2007 ENGINE

Engine Exhaust - Avalanche, Escalade, Suburban, Tahoe & Yukon

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Catalytic Converter to Exhaust Manifold Nut	50 N.m	37 lb ft
Engine Shield Bolt	20 N.m	15 lb ft
Exhaust Heat Shield Nut	9 N.m	80 lb in
Exhaust Manifold Bolt		
• First Pass in Sequence	15 N.m	11 lb ft
• Final Pass in Sequence	20 N.m	15 lb ft
Exhaust Muffler to Right Catalytic Converter Nut	45 N.m	33 lb ft
Exhaust Pipe Clamp at Left Catalytic Converter	44 N.m	32 lb ft
Exhaust Pipe Hanger Bracket Bolt	25 N.m	18 lb ft
Heated Oxygen Sensor (HO2S)	42 N.m	31 lb ft
Muffler to Catalytic Converter Nut	45 N.m	33 lb ft
Stabilizer Shaft Link to Frame Bolt/Nut	65 N.m	48 lb ft
Oil Pan Skid Plate Bolt	28 N.m	21 lb ft
Rear Axle Tie Rod Bolt/Nut (Left Side)	105 N.m	77 lb ft
Rear Shock Absorber Lower Bolt/Nut	95 N.m	70 lb ft

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

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Strategy Based Diagnosis .

Visual/Physical Inspection

- Inspect for aftermarket or non-OEM devices such as, but not limited too; 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**.
- 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

Test Description

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

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

3: 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 heater oxygen sensor (HO2S) may set a diagnostic trouble code (DTC). When finishing this diagnostic table, be sure to clear all codes.

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

7: Confirming that the condition has been fixed is essential. If the symptom still exists and the vehicle has

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a dual exhaust system, proceed to Step 2 and repeat the 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	1. Remove the heated oxygen sensor (HO2S) that is in front of and closest to the catalytic converter. Refer to **Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 (2500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series)** . 2. Install the **J 35314-A** Exhaust Back Pressure Gage in place of the HO2S sensor. See **Special Tools**. 3. Start the engine. 4. Increase and monitor the engine speed at 2,000 RPM. 5. Observe the exhaust system back pressure reading on the gage. Does the reading exceed the specified value?	3.4 kPa (0.5 psi)	Go to **Step 4**	Go to **Step 7**
	1. Turn the engine OFF and place the ignition in the lock position. 2. Remove the **J 35314-A** . See **Special Tools**. 3. Re-install the HO2S sensor. Refer to **Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 1 Sensor 1 (2500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series)** .			

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4	4. Remove the post-catalyst HO2S sensor. Refer to **Heated Oxygen Sensor Replacement - Bank 1 Sensor 2 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 1 Sensor 2 (2500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 (2500 Series)** . 5. Install the **J 35314-A** in place of the post HO2S sensor. See **Special Tools**. 6. Start the engine. 7. Increase and monitor the engine speed at 2,000 RPM. 8. Observe the exhaust system back pressure reading on the gage. Does the reading exceed the specified value?	3.4 kPa (0.5 psi)	Go to **Step 5**	Go to **Step 6**
5	Inspect the exhaust system for the following conditions: • Damage in the exhaust pipe • Debris in the exhaust pipe • Muffler internal failure • Two-layer exhaust pipe separation Did you find and correct the condition?	-	Go to **Step 7**	-
6	Replace the catalytic converter. Refer to **Catalytic Converter Replacement (1500 Series)**. Did you find and correct the condition?	-	Go to **Step 7**	-
7	1. Remove the **J 35314-A** . See **Special Tools**. 2. Re-install the HO2S sensor. Refer to **Heated Oxygen Sensor Replacement - Bank 1 Sensor 2 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 1 Sensor 2 (2500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 2 (2500 Series)** .	-		

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	3. Clear any codes. 4. Road test the vehicle in order to verify the repair. Did you correct the condition?		System OK	Go to **Step 2**

EXHAUST LEAKAGE

Exhaust Leakage

Problem	Action
CAUTION: **While engine is operating, the exhaust system will become extremely hot. To prevent burns avoid contacting a hot exhaust system.** 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.	• Align and tighten the components to the specifications. Refer to **Fastener Tightening Specifications**. • Ensure the exhaust hangers are in the proper locations and not loose.
Exhaust leaks at the following connections: • Exhaust manifold to pipe • Flanges • Pipe clamps	Tighten the components to the specifications. Refer to **Fastener Tightening Specifications**.
Seals or gaskets leaking. • Exhaust manifold to cylinder head • Exhaust pipes to exhaust manifold • Catalytic converter connection • EGR connections, if equipped	Replace the leaking seal or gasket. Refer to the affected components procedure for service.
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: • **Exhaust Manifold Replacement - Left Side**

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	• **Exhaust Manifold Replacement - Right Side**.
Exhaust system component connection welds leaking.	Replace the leaking component. Refer to the affected component's procedure for service.
Muffler damaged or leaking at the seams.	Replace the affected muffler. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.

EXHAUST NOISE

Exhaust Noise

Condition	Action
CAUTION: **While engine is operating, the exhaust system will become extremely hot. To prevent burns avoid contacting a hot exhaust system.** 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 **Exhaust Leakage**.
Loud exhaust	1. Compare to a known good vehicle. 2. Inspect for a damaged or failed muffler or resonator. 3. Replace the faulty muffler. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
External rattle or vibration noise	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	1. Test the components by tapping with a rubber mallet to confirm a rattle. 2. Replace the faulty catalytic converter, or muffler. Refer to one of the following procedures: • **Catalytic Converter Replacement (1500 Series)** • **Muffler Replacement (1500 - w/RPO L92)Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76) Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5) Muffler Replacement (2500)**

REPAIR INSTRUCTIONS

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EXHAUST MANIFOLD REPLACEMENT - LEFT SIDE

Removal Procedure

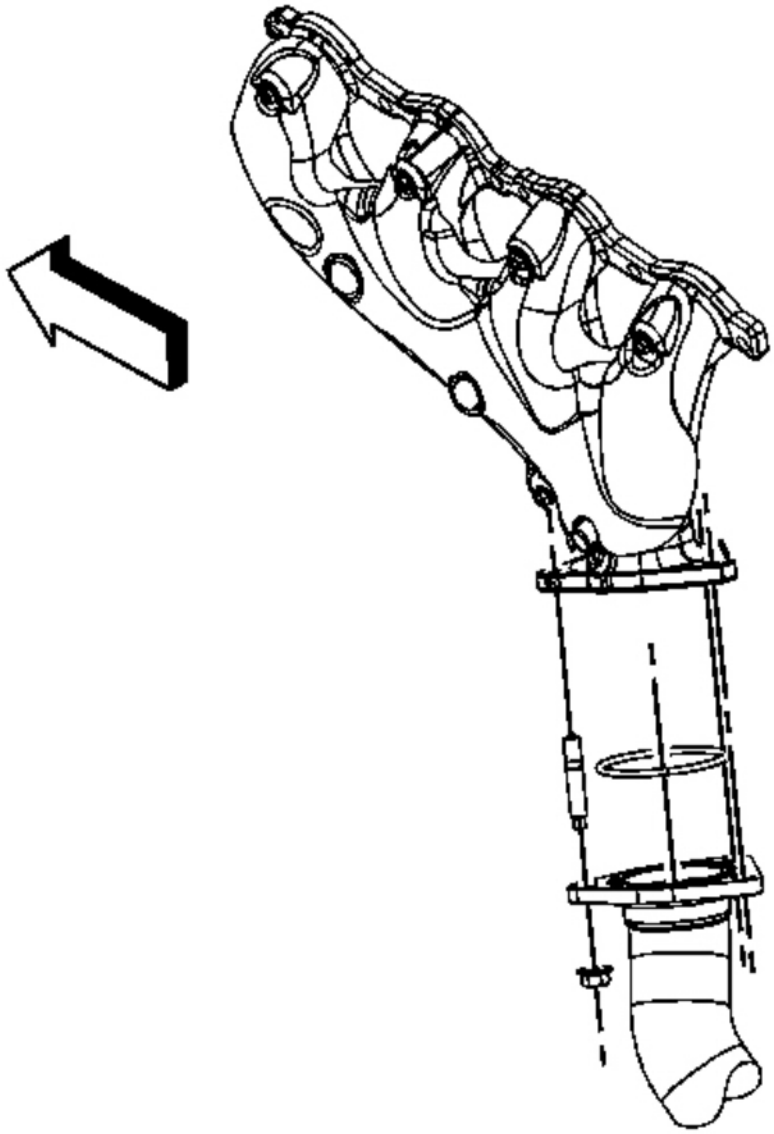


Fig. 1: View Of Exhaust Manifold, Gasket & Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

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1. Remove the ignition coils. Refer to **Ignition Coil Replacement** .
2. Remove the spark plugs. Refer to **Spark Plug Replacement** .
3. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
4. Remove the catalytic converter to exhaust manifold nuts. (1500 series shown, 2500 series similar).
5. Lower the vehicle.

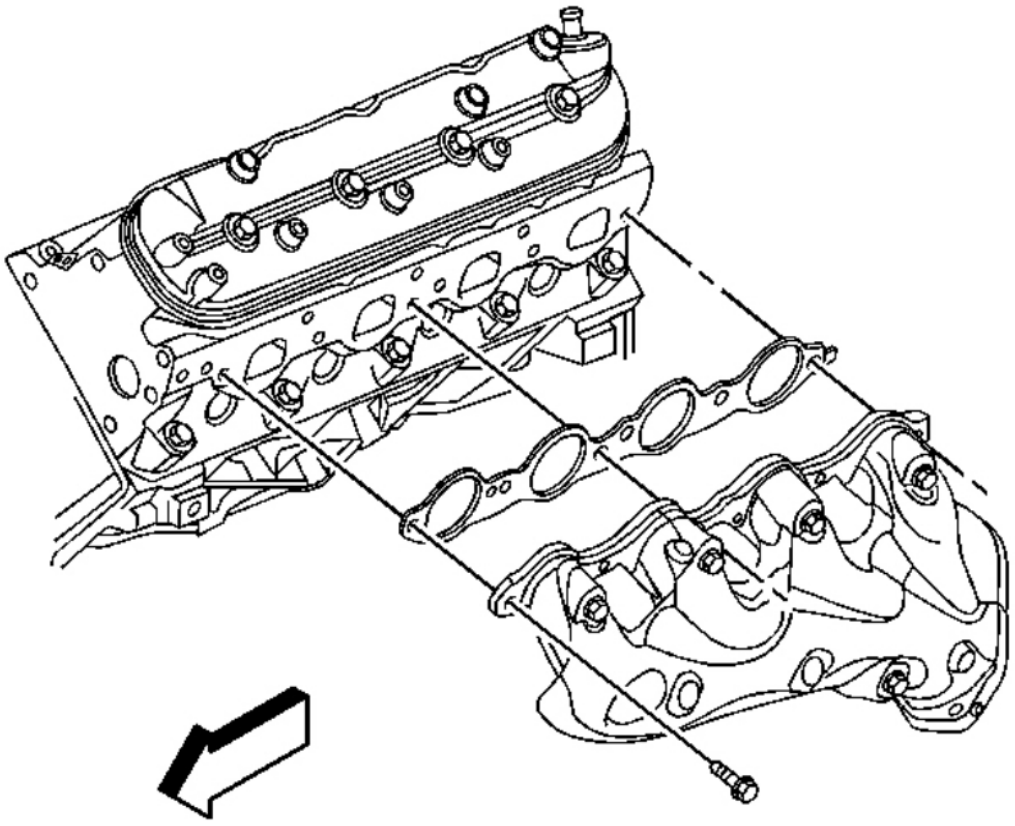


Fig. 2: View Of Exhaust Manifold, Manifold Bolts & Gasket
Courtesy of GENERAL MOTORS CORP.

