers.
5. Pull back and separate the muffler (2) flange studs from the catalytic converter flange.
6. Reposition and secure the muffler end out of the way.
7. Remove and discard the old exhaust gasket.

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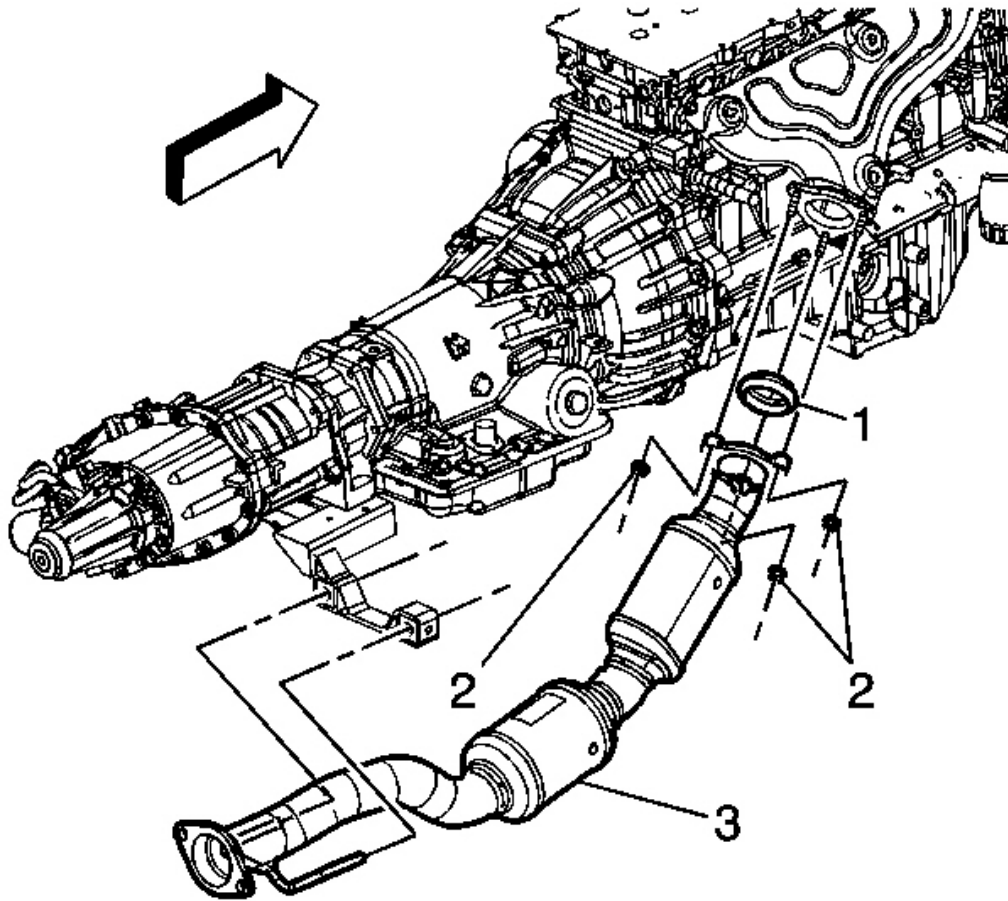


Fig. 22: View Of Exhaust Manifold, Catalytic Converter, Sealing Ring & Nuts
Courtesy of GENERAL MOTORS CORP.

8. Remove the catalytic converter to exhaust manifold nuts (2).
9. Remove the catalytic converter (3) from the vehicle.
10. Remove and discard the old exhaust seal (1).

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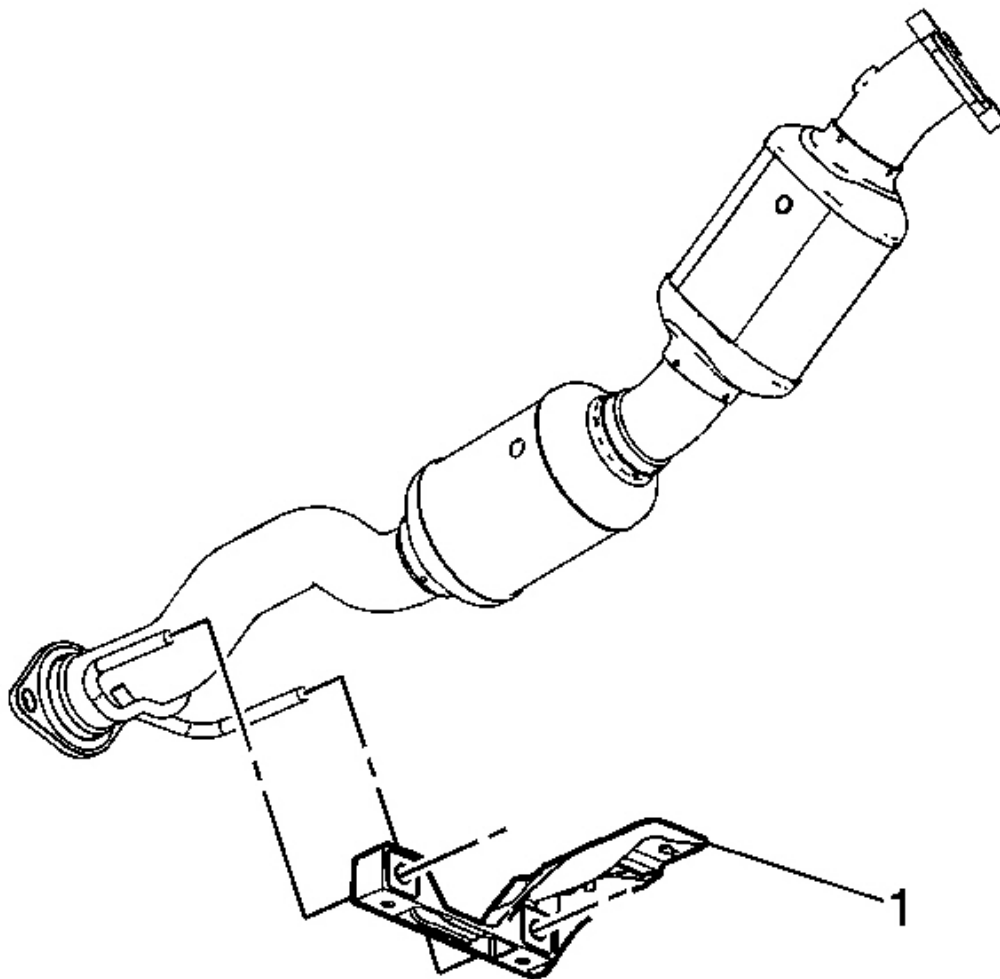


Fig. 23: View Of Catalytic Converter Hangers & Bracket
Courtesy of GENERAL MOTORS CORP.

11. Remove the catalytic converter hanger (1) from the catalytic converter.

Installation Procedure

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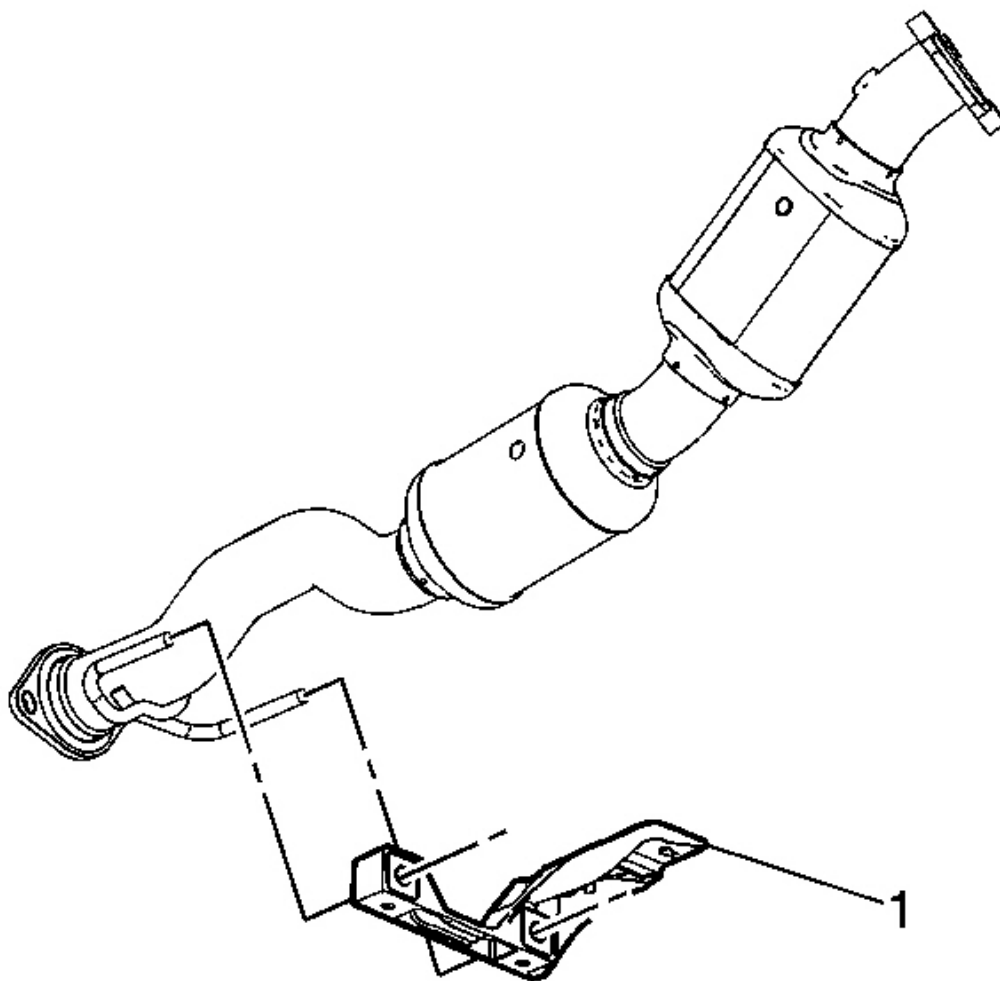


Fig. 24: View Of Catalytic Converter Hangers & Bracket
Courtesy of GENERAL MOTORS CORP.

1. Install the catalytic converter hanger (1) to the catalytic converter.

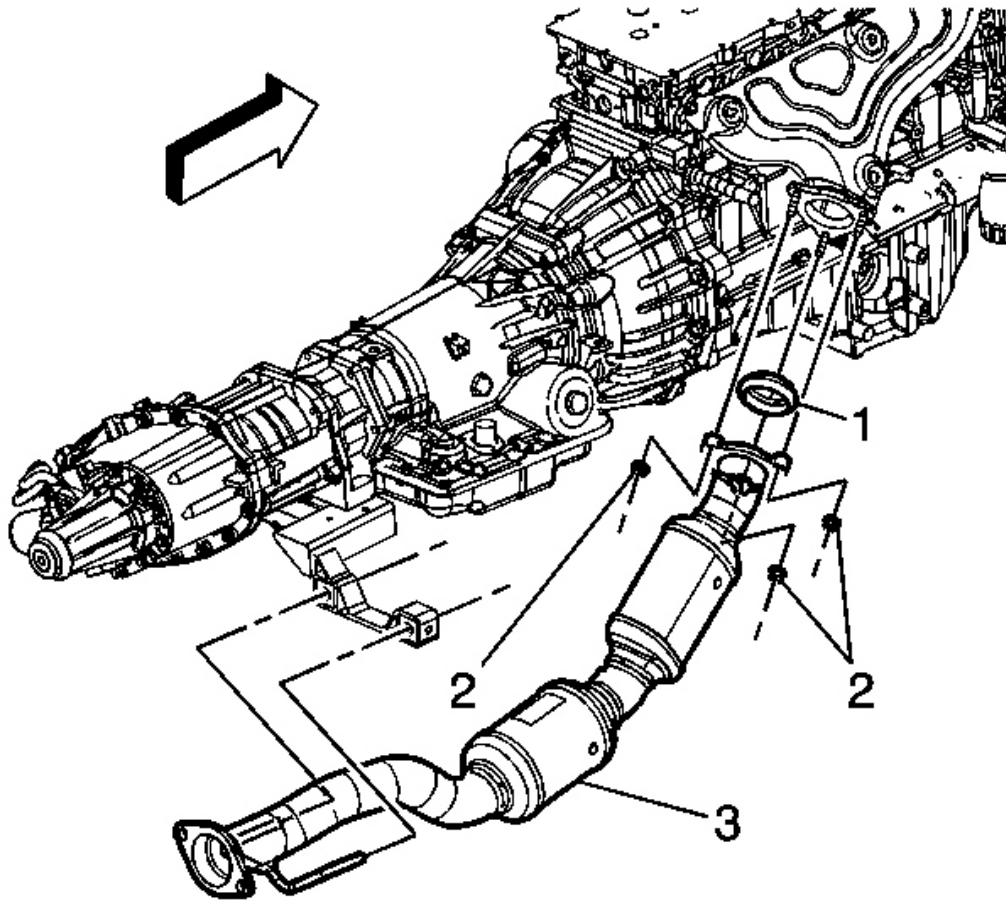


Fig. 25: View Of Exhaust Manifold, Catalytic Converter, Sealing Ring & Nuts
Courtesy of GENERAL MOTORS CORP.

2. Install a NEW exhaust seal (1) into the exhaust manifold.
3. Install the catalytic converter (3) to the vehicle.

NOTE: Refer to Fastener Notice .

4. Install the catalytic converter to exhaust manifold nuts (2).

Tighten: Tighten the nuts to 45 N.m (33 lb ft).

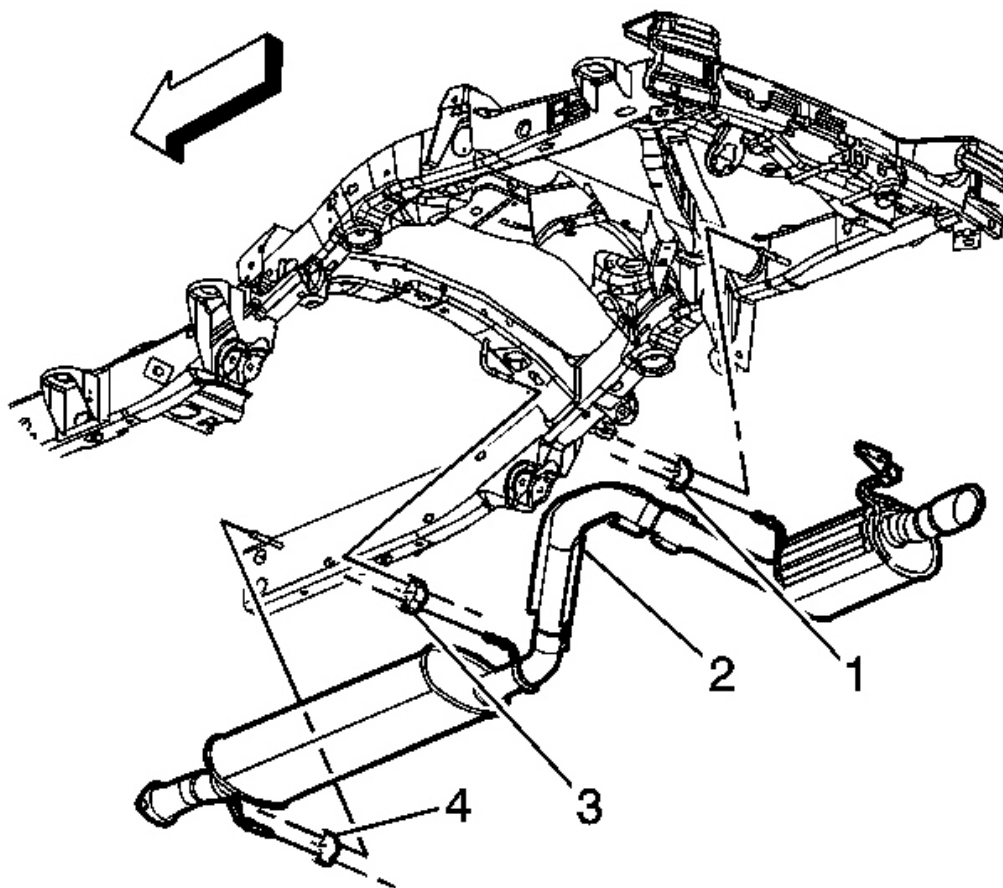


Fig. 26: Locating Exhaust Insulators
Courtesy of GENERAL MOTORS CORP.

5. Unsecure and position the muffler assembly.
6. Install a NEW exhaust gasket onto the muffler studs.
7. Pull back and install the muffler (2) flange studs to the catalytic converter flange.
8. Install the front 2 muffler insulators (3 and 4) to the muffler hangers.

