

2007 Hummer H3

2007 ENGINE Engine Exhaust - H3

2007 ENGINE

Engine Exhaust - H3

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Catalytic Converter Heat Shield	9 N.m	80 lb in
Catalytic Converter Nut	50 N.m	37 lb ft
Exhaust Manifold Bolt		
• 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 Heat Shield Nut	10 N.m	89 lb in
Exhaust Muffler Heat Shield	9 N.m	80 lb in
Exhaust Pipe Heat Shield	9 N.m	80 lb in
Leaf Spring Bolt and Nut	85 N.m	63 lb ft
Lower Shock Absorber Bolt and Nut	95 N.m	70 lb ft
Muffler Nut	45 N.m	33 lb ft
Transmission Filler Tube Bracket Nut	12.5 N.m	111 lb in

DIAGNOSTIC INFORMATION AND 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 **Strategy Based Diagnosis** .

Visual/Physical Inspection

- Inspect for aftermarket or non-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

Tools Required

J 35314-A Exhaust Back Pressure Gage. See **Special Tools**.

Diagnostic Aids

CAUTION: Refer to Hot Exhaust System Caution .

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.

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** . See **Special Tools**. Removing the heated oxygen sensor (HO2S) may set a DTC. When finishing this diagnostic table, be sure to clear all codes.

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

8: 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
	1. Remove the heated oxygen sensor (HO2S) that is in front of the catalytic converter. Refer to Heated Oxygen			

<p>4</p>	<p><u>Sensor 1 Replacement</u> .</p> <ol style="list-style-type: none"> 2. Install the J 35314-A Exhaust Back Pressure Gage in place of the HO2S sensor. See <u>Special Tools</u>. 3. Start the engine. 4. Increase and monitor the engine speed at 2,500 RPM. 5. Observe the exhaust system back pressure reading on the gage. <p>Does the reading exceed the specified value?</p>	<p>9 kPa (1.25 psi)</p>	<p>Go to Step 5</p>	<p>Go to Step 8</p>
<p>5</p>	<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 <u>Special Tools</u>. 3. Re-install the HO2S sensor. Refer to <u>Heated Oxygen Sensor 1 Replacement</u> . 4. Remove the post-catalyst HO2S sensor. Refer to <u>Heated Oxygen Sensor 2 Replacement</u> . 5. Install the J 35314-A in place of the post HO2S sensor. See <u>Special Tools</u>. 6. Start the engine. 7. Increase and monitor the engine speed at 2,500 RPM. 8. Observe the exhaust system back pressure reading on the gage. <p>Does the reading exceed the</p>	<p>9 kPa (1.25 psi)</p>		

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	specified value?		Go to Step 6	Go to Step 7
6	<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 <p>Did you find and correct the condition?</p>	-		
			Go to Step 8	-
7	<p>Replace the catalytic converter. Refer to <u>Catalytic Converter Replacement</u>.</p> <p>Did you find and correct the condition?</p>	-		
			Go to Step 8	-
8	<ol style="list-style-type: none"> 1. Remove the J 35314-A . See <u>Special Tools</u>. 2. Reinstall the applicable HO2S sensor. Refer to the following: <ul style="list-style-type: none"> • <u>Heated Oxygen Sensor 1 Replacement</u> • <u>Heated Oxygen Sensor 2 Replacement</u> 3. Clear any codes. 4. Road test the vehicle in order to verify the repair. <p>Did you correct the condition?</p>	-		
			System OK	Go to Step 2

EXHAUST LEAKAGE

Exhaust Leakage

Condition	Action

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CAUTION:

Refer to Hot Exhaust System Caution .

DEFINITION: An exhaust leak may show stains at the area of the leak. The leak may be felt by holding a 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	<ul style="list-style-type: none">• Align and tighten the exhaust system components to the specifications. Refer to <u>Fastener Tightening Specifications</u>.• Ensure the exhaust hangers are in the proper locations and not loose. Refer to <u>Exhaust System Insulator, Hanger, Bracket Replacement</u>.
Exhaust leaks at the following connections: <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> .
Seals or gaskets leaking: <ul style="list-style-type: none">• Exhaust manifold to cylinder head• Catalytic converter to exhaust manifold• Catalytic converter to muffler	Replace the leaking seal or gasket. Refer to the following: <ul style="list-style-type: none">• <u>Exhaust Manifold Replacement</u>• <u>Exhaust Seal Replacement</u>
Irregularities at the mating surfaces on the flange connections	Repair as required or replace the affected component. Refer to the affected components procedure for service.
Exhaust manifold cracked or broken	Replace the exhaust manifold. Refer to <u>Exhaust Manifold Replacement</u> .
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	Replace the affected muffler or resonator, if equipped. Refer to <u>Muffler Replacement</u> .

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leaking at the seams

EXHAUST NOISE

Exhaust Noise

Condition	Action
CAUTION: Refer to <u>Hot Exhaust System Caution</u> .	
IMPORTANT: Refer to <u>Symptoms - Engine Exhaust</u> prior to beginning this table.	
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.	
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.3. Replace the faulty muffler. 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</u>• <u>Muffler Replacement</u>

REPAIR INSTRUCTIONS

EXHAUST MANIFOLD REPLACEMENT

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

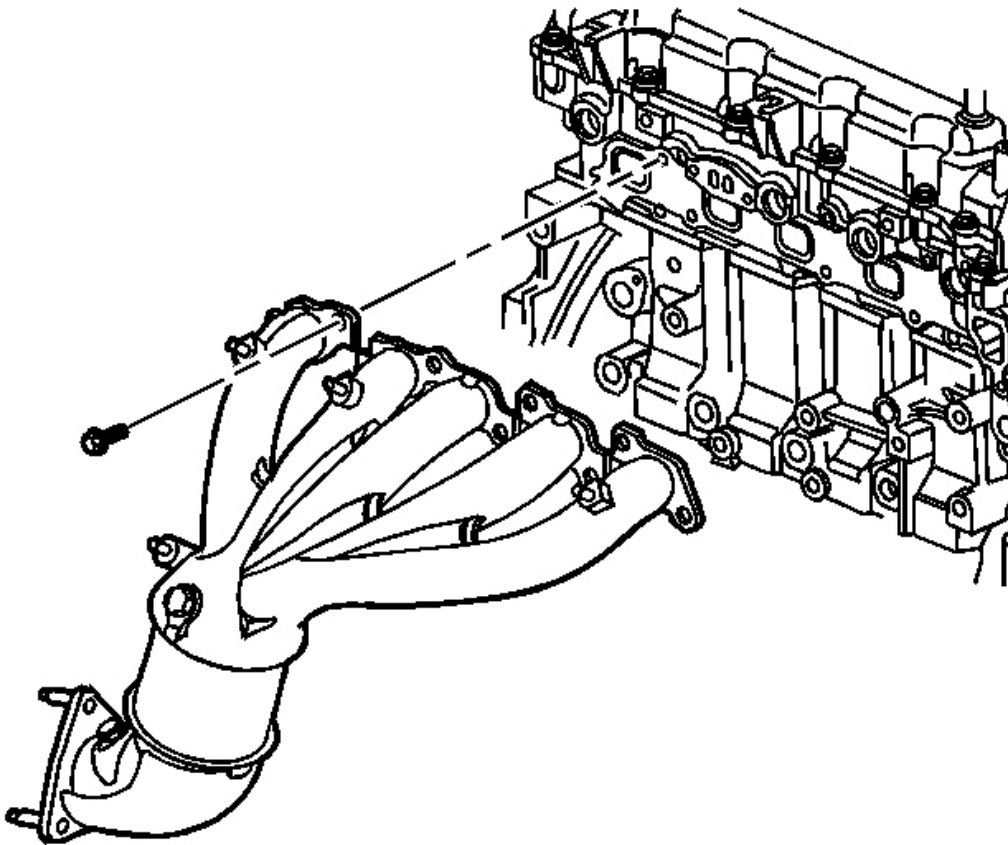


Fig. 1: View Of Exhaust Manifold
Courtesy of GENERAL MOTORS CORP.

1. Remove the secondary air injection (AIR) check valve. Refer to Secondary Air Injection Check Valve Replacement .
2. Remove the exhaust seal. Refer to Exhaust Seal Replacement.
3. Remove the exhaust manifold heat shield. Refer to Exhaust Manifold Heat Shield

Replacement.

4. Remove the exhaust manifold bolts.
5. Remove the exhaust manifold.

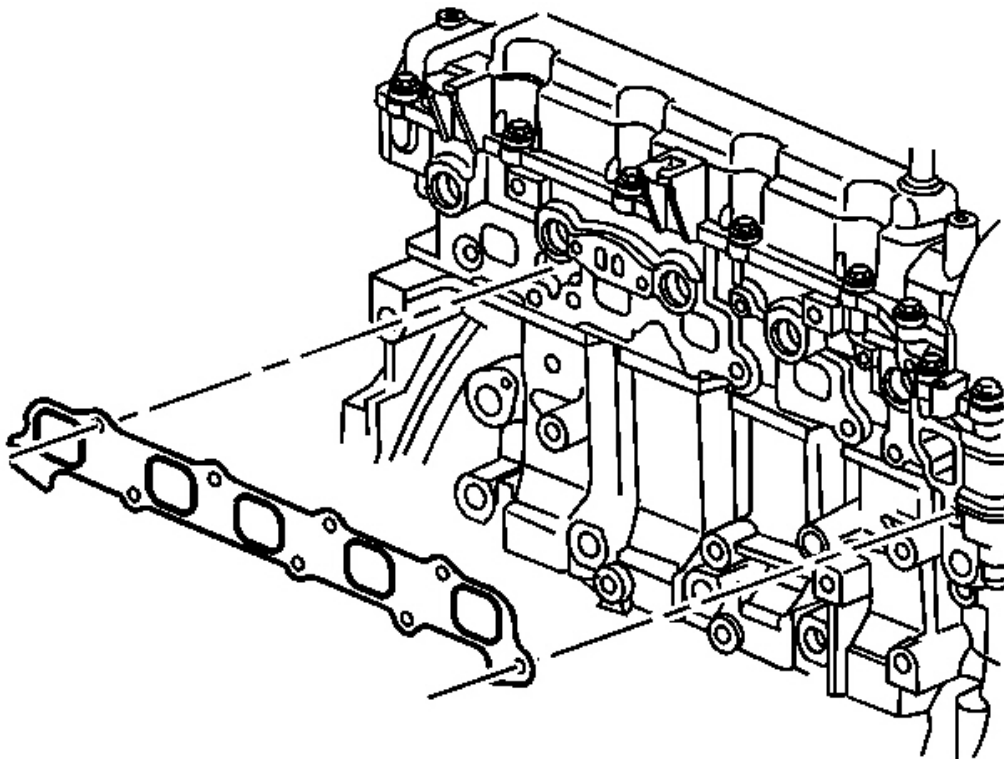


Fig. 2: View Of Exhaust Manifold Gasket
Courtesy of GENERAL MOTORS CORP.

6. Remove and discard the exhaust manifold gasket.
7. Clean and inspect the exhaust manifold. Refer to **Exhaust Manifold Cleaning and Inspection** .

Installation Procedure

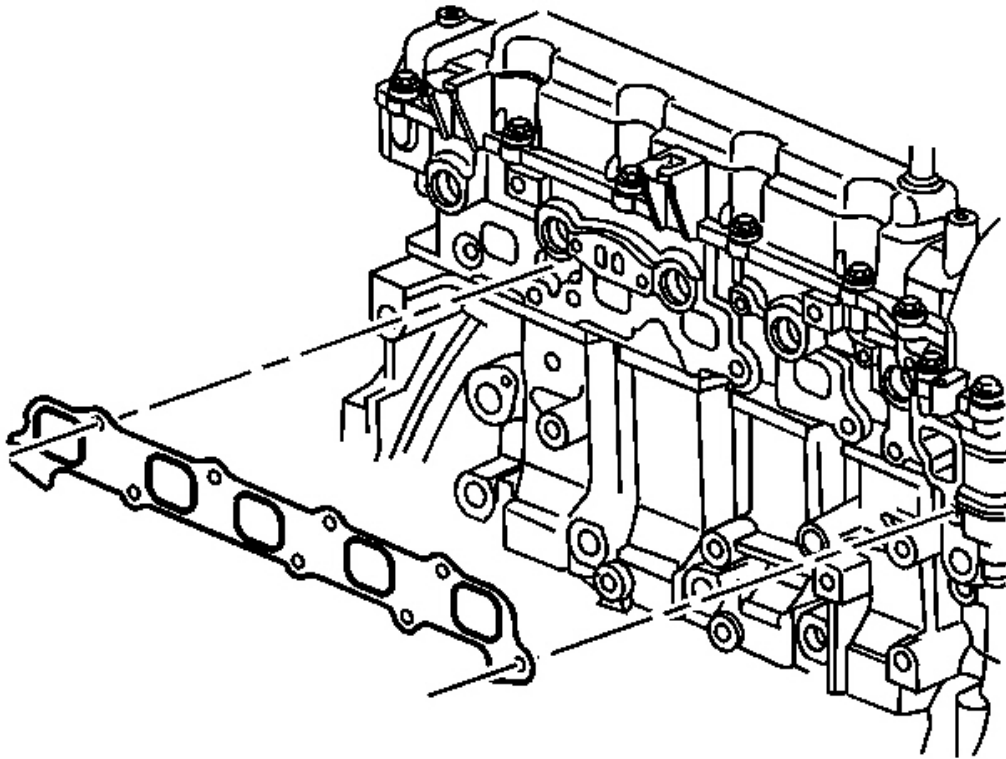


Fig. 3: View Of Exhaust Manifold Gasket
Courtesy of GENERAL MOTORS CORP.

1. Clean and apply threadlock GM P/N 12345493 (Canadian P/N 10953488) to the exhaust manifold bolt threads.
2. Position a NEW exhaust manifold gasket onto the cylinder head.

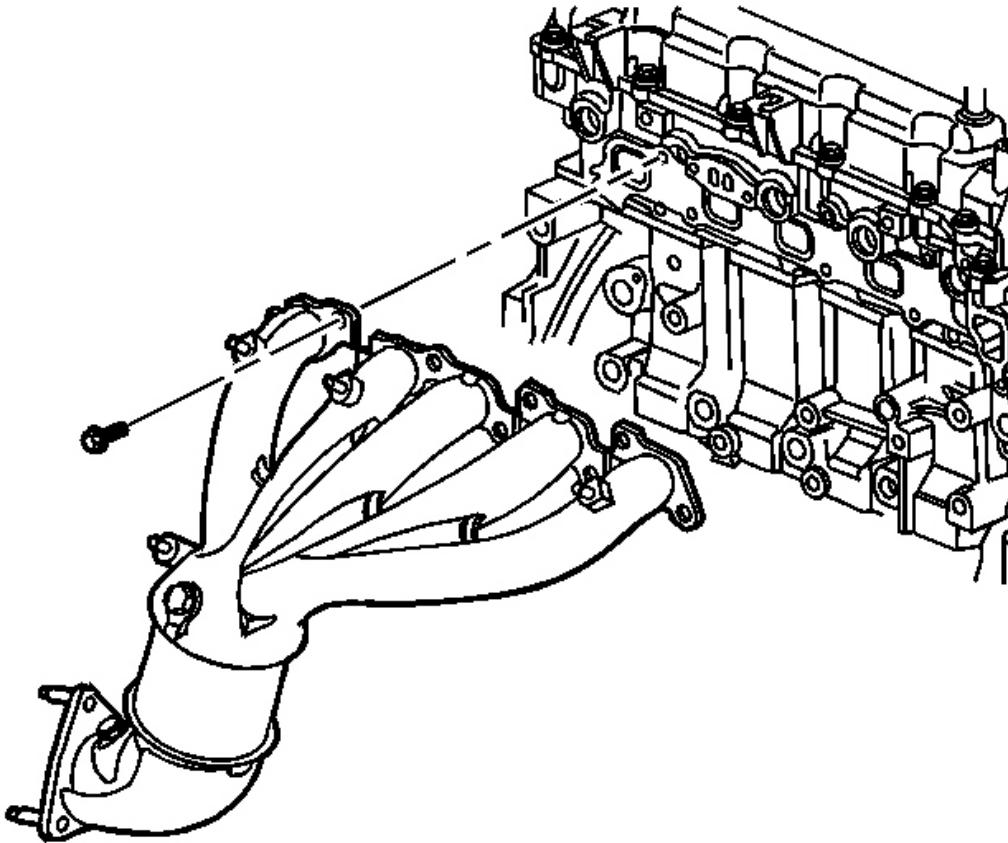


Fig. 4: View Of Exhaust Manifold
Courtesy of GENERAL MOTORS CORP.

3. Position the exhaust manifold against cylinder head.
4. Install the exhaust manifold bolts.

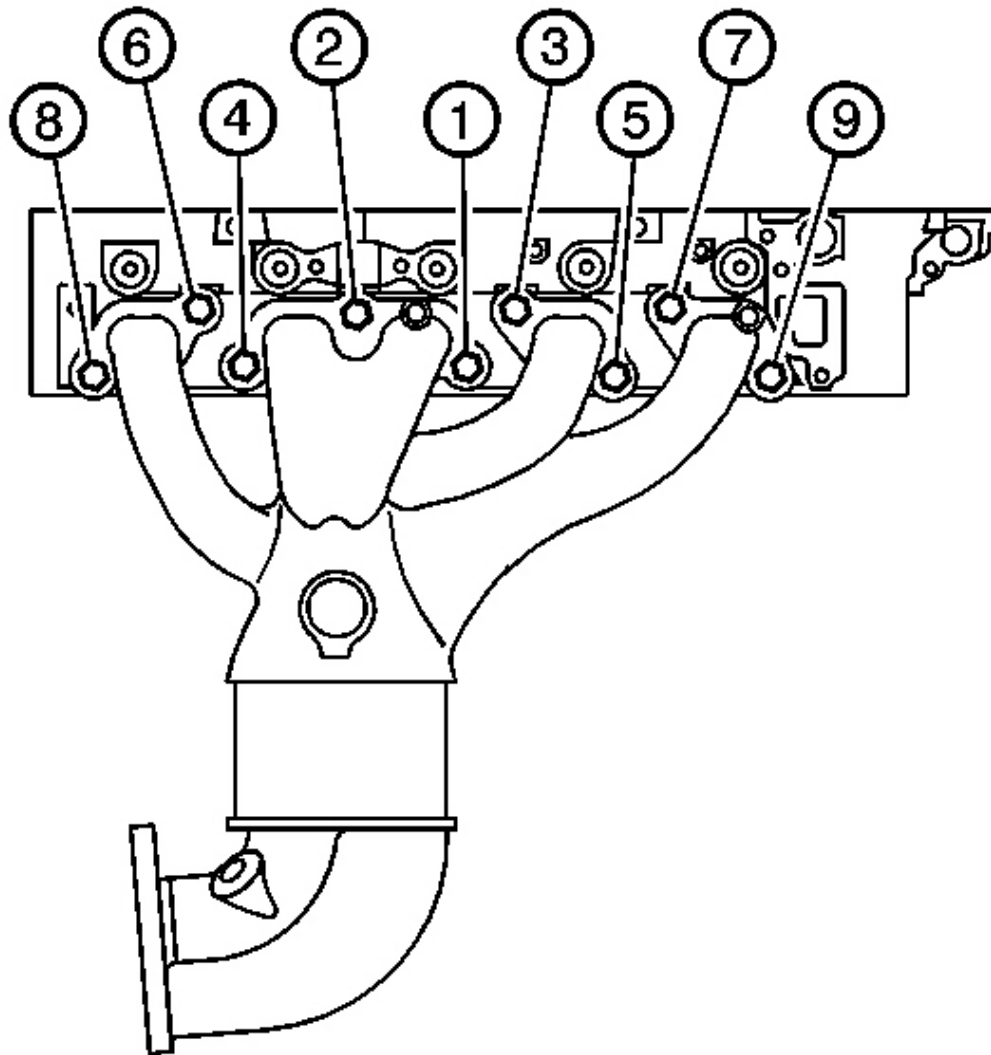


Fig. 5: View Of Bolt Sequence For Exhaust Manifold
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

5. Tighten the exhaust manifold bolts.

Tighten:

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1. Tighten the bolts a first pass in sequence to 20 N.m (15 lb ft).
2. Tighten the bolts a second pass in sequence to 20 N.m (15 lb ft).
3. Tighten the bolts a final pass in sequence to 20 N.m (15 lb ft).
6. Install the exhaust manifold heat shield. Refer to **Exhaust Manifold Heat Shield Replacement**.
7. Install the exhaust seal. Refer to **Exhaust Seal Replacement**.
8. Install the AIR check valve. Refer to **Secondary Air Injection Check Valve Replacement** .