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

Installation Procedure

IMPORTANT:

- **Tighten the exhaust manifold bolts as specified in the service procedure.**

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Improperly installed and/or leaking exhaust manifold gaskets may affect vehicle emissions and/or On-Board Diagnostic (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.**

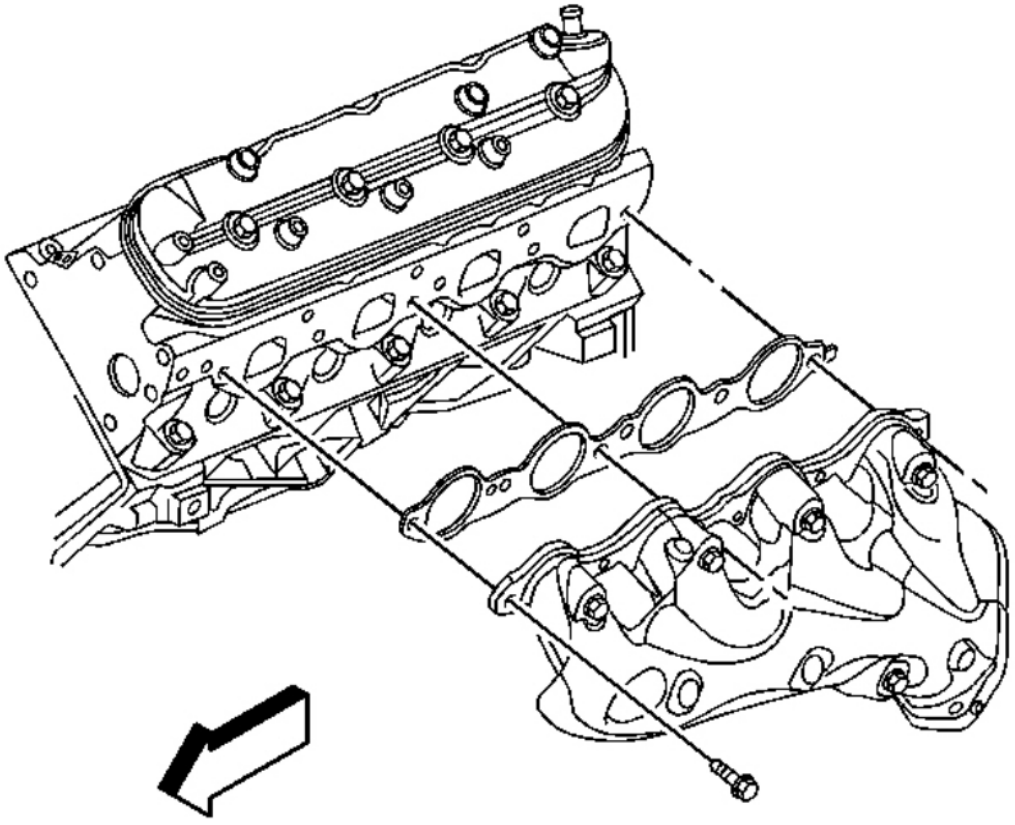


Fig. 3: View Of Exhaust Manifold, Manifold Bolts & Gasket
Courtesy of GENERAL MOTORS CORP.

1. Apply a 5 mm (0.2 in) wide band of threadlock GM P/N 12345493 (Canadian P/N 10953488), or equivalent to the threads of the exhaust manifold bolts.
2. Position the NEW exhaust manifold gasket and exhaust manifold to the cylinder head.

NOTE: **Refer to Fastener Notice .**

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3. Install the exhaust manifold bolts.

   Tighten:

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

4. Using a flat punch, bend the gasket tab at the rear of the gasket around the cylinder head edge.
5. Raise the vehicle.

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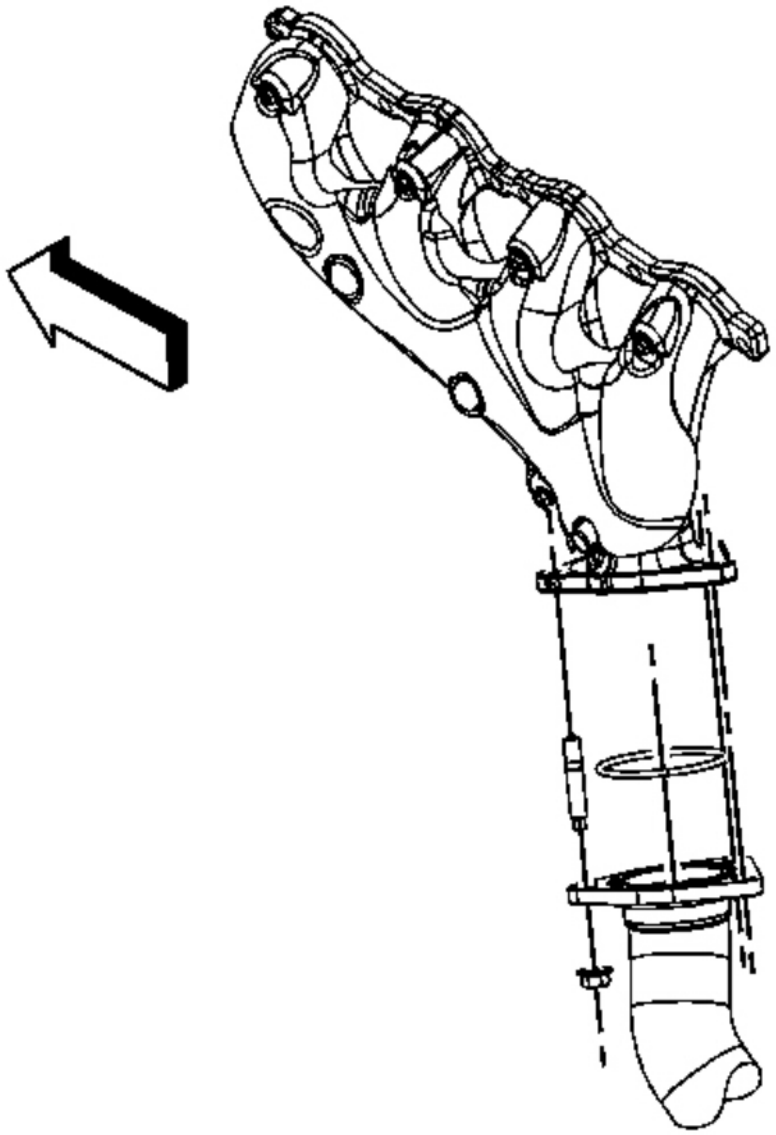


Fig. 4: View Of Exhaust Manifold, Gasket & Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

6. Ensure that the exhaust seal is seated in the catalytic converter.
7. Install the catalytic converter to exhaust manifold nuts. (1500 series shown, 2500 series similar).

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

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8. Lower the vehicle.
9. Install the spark plugs. Refer to **Spark Plug Replacement** .
10. Install the ignition coils. Refer to **Ignition Coil Replacement** .

EXHAUST MANIFOLD REPLACEMENT - RIGHT SIDE

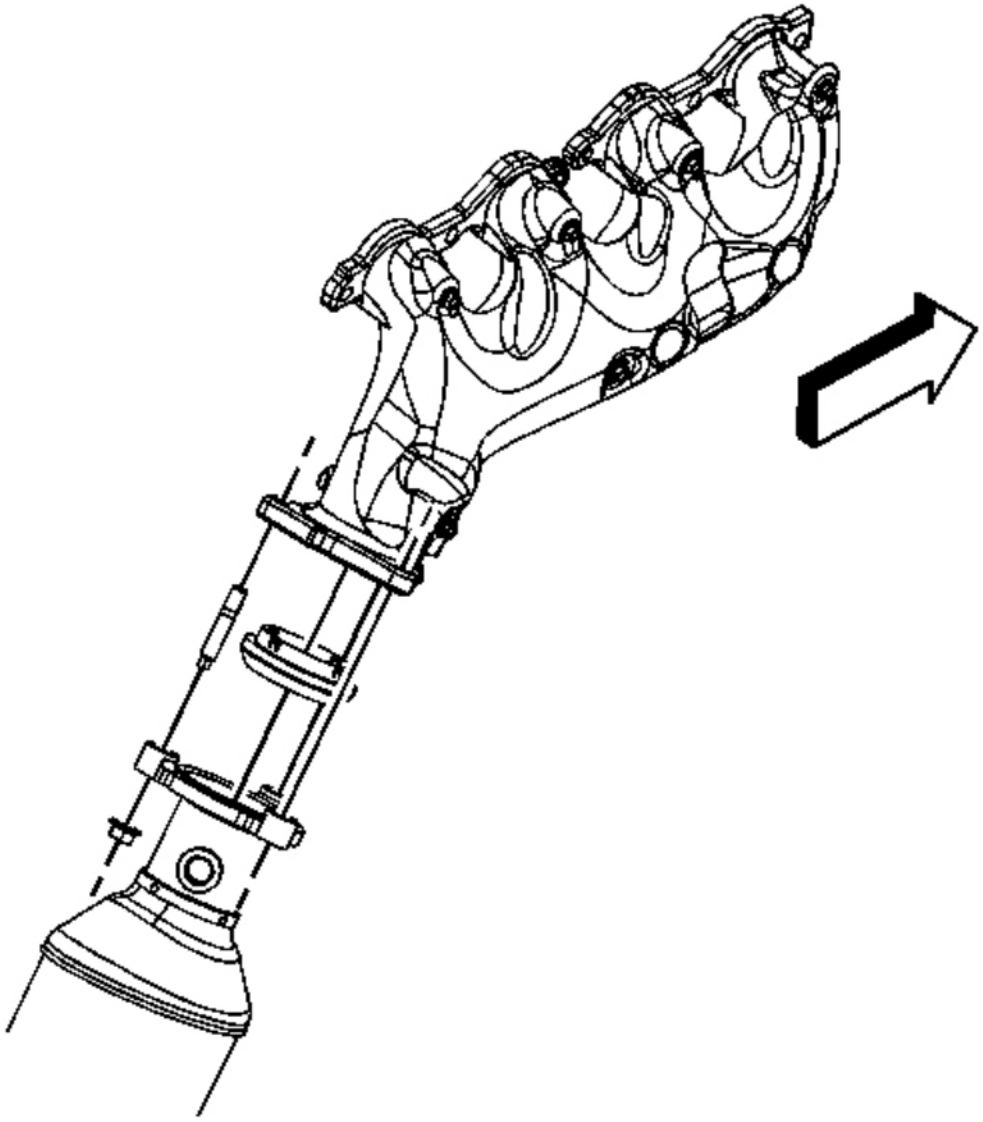


Fig. 5: View Of Exhaust Manifold, Gasket & Catalytic Converter

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Courtesy of GENERAL MOTORS CORP.

1. Drain the cooling system, if equipped with rear air conditioning (A/C). Refer to **Draining and Filling Cooling System** .
2. Remove the ignition coils. Refer to **Ignition Coil Replacement** .
3. Remove the spark plugs. Refer to **Spark Plug Replacement** .
4. Remove the oil level indicator tube. Refer to **Oil Level Indicator and Tube Replacement** .
5. Remove the heated oxygen sensor (HO2S). Refer to **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series)** .
6. Remove the catalytic converter to exhaust manifold nuts. (1500 series shown, 2500 series similar).
7. Lower the vehicle.

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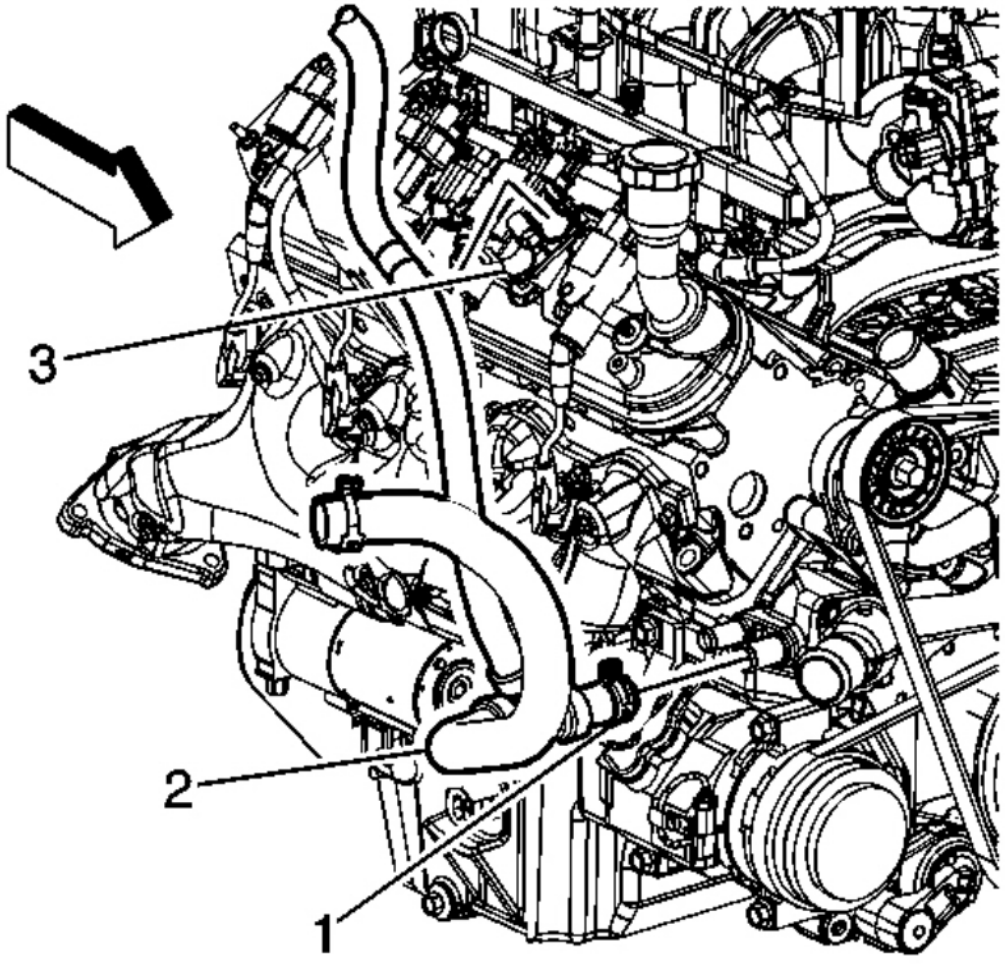


Fig. 6: View Of Radiator Surge Tank Outlet Hose, Clamp & Water Pump
Courtesy of GENERAL MOTORS CORP.

8. If equipped with rear A/C perform the following steps, otherwise proceed to step 15.
9. Reposition the radiator surge tank outlet hose clamp at the water pump (1).
10. Remove the radiator surge tank outlet hose (2) from the water pump.
11. Reposition the outlet hose out of the way.