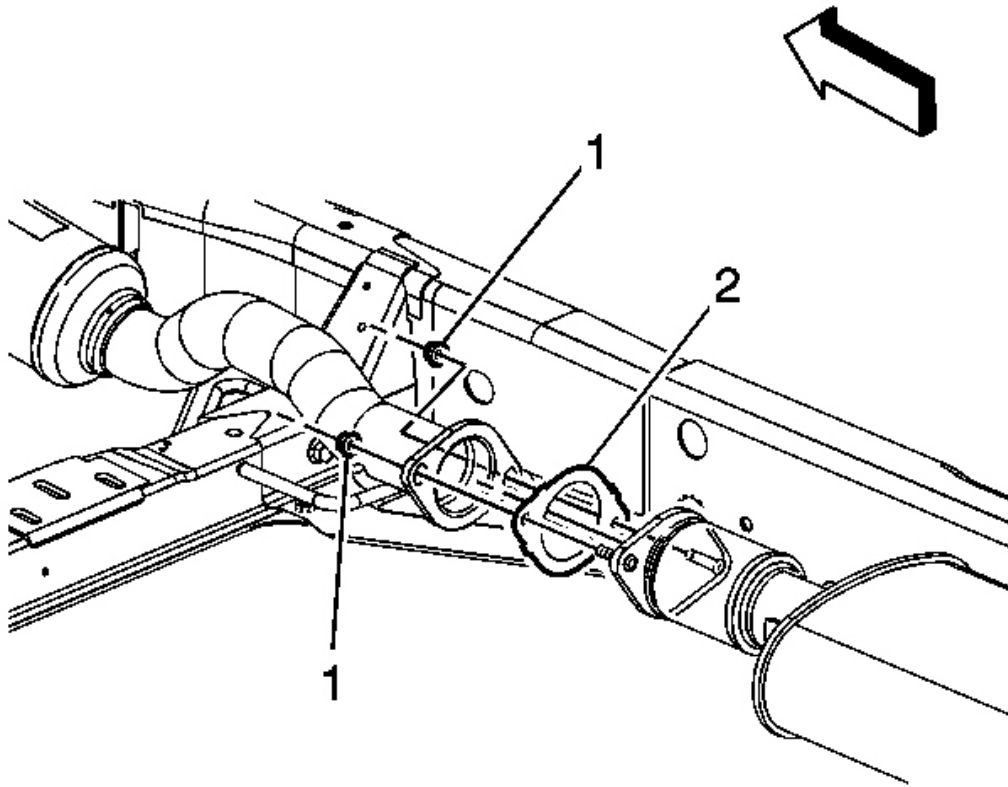


Fig. 27: View Of Catalytic Converter, Muffler, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

9. Install the catalytic converter to muffler nuts (1).

Tighten: Tighten the nuts to 45 N.m (33 lb ft).

10. Install the transmission mount. Refer to **Transmission Mount Replacement (4.2L)** or **Transmission Mount Replacement (5.3L)** .
11. Install the H2OS. Refer to **Heated Oxygen Sensor 1 Replacement** and **Heated Oxygen Sensor 2 Replacement** .

CATALYTIC CONVERTER REPLACEMENT (LH6/LS2)

Removal Procedure

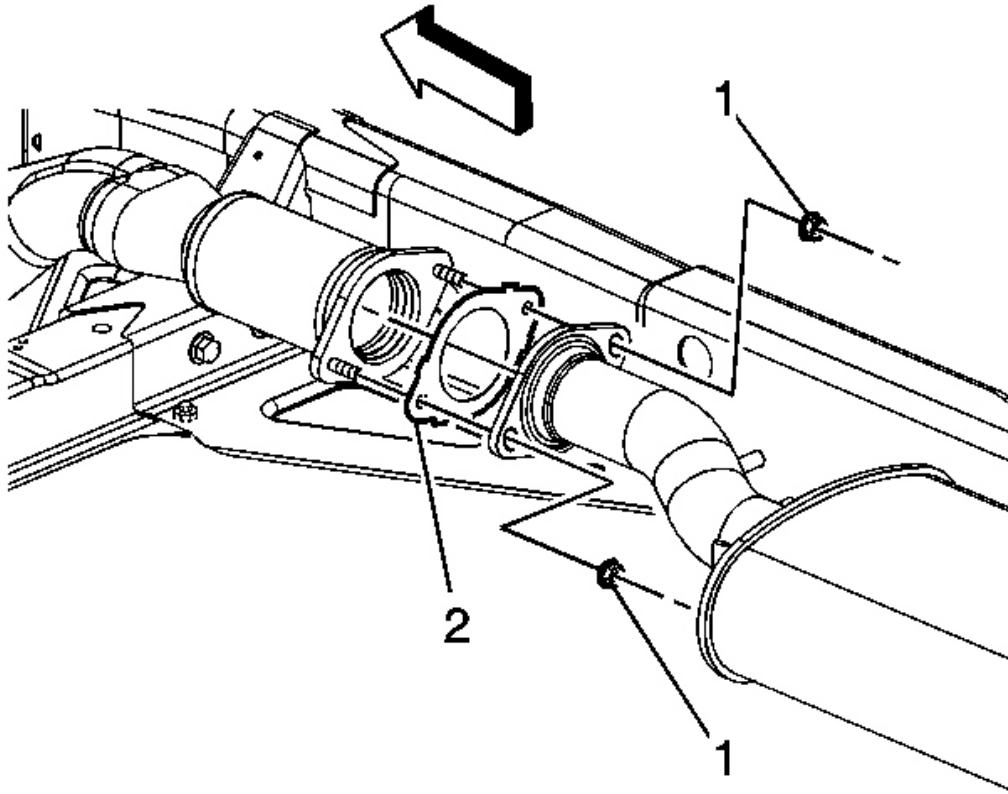


Fig. 28: View Of Catalytic Converter, Muffler, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Remove the heated oxygen sensors (HO2S). Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 , Heated Oxygen Sensor Replacement - Bank 1 Sensor 2 , Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 , and Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 .
2. Remove the rear propeller shaft. Refer to **Rear Propeller Shaft Replacement** .
3. If equipped with four wheel drive (4WD), remove the front propeller shaft. Refer to **Front Propeller Shaft Replacement** .
4. Remove the transmission support. Refer to **Transmission Support Replacement** .
5. Remove the muffler to catalytic converter nuts (1).

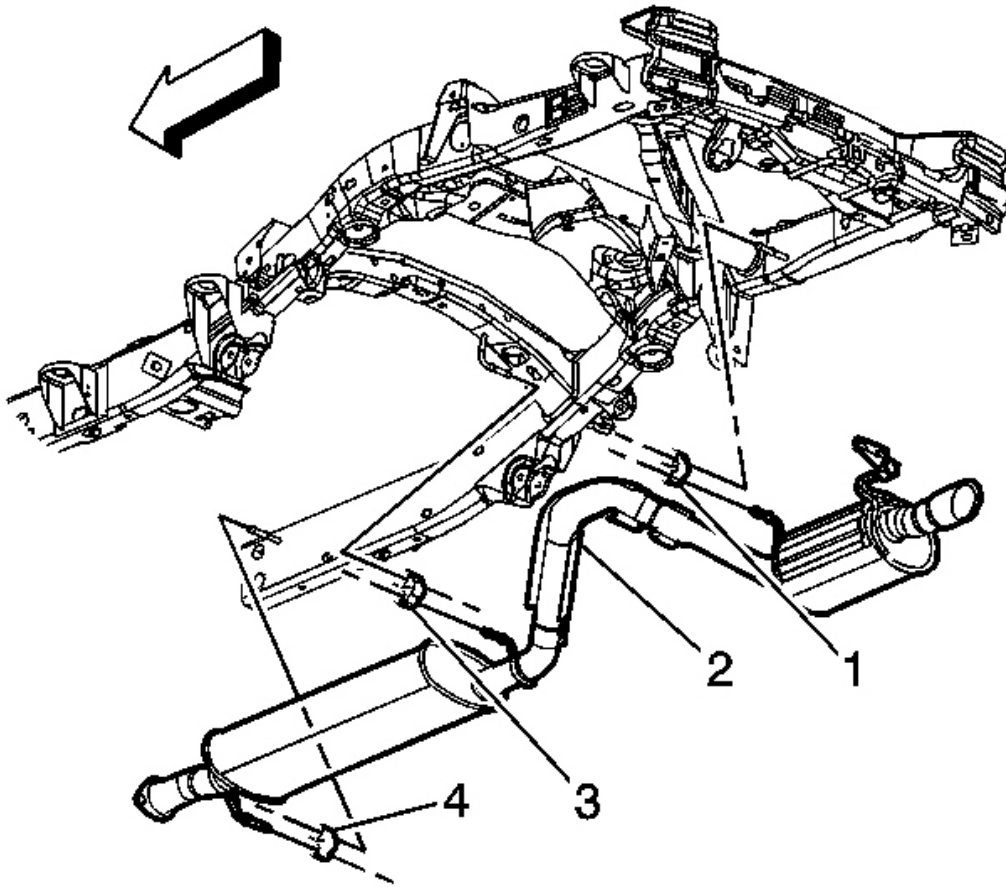


Fig. 29: Locating Exhaust Insulators
Courtesy of GENERAL MOTORS CORP.

6. Remove the front 2 muffler insulators (3 and 4) from the muffler hangers.
7. Pull back and separate the muffler (2) flange from the catalytic converter flange studs.
8. Reposition and secure the muffler end out of the way.
9. Remove and discard the old exhaust gasket.

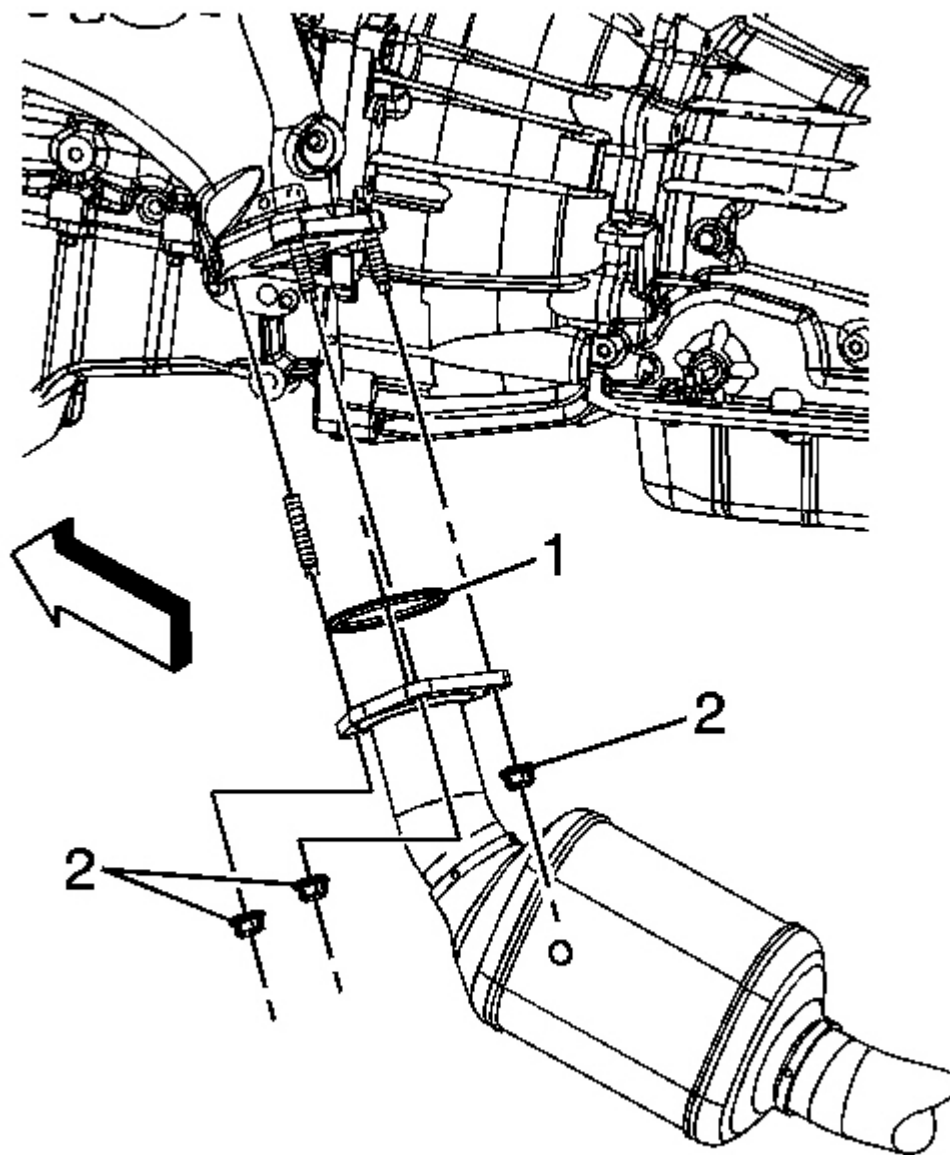


Fig. 30: View Of Exhaust Manifold, Catalytic Converter, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

10. Remove the catalytic converter to left exhaust manifold nuts (2).

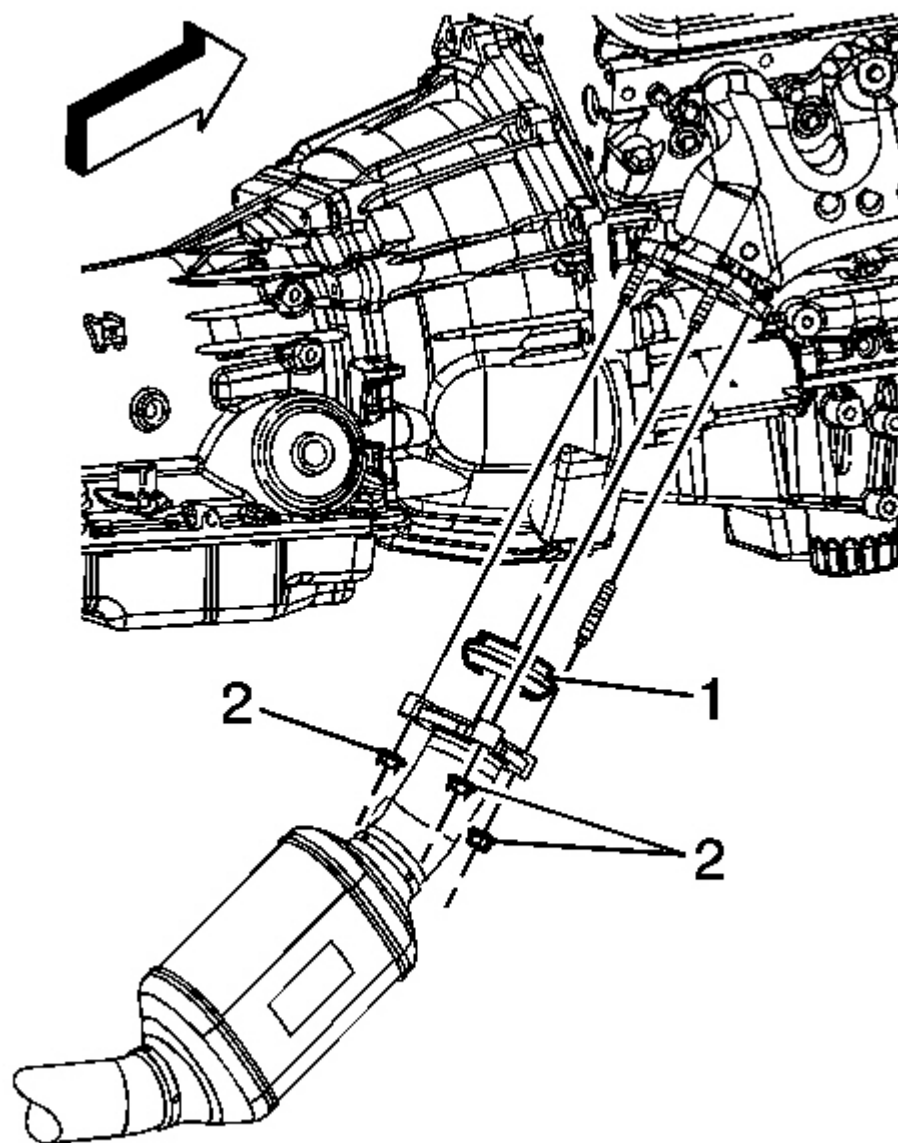


Fig. 31: View Of Exhaust Manifold, Catalytic Converter, Sealing Ring & Nuts
Courtesy of GENERAL MOTORS CORP.