EXHAUST SEAL REPLACEMENT

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .

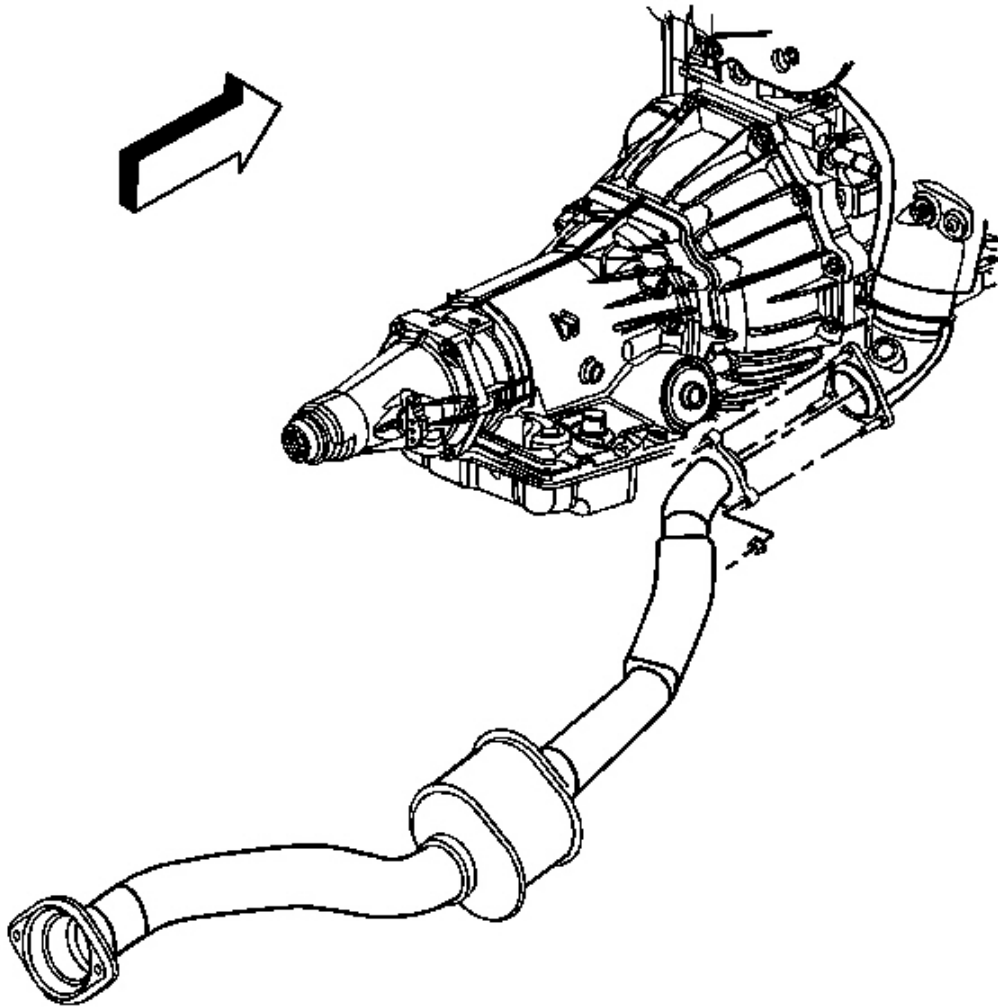


Fig. 6: View Of Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

2. Remove the nuts attaching the catalytic converter to the exhaust manifold.
3. Position the exhaust system rearward, enough to allow clearance to remove the seal.

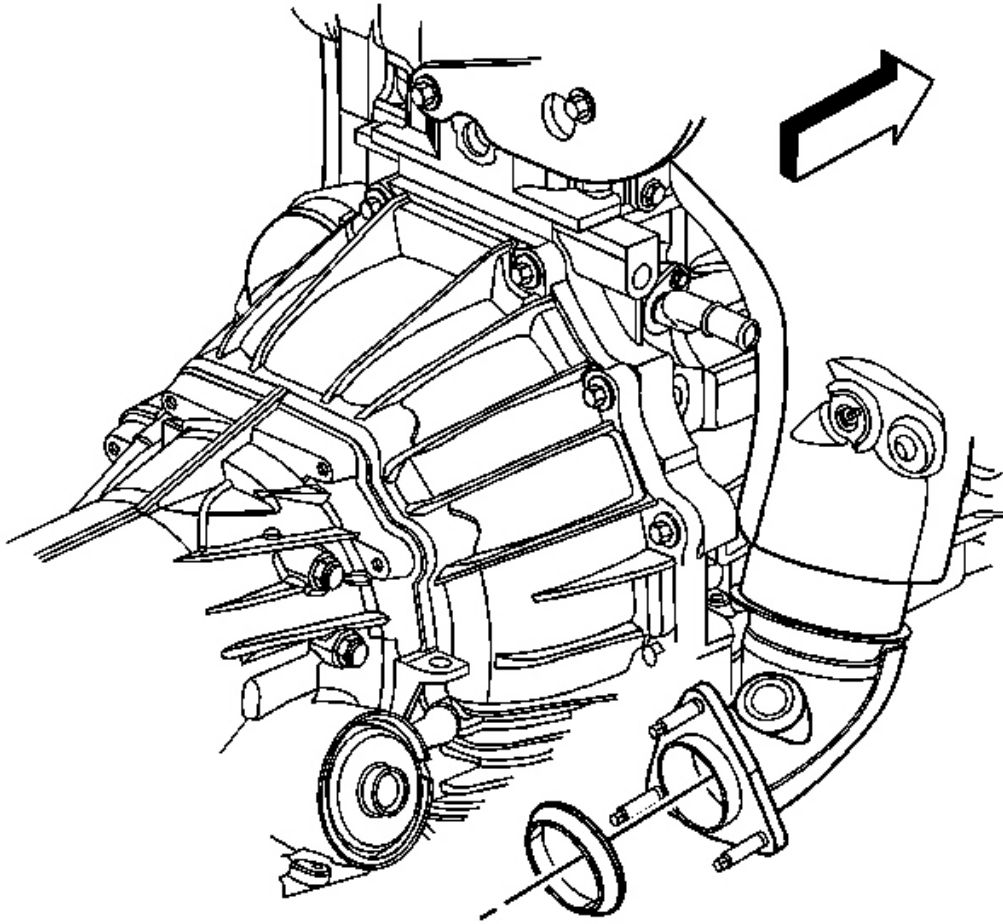


Fig. 7: View Of Exhaust Manifold Seal
Courtesy of GENERAL MOTORS CORP.

4. Remove and discard the exhaust manifold seal.

Installation Procedure

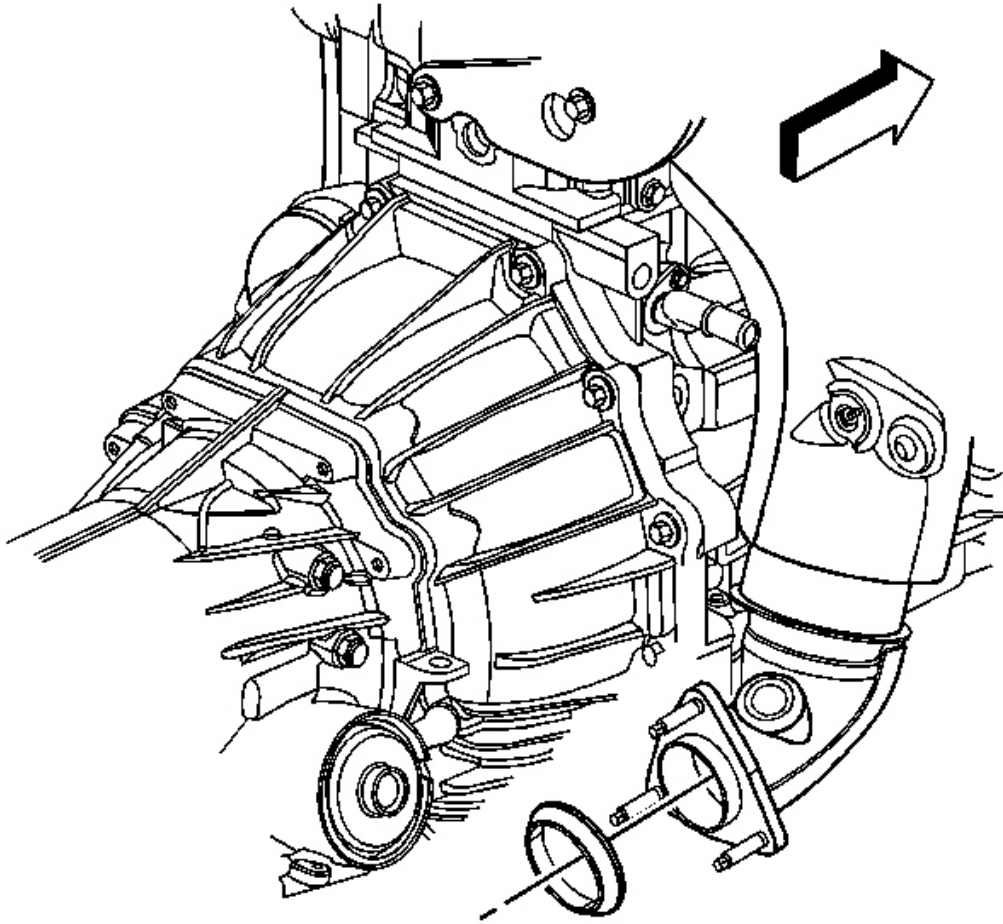


Fig. 8: View Of Exhaust Manifold Seal
Courtesy of GENERAL MOTORS CORP.

1. Install a NEW seal to the exhaust manifold flange.

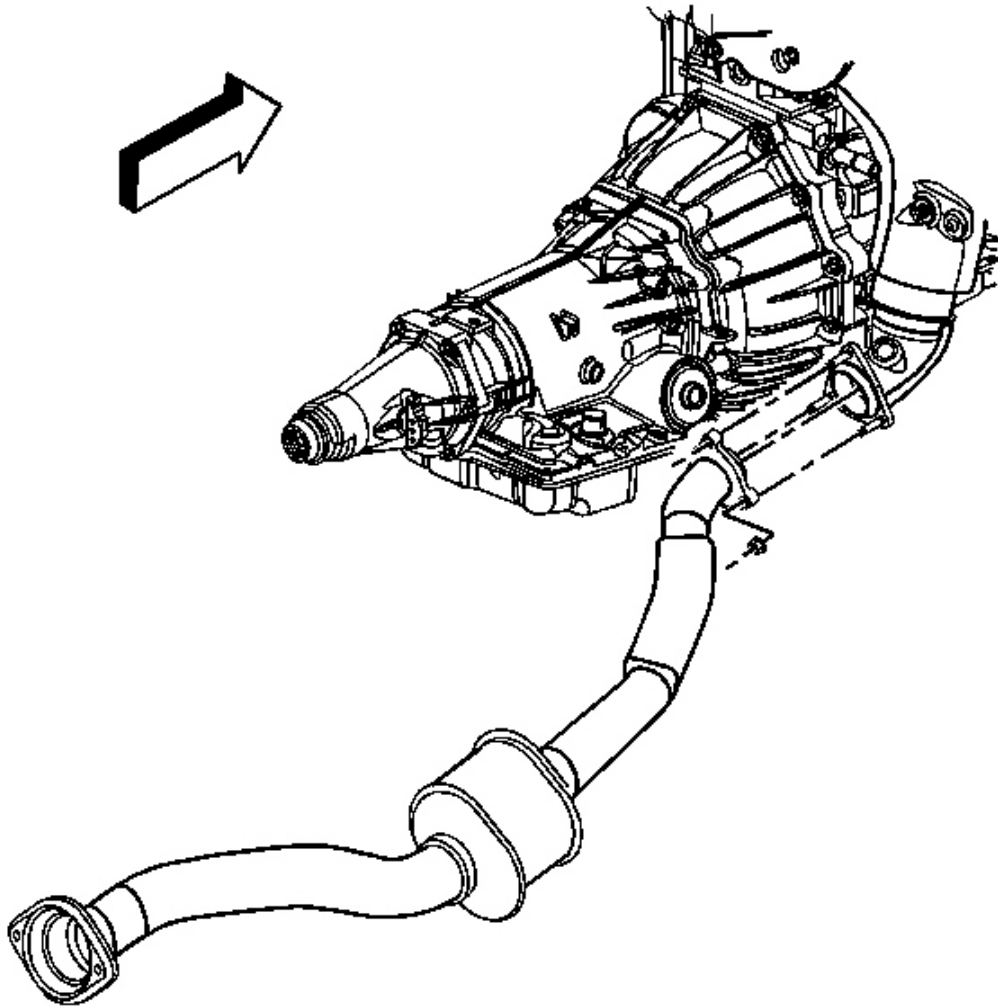


Fig. 9: View Of Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

2. Position the catalytic converter to the exhaust manifold.

NOTE: Refer to Fastener Notice .

3. Install the nuts attaching the catalytic converter to the exhaust manifold.

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

4. Lower the vehicle.

CATALYTIC CONVERTER REPLACEMENT

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

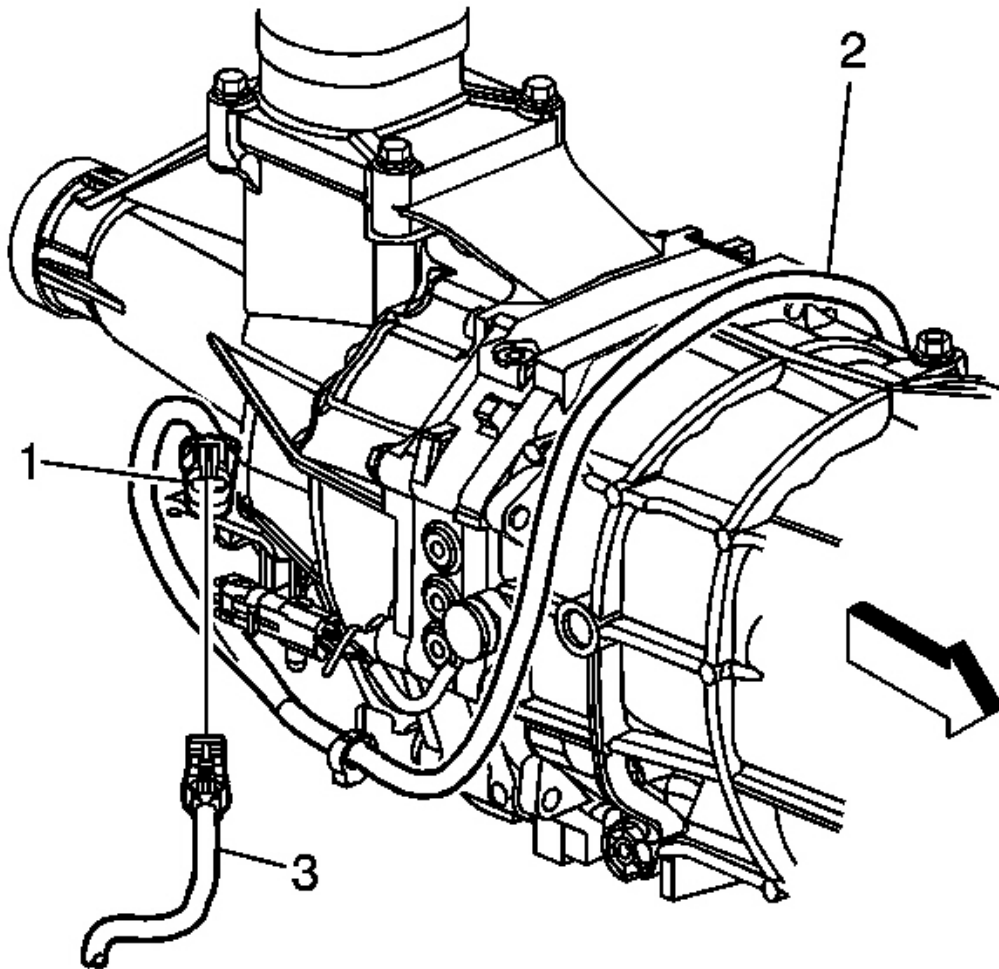


Fig. 10: View Of HO2S Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Remove the right torsion bar. Refer to **Torsion Bar Replacement** .
2. Disconnect the heated oxygen sensor (HO2S) at the sensor pigtail (3).
3. Remove the HO2S if replacement is necessary. Refer to **Heated Oxygen Sensor 2 Replacement** .