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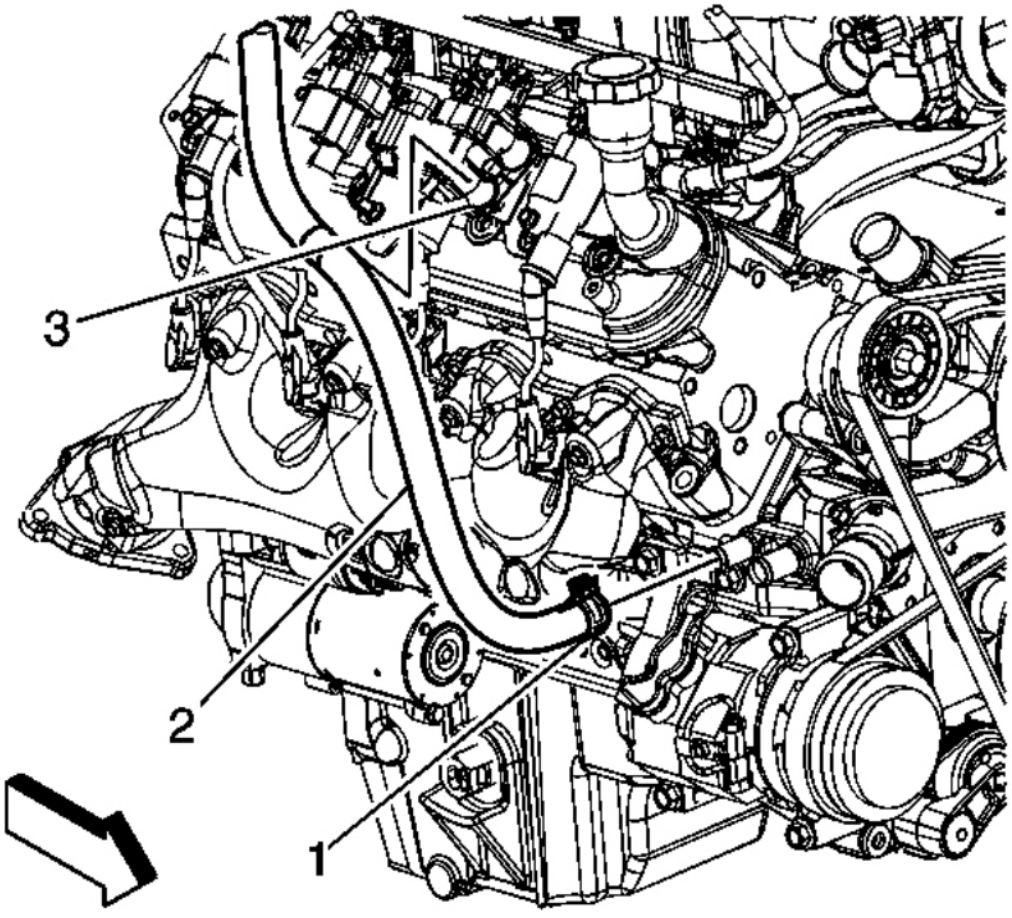


Fig. 7: View Of Heater Inlet Hose, Clamp & Waterpump
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12. Reposition the heater inlet hose clamp (1) at the water pump.
13. Remove the heater inlet hose (2) from the water pump.
14. Reposition the inlet hose out of the way.

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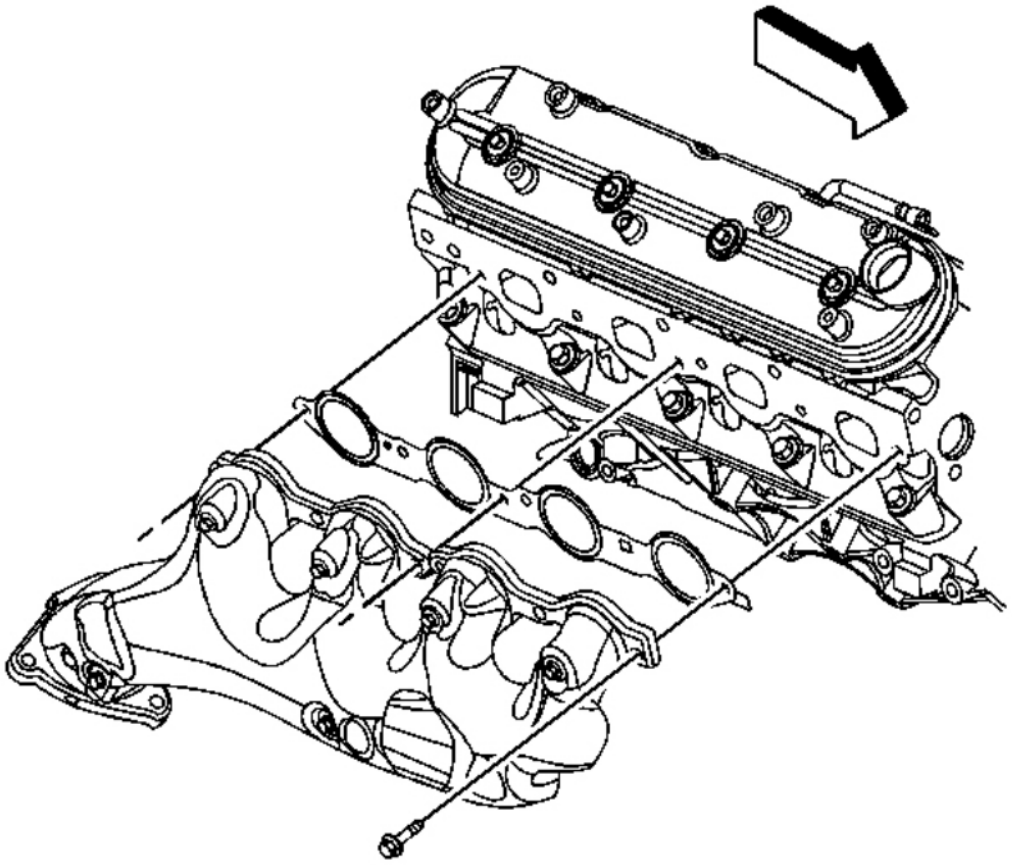


Fig. 8: View Of Exhaust Manifold, Gasket & Bolts
Courtesy of GENERAL MOTORS CORP.

15. Remove the exhaust manifold bolts and exhaust manifold.
16. Remove and discard the exhaust manifold gasket.
17. Remove the exhaust seal from the exhaust manifold.

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.**

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

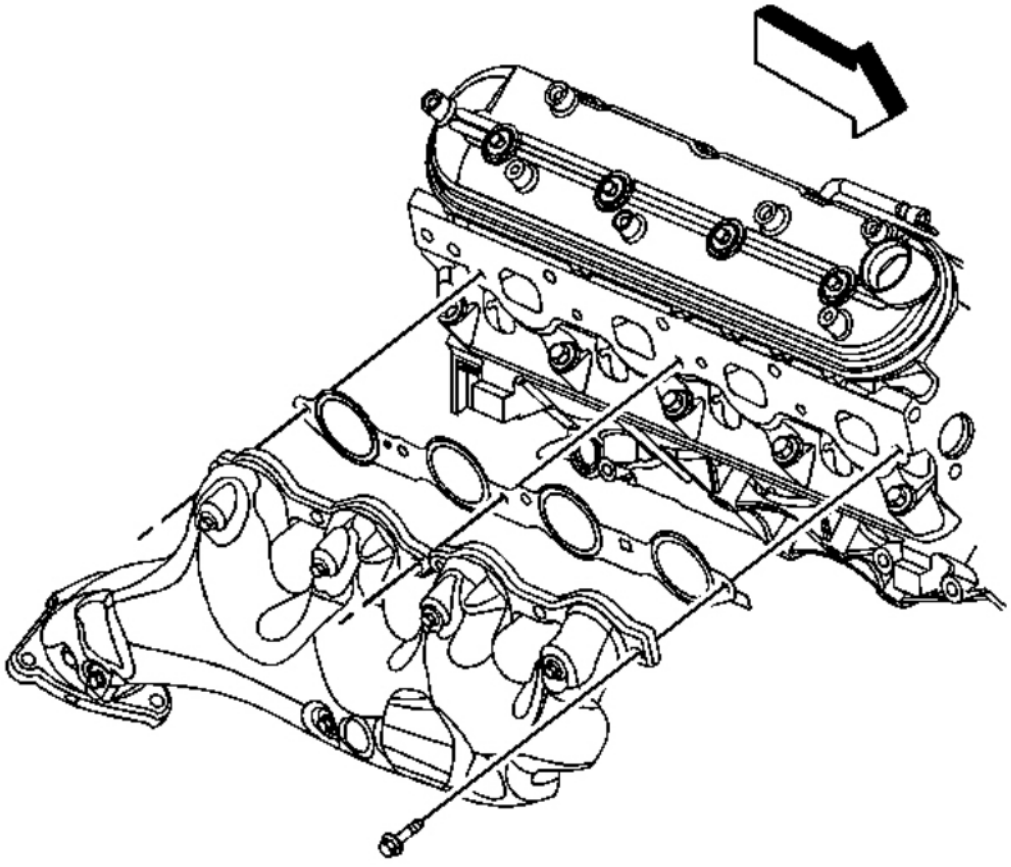


Fig. 9: View Of Exhaust Manifold, Gasket & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Install the exhaust seal to the exhaust manifold.
2. Apply a 5 mm (0.2 in) wide band of threadlock GM P/N 12345493 (Canadian P/N 10953488), or equivalent to the threads of the exhaust manifold bolts.
3. Position the NEW exhaust manifold gasket and exhaust manifold to the cylinder head.

NOTE: **Refer to Fastener Notice .**

4. Install the exhaust manifold bolts.

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Tighten:

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

5. Using a flat punch, bend the gasket tab at the rear of the gasket around the cylinder head edge.

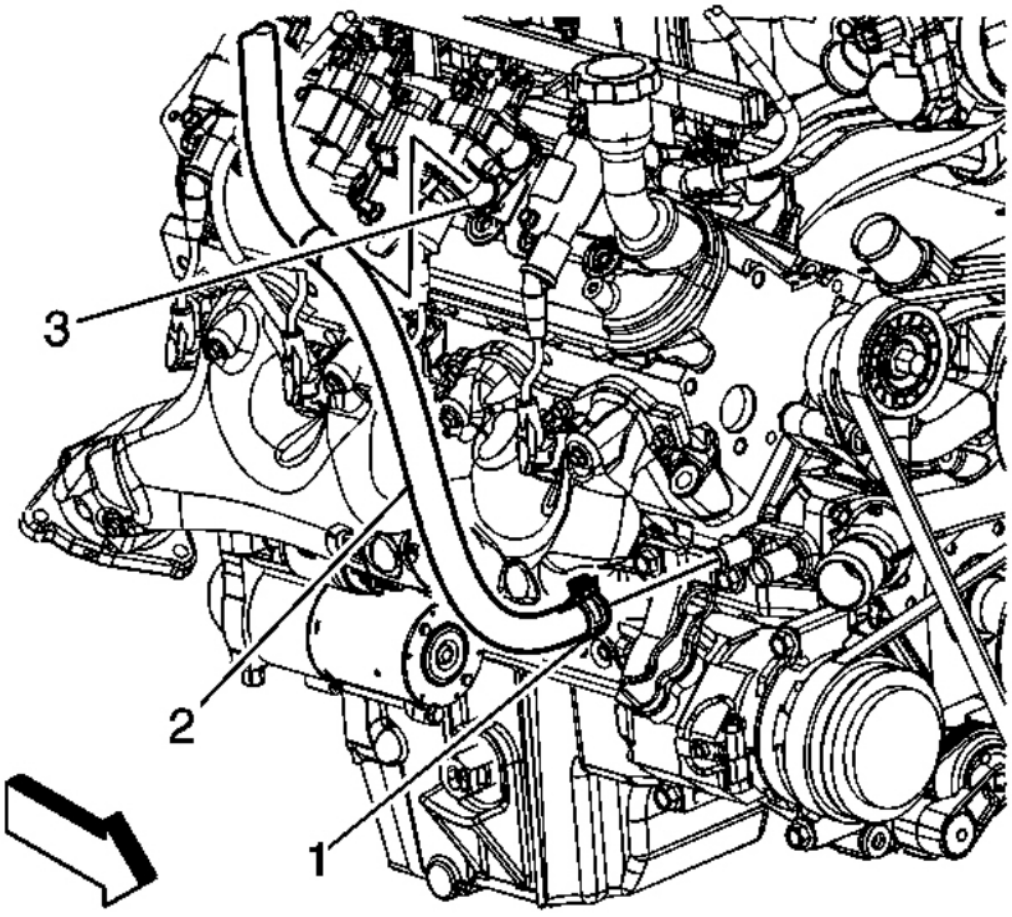


Fig. 10: View Of Heater Inlet Hose, Clamp & Waterpump
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6. If equipped with rear A/C perform the following steps, otherwise proceed to step 15.
7. Position the inlet hose.

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8. Install the heater inlet hose (2) to the water pump.
9. Position the heater inlet hose clamp (1) at the water pump.