11. Remove the catalytic converter to right exhaust manifold nuts (2).

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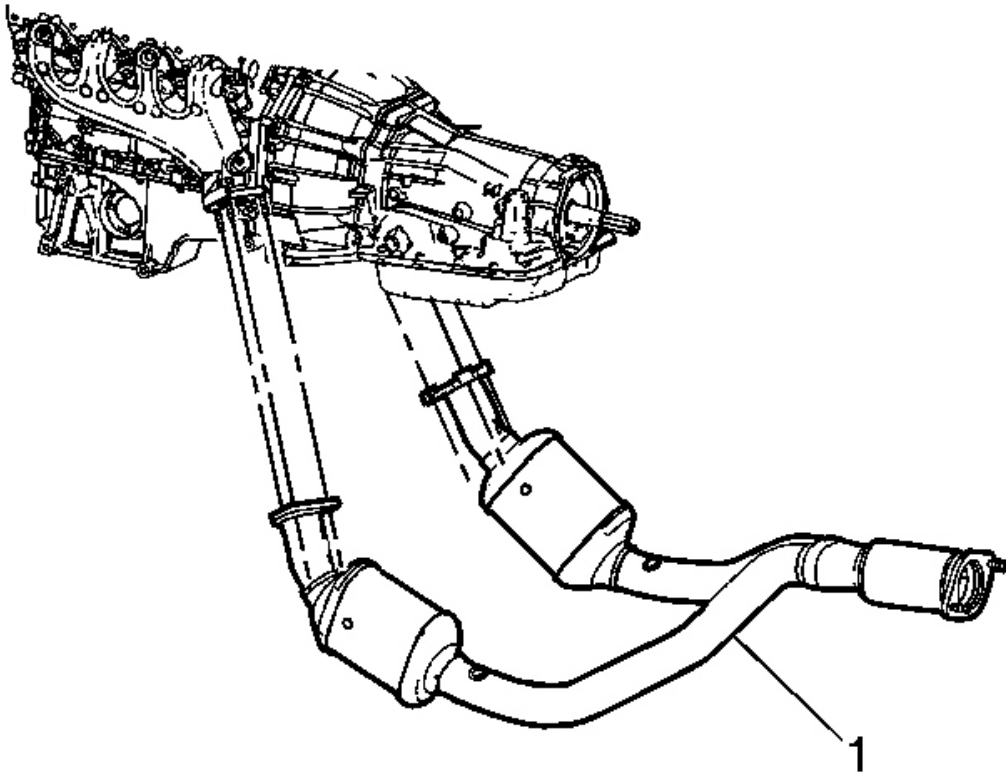


Fig. 32: View Of Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

12. Raise the transmission using the transmission jack for additional catalytic converter pipe clearance.
13. Tilt the catalytic converter in order to lower the left side pipe below the vehicle frame. Rotate the catalytic converter outlet pipe toward the left side of the vehicle to gain the necessary clearance for the right side pipe to clear the vehicle frame. Remove the catalytic converter (1) from the vehicle.
14. Remove and discard the catalytic converter to exhaust manifold seals.

Installation Procedure

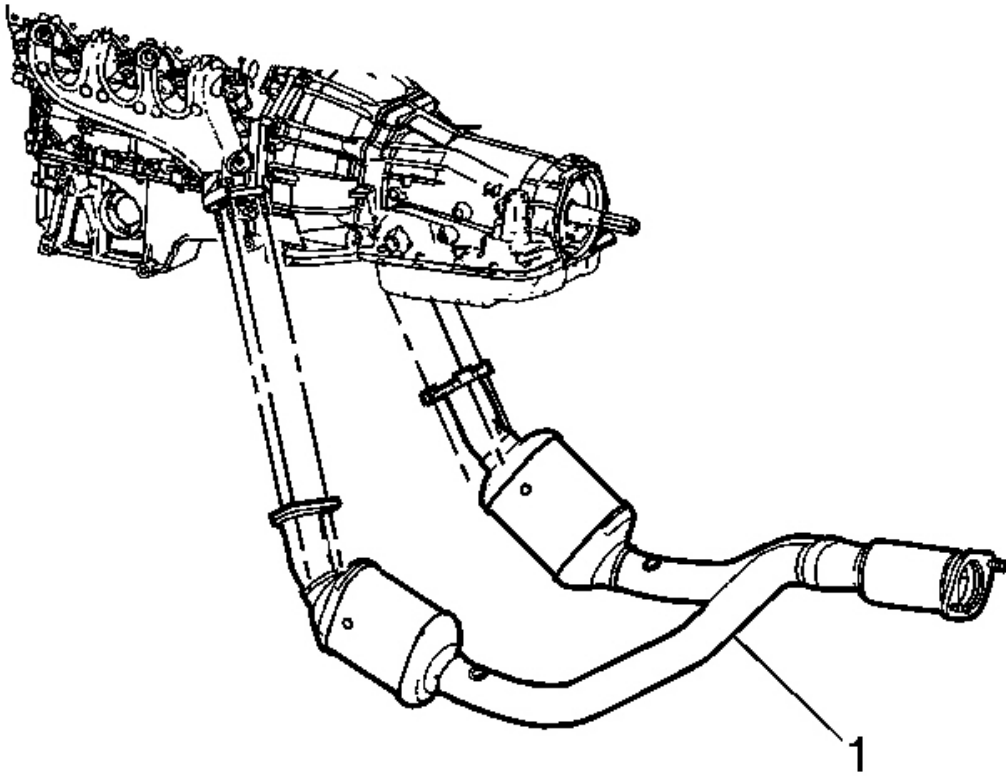


Fig. 33: View Of Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

1. Install the catalytic converter in reverse order of removal by starting with the catalytic converter outlet pipe angled toward the left side of the vehicle and positioning the right side pipe above the frame. Rotate the catalytic converter outlet pipe toward the rear of the vehicle and lift the left side pipe up above the frame.
2. Install a NEW exhaust seal to the right exhaust manifold.
3. Install a NEW exhaust seal onto the groove on the catalytic converter left side flange.
4. Install the catalytic converter (1) to the exhaust manifold studs.

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2008 ENGINE Engine Exhaust - Ascender, Envoy & Trailblazer

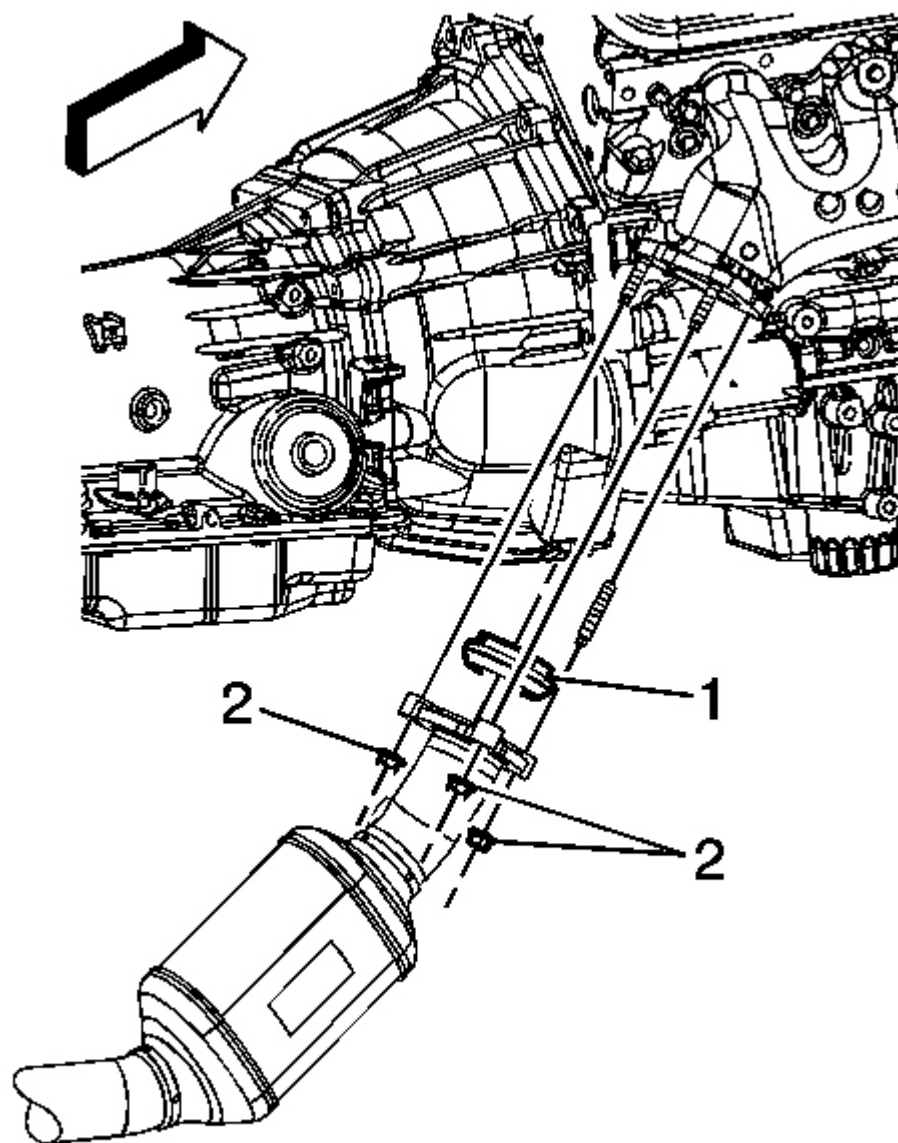


Fig. 34: View Of Exhaust Manifold, Catalytic Converter, Sealing Ring & Nuts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

5. Install the catalytic converter to right exhaust manifold nuts (2).

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

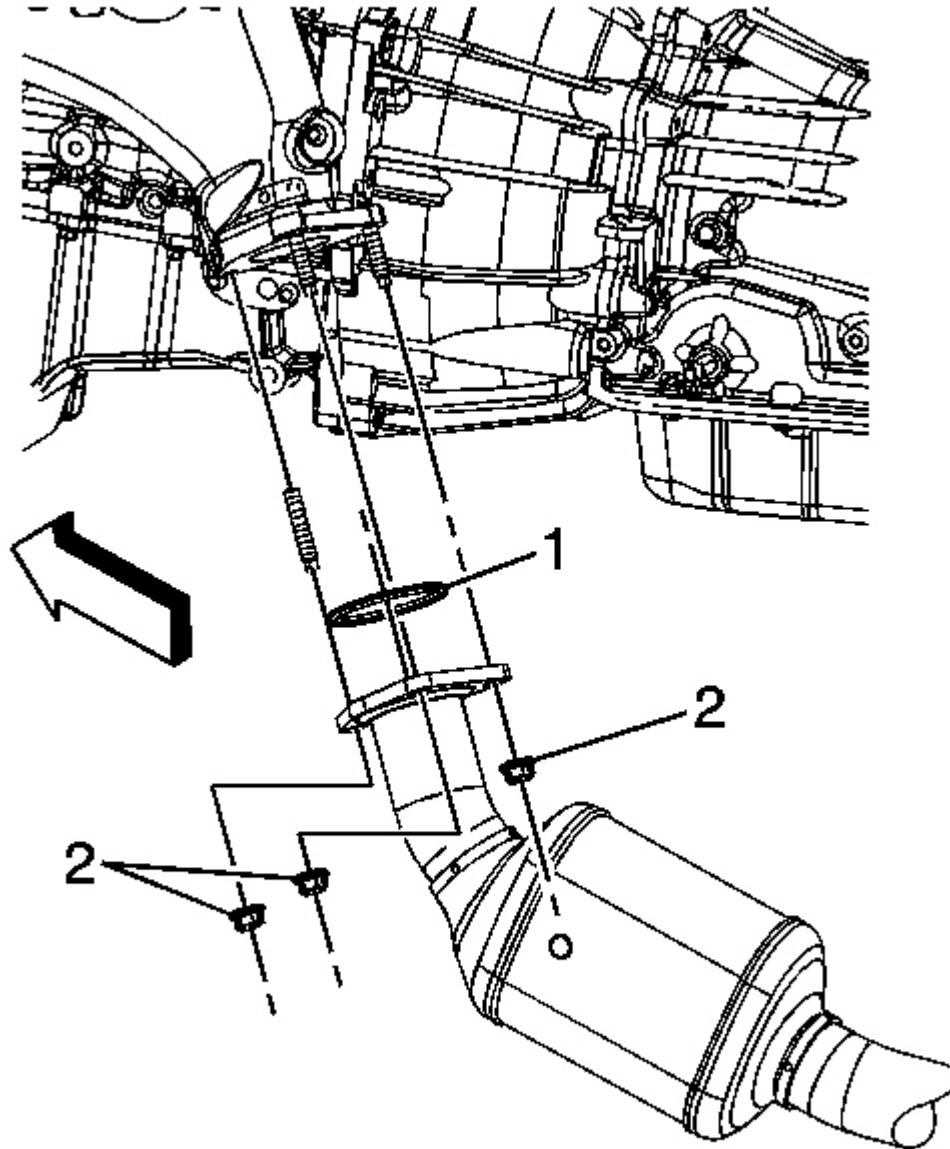


Fig. 35: View Of Exhaust Manifold, Catalytic Converter, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

6. Install the catalytic converter to left exhaust manifold nuts (2).

Tighten: Tighten the nuts to 50 N.m (37 lb ft).

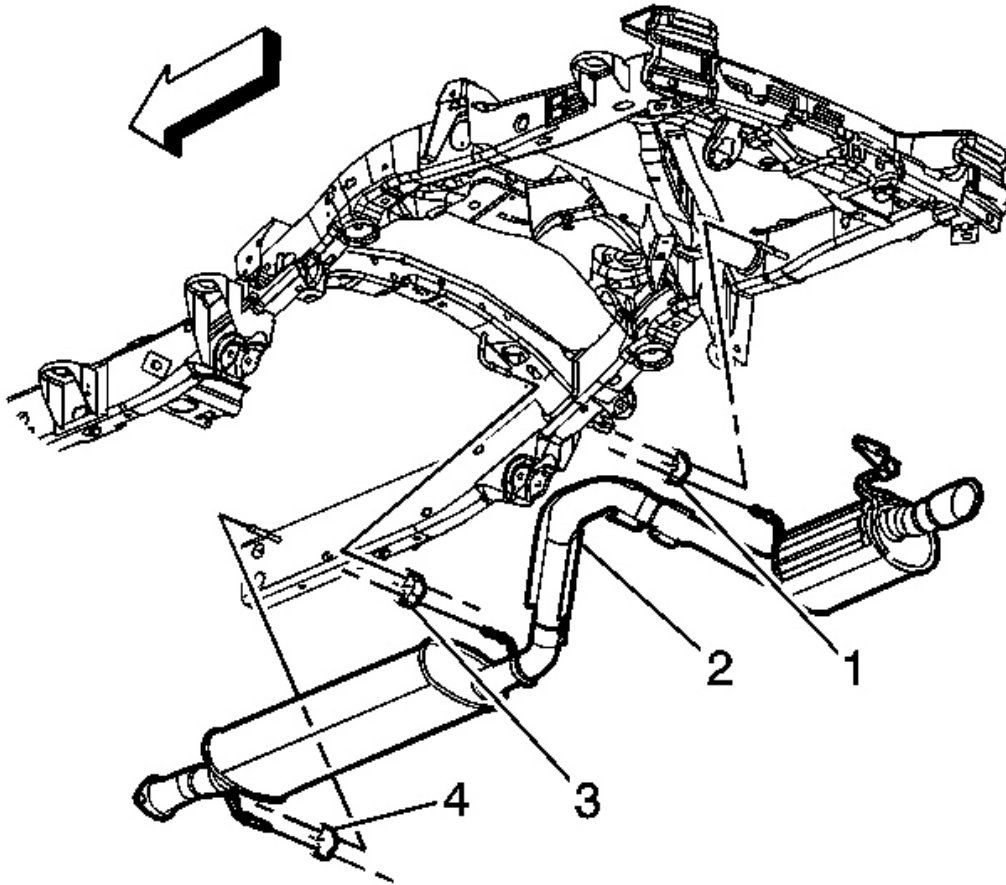


Fig. 36: Locating Exhaust Insulators
Courtesy of GENERAL MOTORS CORP.

7. Unsecure and position the muffler assembly.
8. Install a NEW exhaust gasket onto the catalytic converter studs.
9. Pull back and install the muffler (2) flange onto the catalytic converter flange studs.
10. Install the front 2 muffler insulators (3 and 4) to the muffler hangers.

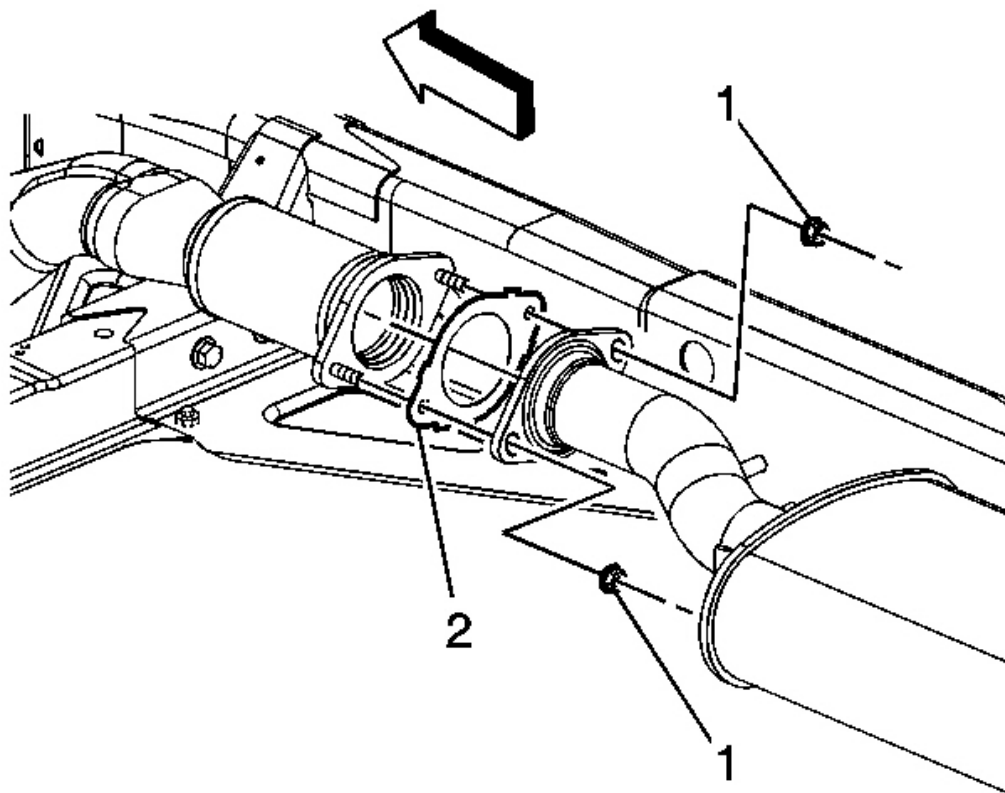


Fig. 37: View Of Catalytic Converter, Muffler, Gasket & Nuts
 Courtesy of GENERAL MOTORS CORP.