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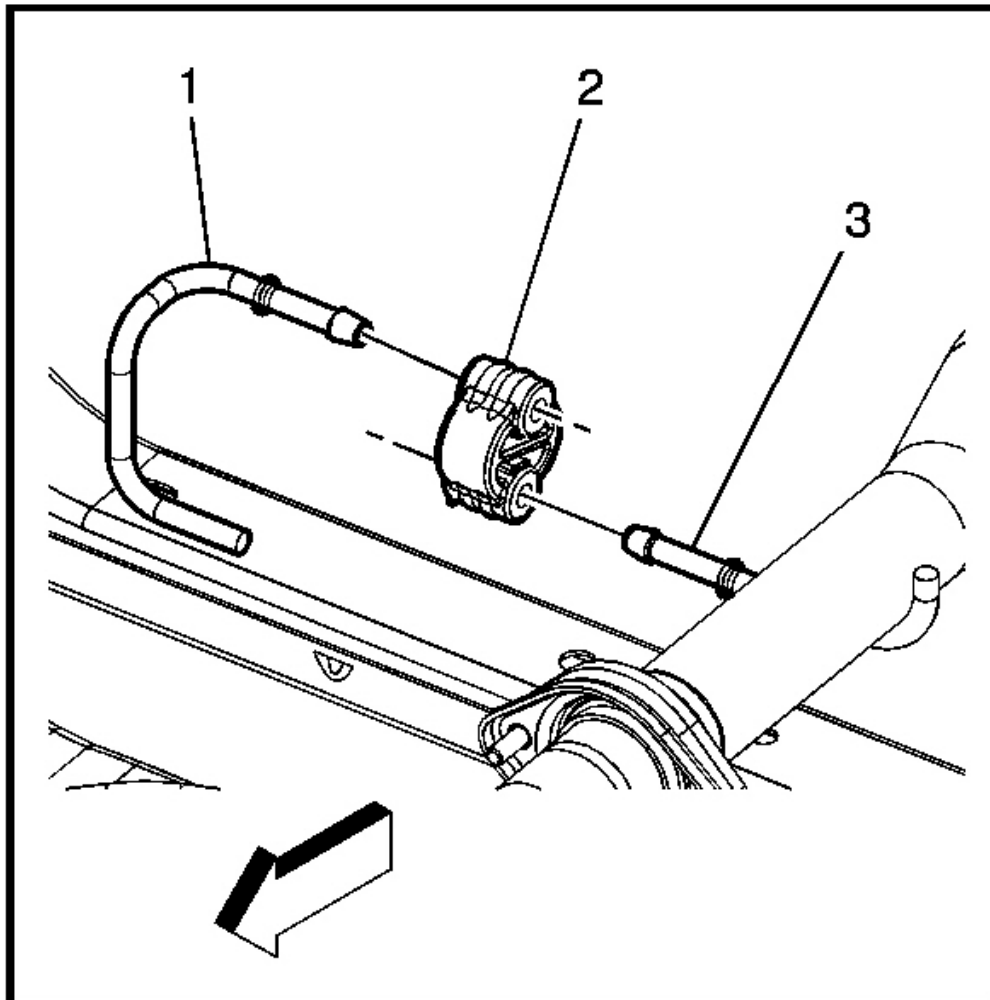
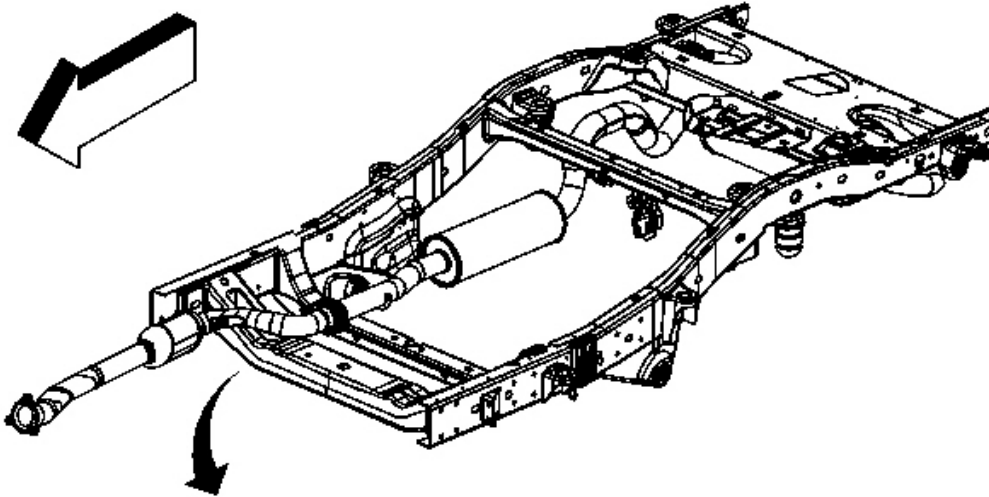


Fig. 11: View Of Exhaust Hanger And Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

4. Apply a soapy solution to the exhaust muffler hanger rod (3) in order to ease the removal of the exhaust hanger (2), if necessary.
5. Pry the exhaust hanger (2) free from the exhaust muffler hanger rod (3), if necessary.

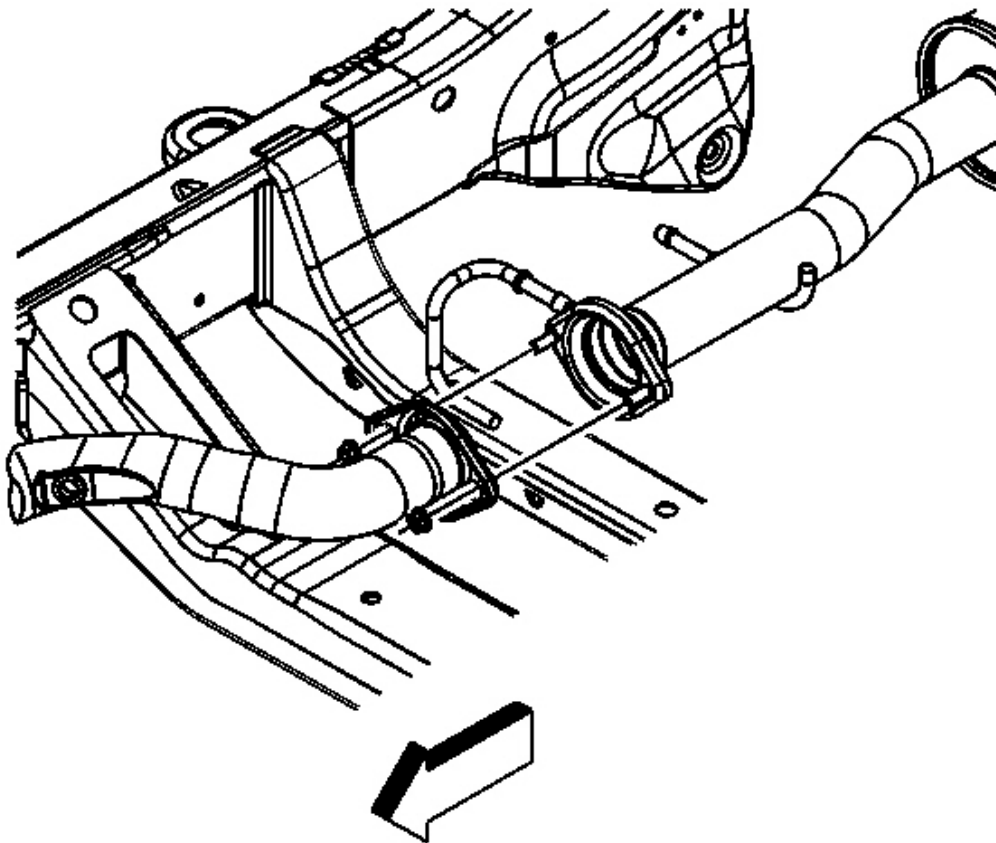


Fig. 12: View Of Nuts Securing Muffler To Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

6. Remove the nuts securing the muffler to the catalytic converter.

7. Position the muffler rearward enough to allow the studs located in the muffler to clear the catalytic converter pipe flange.

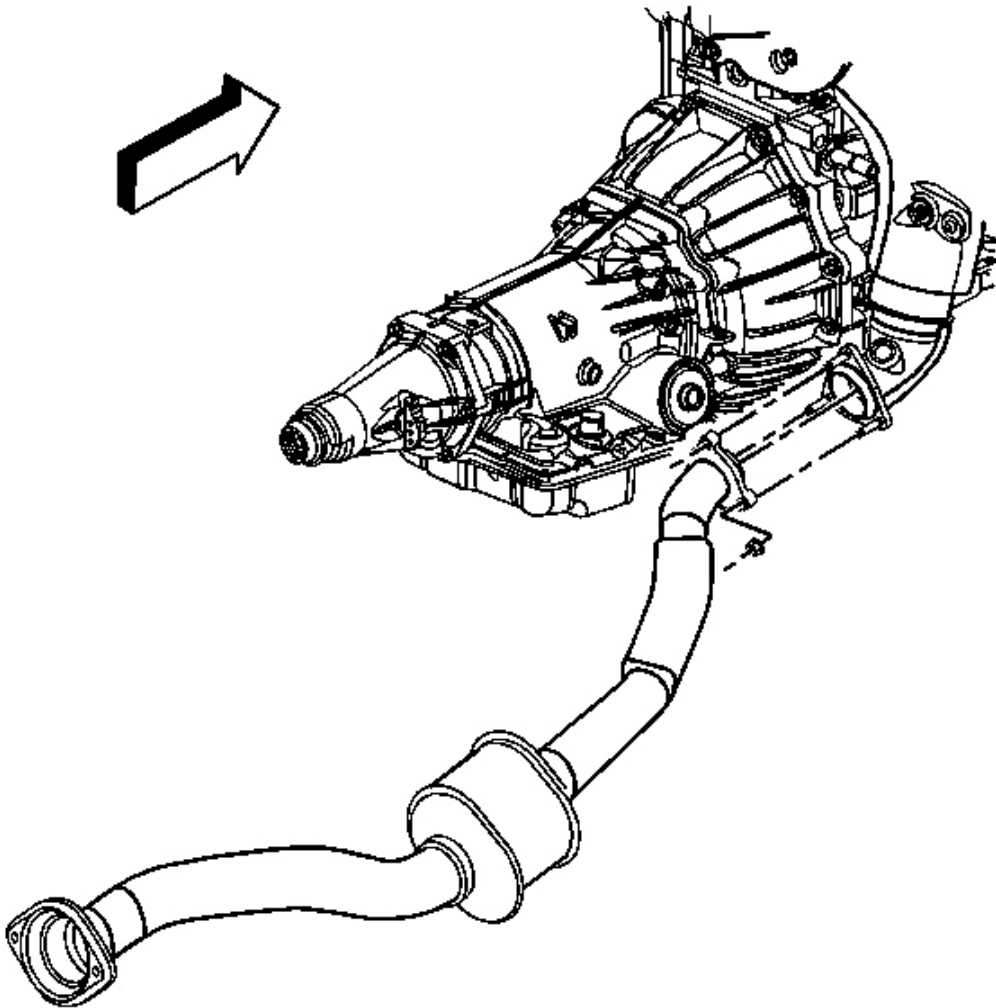


Fig. 13: View Of Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

8. Remove the nuts attaching the catalytic converter to the exhaust manifold.
9. Remove the catalytic converter.

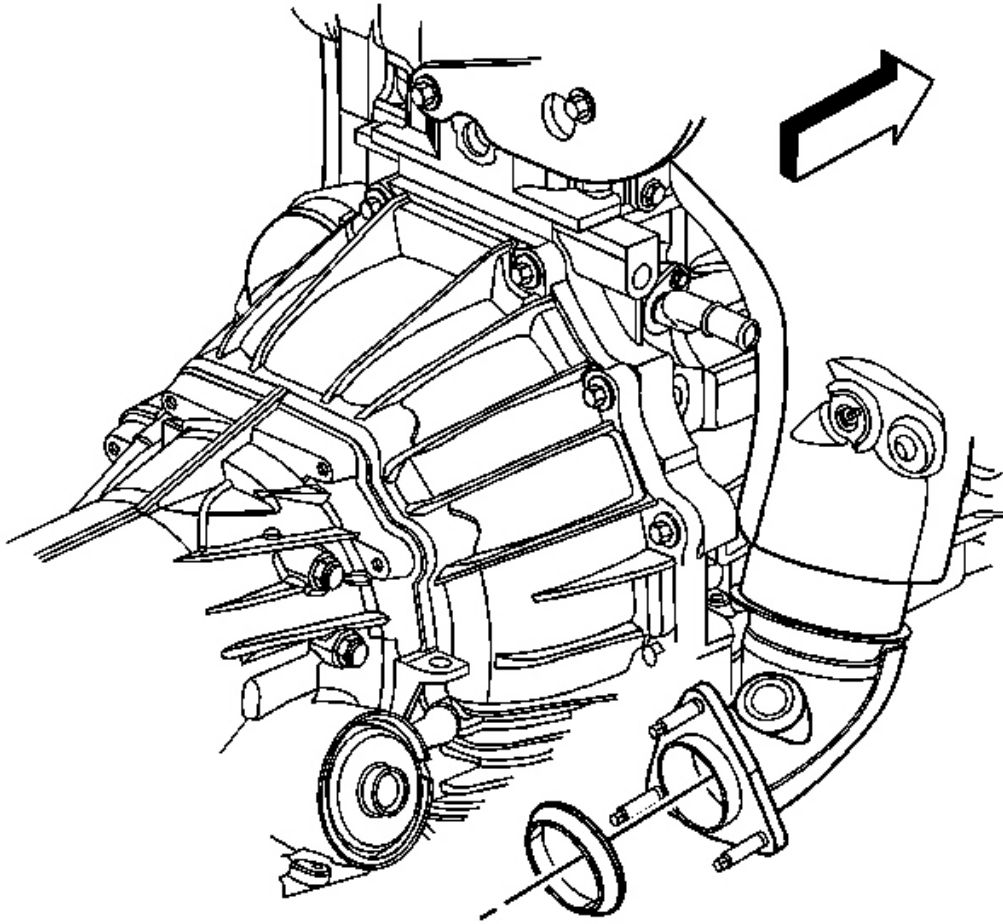


Fig. 14: View Of Exhaust Manifold Seal
Courtesy of GENERAL MOTORS CORP.

10. Remove and discard the exhaust manifold seal at the exhaust manifold flange.

Installation Procedure

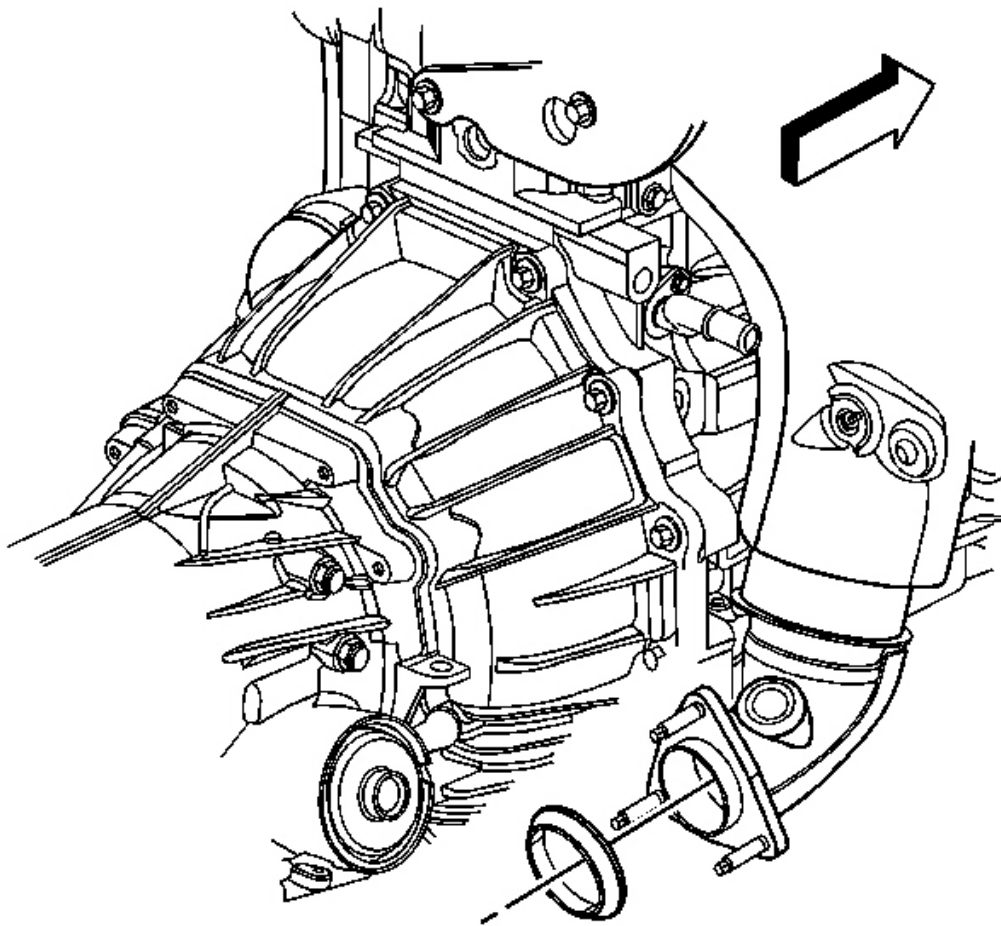


Fig. 15: View Of Exhaust Manifold Seal
Courtesy of GENERAL MOTORS CORP.