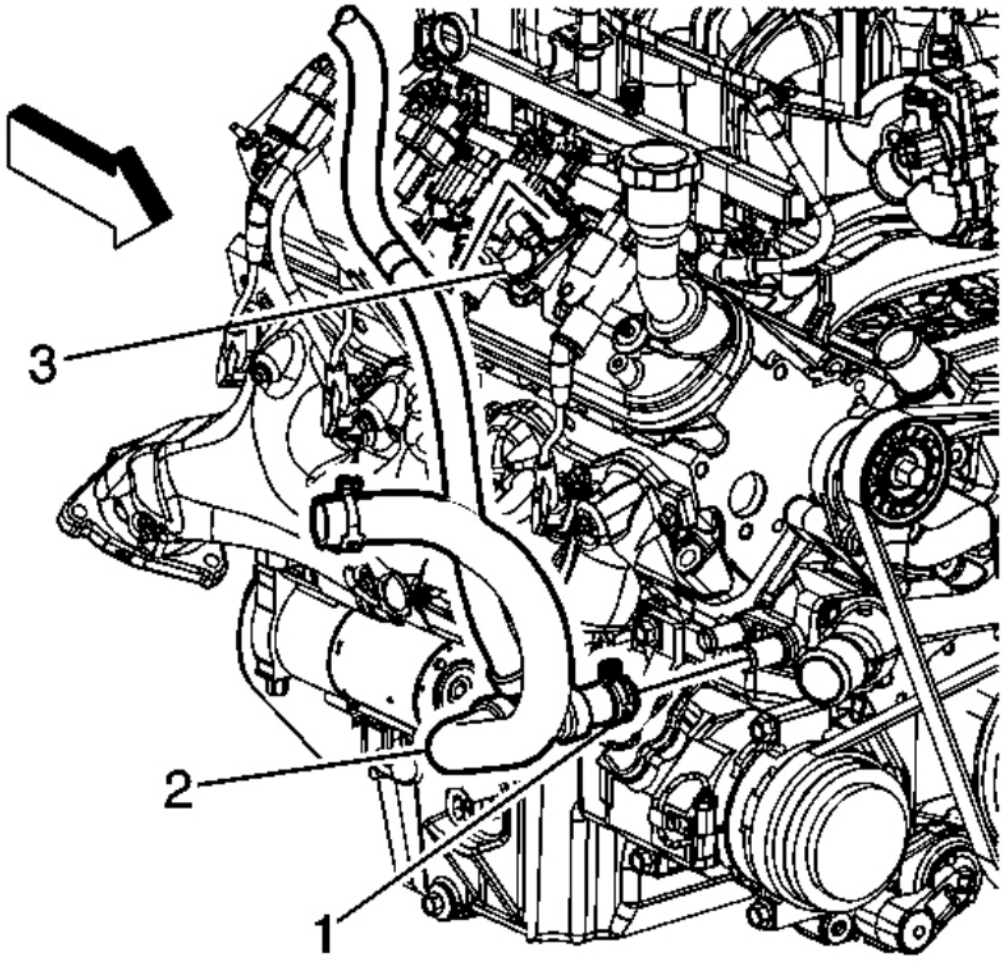


Fig. 11: View Of Radiator Surge Tank Outlet Hose, Clamp & Water Pump
Courtesy of GENERAL MOTORS CORP.

10. Position the outlet hose.
11. Install the radiator surge tank outlet hose (2) to the water pump.
12. Position the radiator surge tank outlet hose clamp at the water pump (1).
13. Raise and support the vehicle.

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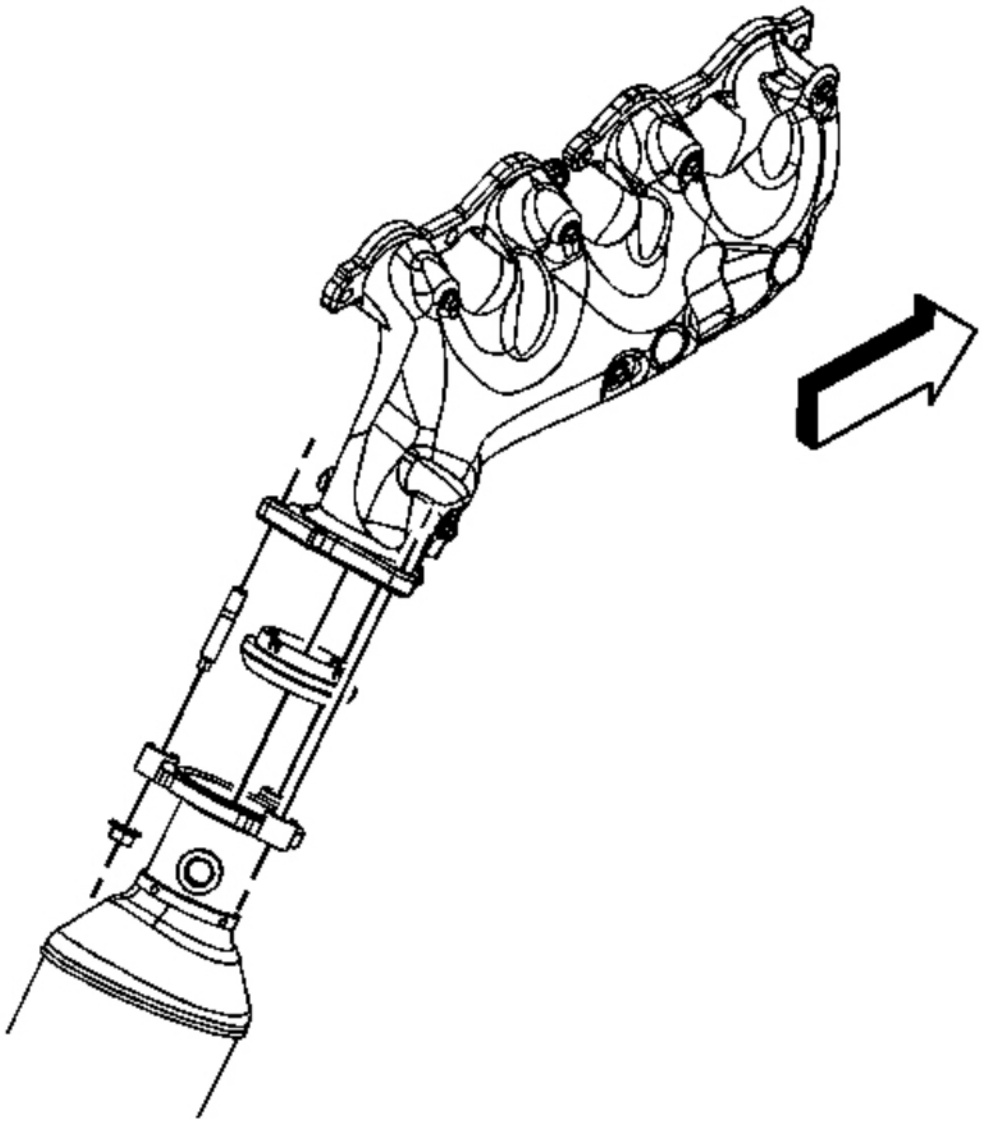


Fig. 12: View Of Exhaust Manifold, Gasket & Catalytic Converter
Courtesy of GENERAL MOTORS CORP.

14. Install the catalytic converter to exhaust manifold nuts. (1500 series shown, 2500 series similar).

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

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15. Install the HO2S. Refer to **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series)** .
16. Lower the vehicle.
17. Install the oil level indicator tube. Refer to **Oil Level Indicator and Tube Replacement** .
18. Install the spark plugs. Refer to **Spark Plug Replacement** .
19. Install the ignition coils. Refer to **Ignition Coil Replacement** .
20. Fill the cooling system. Refer to **Draining and Filling Cooling System** .

EXHAUST SEAL REPLACEMENT (1500 SERIES)

Removal Procedure

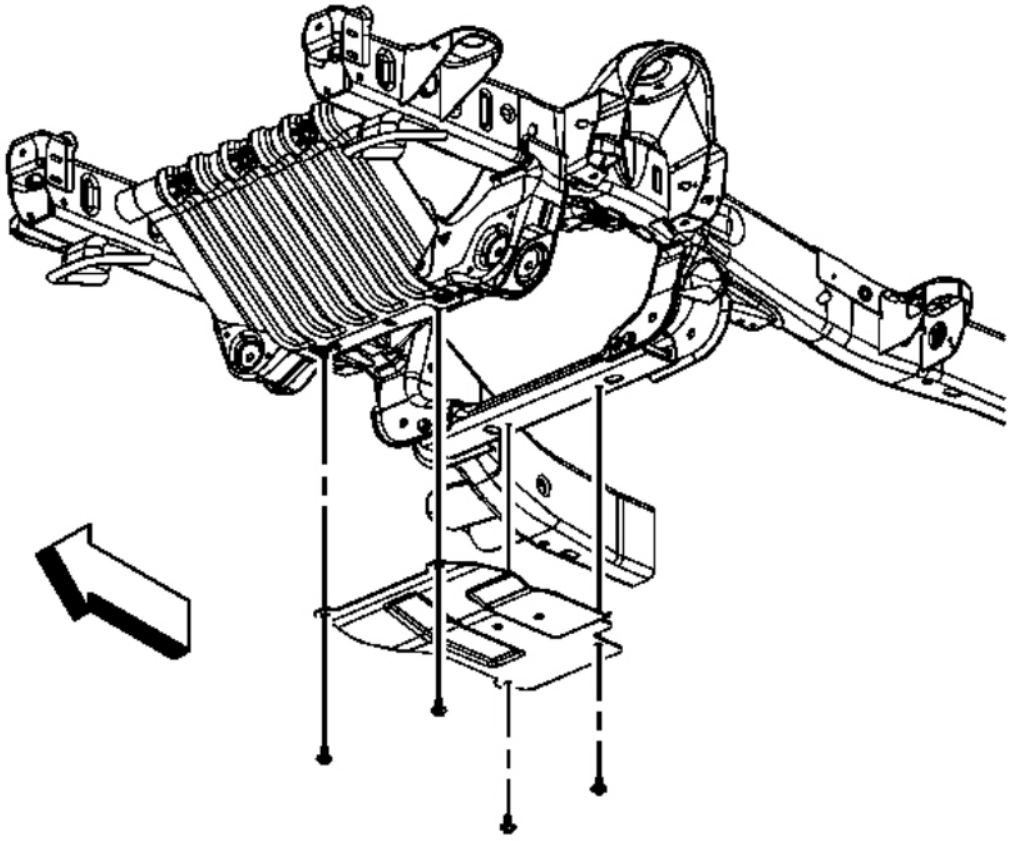


Fig. 13: View Of Oil Pan Skid Plate & Bolts
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1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the oil pan skid plate bolts and skid plate, if equipped.

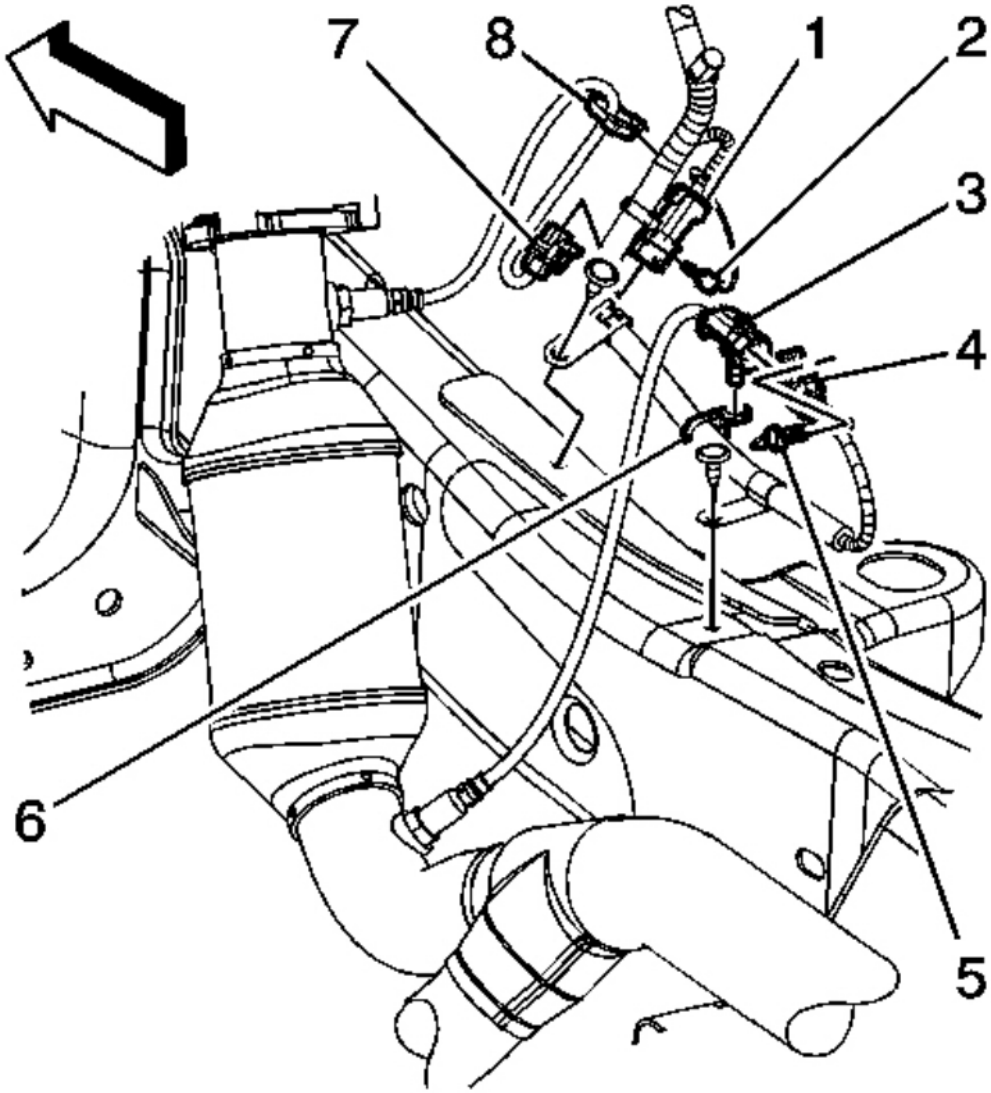


Fig. 14: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clips
Courtesy of GENERAL MOTORS CORP.