11. Install the muffler to catalytic converter nuts (1).

Tighten: Tighten the nuts to 45 N.m (33 lb ft).

12. Install the transmission support. Refer to **Transmission Support Replacement** .
13. If equipped with 4WD, install the front propeller shaft. Refer to **Front Propeller Shaft Replacement** .
14. Install the rear propeller shaft. Refer to **Rear Propeller Shaft Replacement** .
15. Install the HO2S. Refer to Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 , Heated Oxygen Sensor Replacement - Bank 1 Sensor 2 , Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 , and Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 .

EXHAUST SYSTEM INSULATOR, HANGER, BRACKET REPLACEMENT (LL8)

Removal Procedure

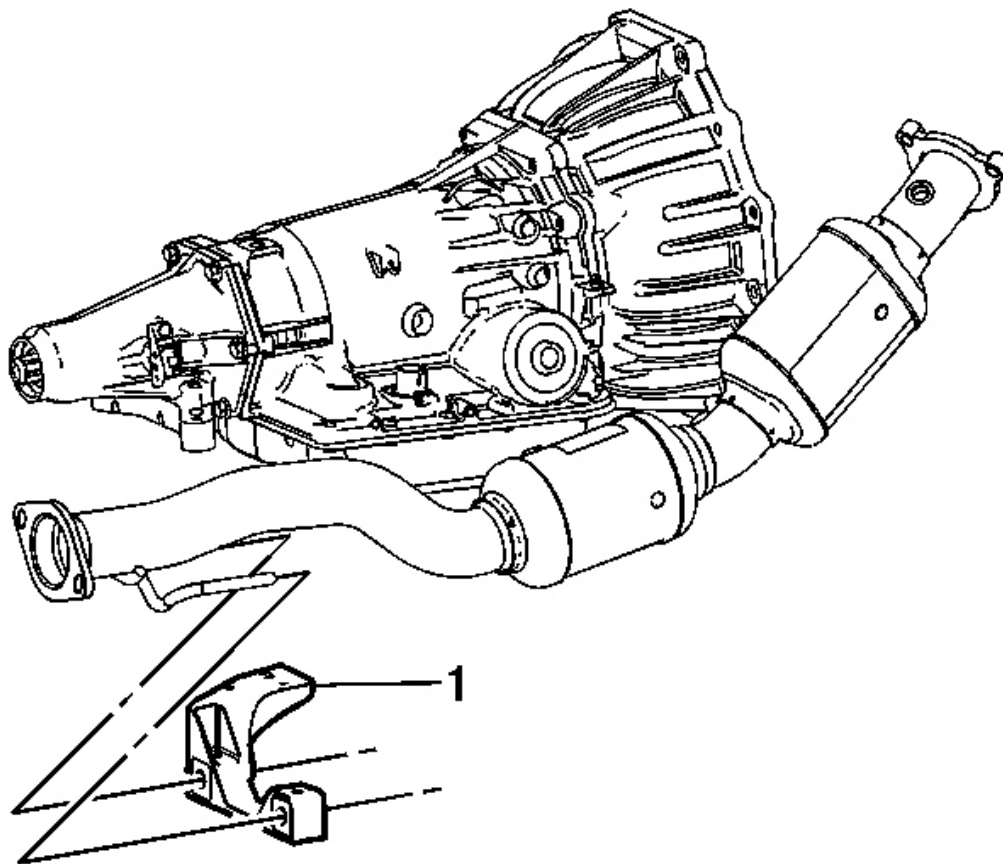


Fig. 38: View Of Catalytic Converter Hanger Bracket
Courtesy of GENERAL MOTORS CORP.

1. Remove the transmission mount. Refer to **Transmission Mount Replacement (4.2L)** or **Transmission Mount Replacement (5.3L)** .
2. If equipped with 2 wheel drive (2WD), slide the catalytic converter hanger (1) towards the front of the vehicle and remove the hanger.

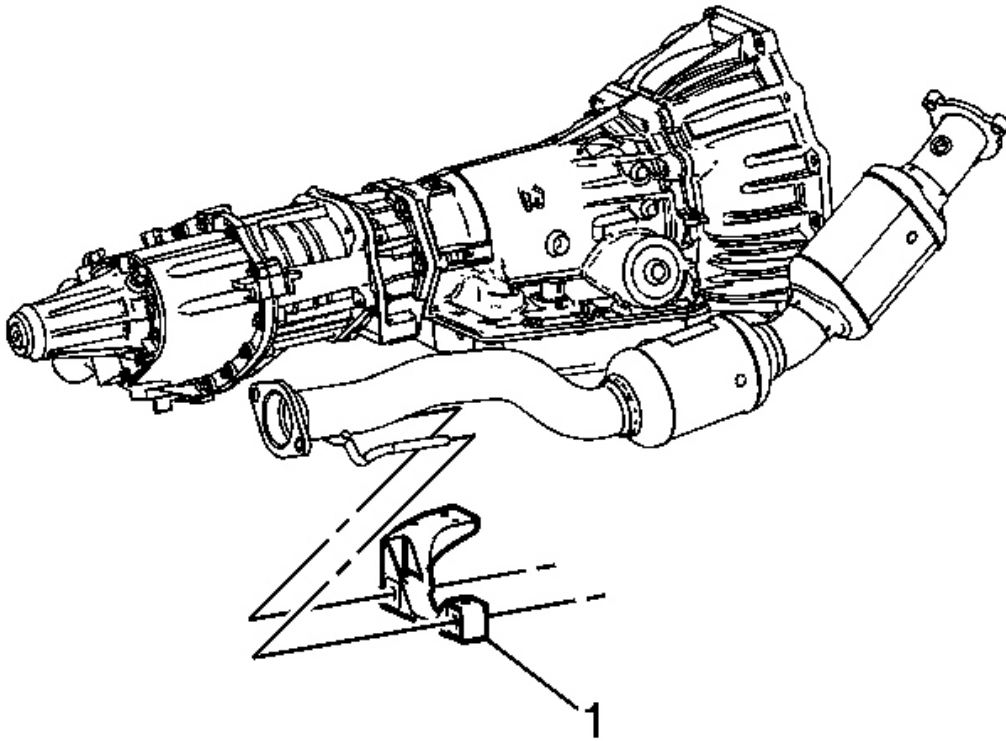


Fig. 39: View Of Catalytic Converter Hanger Bracket
Courtesy of GENERAL MOTORS CORP.

3. If equipped with 4 wheel drive (4WD), slide the catalytic converter hanger (1) towards the front of the vehicle and remove the hanger.

Installation Procedure

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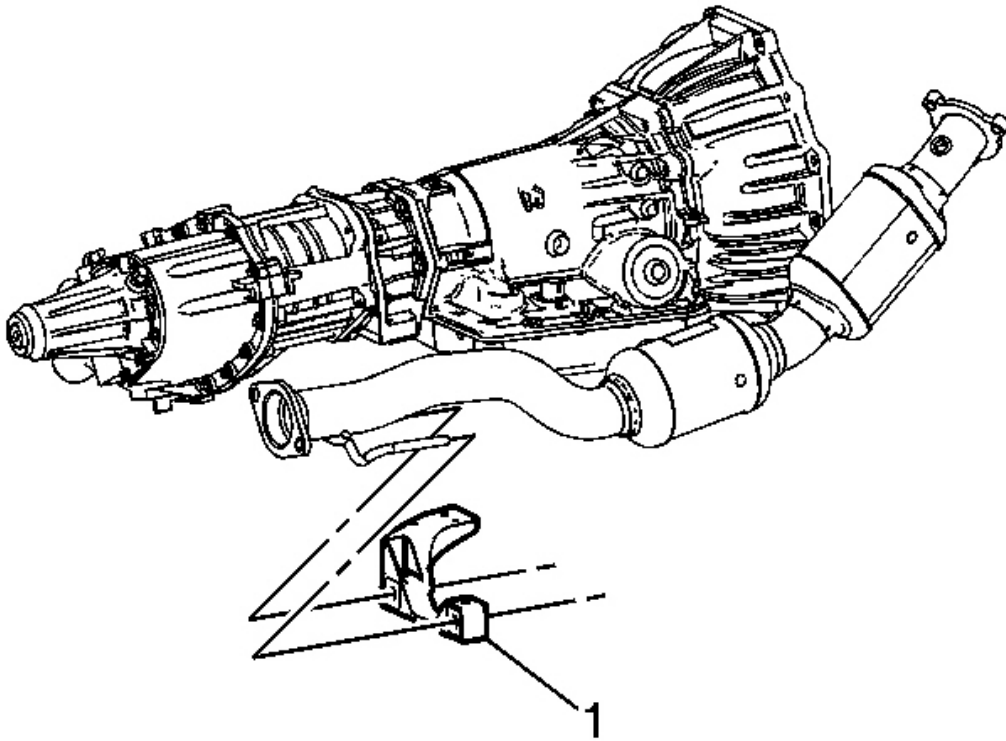


Fig. 40: View Of Catalytic Converter Hanger Bracket
Courtesy of GENERAL MOTORS CORP.

1. If equipped with 4WD, position the hanger and slide the catalytic converter hanger (1) towards the rear of the vehicle.

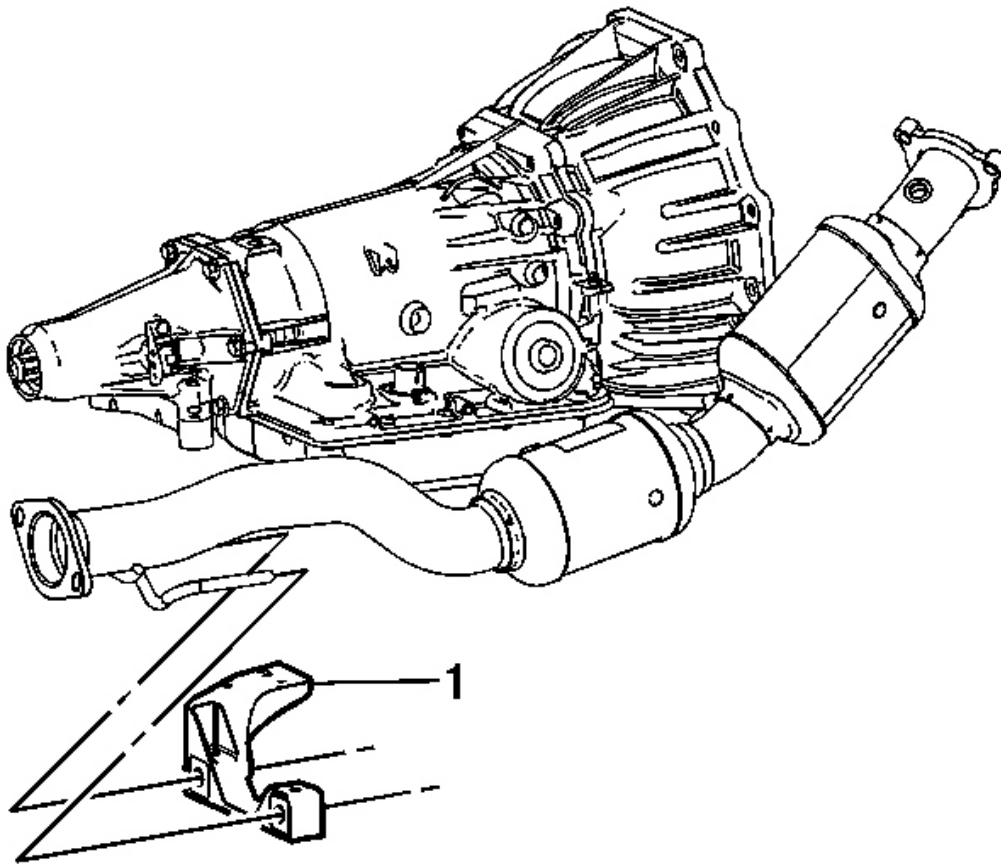


Fig. 41: View Of Catalytic Converter Hanger Bracket
Courtesy of GENERAL MOTORS CORP.

2. If equipped with 2WD, position the hanger and slide the catalytic converter hanger (1) towards the rear of the vehicle.
3. Install the transmission mount. Refer to **Transmission Mount Replacement (4.2L)** or **Transmission Mount Replacement (5.3L)** .

MUFFLER REPLACEMENT

Removal Procedure

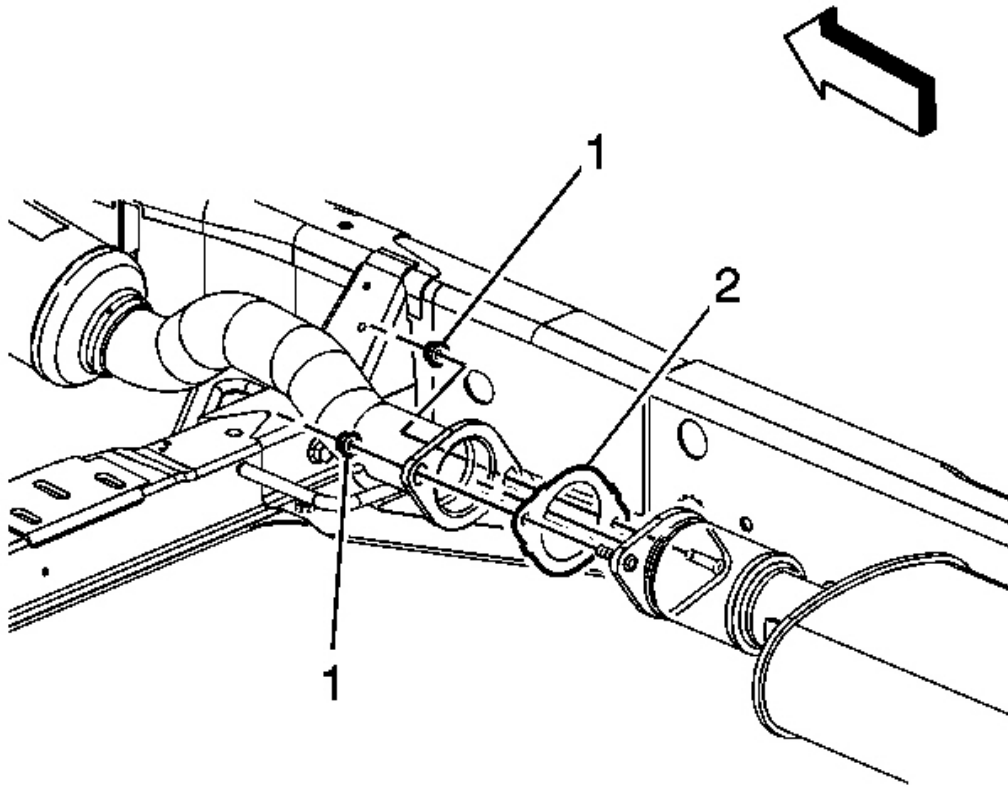


Fig. 42: View Of Catalytic Converter, Muffler, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Remove the frame brace. Refer to **Frame Brace Replacement** .
2. Remove the spare tire.
3. Remove the rear axle tie rod. Refer to **Rear Axle Tie Rod Replacement** .
4. Remove the rear axle brace. Refer to **Rear Axle Brace Replacement** .
5. Remove the shock absorber lower mounting bolts and move aside. Refer to **Shock Absorber Replacement** .
6. Remove the right rear coil spring, if equipped. Refer to **Coil Spring Replacement** .
7. If equipped with a 4.2L engine, remove the catalytic converter to muffler nuts (1).