1. Install a NEW seal to the exhaust manifold flange.

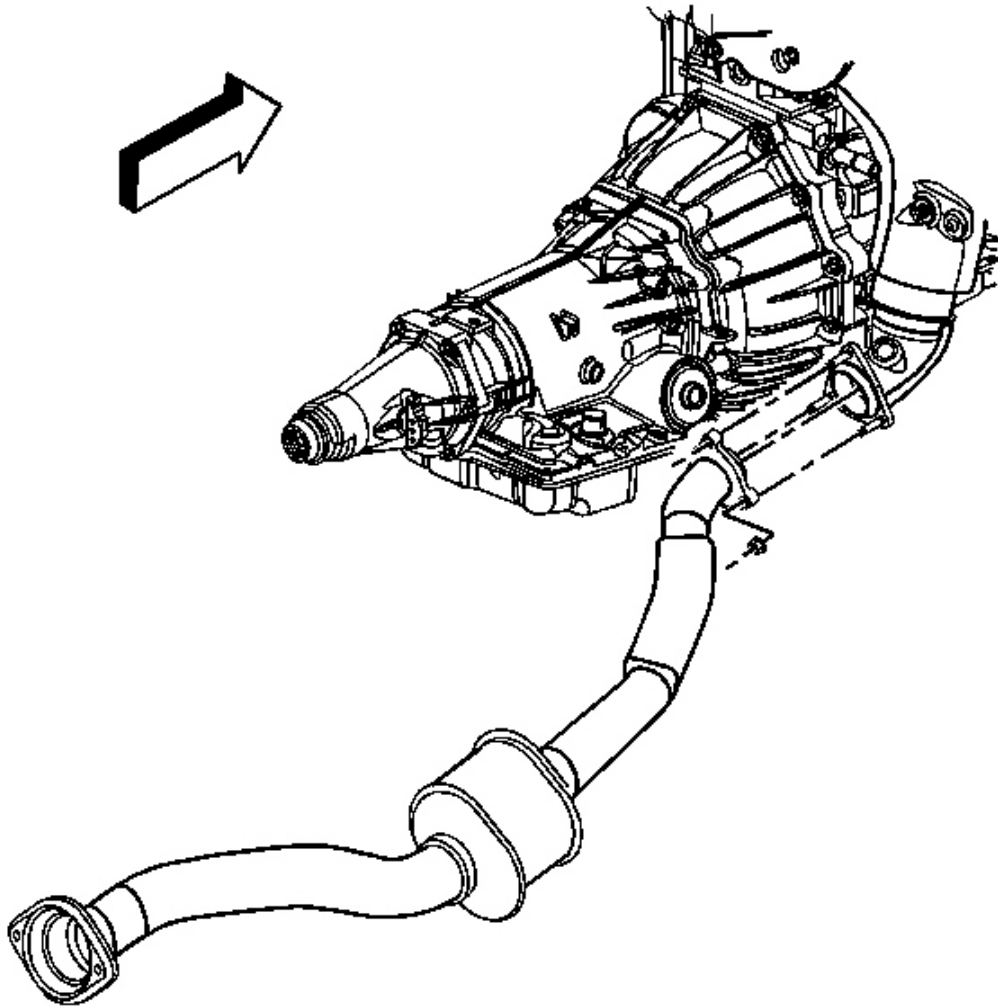


Fig. 16: View Of Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Exhaust System Inspection Notice .

2. Install the catalytic converter to the exhaust manifold.
3. Install the nuts attaching the catalytic converter to the exhaust manifold. Do not tighten at this time.

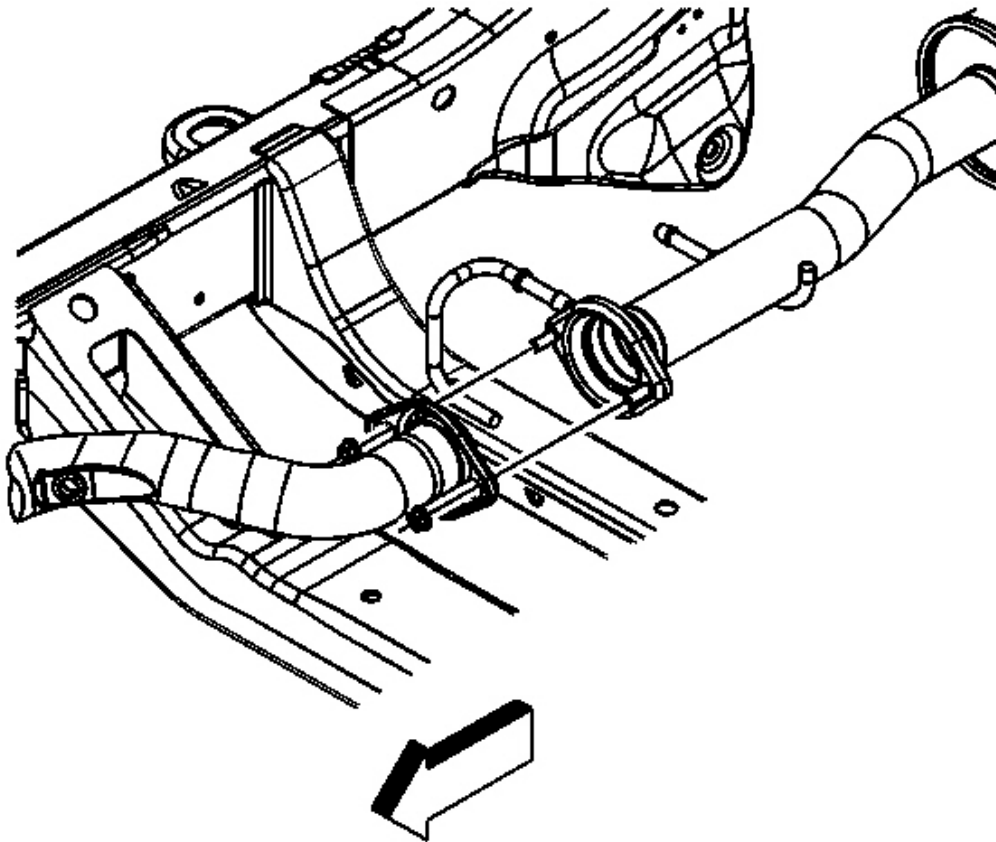


Fig. 17: View Of Nuts Securing Muffler To Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

4. Align the catalytic converter with the studs located in the muffler.

NOTE: Refer to Fastener Notice .

5. Install the nuts securing the muffler to the catalytic converter. Tighten the nuts by hand until each contacts the metal flange.

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

6. Tighten the catalytic converter nuts previously installed in step 3.

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

7. Install the HO2S if previously removed. Refer to **Heated Oxygen Sensor 2 Replacement** .

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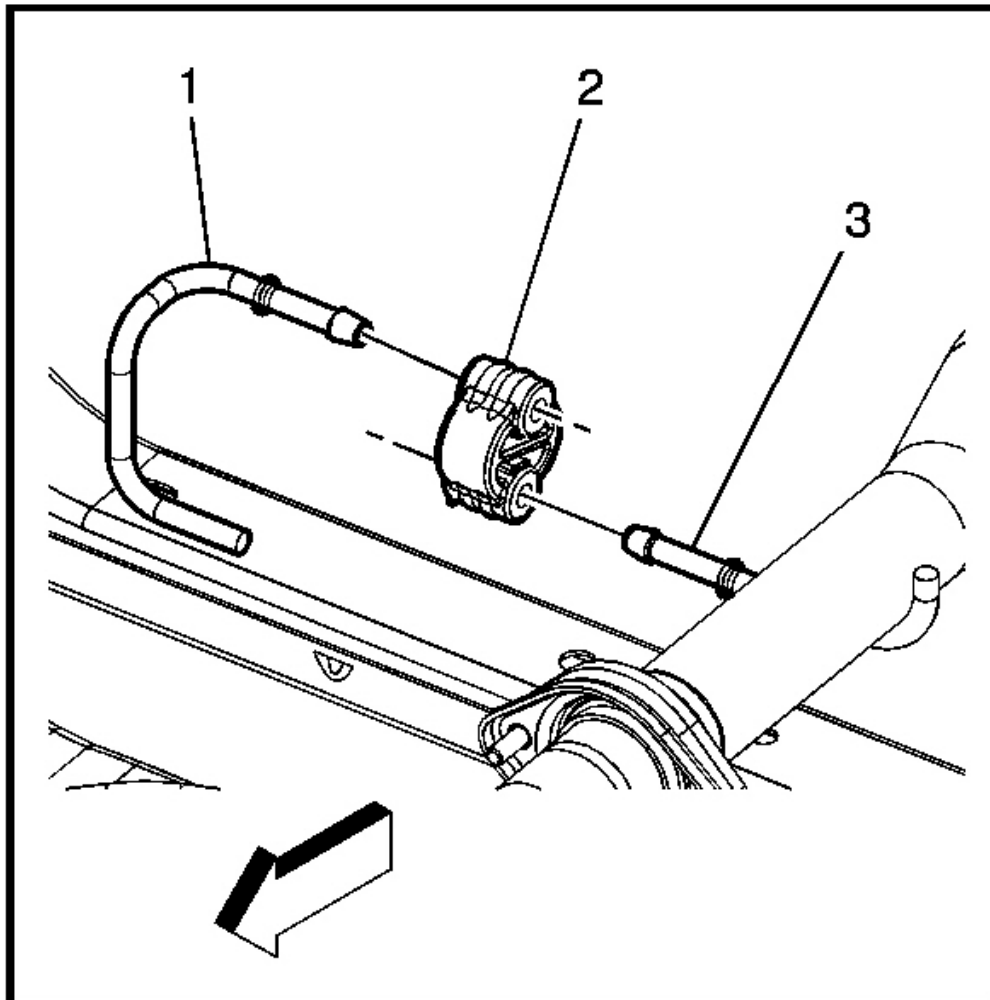
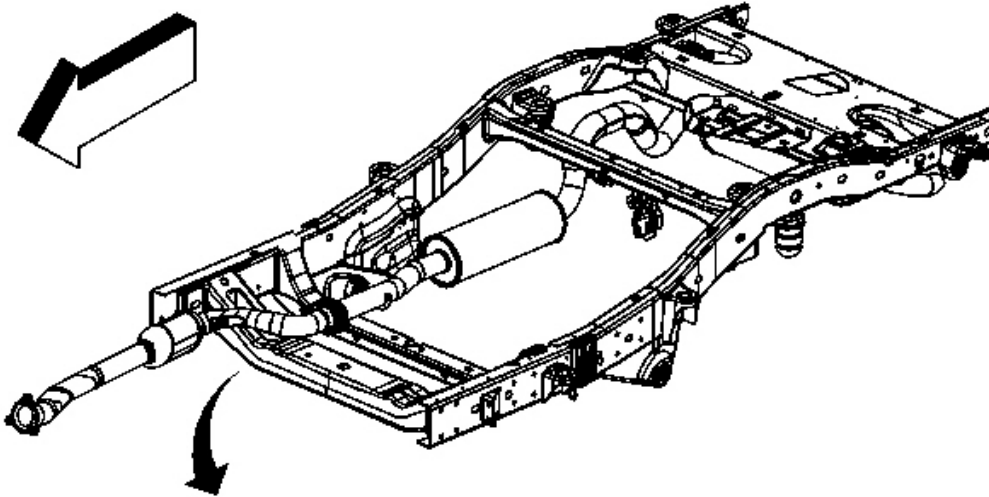


Fig. 18: View Of Exhaust Hanger And Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

8. Apply a soapy solution to the following in order to ease the installation of the hanger (2):
- The inner diameter of the exhaust muffler hanger (2)
 - The exhaust muffler hanger rod (3)

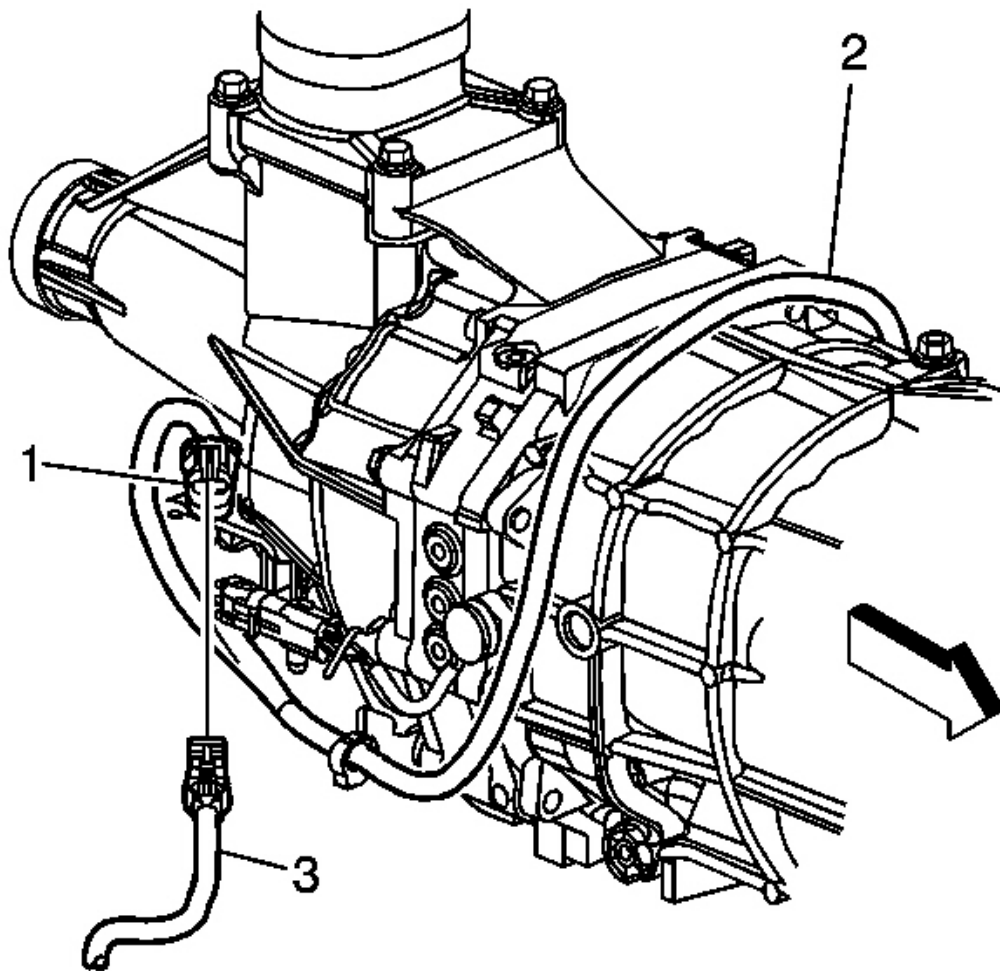


Fig. 19: View Of HO2S Electrical Connector

Courtesy of GENERAL MOTORS CORP.

9. Connect the HO2S at the pigtail (3).
10. Install the right torsion bar. Refer to **Torsion Bar Replacement** .

EXHAUST SYSTEM INSULATOR, HANGER, BRACKET REPLACEMENT

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .

IMPORTANT: Service the exhaust hangers individually in order to retain the support of the exhaust system.

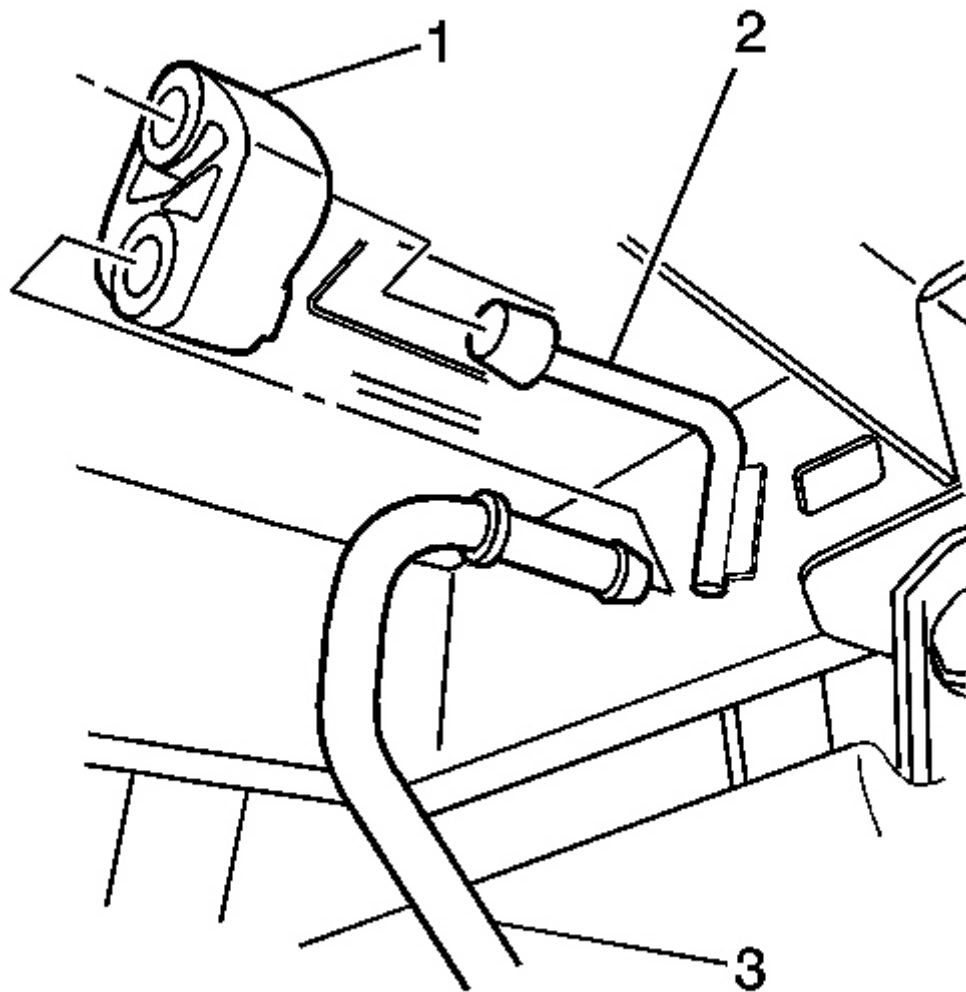


Fig. 20: View Of Exhaust Pipe Hanger
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

2. Apply a soapy solution to the following in order to ease the removal of the hanger (1):
 - The frame support bracket rod (2)
 - The exhaust pipe hanger rod (3)
3. Pry the exhaust pipe hanger (1) free from the following:

- The frame support bracket rod (2)
- The exhaust pipe hanger rod (3)

Installation Procedure

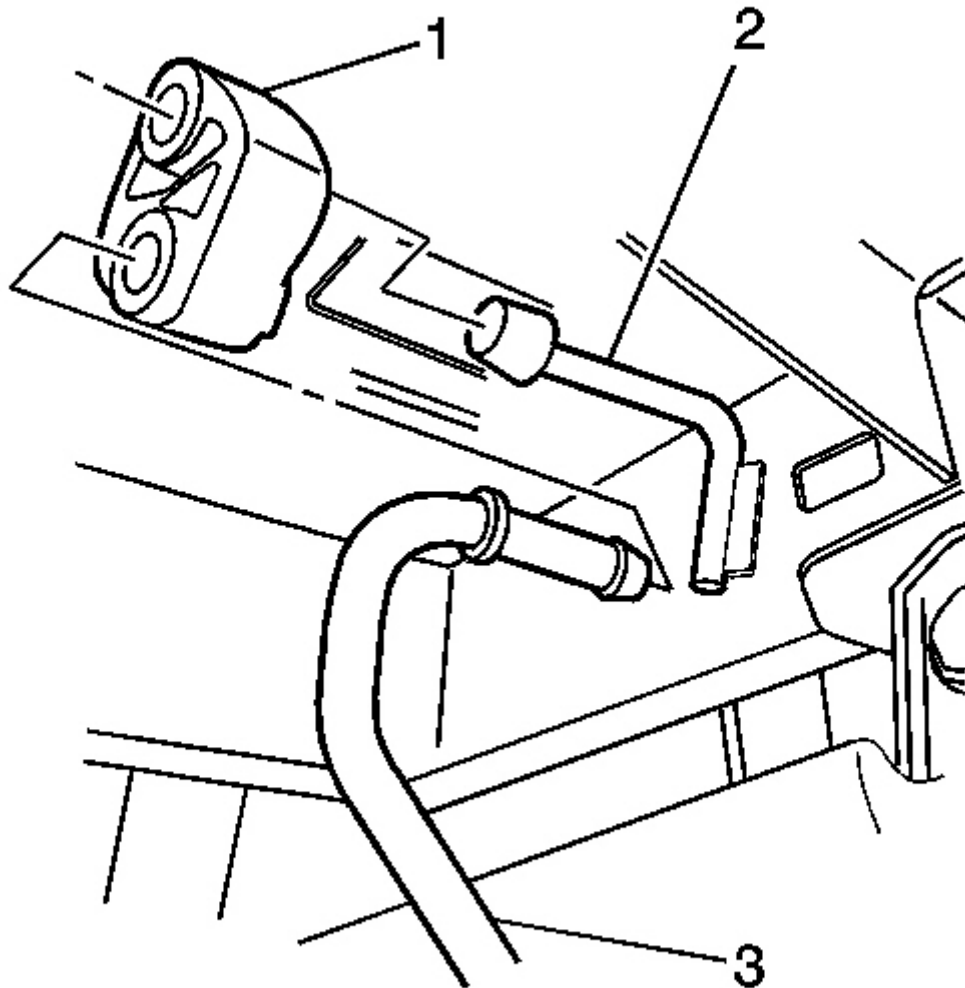


Fig. 21: View Of Exhaust Pipe Hanger
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

1. Apply a soapy solution to the following in order to ease the installation of the hanger (1):
 - The frame support bracket rod (2)
 - The inner diameter of the exhaust pipe hanger (1)
 - The exhaust pipe hanger rod (3)
2. Press the exhaust pipe hanger (1) over the following:
 - The frame support bracket rod (2)
 - The exhaust pipe hanger rod (3)
3. Lower the vehicle.