3. Remove the right front connector position assurance (CPA) retainer (2).

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4. Disconnect the right front heated oxygen sensor (HO2S) electrical connector from the engine wiring harness electrical connector (1).
5. Remove the right rear CPA retainer (4).
6. Disconnect the engine wiring harness electrical connector (3) from the right rear HO2S electrical connector.
7. Remove the right rear HO2S electrical connector clip from the engine harness clip (5).

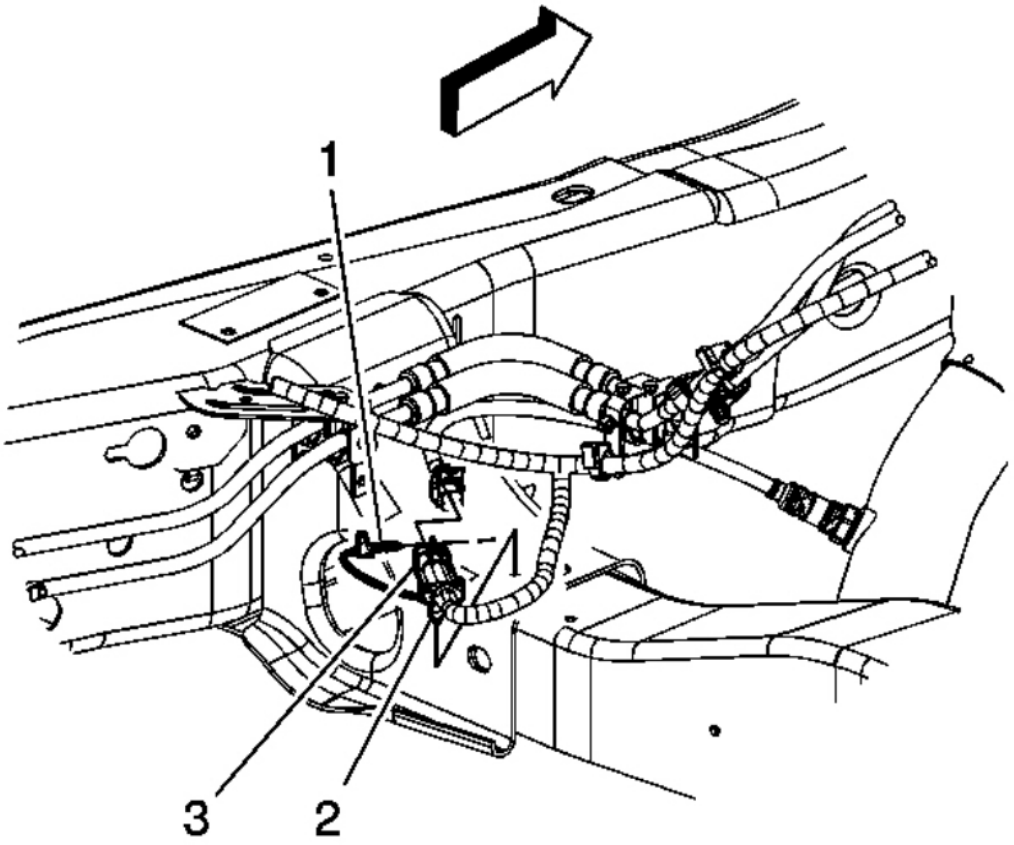


Fig. 15: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
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8. Remove the left rear CPA retainer (1).
9. Disconnect the left rear HO2S electrical connector from the engine wiring harness electrical connector (3).

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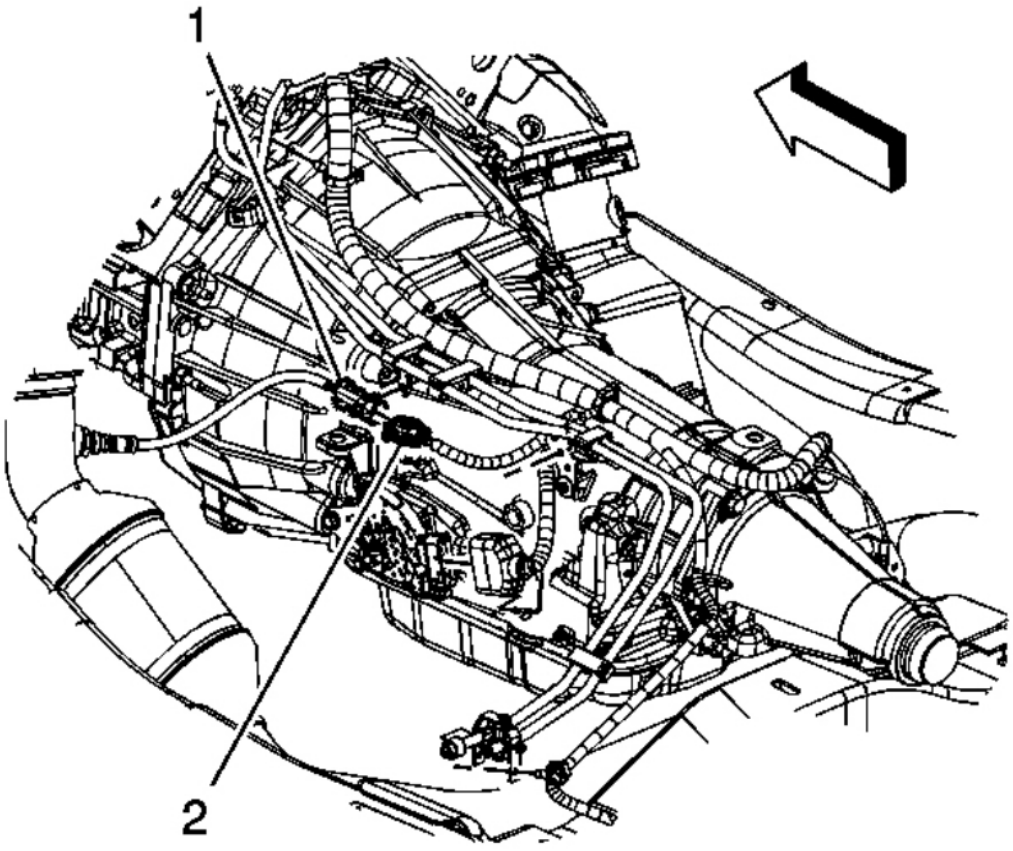


Fig. 16: View Of Left Front HO2S Electrical Connector Clip & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

10. For vehicles equipped with a 4L60-E/4L70-E automatic transmission perform the following steps, for vehicles equipped with a 6L80-E automatic transmission proceed to step 14.
11. Remove the left front CPA retainer.
12. Disconnect the engine wiring harness electrical connector (2) from the left front HO2S.
13. Remove the left front HO2S electrical connector clip (1) from the fuel line clip.

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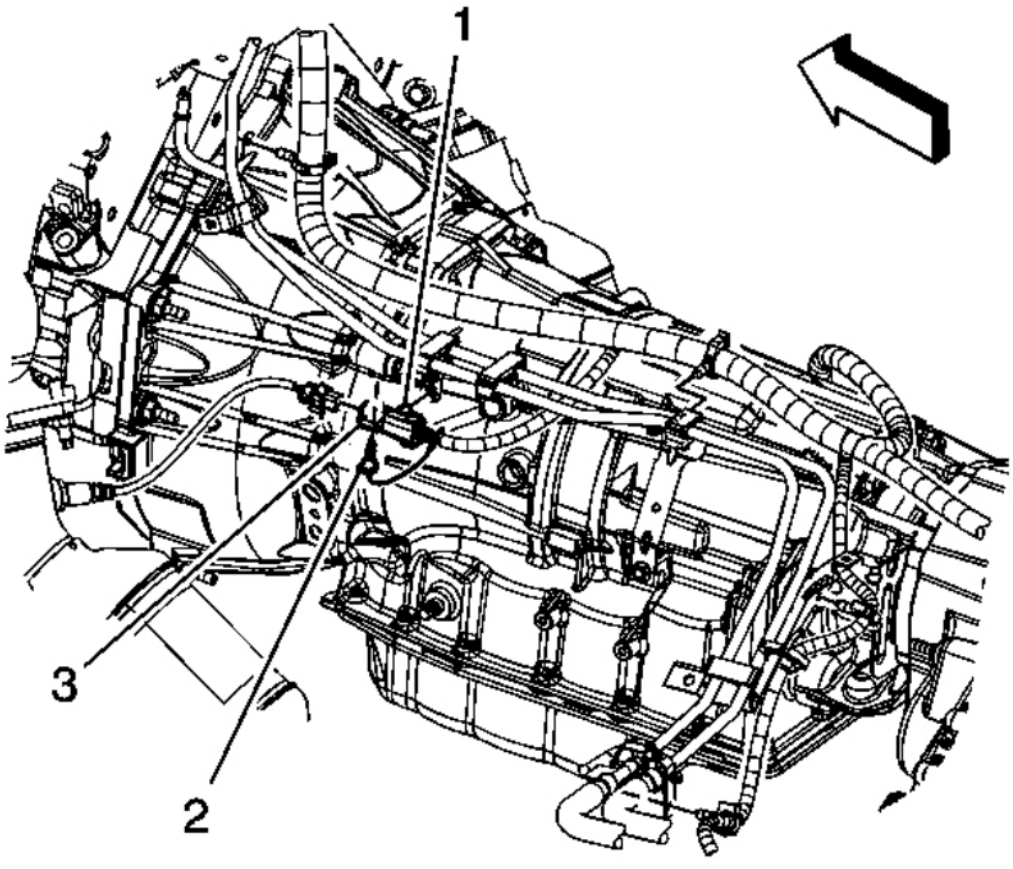


Fig. 17: View Of Engine Wiring Harness Electrical Connector Clip & Electrical Connector
Courtesy of GENERAL MOTORS CORP.

14. Remove the left front CPA retainer (2).
15. Remove the engine wiring harness electrical connector clip (1) from the fuel line clip.
16. Disconnect the engine wiring harness electrical connector (3) from the left front HO2S.
17. Support the catalytic converter assembly with a suitable adjustable jack.
18. Remove the HO2S. Refer to **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series)** .

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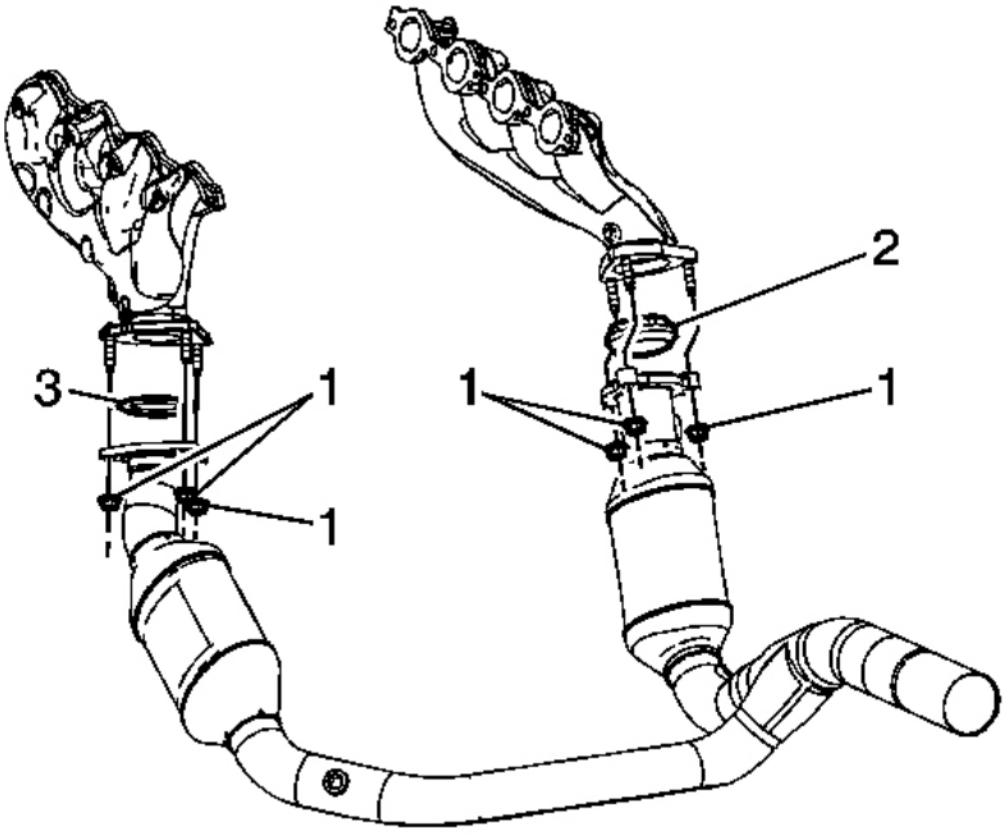


Fig. 18: View Of Catalytic Converter To Exhaust Manifold Nuts & Exhaust Seals
Courtesy of GENERAL MOTORS CORP.