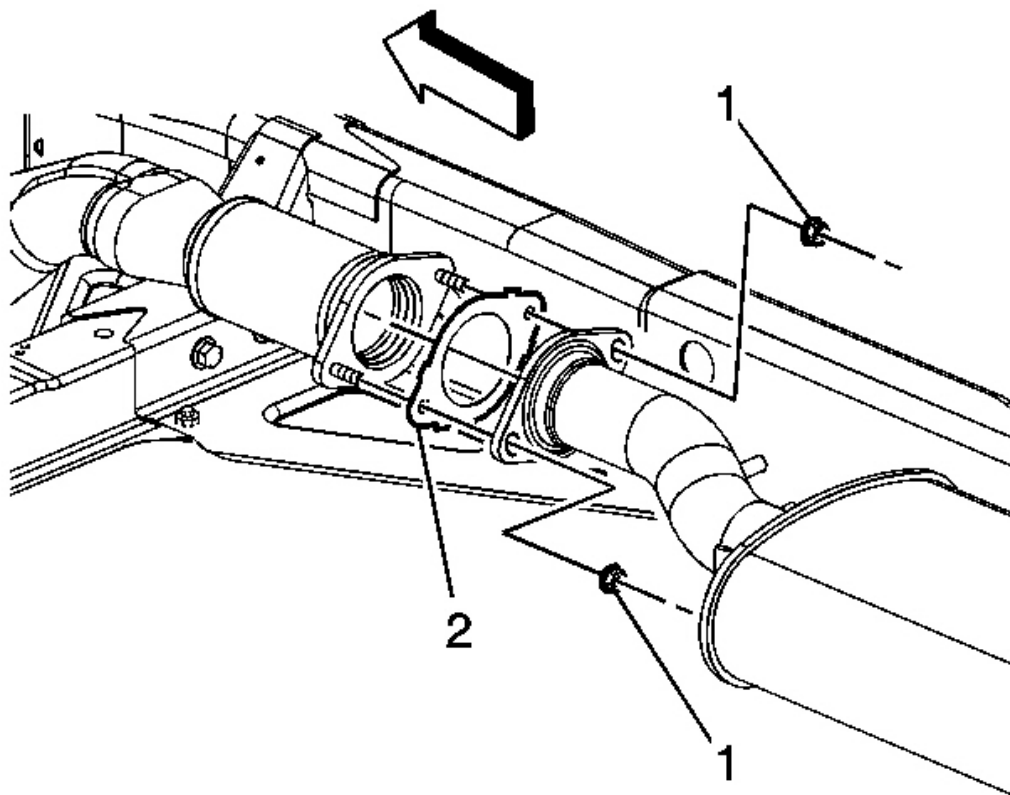


Fig. 43: View Of Catalytic Converter, Muffler, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

8. If equipped with a 5.3L, or 6.0L engine, remove the muffler to catalytic converter nuts (1).

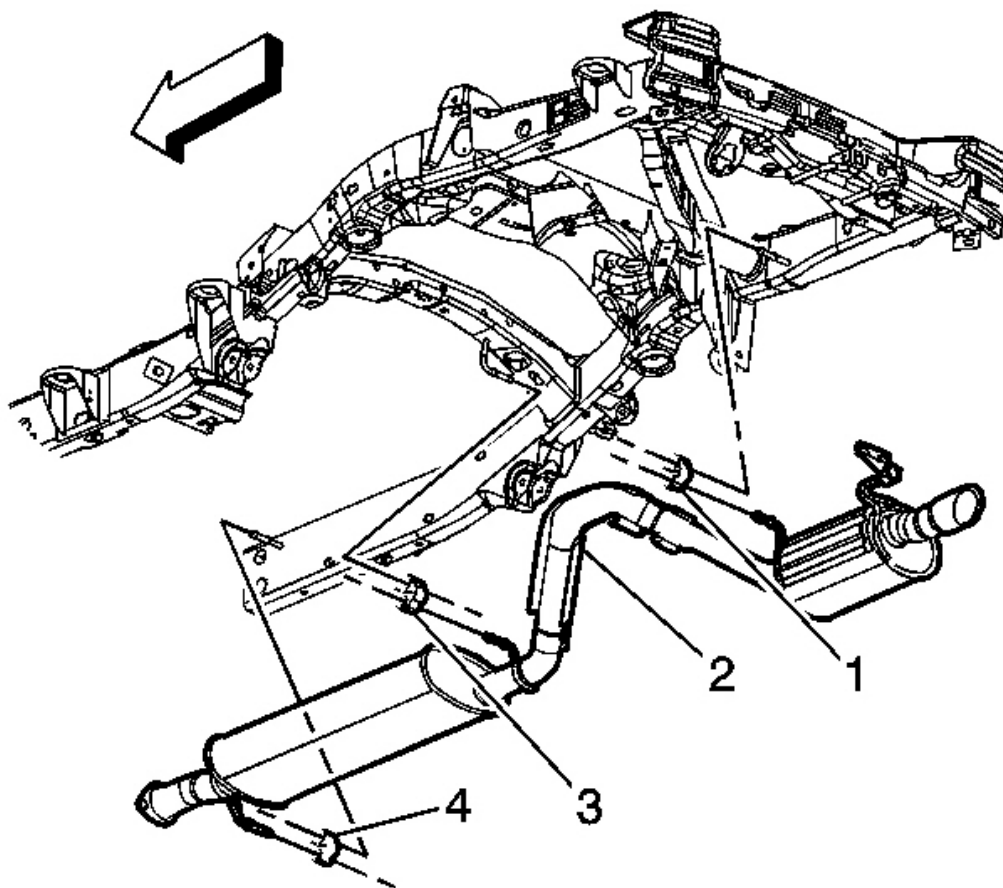


Fig. 44: Locating Exhaust Insulators
Courtesy of GENERAL MOTORS CORP.

9. With the aid of an assistant, separate the exhaust insulators (1, 3, and 4) from the muffler hangers.
10. With the aid of an assistant, remove the muffler assembly (2) from the vehicle.

Installation Procedure

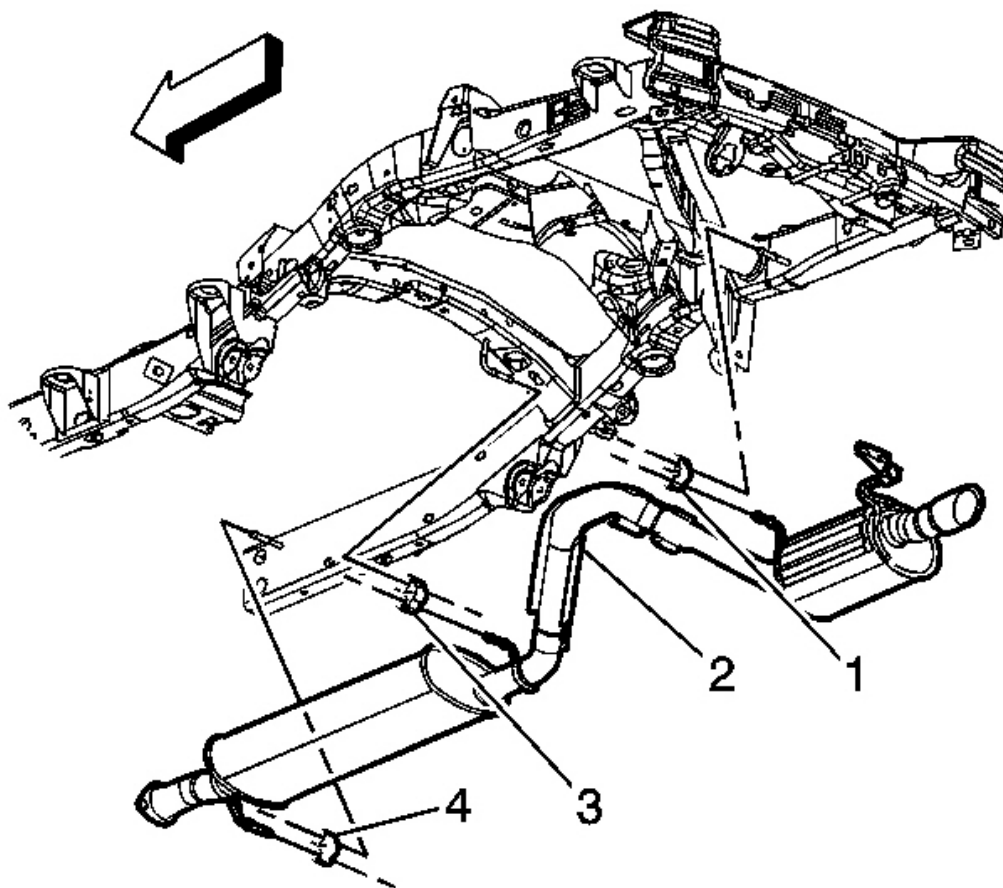


Fig. 45: Locating Exhaust Insulators
Courtesy of GENERAL MOTORS CORP.

1. With the aid of an assistant, install the muffler assembly (2) to the vehicle.
2. With the aid of an assistant, install the exhaust insulators (1, 3, and 4) to the muffler hangers.

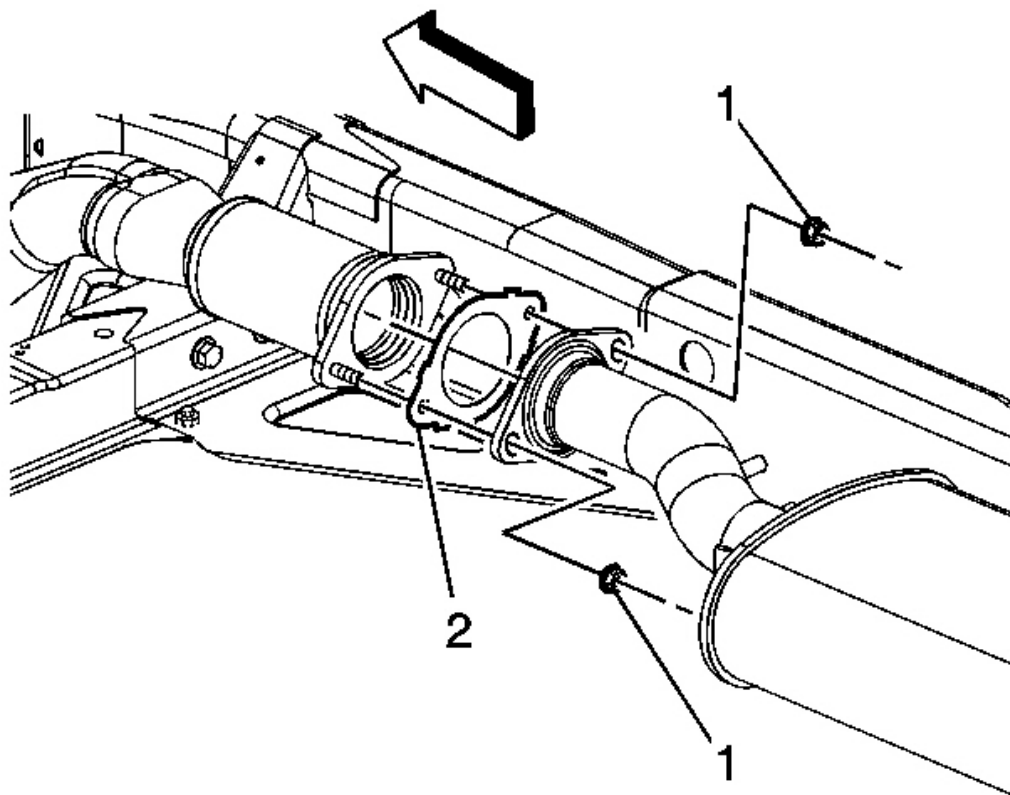


Fig. 46: View Of Catalytic Converter, Muffler, Gasket & Nuts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

3. If equipped with a 5.3L, or 6.0L engine, install the muffler to catalytic converter nuts (1).

Tighten: Tighten the nuts to 45 N.m (33 lb ft).

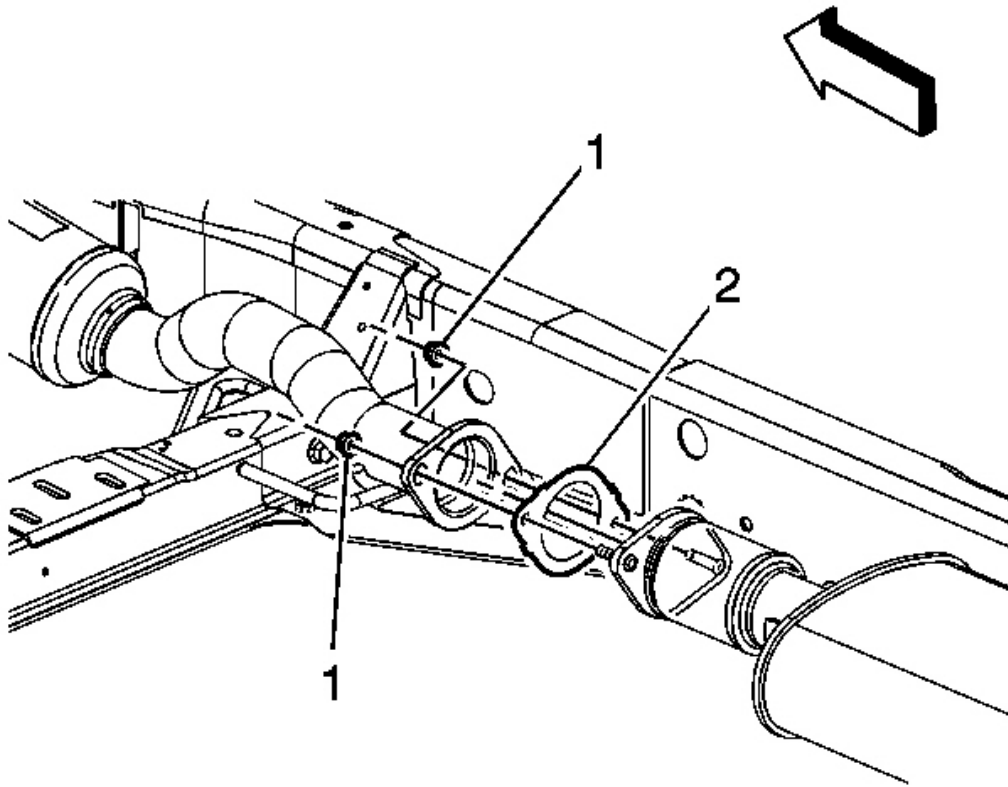


Fig. 47: View Of Catalytic Converter, Muffler, Gasket & Nuts
 Courtesy of GENERAL MOTORS CORP.

4. If equipped with a 4.2L engine, install the catalytic converter to muffler nuts (1).

Tighten: Tighten the nuts to 45 N.m (33 lb ft).

5. Install the right rear coil spring, if equipped. Refer to **Coil Spring Replacement** .
6. Position the shock absorbers and install the lower mounting bolts. Refer to **Shock Absorber Replacement** .
7. Install the rear axle brace. Refer to **Rear Axle Brace Replacement** .
8. Install the rear axle tie rod. Refer to **Rear Axle Tie Rod Replacement** .
9. Install the spare tire.
10. Install the frame brace. Refer to **Frame Brace Replacement** .

CATALYTIC CONVERTER HEAT SHIELD REPLACEMENT

Removal Procedure

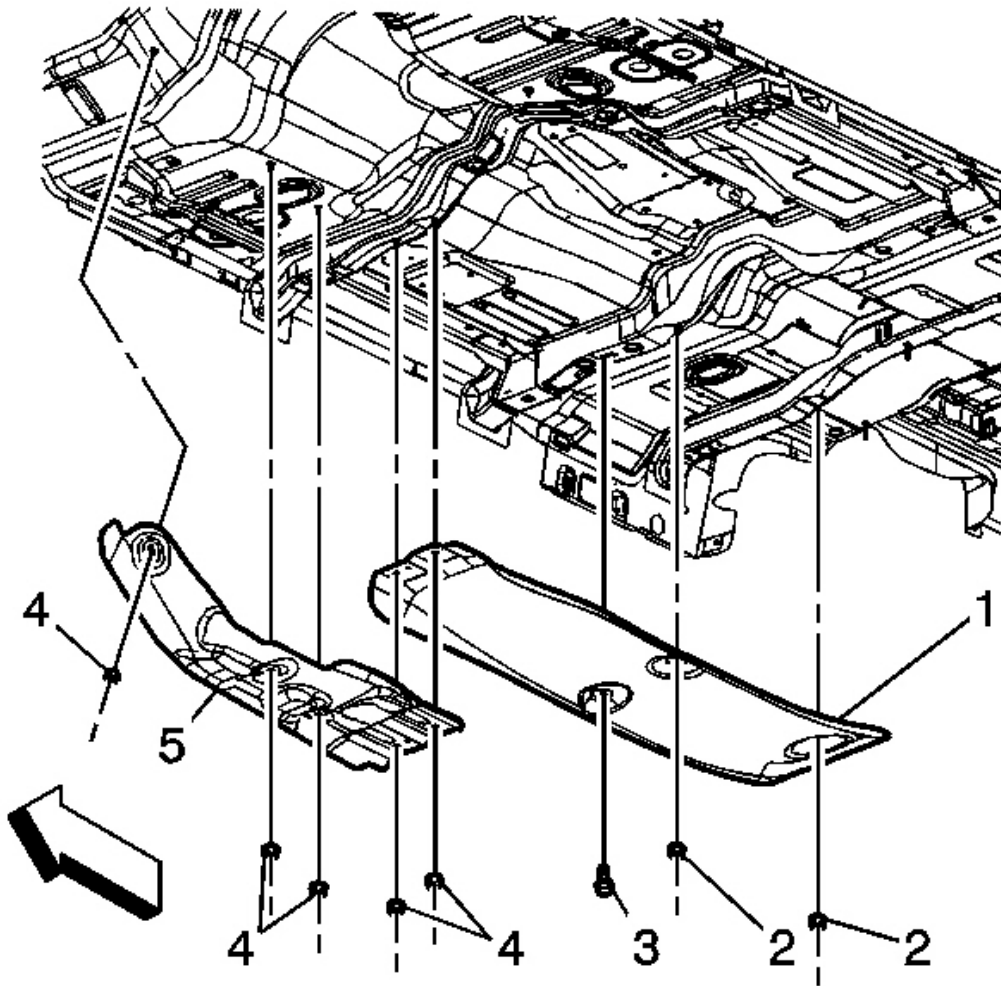


Fig. 48: View Of Catalytic Converter Heat Shields & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Raise and suitably support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the nuts (4) securing the heat shield to the underbody.
3. Remove the heat shield (5) from the underbody.