MUFFLER REPLACEMENT

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

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

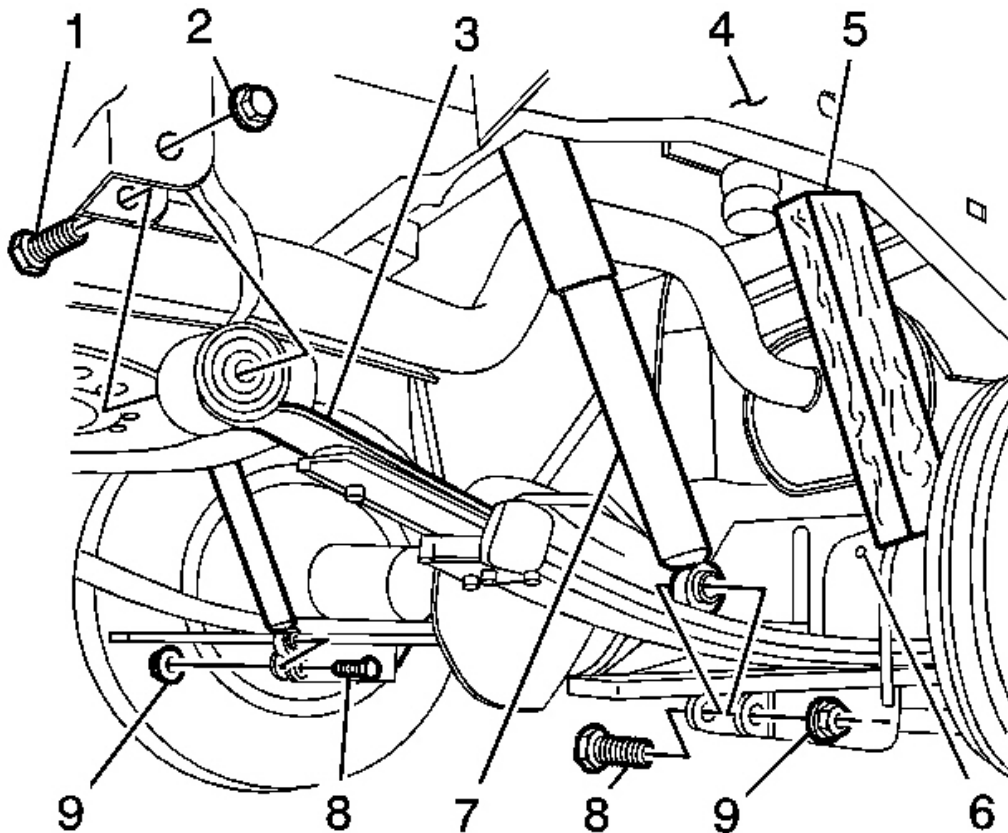


Fig. 22: View Of Rear Right Wheel Suspension Assembly
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use care not to over extend the rear brake hose.

2. Complete the following in order to gain clearance to remove the muffler:
 1. Remove the lower shock absorber nuts (9) and bolts (8).
 2. Remove the right rear leaf spring nut (2) and bolt (1).
 3. Wedge a block of wood (5) between the frame (4) and the rear axle (6).

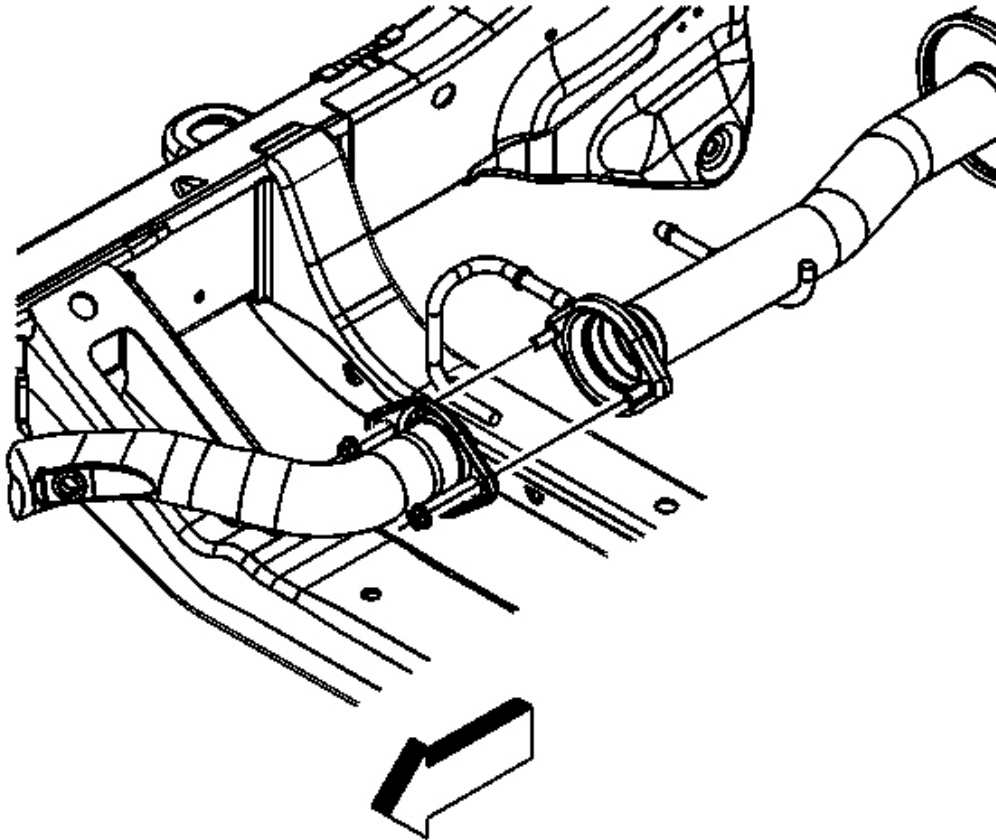


Fig. 23: View Of Nuts Securing Muffler To Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

3. Remove the nuts securing the muffler to the catalytic converter.

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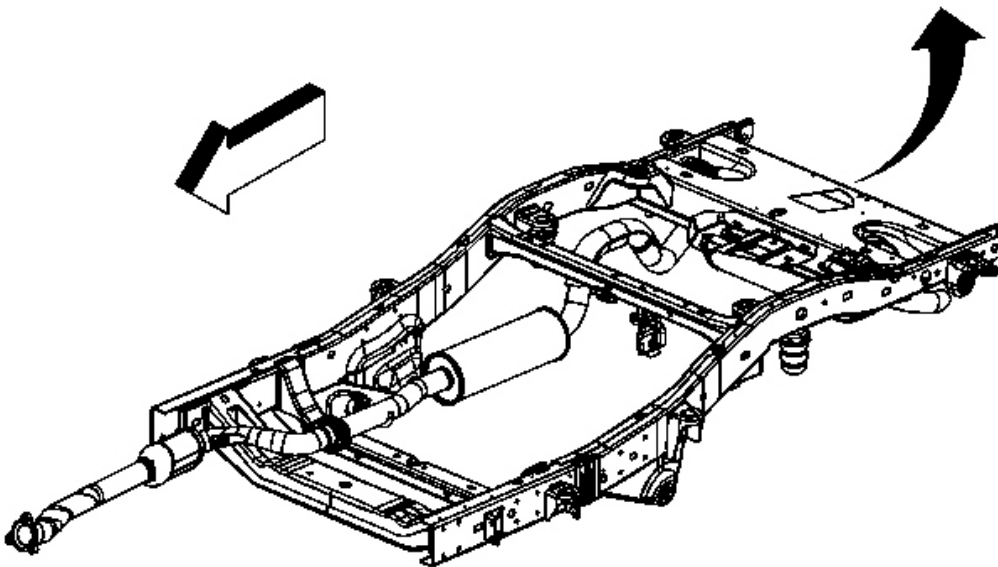
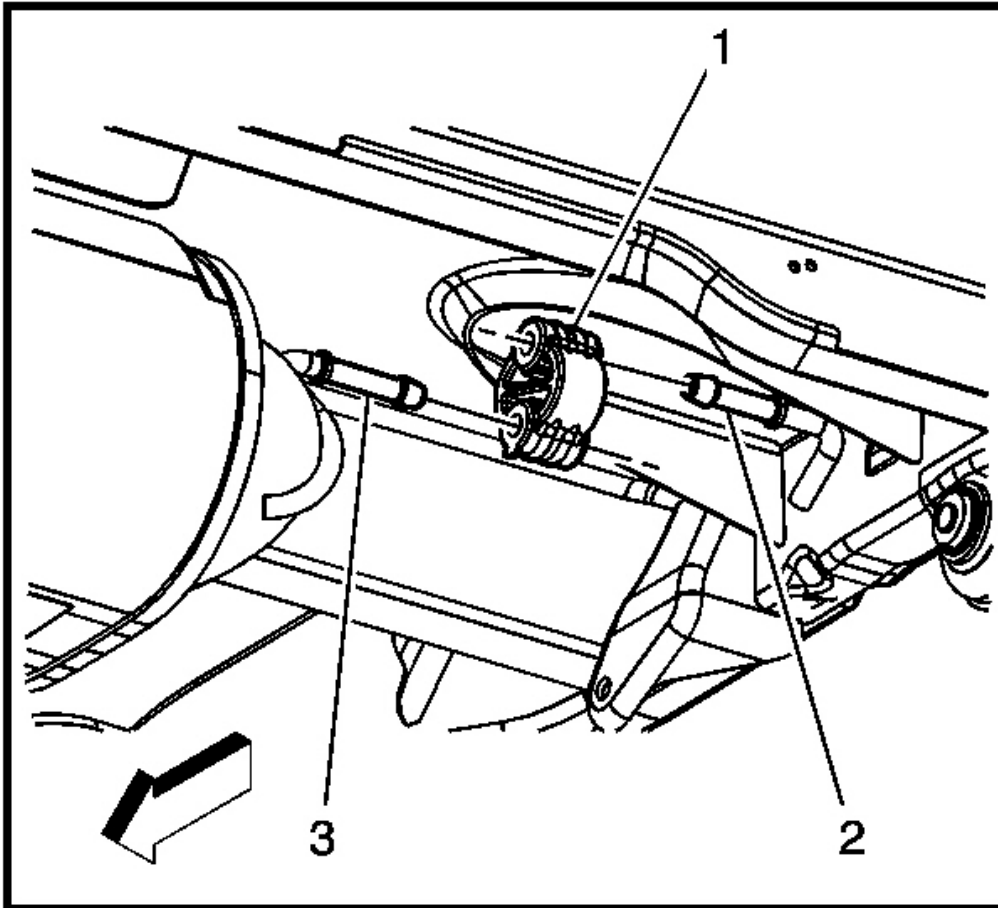


Fig. 24: View Of Exhaust Hanger & Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

4. Apply a soapy solution to the exhaust muffler hanger rod (3) in order to ease the removal of the exhaust hanger (1).
5. Pry the exhaust hanger (1) free from the exhaust muffler hanger rod (3).

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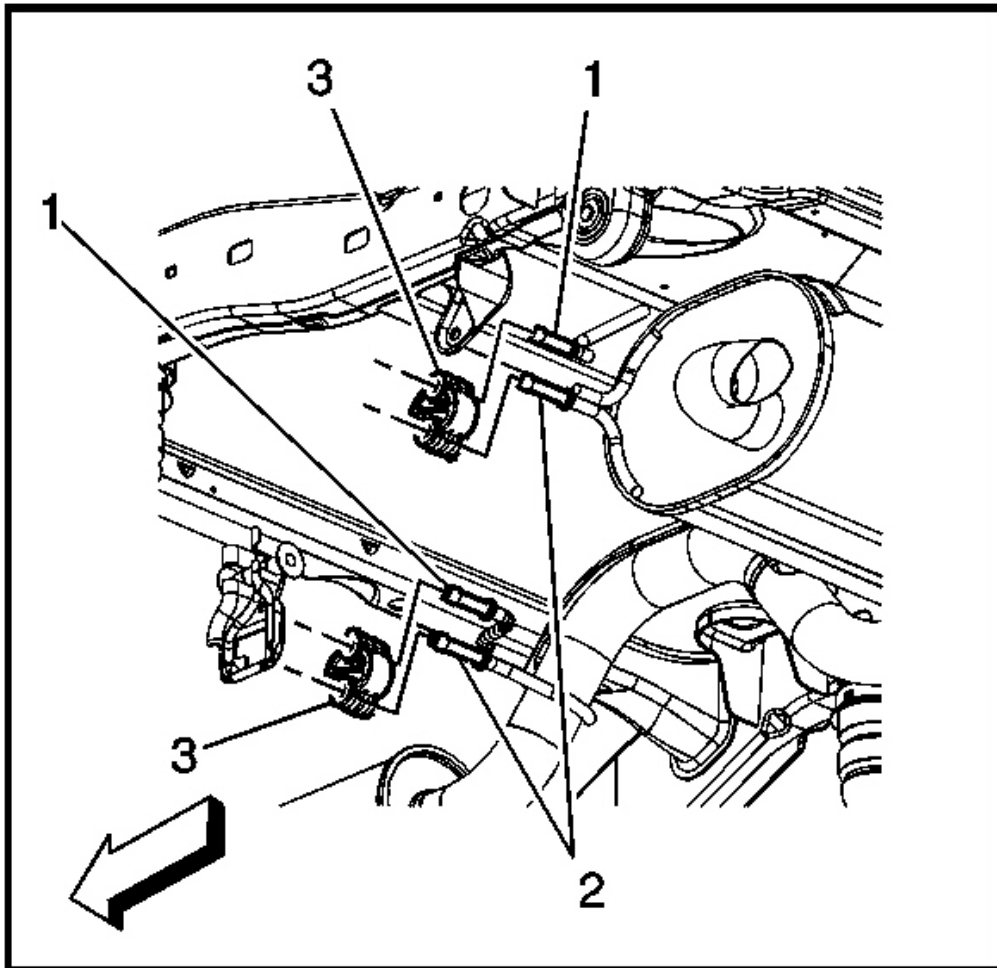
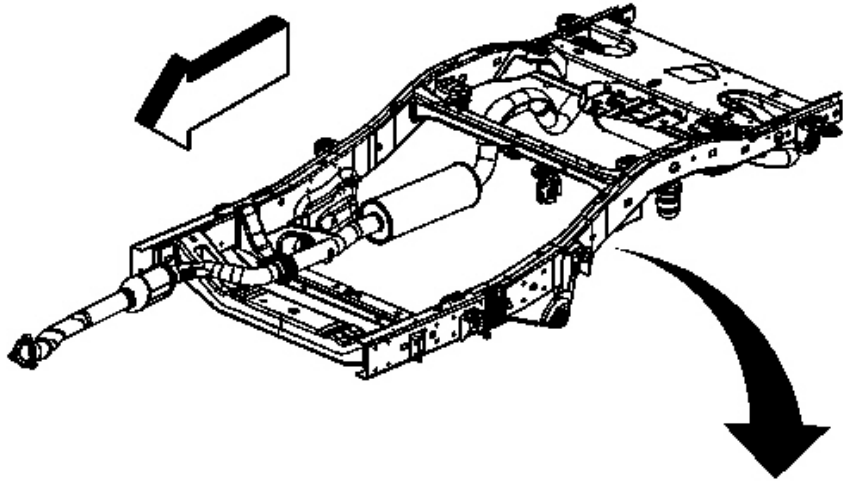


Fig. 25: Identifying Exhaust Hanger & Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

6. Apply a soapy solution to the exhaust muffler hanger rod (2) in order to ease the removal of the exhaust hanger (3).
7. Pry the exhaust hanger (3) free from the exhaust muffler hanger rod (2).