19. Remove the catalytic converter to exhaust manifold nuts (1).
20. Separate the catalytic converter assembly from the exhaust manifolds.
21. Lower the catalytic converter assembly using the adjustable jack.
22. Remove the exhaust seal (2 or 3) as required.

Installation Procedure

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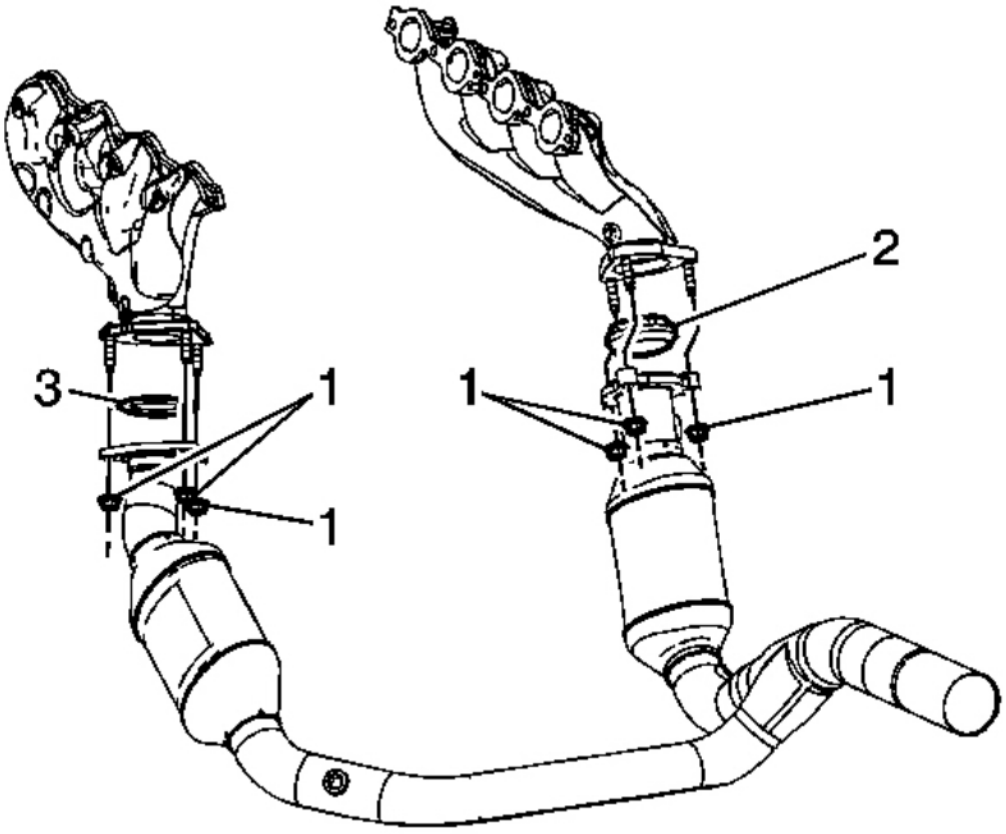


Fig. 19: View Of Catalytic Converter To Exhaust Manifold Nuts & Exhaust Seals
Courtesy of GENERAL MOTORS CORP.

1. Install the NEW exhaust seal (2 or 3) as required.
2. Raise the catalytic converter assembly into place using the adjustable jack.
3. Install the catalytic converter assembly to the exhaust manifolds.

NOTE: **Refer to Fastener Notice .**

4. Install the catalytic converter to exhaust manifold nuts (1).

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

5. Remove the adjustable jack from the catalytic converter assembly.
6. Install the HO2S. Refer to **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or

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Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series) .

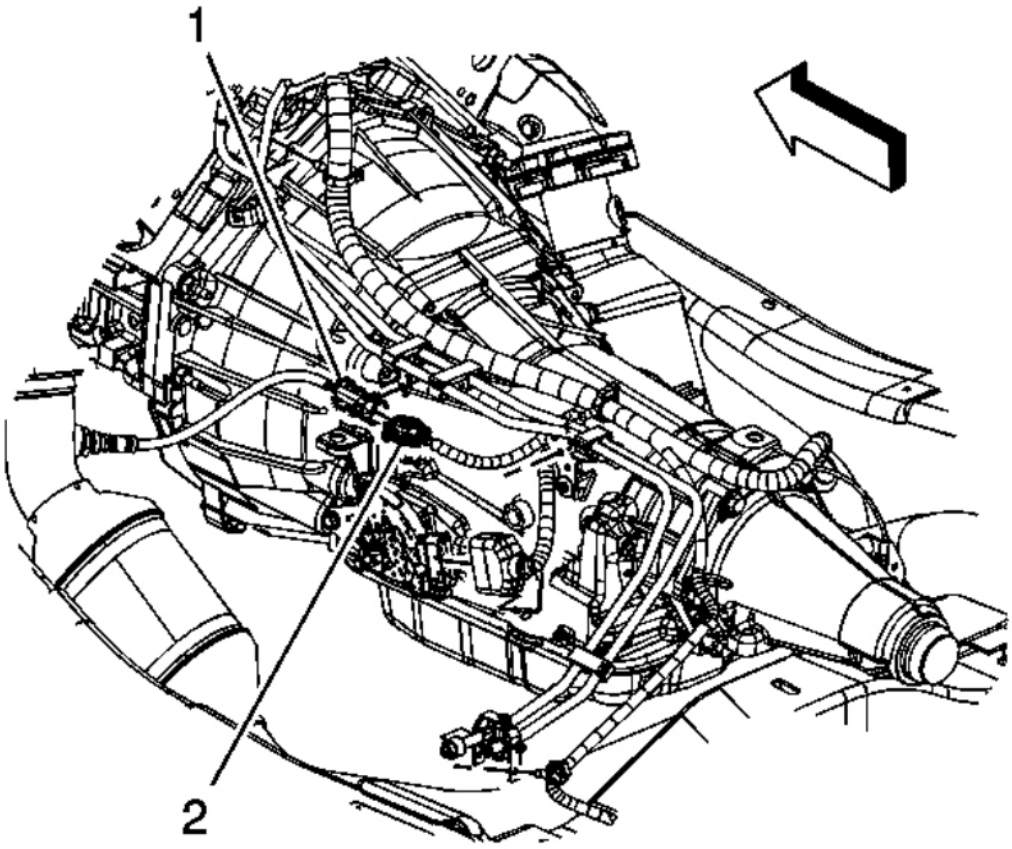


Fig. 20: View Of Left Front HO2S Electrical Connector Clip & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

7. For vehicles equipped with a 4L60-E/4L70-E automatic transmission perform the following steps, for vehicles equipped with a 6L80-E automatic transmission proceed to step 10.
8. Install the HO2S electrical connector clip (1) to the fuel line clip.
9. Connect the engine wiring harness electrical connector (2) to the HO2S.
10. Install the CPA retainer.

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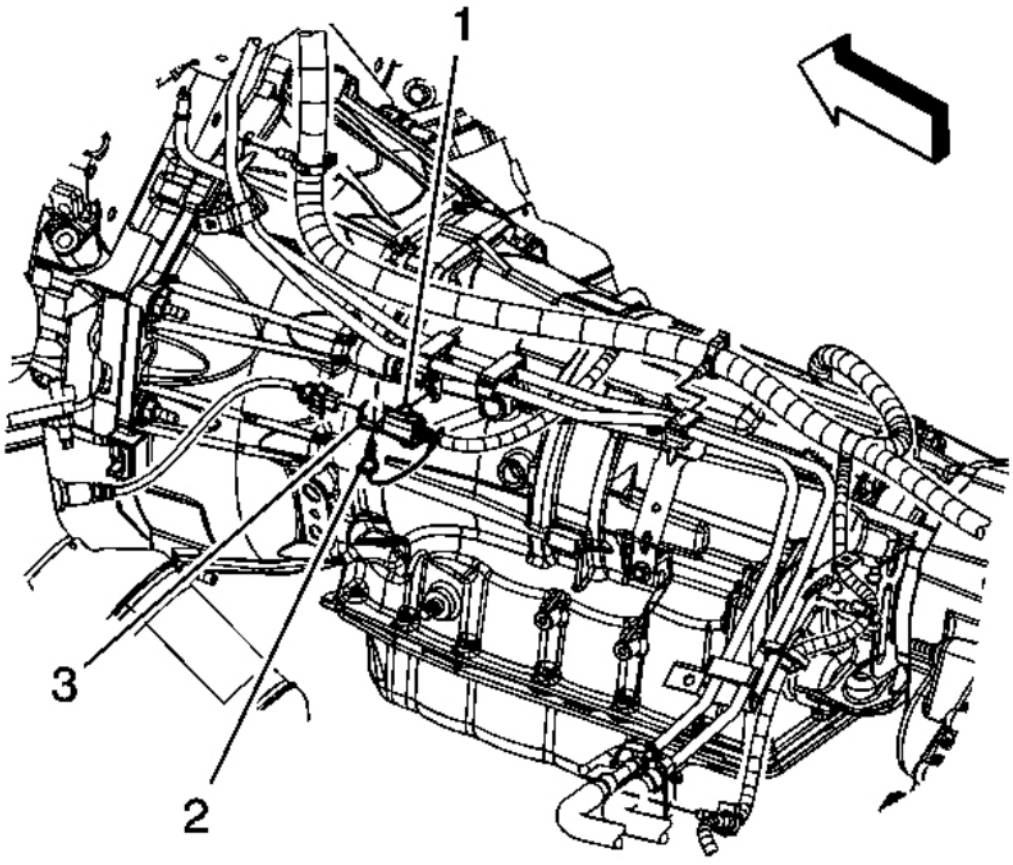


Fig. 21: View Of Engine Wiring Harness Electrical Connector Clip & Electrical Connector
Courtesy of GENERAL MOTORS CORP.

11. Connect the engine wiring harness electrical connector (3) to the HO2S.
12. Install the engine wiring harness electrical connector clip (1) to the fuel line clip.
13. Install the CPA retainer (2).

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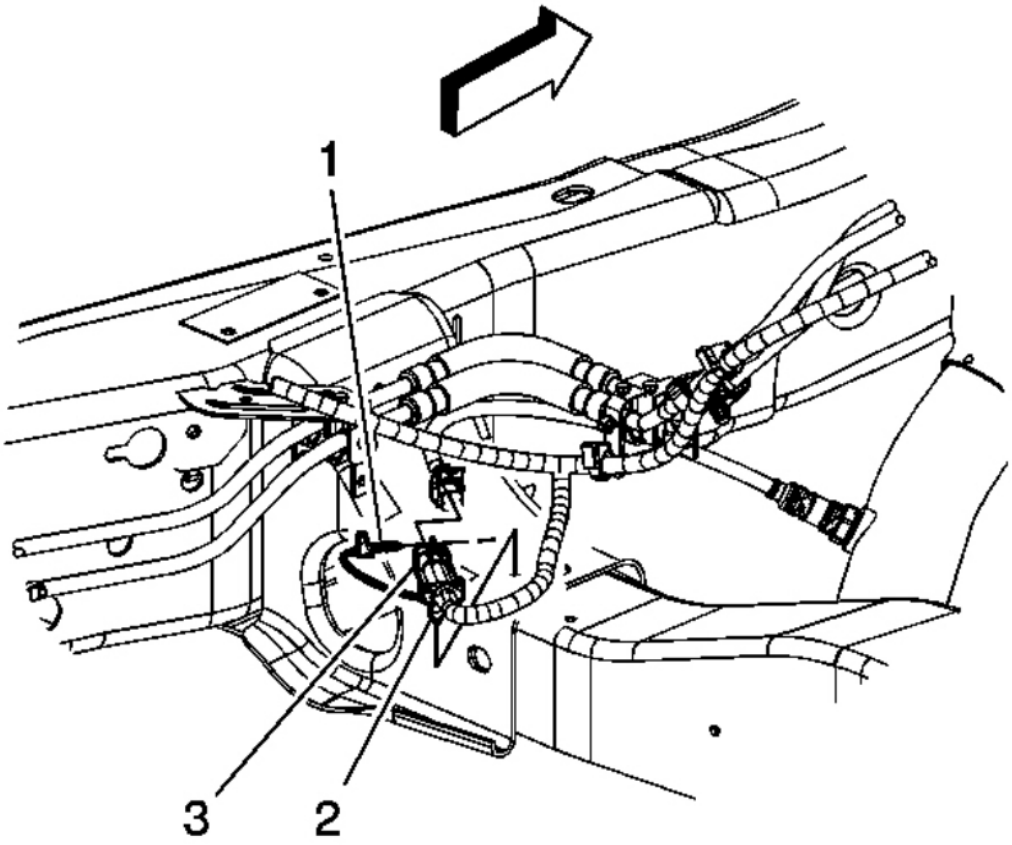


Fig. 22: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

14. Connect the left rear HO2S electrical connector to the engine wiring harness electrical connector (3).
15. Install the left rear CPA retainer (1).