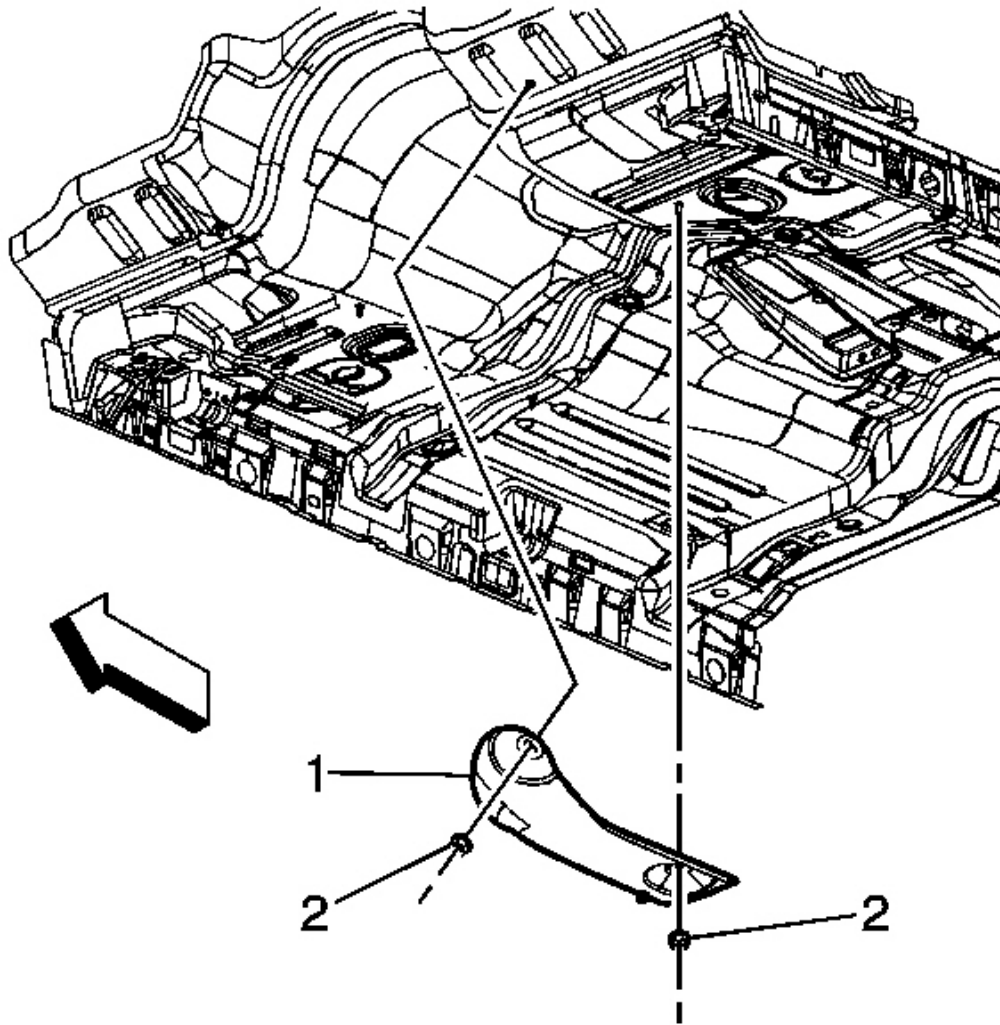


Fig. 49: View Of Heat Shield & Nuts
Courtesy of GENERAL MOTORS CORP.

4. Remove the nuts (2) securing the heat shield to the underbody, if equipped.
5. Remove the heat shield (1) from the underbody, if equipped.

Installation Procedure

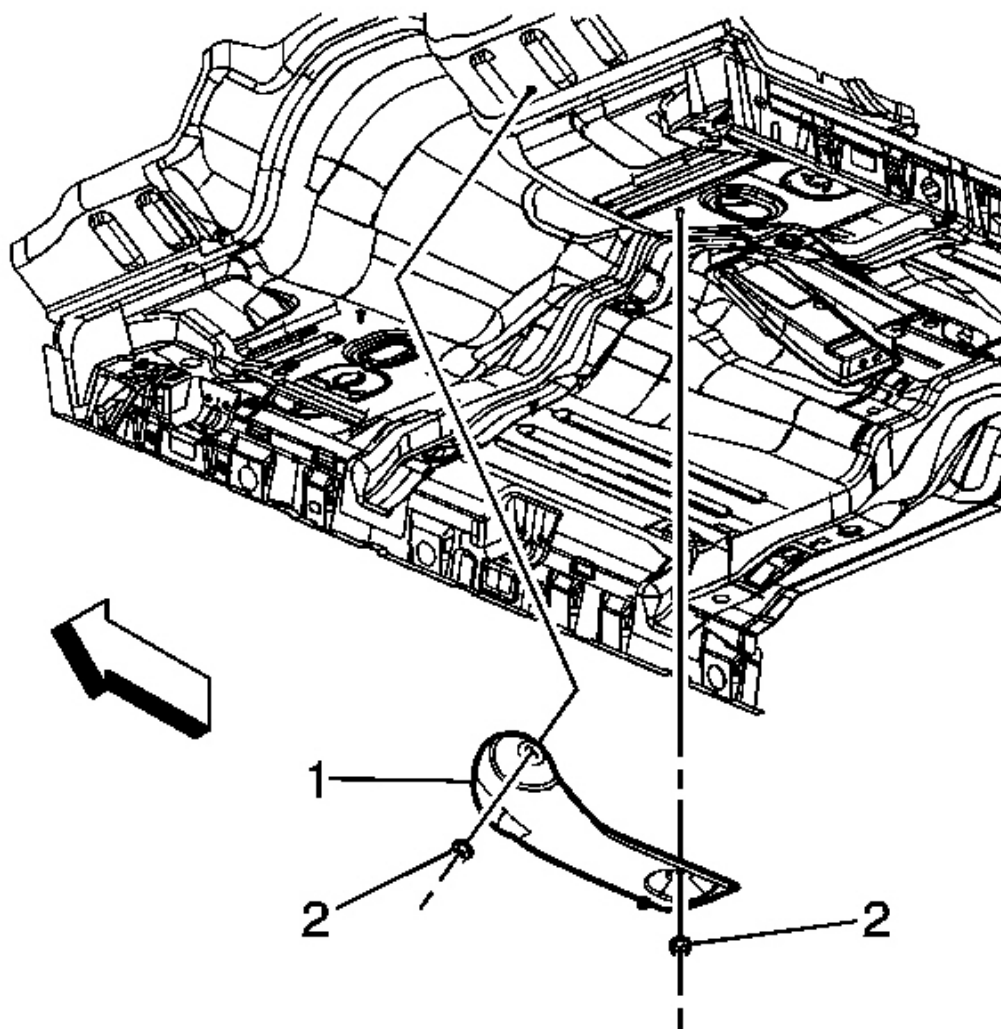


Fig. 50: View Of Heat Shield & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Install the heat shield (1) to the underbody, if equipped.

NOTE: Refer to Fastener Notice .

2. Install the nuts (2) securing the heat shield to the underbody, if equipped.

Tighten: Tighten the nuts to 7 N.m (62 lb in).

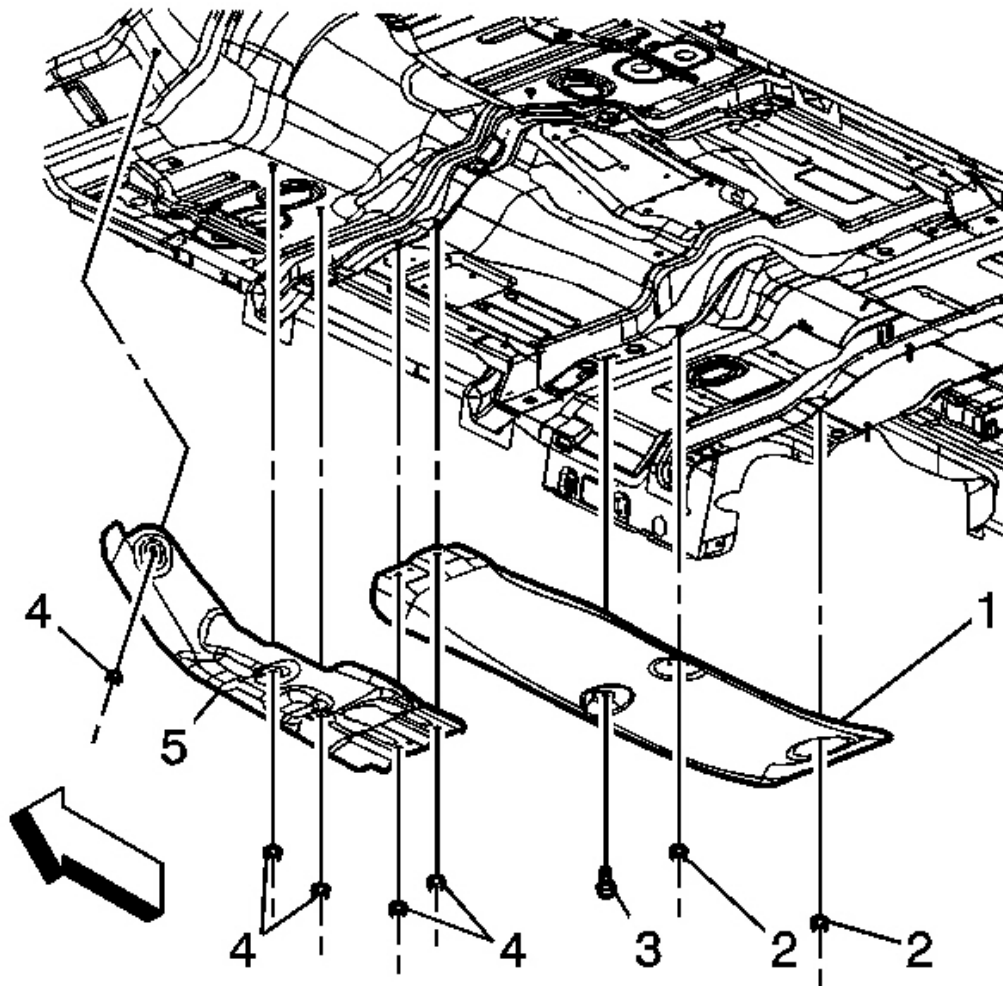


Fig. 51: View Of Catalytic Converter Heat Shields & Nuts
Courtesy of GENERAL MOTORS CORP.

3. Install the heat shield (5) to the underbody.
4. Install the nuts (4) securing the heat shield to the underbody.

Tighten: Tighten the nuts to 7 N.m (62 lb in).

5. Lower the vehicle.

EXHAUST MANIFOLD HEAT SHIELD REPLACEMENT (LL8)

Removal Procedure

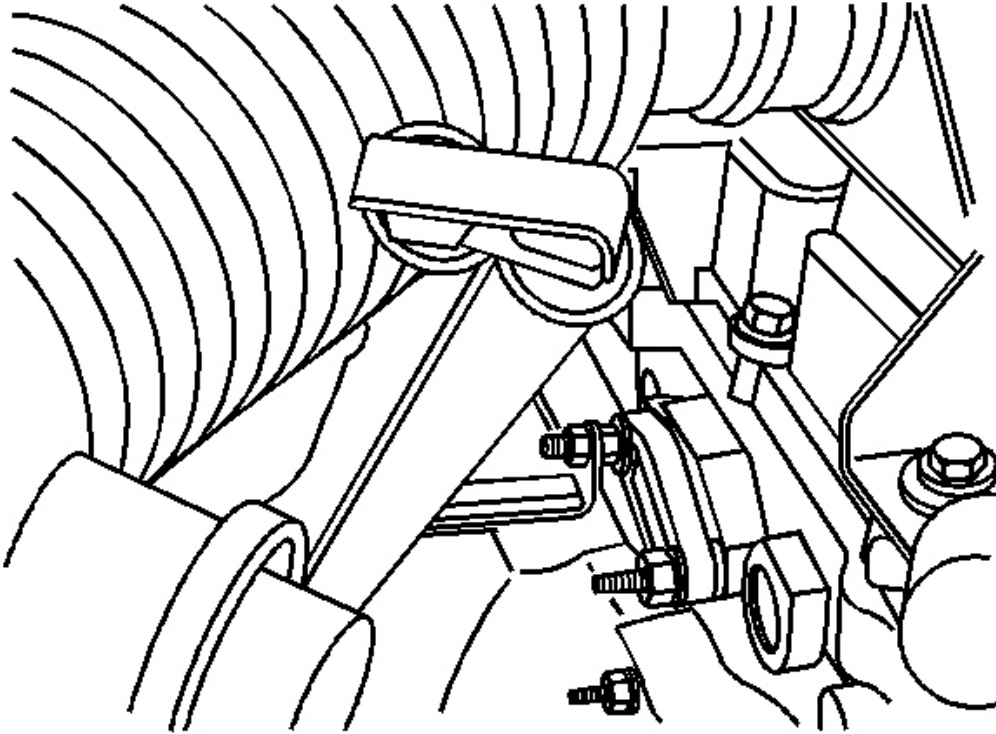


Fig. 52: View Of Transmission Filler Tube & Bracket
Courtesy of GENERAL MOTORS CORP.

1. Remove the air cleaner outlet resonator. Refer to **Air Cleaner Outlet Resonator Replacement** .
2. Remove the transmission filler tube stud nut from the secondary air injection (AIR) adapter and move the filler out of the way.
3. Remove the oil level indicator tube. Refer to **Oil Level Indicator and Tube Replacement** .
4. Remove the oxygen sensor from the exhaust manifold. Refer to **Heated Oxygen Sensor 1 Replacement** .

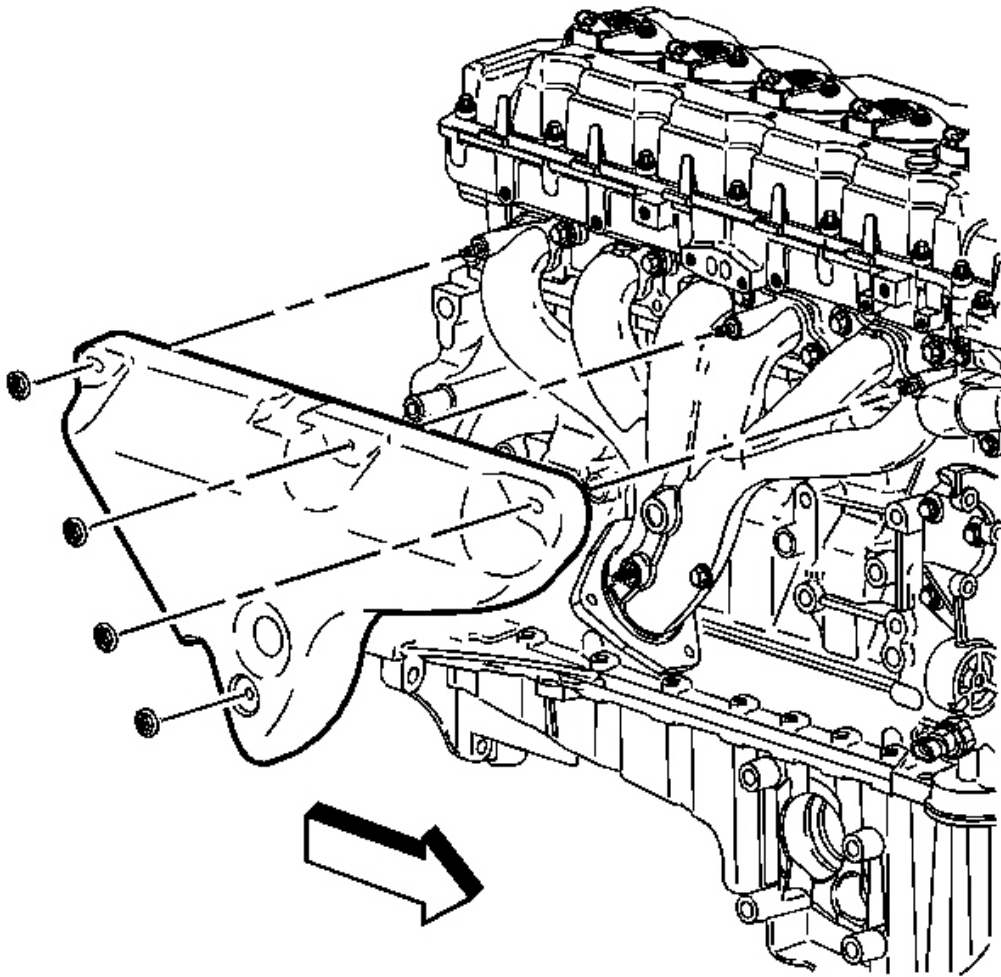


Fig. 53: View Of Exhaust Manifold Heat Shield & Nuts
Courtesy of GENERAL MOTORS CORP.