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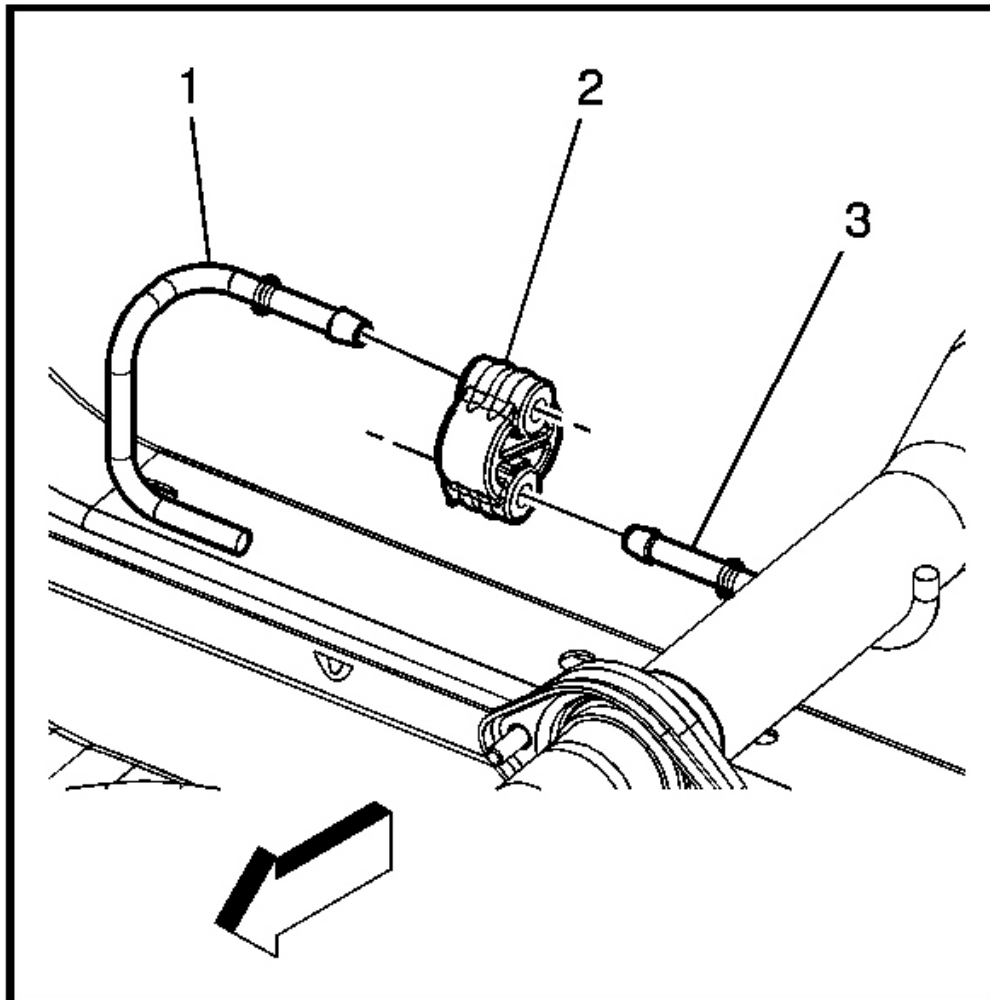
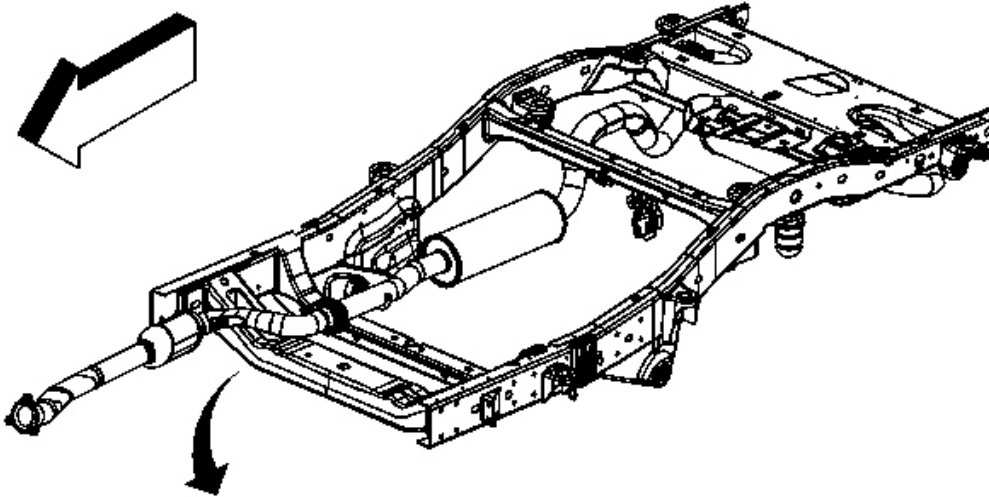


Fig. 26: View Of Exhaust Hanger And Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

8. Apply a soapy solution to the exhaust muffler hanger rod (3) in order to ease the removal of the exhaust hanger (2).
9. Pry the exhaust hanger (2) free from the exhaust muffler hanger rod (3).
10. Complete the following in order to remove the muffler from the vehicle:
 1. Slide the muffler rearward from the catalytic converter.
 2. Rotate the muffler 90 degrees counterclockwise from the rear.
 3. Carefully remove the muffler rearward from the vehicle.

Installation Procedure

1. Complete the following in order to install the muffler to the vehicle:
 1. With the muffler turned 90 degrees counterclockwise from the rear, carefully insert the muffler over the rear axle until the flange is near the catalytic converter.
 2. Rotate the muffler clockwise 90 degrees to the installed position.
 3. Slide the muffler forward into position, aligning the studs with the rear of the catalytic converter.

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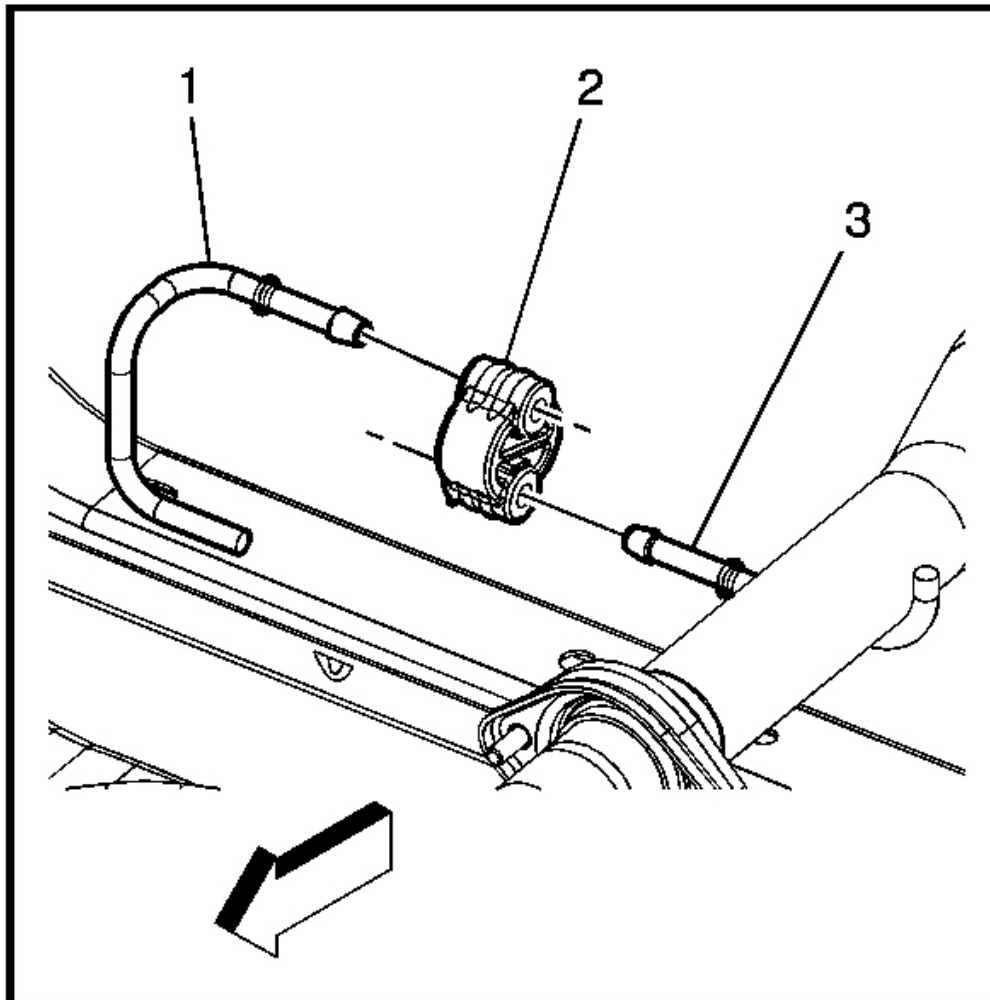
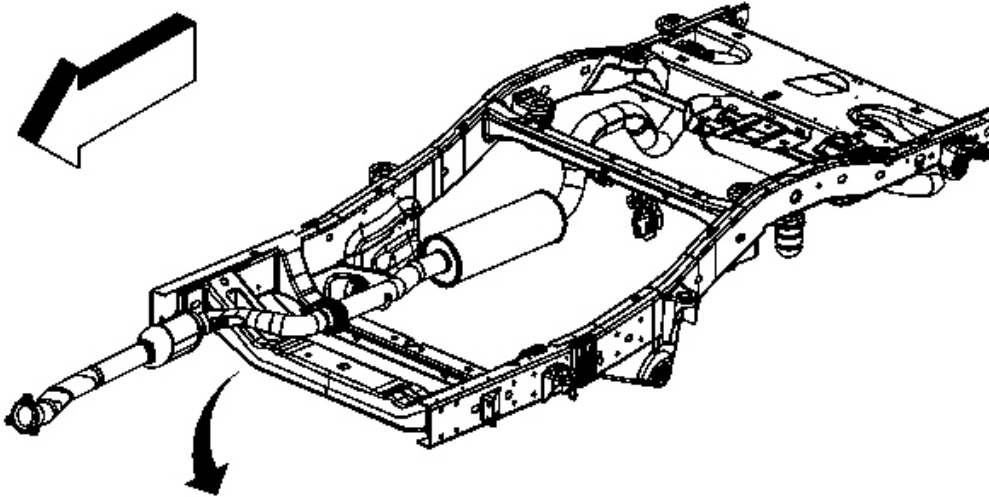


Fig. 27: View Of Exhaust Hanger And Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

2. Apply a soapy solution to the following in order to ease the installation of the hanger (2):
 - The inner diameter of the exhaust muffler hanger (2)
 - The exhaust muffler hanger rod (3)
3. Press the exhaust muffler hanger (3) over the exhaust pipe hanger rod (1).

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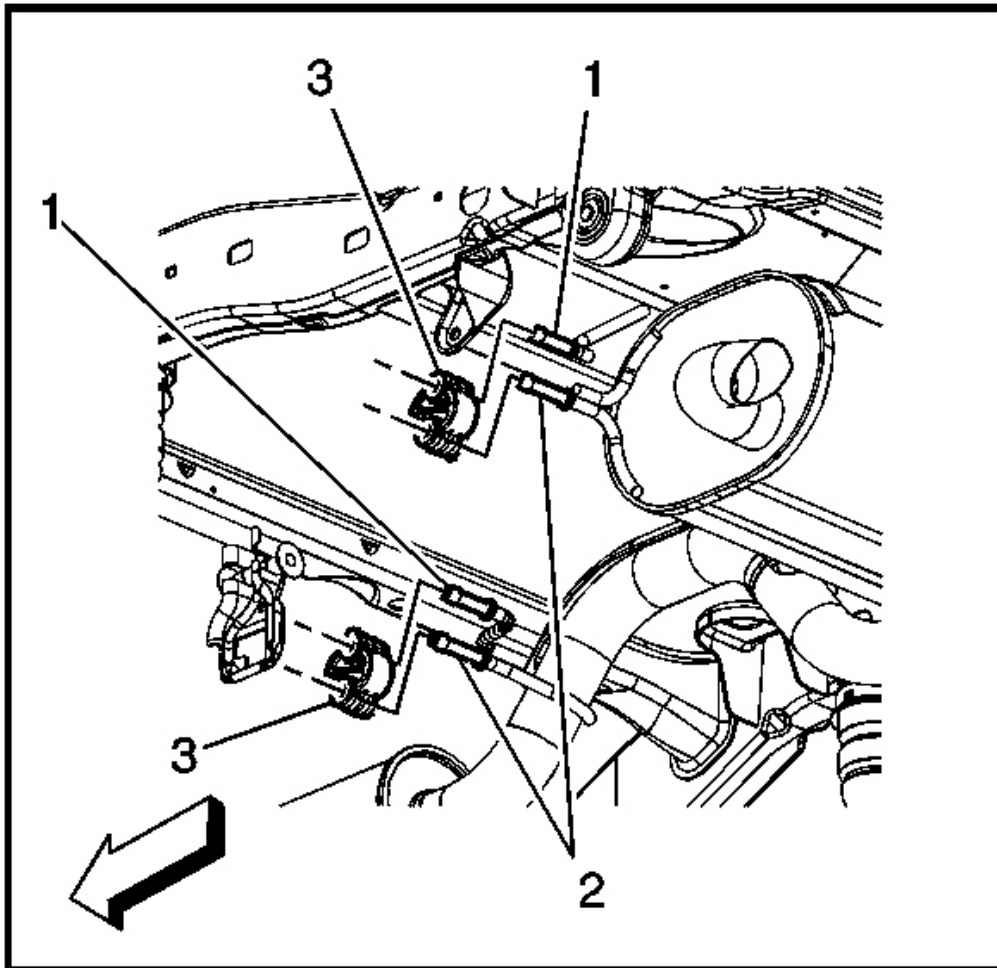
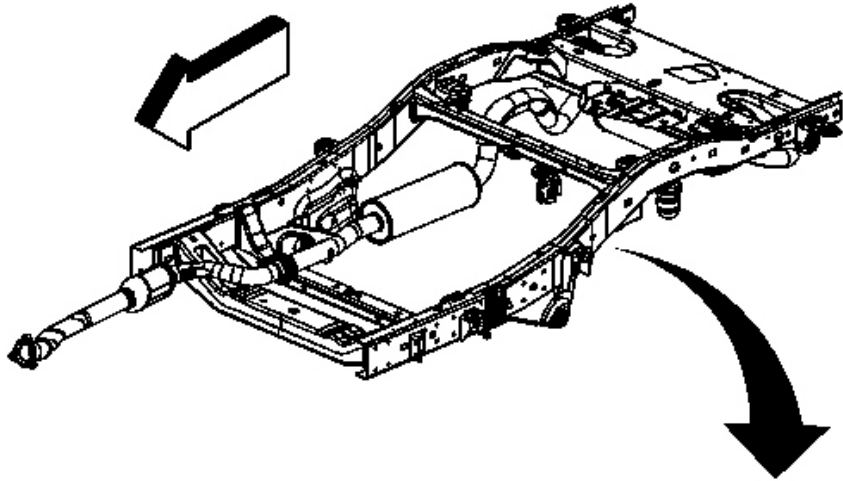


Fig. 28: Identifying Exhaust Hanger & Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

4. Apply a soapy solution to the following in order to ease the installation of the hanger (3):
 - The inner diameter of the exhaust muffler hanger (3)
 - The exhaust muffler hanger rod (2)
5. Press the exhaust muffler hanger (3) over the exhaust pipe hanger rod (1).

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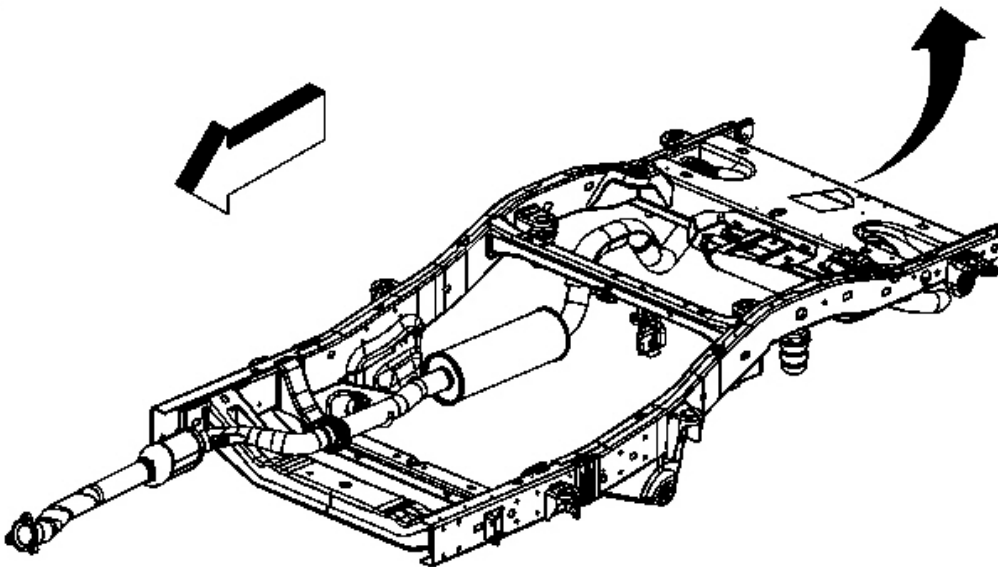
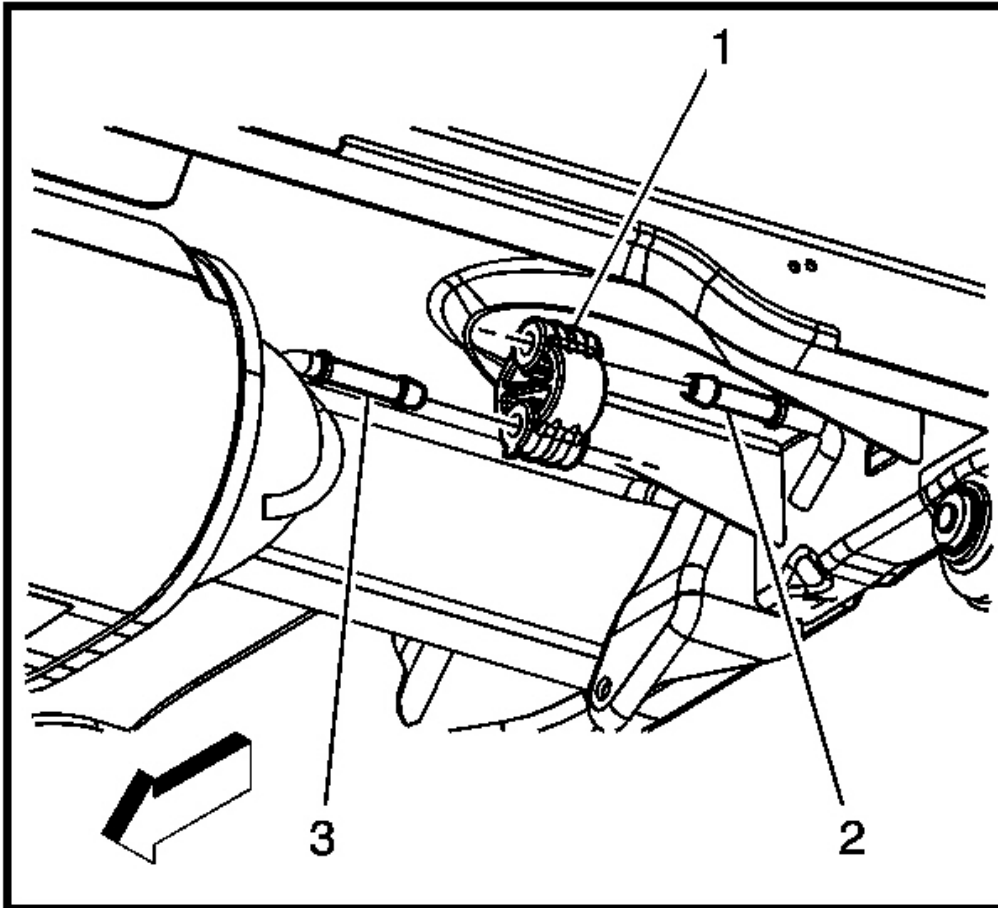


Fig. 29: View Of Exhaust Hanger & Exhaust Muffler Hanger Rod
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

6. Apply a soapy solution to the following in order to ease the installation of the hanger (1):
 - The inner diameter of the exhaust muffler hanger (1)
 - The exhaust muffler hanger rod (3)
7. Press the exhaust muffler hanger (1) over the exhaust pipe hanger rod (3).