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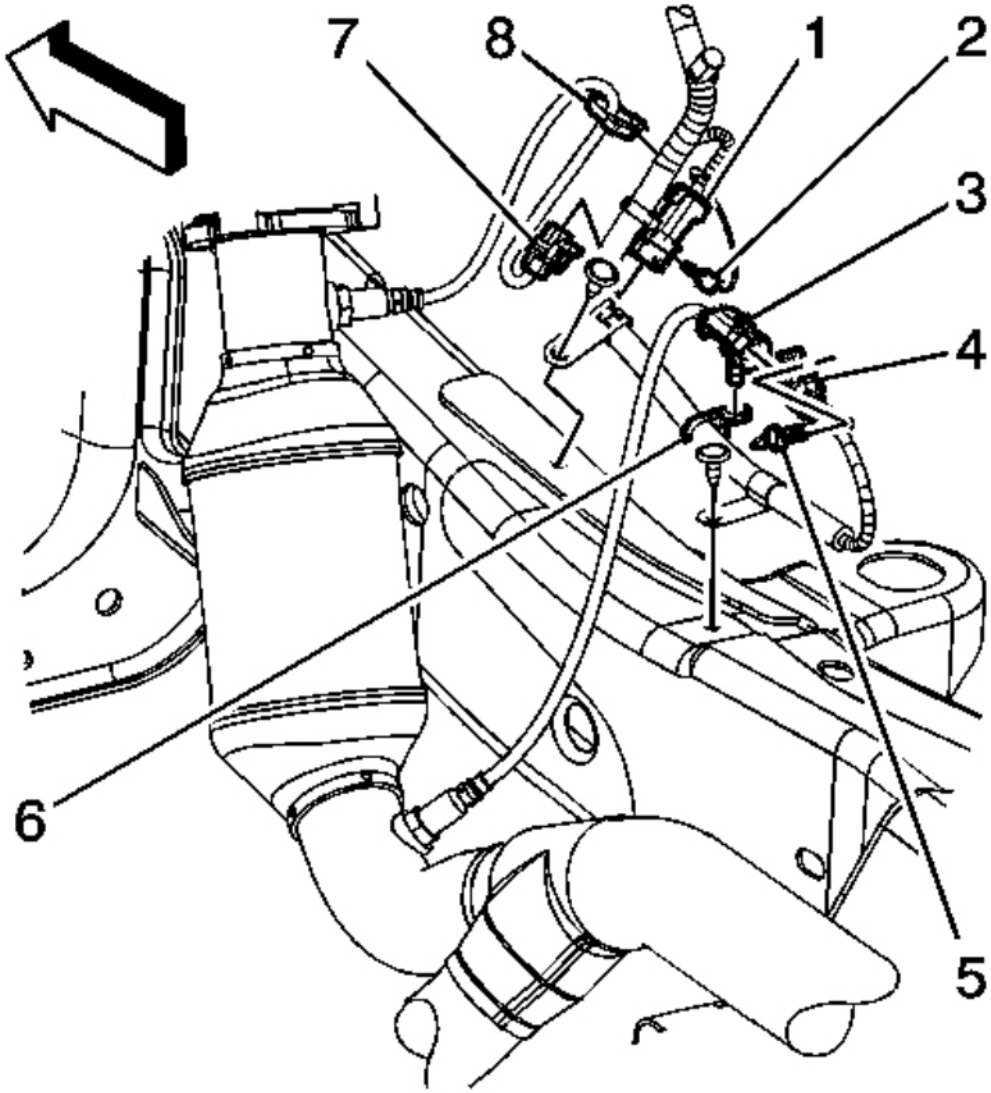


Fig. 23: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clips
Courtesy of GENERAL MOTORS CORP.

16. Install the right rear HO2S electrical connector clip to the engine harness clip (5).
17. Connect the engine wiring harness electrical connector (3) to the right rear HO2S electrical connector.
18. Install the right rear CPA retainer (4).
19. Connect the right front HO2S electrical connector to the engine wiring harness electrical connector (1).

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20. Install the right front CPA retainer (2).

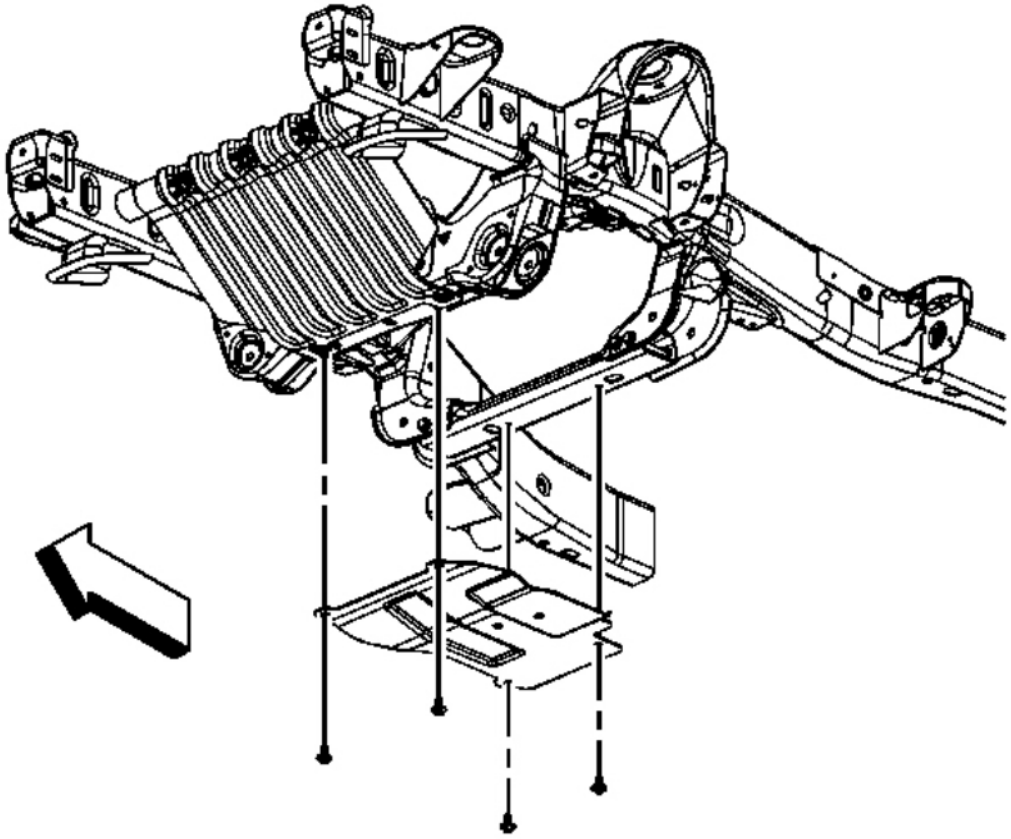


Fig. 24: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

21. Position the oil pan skid plate and install the oil pan skid plate bolts, if equipped.

    Tighten: Tighten the bolts to 28 N.m (21 lb ft).

22. Lower the vehicle.

EXHAUST SEAL REPLACEMENT (2500 SERIES)

Removal Procedure

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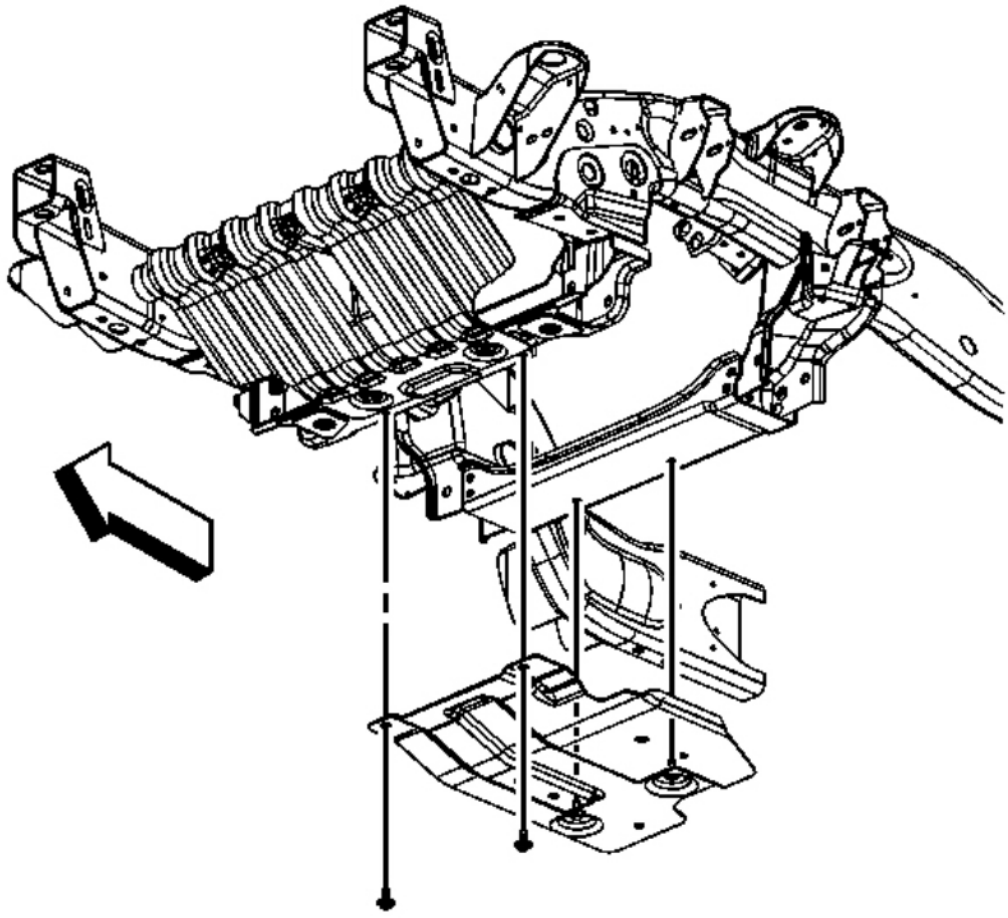


Fig. 25: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Loosen the 2 rear oil pan skid plate bolts, remove the 2 front oil pad skid plate bolts and skid plate, if equipped.

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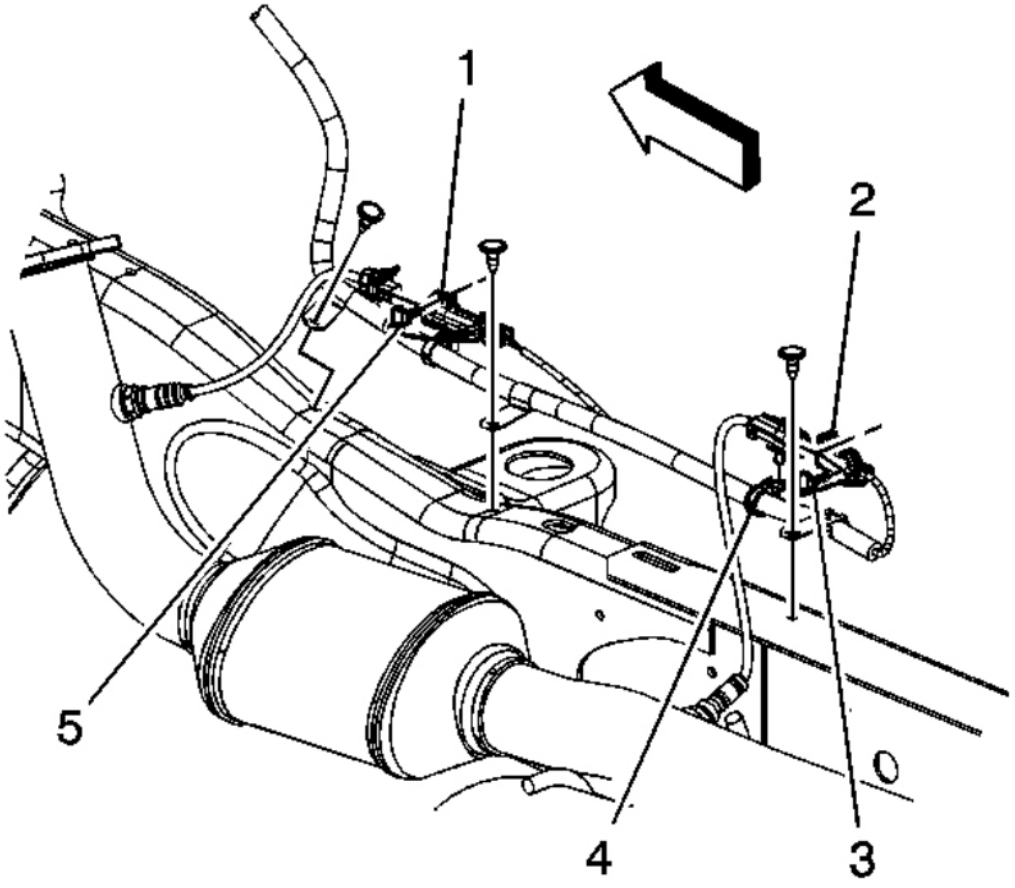


Fig. 26: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clip
Courtesy of GENERAL MOTORS CORP.