5. Remove the 4 manifold heat shield nuts and remove the heat shield.

Installation Procedure

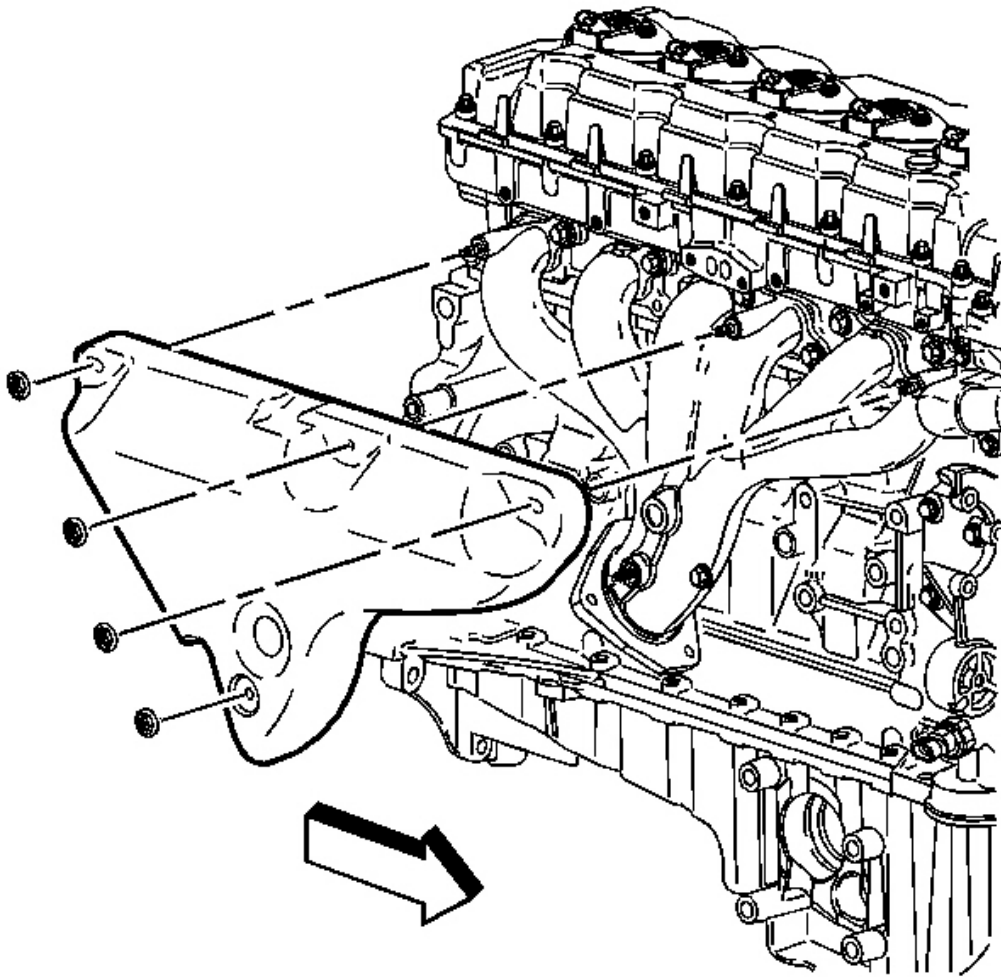


Fig. 54: View Of Exhaust Manifold Heat Shield & Nuts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the exhaust manifold heat shield with the 4 nuts.

Tighten: Tighten the exhaust manifold heat shield nuts to 10 N.m (89 lb in).

2. Install the oxygen sensor. Refer to Heated Oxygen Sensor 1 Replacement .
3. Install the oil level indicator. Refer to Oil Level Indicator and Tube Replacement .
4. Move the transmission filler tube back onto the stud and secure the tube with the nut.

Tighten: Tighten the transmission filler tube bracket nut to 10 N.m (89 lb in).

5. Install the air cleaner outlet resonator. Refer to [Air Cleaner Outlet Resonator Replacement](#) .

EXHAUST MANIFOLD HEAT SHIELD REPLACEMENT - RIGHT SIDE (LH6/LS2)

Removal Procedure

1. Remove the spark plugs. Refer to Spark Plug Replacement .

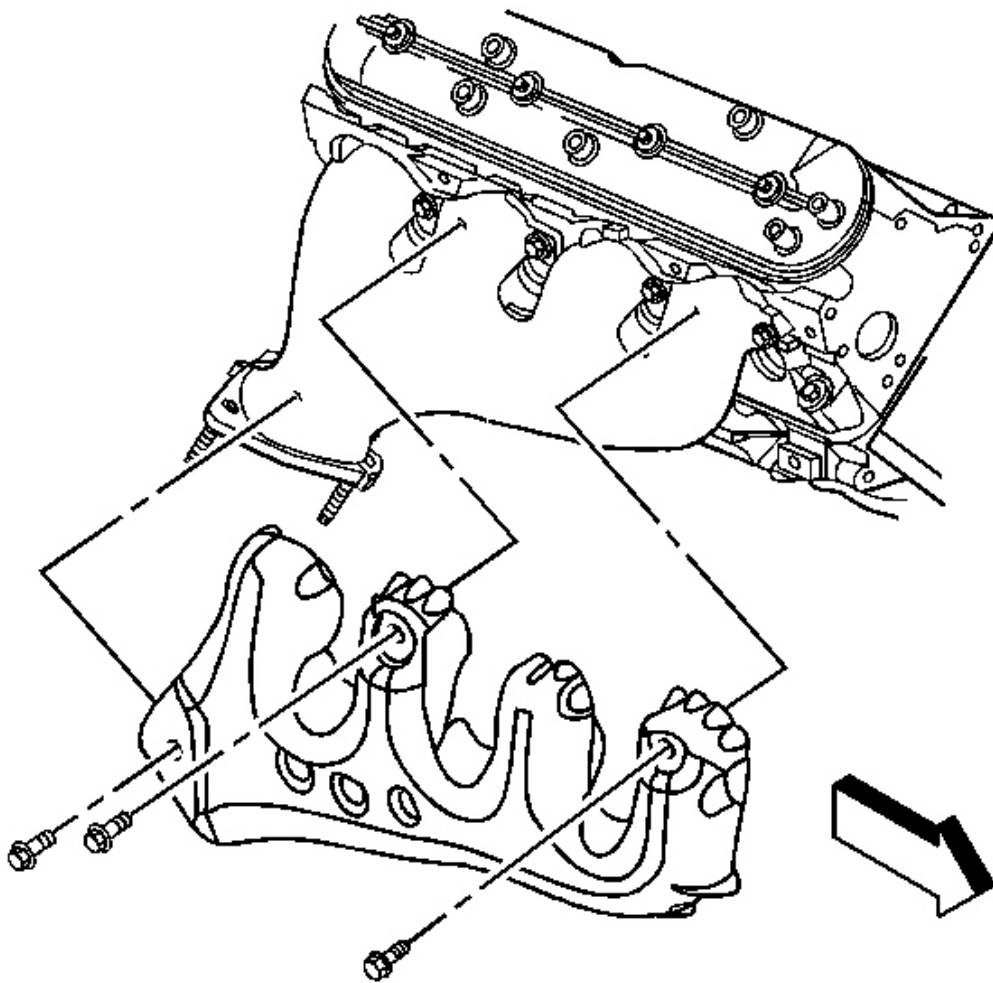


Fig. 55: View Of Right Exhaust Manifold Heat Shield
Courtesy of GENERAL MOTORS CORP.

2. Remove the heat shield bolts and the shield from the exhaust manifold.

Installation Procedure

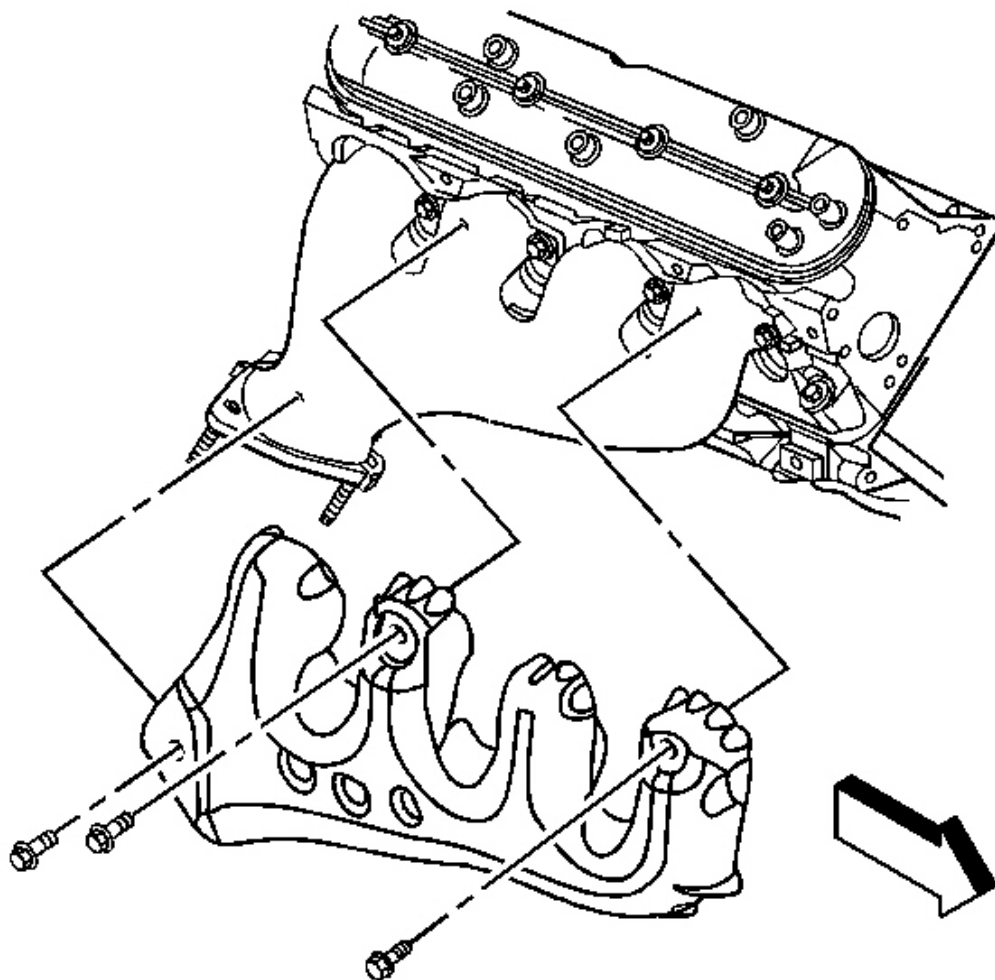


Fig. 56: View Of Right Exhaust Manifold Heat Shield
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to **Fastener Notice** .

1. Install the heat shield and the bolts to the exhaust manifold.

Tighten: Tighten the bolts to 9 N.m (80 lb in).

2. Install the spark plugs. Refer to Spark Plug Replacement .

EXHAUST MANIFOLD HEAT SHIELD REPLACEMENT - LEFT SIDE (LH6/LS2)

Removal Procedure

1. Remove the spark plugs. Refer to Spark Plug Replacement .

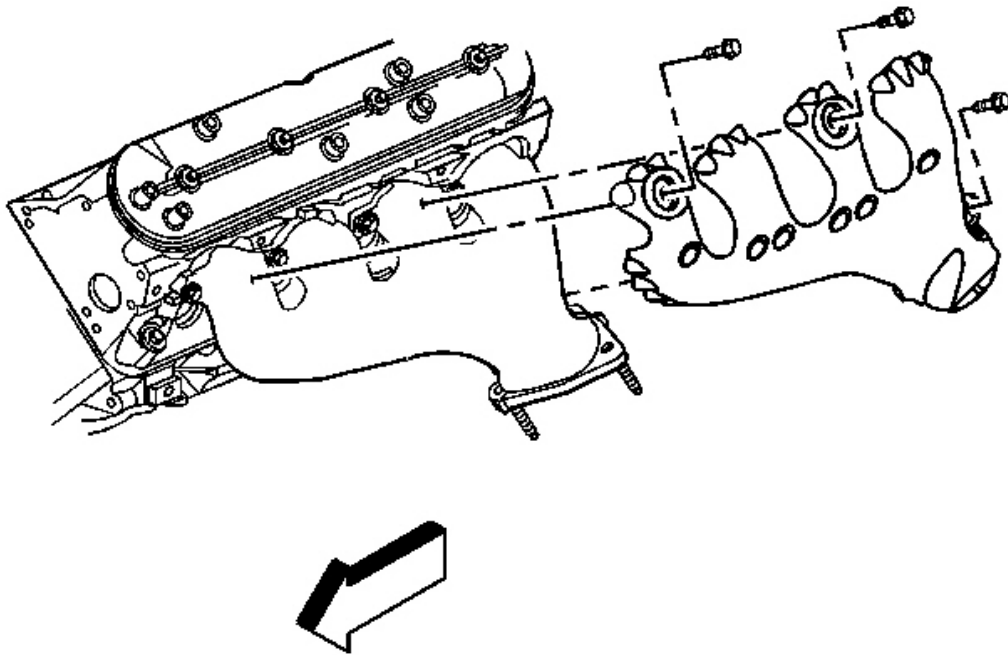


Fig. 57: View Of Left Exhaust Manifold Heat Shield
Courtesy of GENERAL MOTORS CORP.

2. Remove the heat shield bolts and the shield from the exhaust manifold.

Installation Procedure

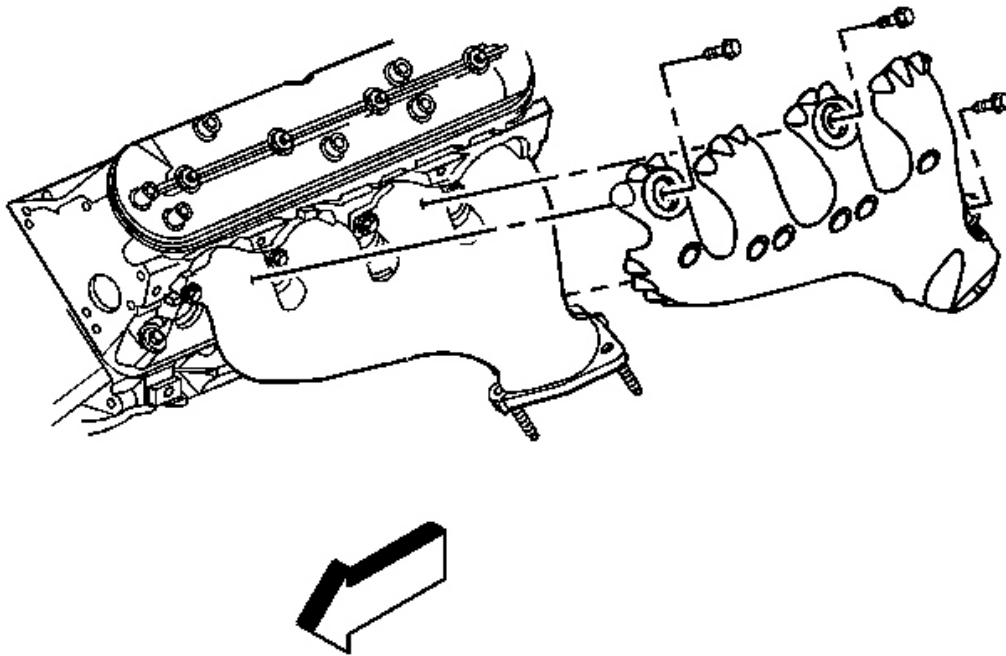


Fig. 58: View Of Left Exhaust Manifold Heat Shield
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Install the heat shield and the bolts to the exhaust manifold.

Tighten: Tighten the bolts to 9 N.m (80 lb in).