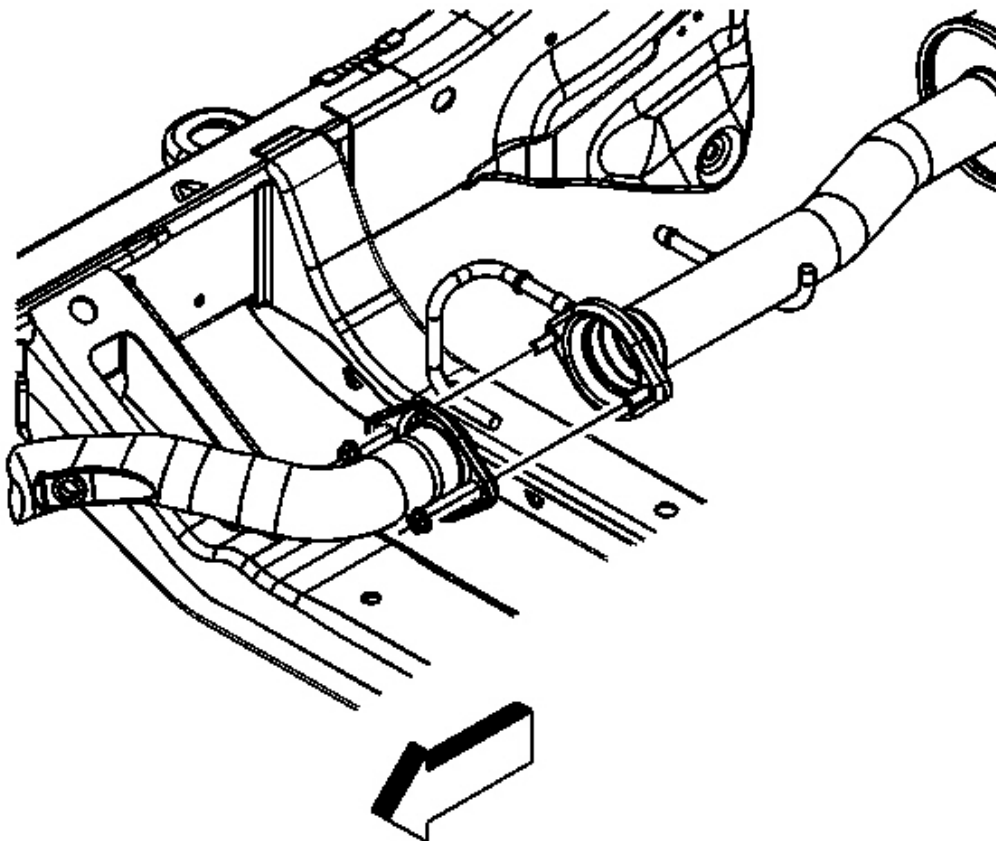


Fig. 30: View Of Nuts Securing Muffler To Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

8. Install the nuts securing the muffler to the catalytic converter. Tighten the muffler nuts by hand until each contacts the metal flange.

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

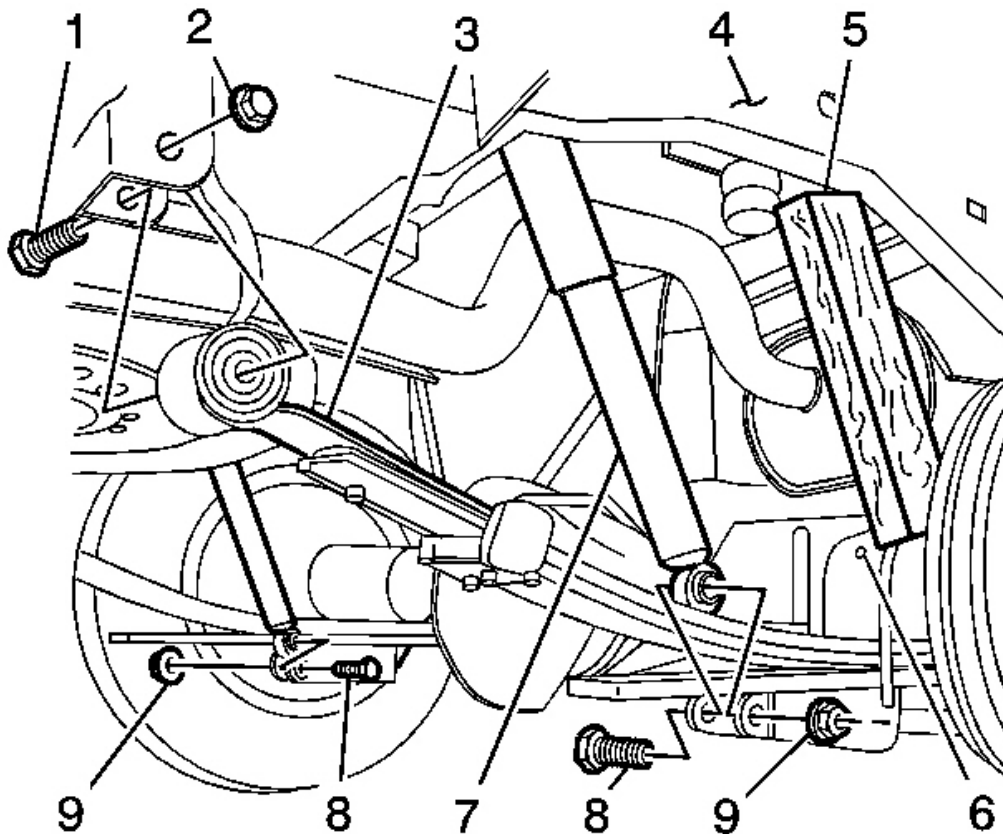


Fig. 31: View Of Rear Right Wheel Suspension Assembly
Courtesy of GENERAL MOTORS CORP.

9. Remove the block of wood (5) from between the frame (4) and rear axle (6).
10. Install the right rear leaf spring bolt (1) and nut (2).

Tighten: Tighten the bolt and nut to 85 N.m (63 lb ft).

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11. Install the lower shock absorber bolts (8) and nuts (9).
Tighten: Tighten the bolts and nuts to 95 N.m (70 lb ft).
12. Inspect the exhaust system for leaks and underbody contact.
13. Lower the vehicle.

CATALYTIC CONVERTER HEAT SHIELD REPLACEMENT

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

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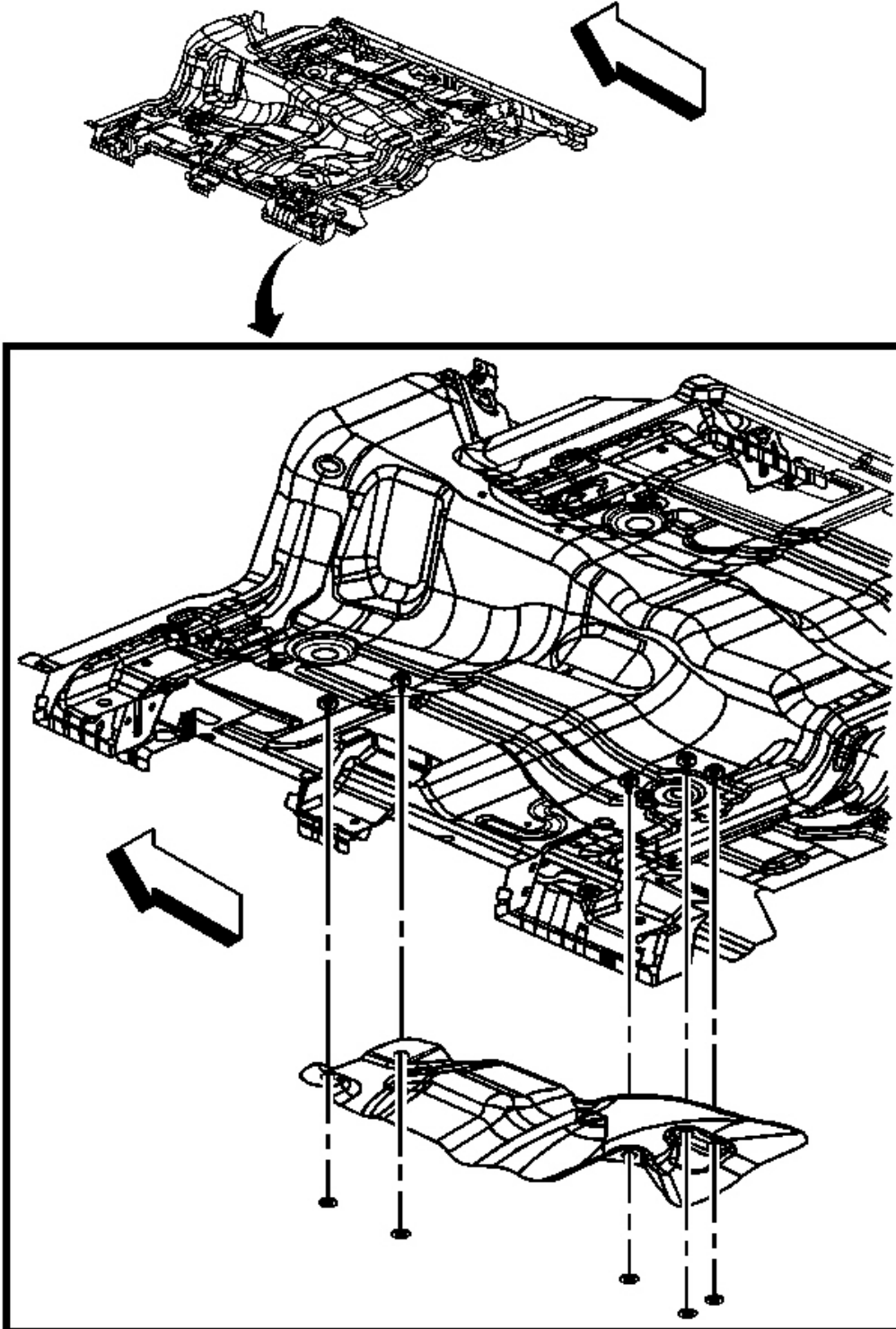


Fig. 32: View Of Catalytic Converter Heat Shield At Floor Panel
Courtesy of GENERAL MOTORS CORP.

1. Remove the catalytic converter. Refer to **Catalytic Converter Replacement**.
2. Remove the nuts securing the heat shield to the floor panel.
3. Remove the catalytic converter heat shield.

Installation Procedure

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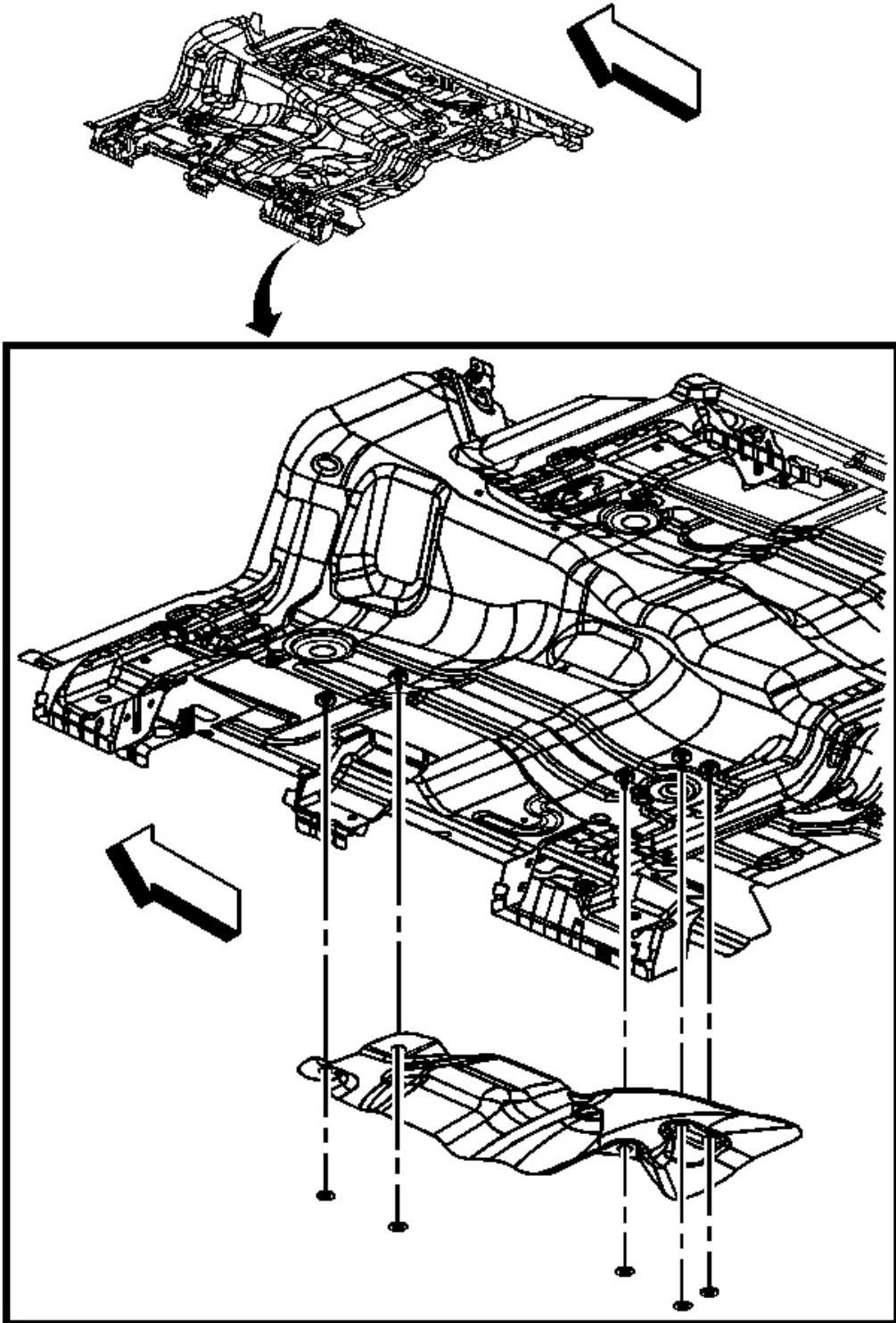


Fig. 33: View Of Catalytic Converter Heat Shield At Floor Panel
Courtesy of GENERAL MOTORS CORP.

1. Position the catalytic converter heat shield to the floor panel studs.

NOTE: Refer to Fastener Notice .

2. Install the nuts securing the heat shield to the floor panel.

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

3. Remove the catalytic converter. Refer to Catalytic Converter Replacement.

EXHAUST MANIFOLD HEAT SHIELD REPLACEMENT

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

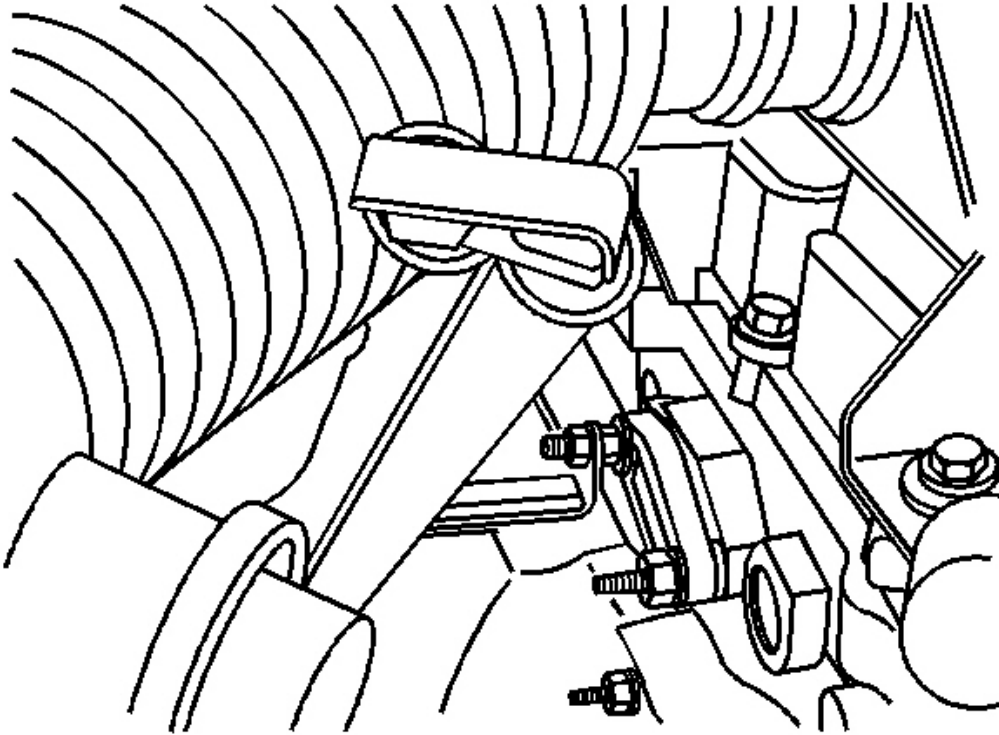


Fig. 34: View Of Transmission Filler Tube & Bracket
Courtesy of GENERAL MOTORS CORP.

1. Remove the air cleaner outlet duct. Refer to **Air Cleaner Outlet Duct Replacement** .
2. Remove the air cleaner assembly. Refer to **Air Cleaner Assembly Replacement** .
3. If equipped with an automatic transmission, remove the transmission filler tube bracket nut from the secondary air injection (AIR) adapter and position aside.
4. Remove the heated oxygen sensor (HO2S) from the exhaust manifold. Refer to **Heated Oxygen Sensor 1 Replacement** .