2. Install the spark plugs. Refer to Spark Plug Replacement .

EXHAUST PIPE HEAT SHIELD REPLACEMENT (LH6/LS2)

Removal Procedure

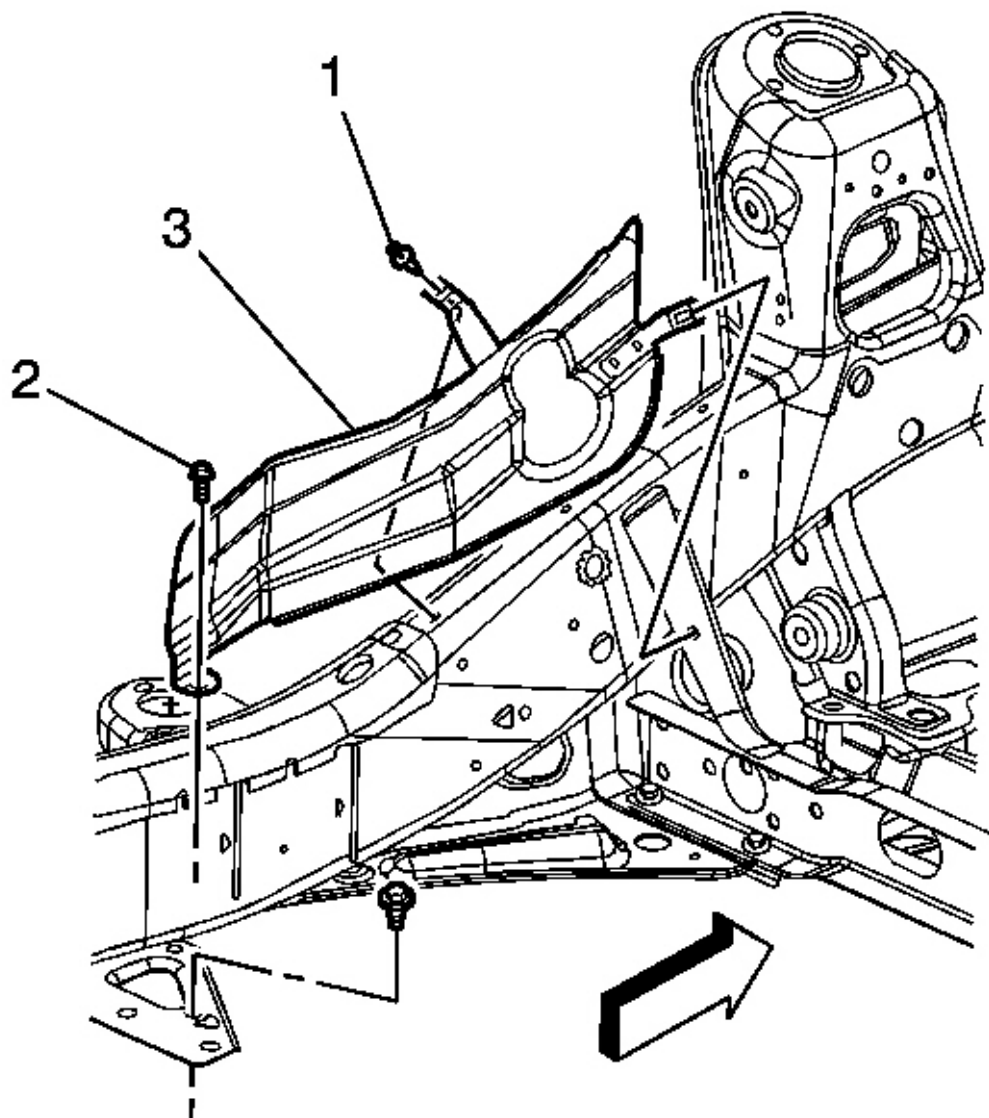


Fig. 59: View Of Heat Shield, Retainer & Bolt
Courtesy of GENERAL MOTORS CORP.

1. Raise and suitably support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the exhaust pipe heat shield retainer (1).
3. Remove the exhaust pipe heat shield bolt (2).
4. Remove the exhaust pipe heat shield (3) from the frame.

Installation Procedure

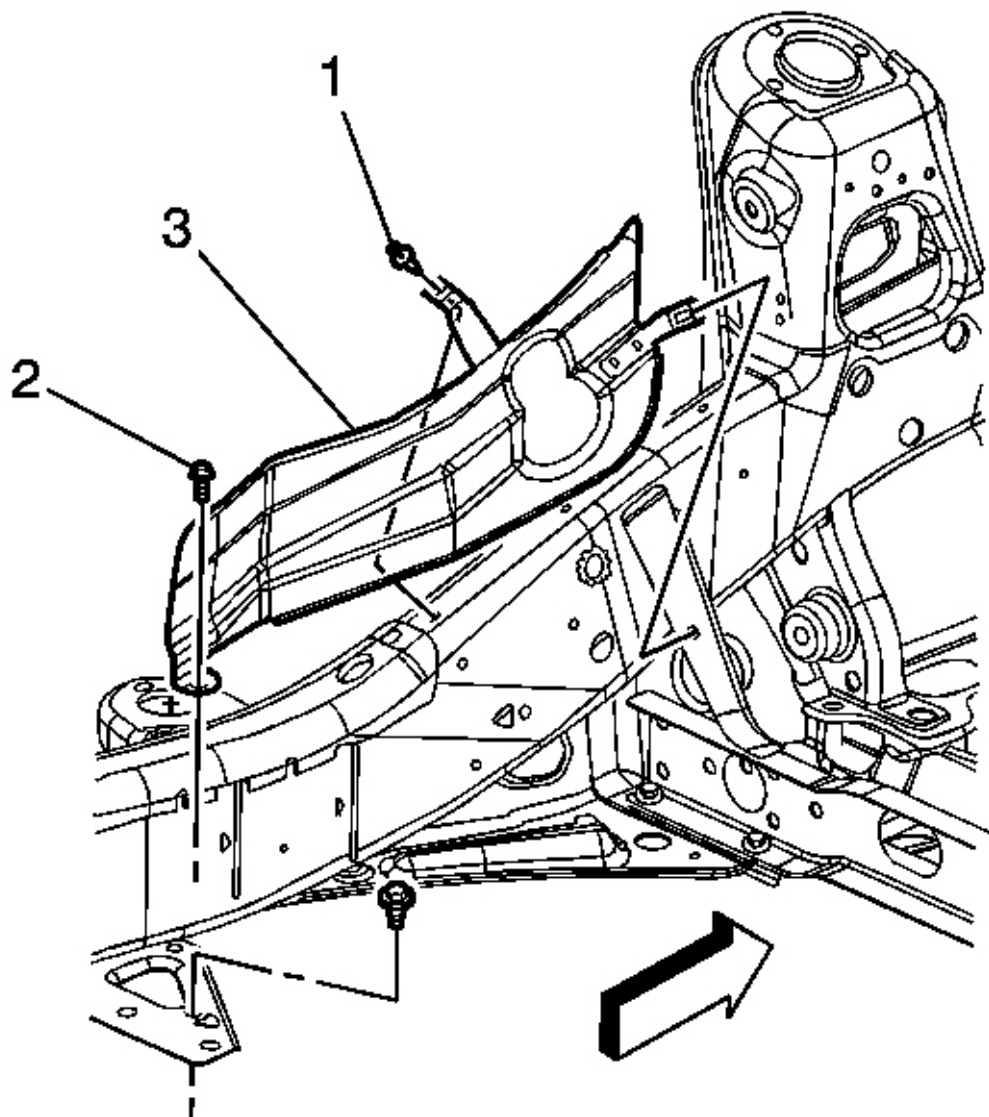


Fig. 60: View Of Heat Shield, Retainer & Bolt
Courtesy of GENERAL MOTORS CORP.

1. Install the exhaust pipe heat shield (3) to the frame.

NOTE: Refer to Fastener Notice .

2. Install the exhaust pipe heat shield bolt (2).

Tighten: Tighten the bolt to 7 N.m (62 lb in).

3. Install the exhaust pipe heat shield retainer (1).
4. Lower the vehicle.

EXHAUST MUFFLER HEAT SHIELD REPLACEMENT

Removal Procedure

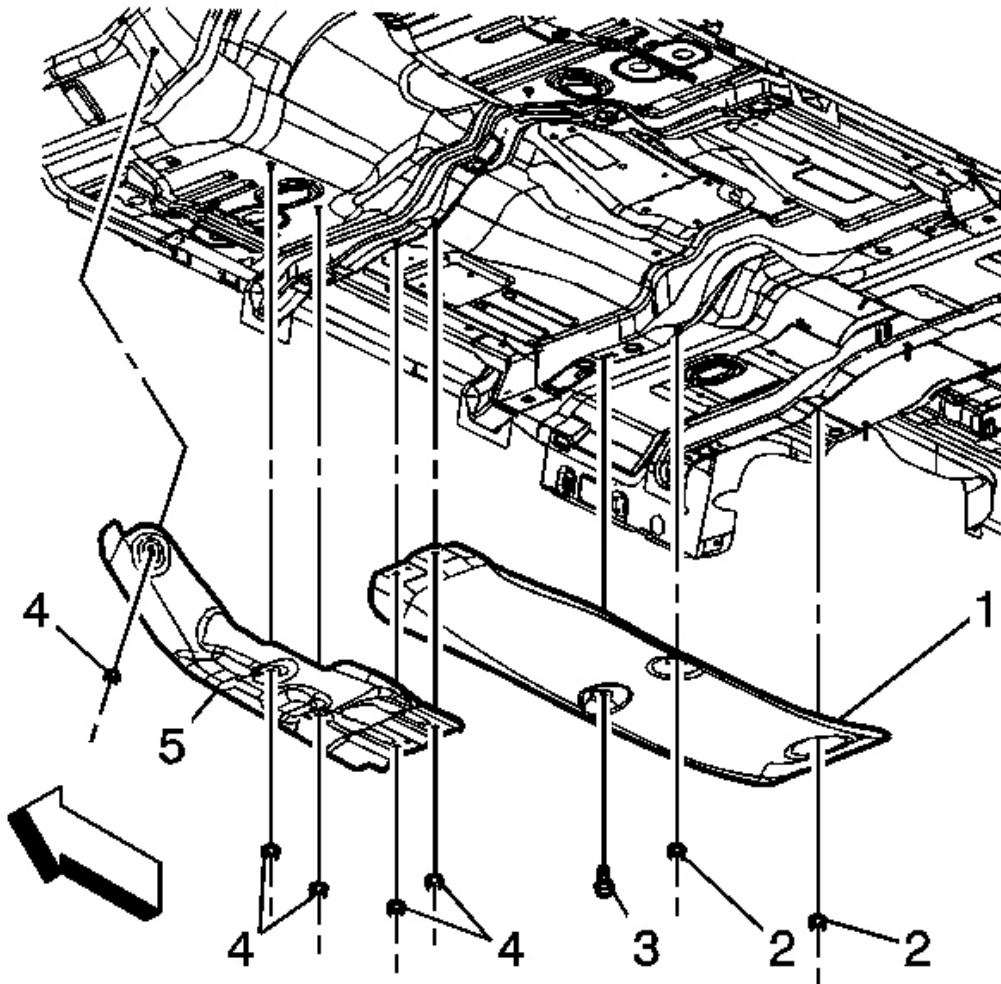


Fig. 61: View Of Catalytic Converter Heat Shields & Nuts

Courtesy of GENERAL MOTORS CORP.

1. Remove the catalytic converter heat shield. Refer to Catalytic Converter Heat Shield Replacement.
2. Remove the exhaust muffler heat shield bolt (3) and nuts (2).
3. Remove the exhaust muffler heat shield from the underbody.

Installation Procedure

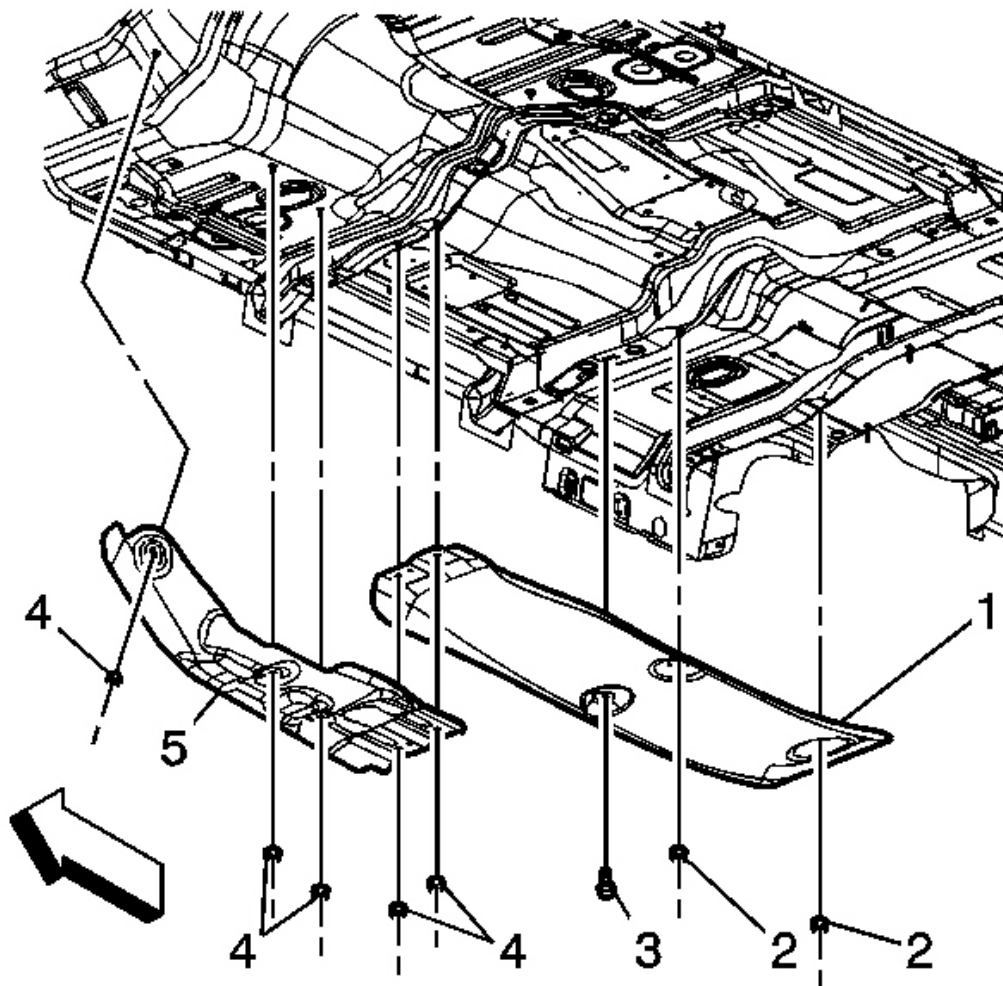


Fig. 62: View Of Catalytic Converter Heat Shields & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Install the exhaust muffler heat shield to the underbody.

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NOTE: Refer to Fastener Notice .

2. Install the exhaust muffler heat shield bolt (3) and nuts (2).

Tighten: Tighten the bolt/nuts to 7 N.m (62 lb in).

3. Install the catalytic converter heat shield. Refer to Catalytic Converter Heat Shield Replacement.

DESCRIPTION & OPERATION

EXHAUST SYSTEM DESCRIPTION

IMPORTANT: Use of non-OEM parts may cause driveability concerns.

The exhaust system carries exhaust gases, treated by the catalytic converter, through a resonator, if applicable and into the exhaust muffler where exhaust noise is lessened.

In order to secure the exhaust pipe to the exhaust manifold, a flange and seal-joint coupling is utilized. The exhaust system may utilize a slip-joint coupling design with a clamp and a U-bolt or a flange connection with a gasket.

Exhaust hangers and rubber insulators help to support the weight of the exhaust pipe along with insulating any exhaust system vibration, rattle, or noise.

Exhaust hangers also space the exhaust system away from the underbody of the vehicle and allows the exhaust system to expand as the exhaust system warms up.

Exhaust heat shields are used to protect the body and other components from damage due to the heat from the exhaust system.

The exhaust system may be comprised of the following components:

- Exhaust manifold
- Exhaust pipes
- Catalytic converters
- Exhaust muffler
- Exhaust resonator, if equipped
- Exhaust tail pipe, if equipped
- Exhaust hangers
- Exhaust heat shields

Resonator

Some exhaust systems are equipped with a resonator. The resonator, located either before or after the muffler,

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allows the use of mufflers with less back pressure. Resonators are used when vehicle characteristics require specific exhaust tuning.

Catalytic Converter

The catalytic converter is an emission control device added to the engine exhaust system in order to reduce hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) pollutants from the exhaust gas.

The catalytic converter is comprised of a ceramic monolith substrate, supported in insulation and housed within a sheet metal shell. The substrate may be washcoated with 3 noble metals:

- Platinum (Pt)
- Palladium (Pd)
- Rhodium (Rh)

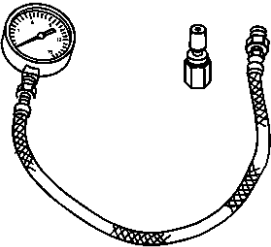
The catalyst in the converter is not serviceable.

Muffler

The exhaust muffler reduces the noise levels of the engine exhaust by the use of tuning tubes. The tuning tubes create channels inside the exhaust muffler that lower the sound levels created by the combustion of the engine.

SPECIAL TOOLS & EQUIPMENT

SPECIAL TOOLS

Illustration	Tool Number/ Description
	J 35314-A Exhaust Back Pressure Gage