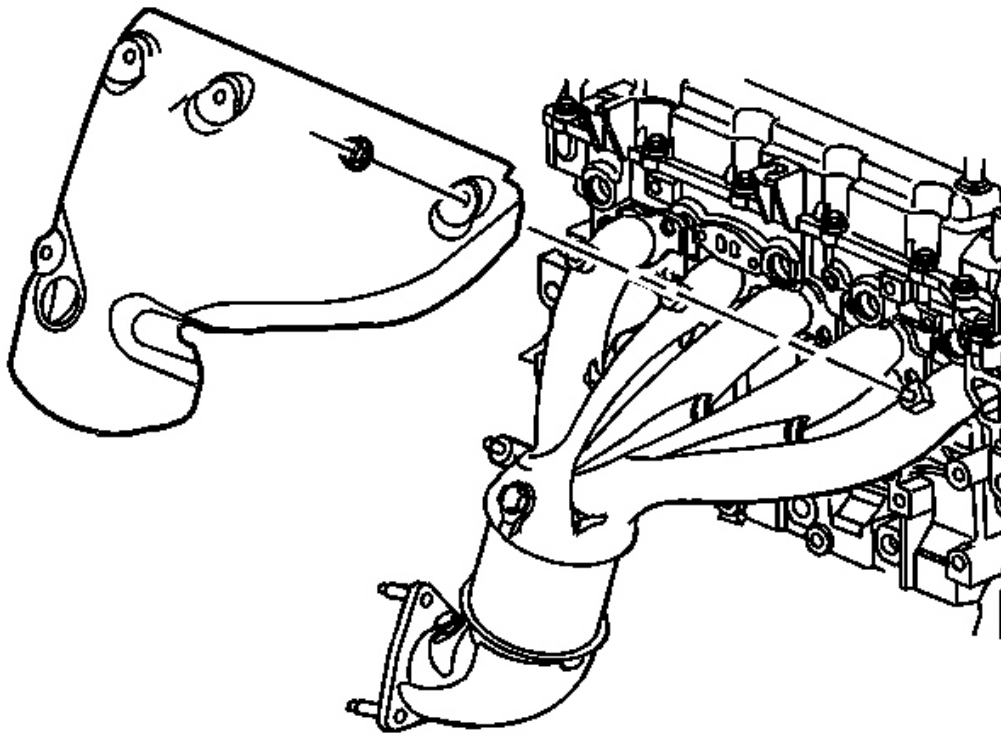


Fig. 35: View Of Exhaust Manifold Heat Shield
Courtesy of GENERAL MOTORS CORP.

5. Remove the nuts securing the heat shield to the exhaust manifold.
6. Remove the exhaust manifold heat shield.

Installation Procedure

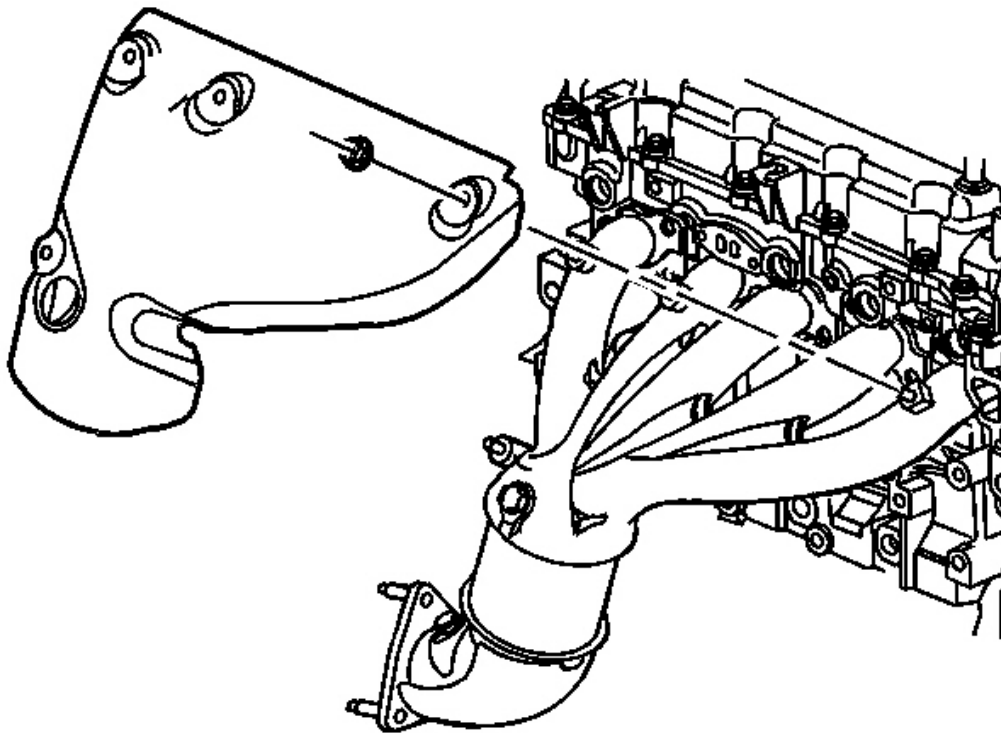


Fig. 36: View Of Exhaust Manifold Heat Shield
Courtesy of GENERAL MOTORS CORP.

1. Install the exhaust manifold heat shield to the exhaust manifold.
2. Apply anti-seize GM P/N 12371386 (Canadian P/N 993128) to the exhaust manifold heat shield nuts.

NOTE: Refer to Fastener Notice .

3. Install the exhaust manifold heat shield nuts.

Tighten: Tighten the nuts to 10 N.m (89 lb in).

4. Install the HO2S to the exhaust manifold. Refer to Heated Oxygen Sensor 1 Replacement .

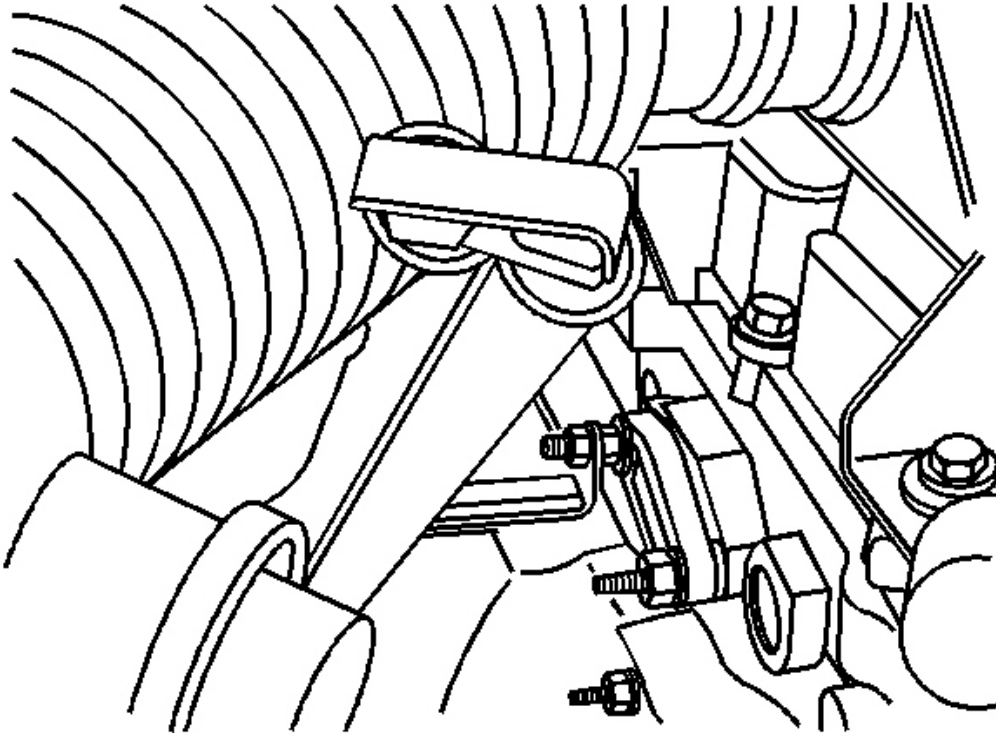


Fig. 37: View Of Transmission Filler Tube & Bracket
Courtesy of GENERAL MOTORS CORP.

5. Position the automatic transmission filler tube to the AIR adapter if previously removed.
6. Install the automatic transmission filler tube bracket nut.

Tighten: Tighten the nut to 12.5 N.m (111 lb in).

7. Install the air cleaner assembly. Refer to [Air Cleaner Assembly Replacement](#) .
8. Install the air cleaner outlet duct. Refer to [Air Cleaner Outlet Duct Replacement](#) .

EXHAUST PIPE HEAT SHIELD REPLACEMENT

Removal Procedure

CAUTION: Refer to [Exhaust Service Caution](#) .

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CAUTION: Refer to Protective Goggles and Glove Caution .

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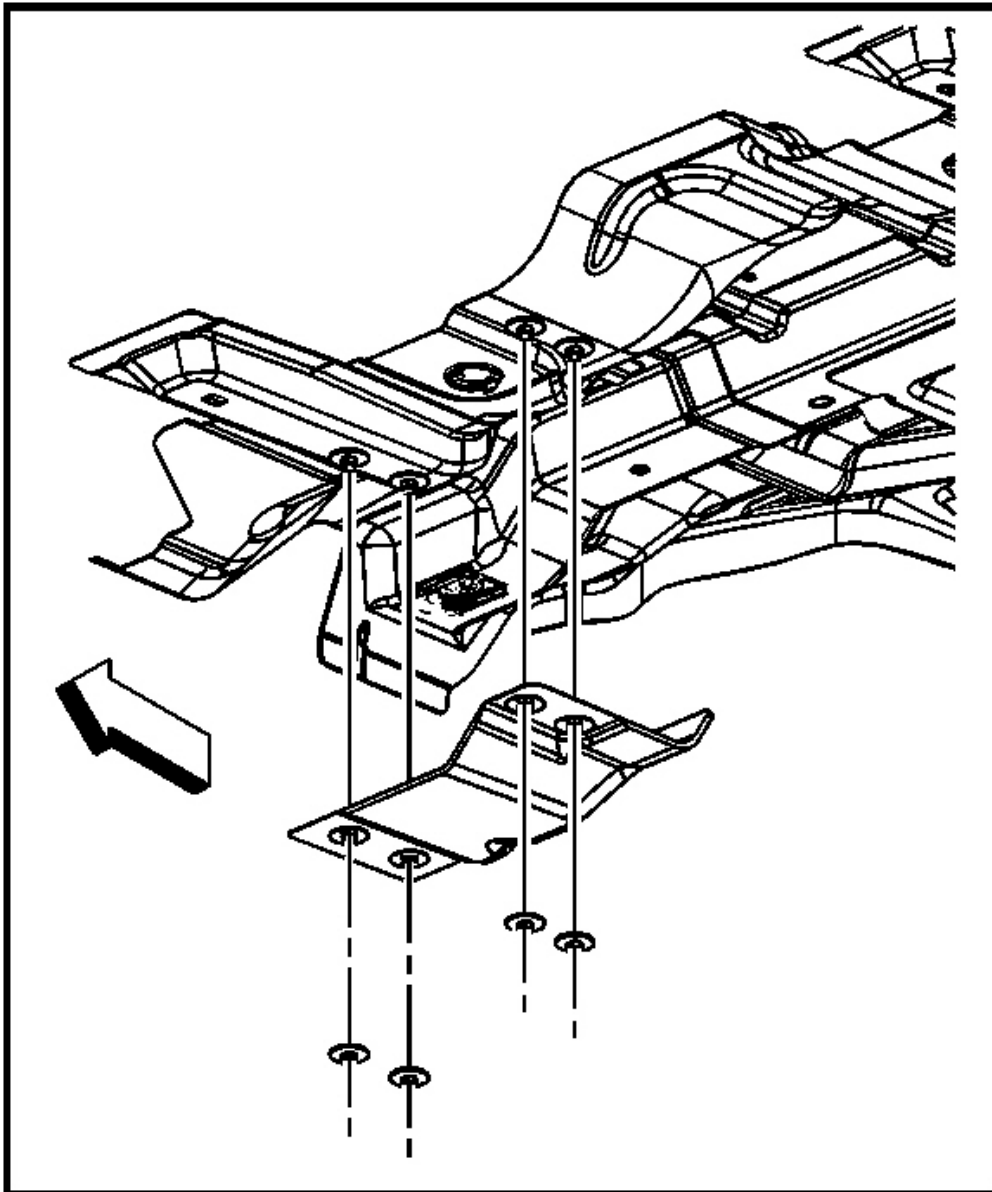
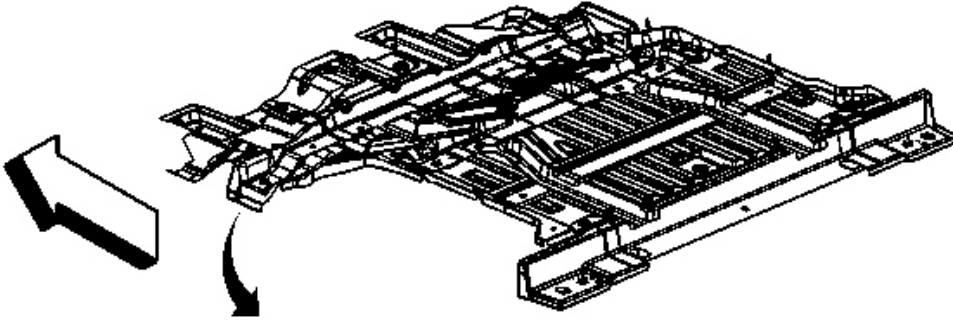


Fig. 38: View Of Exhaust Pipe Heat Shield At Floor Panel
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle .
2. Remove the nuts securing the heat shield to the floor panel.
3. Remove the exhaust pipe heat shield.

Installation Procedure

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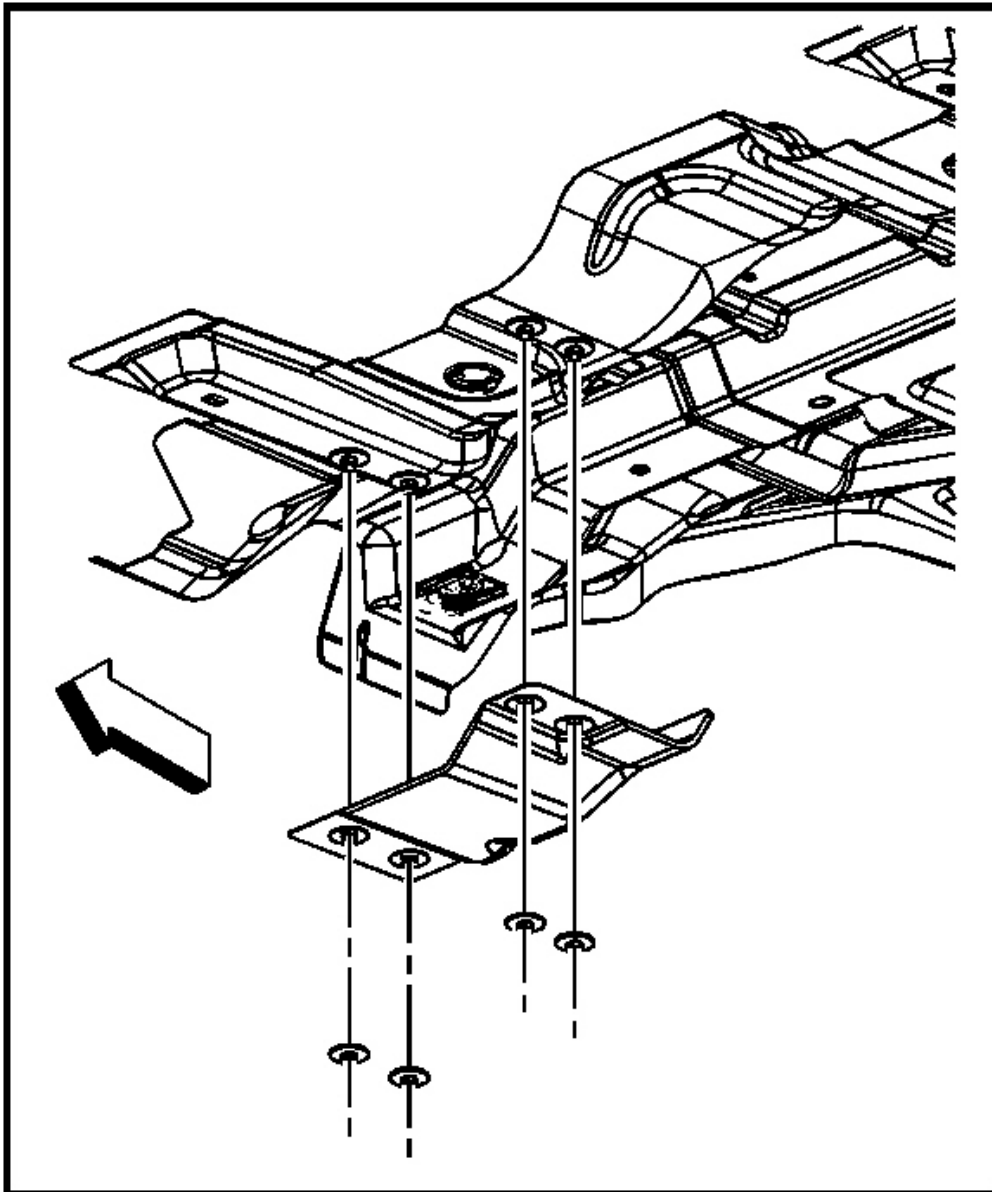
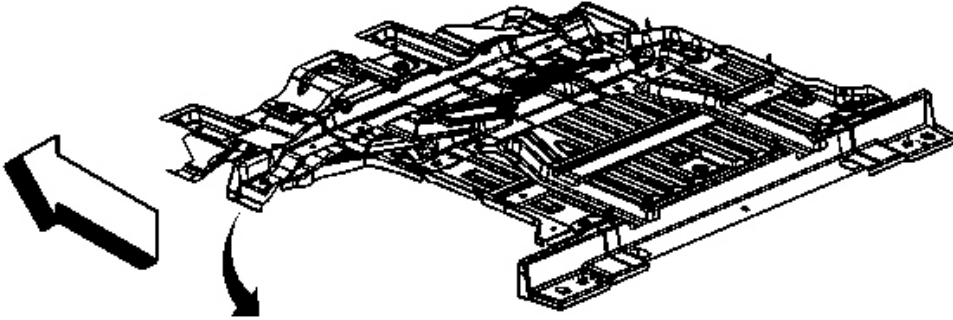


Fig. 39: View Of Exhaust Pipe Heat Shield At Floor Panel
Courtesy of GENERAL MOTORS CORP.

1. Position the exhaust pipe heat shield to the floor panel studs.

NOTE: Refer to Fastener Notice .

2. Install the nuts securing the heat shield to the floor panel.

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

3. Lower the vehicle.

DESCRIPTION AND 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

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- 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, 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 (NO_x) 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 AND EQUIPMENT

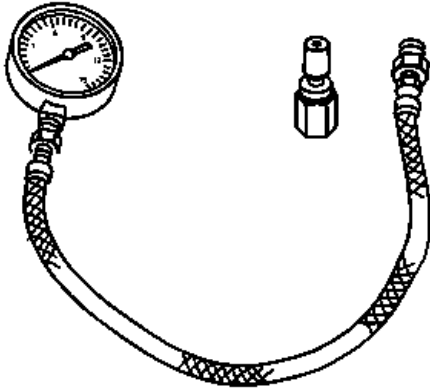
SPECIAL TOOLS

Special Tools

Illustration	Tool Number/Description

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J 35314-A
Exhaust Back Pressure Gage