3. Remove the right front connector position assurance (CPA) retainer (5).
4. Disconnect the right front heated oxygen sensor (HO2S) electrical connector from the engine wiring harness electrical connector (1).
5. Remove the right rear CPA retainer (3).
6. Disconnect the engine wiring harness electrical connector (2) from the right rear HO2S electrical connector.
7. Remove the right rear HO2S electrical connector clip from the engine harness clip (4).

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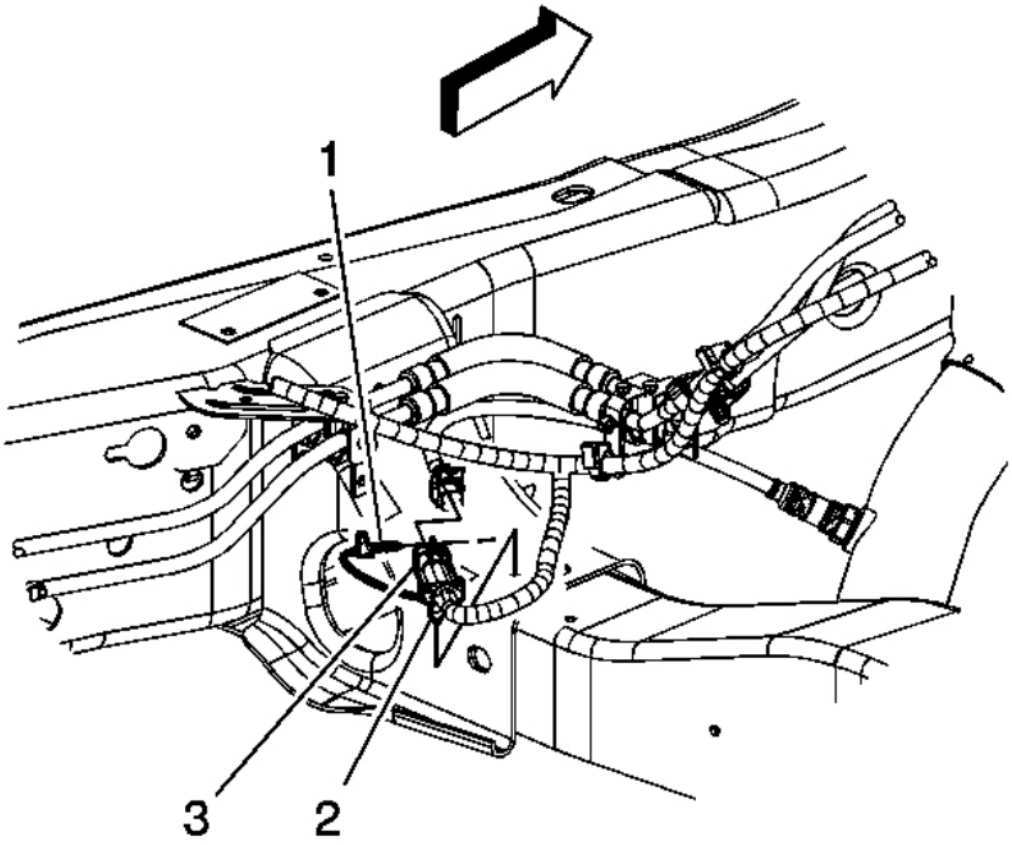


Fig. 27: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

8. Remove the left rear CPA retainer (1).
9. Disconnect the left rear HO2S electrical connector from the engine wiring harness electrical connector (3).

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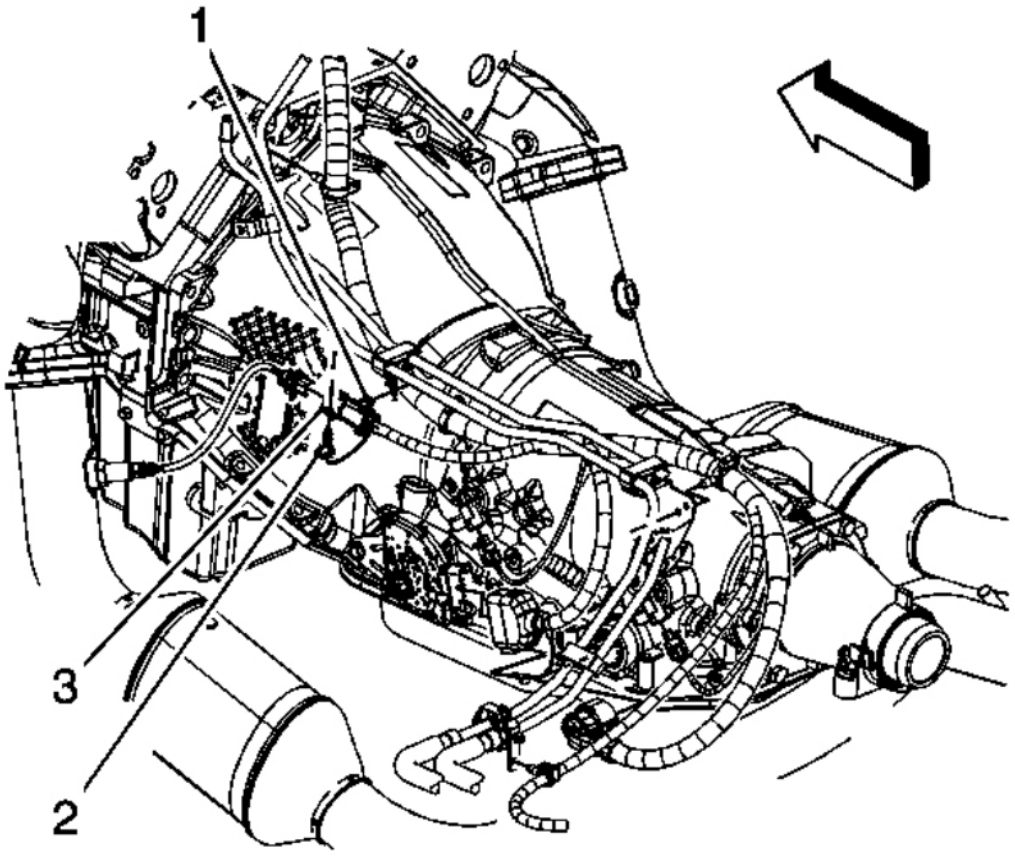


Fig. 28: View Of Left Front CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

10. Remove the left front CPA retainer (2).
11. Disconnect the left front HO2S electrical connector (2) from the engine wiring harness electrical connector (3).

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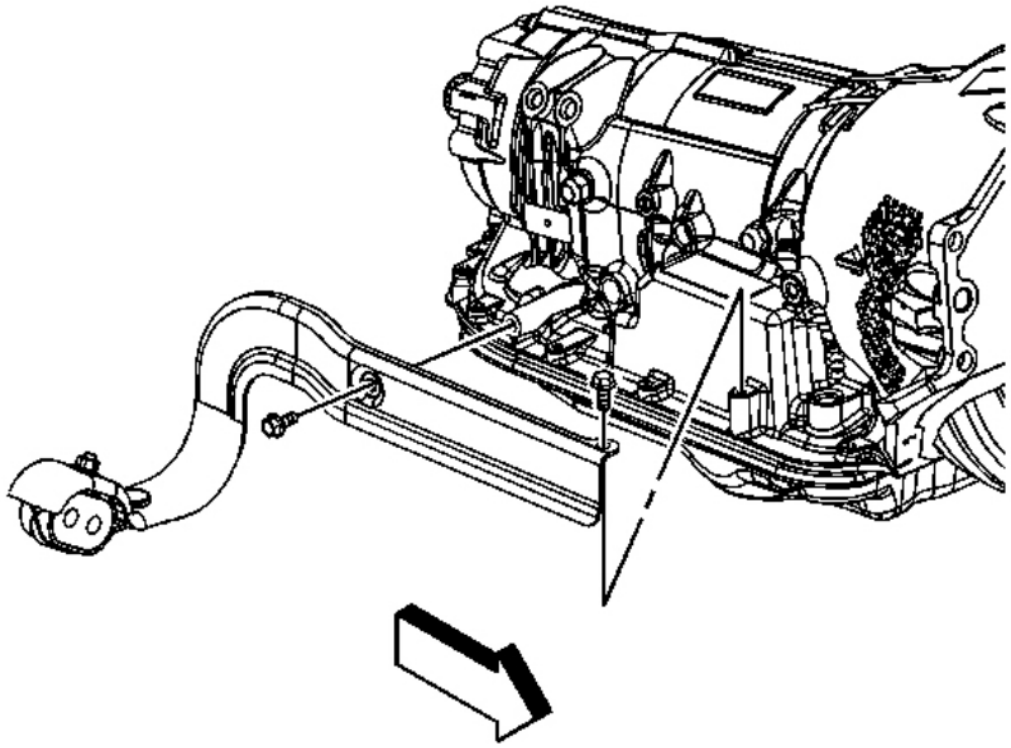


Fig. 29: View Of Exhaust Pipe Hanger Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

12. Support the catalytic converter assemblies with suitable adjustable jacks.
13. Remove the exhaust pipe hanger bracket bolts.

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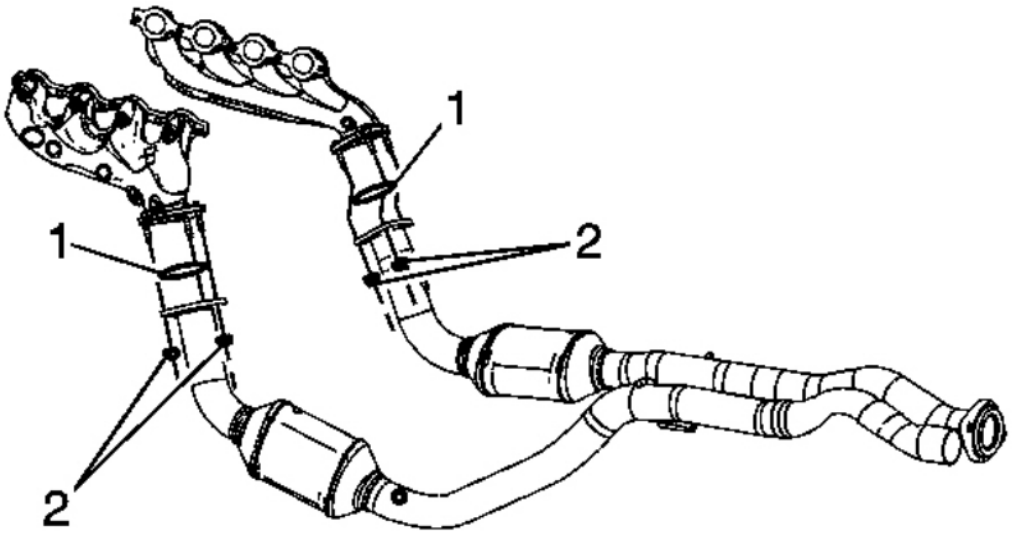


Fig. 30: View Of Exhaust Seals & Exhaust Manifold Nuts
Courtesy of GENERAL MOTORS CORP.

14. Remove the catalytic converter to exhaust manifold nuts (2).
15. Separate the catalytic converter assemblies from the exhaust manifolds.
16. Lower the catalytic converter assemblies using the adjustable jacks.
17. Remove the exhaust seal(s) (1) as required.

Installation Procedure

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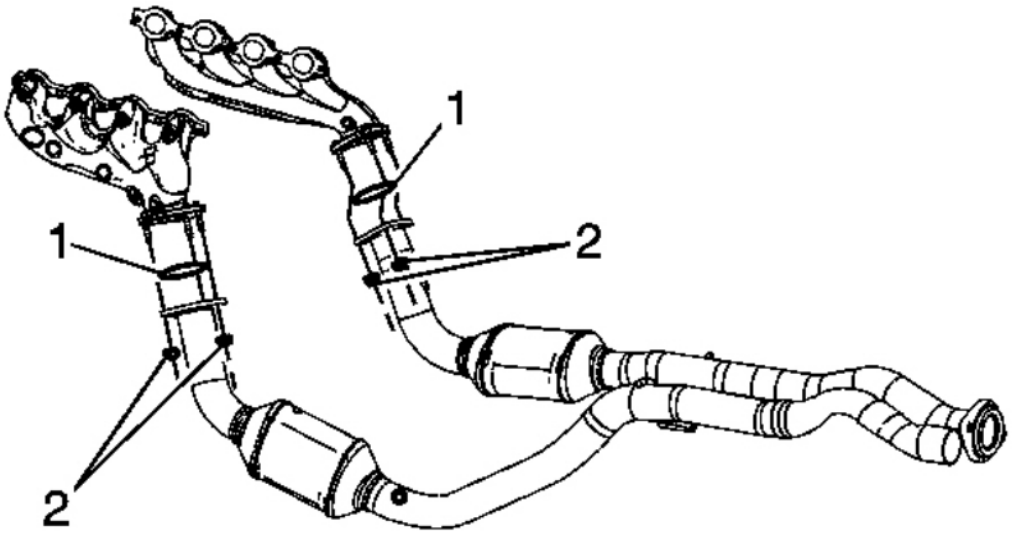


Fig. 31: View Of Exhaust Seals & Exhaust Manifold Nuts
Courtesy of GENERAL MOTORS CORP.

1. Install the NEW exhaust seal(s) (1) as required.
2. Raise the catalytic converter assemblies into place using the adjustable jacks.
3. Install the catalytic converter assemblies to the exhaust manifolds.

NOTE: **Refer to Fastener Notice .**

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

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

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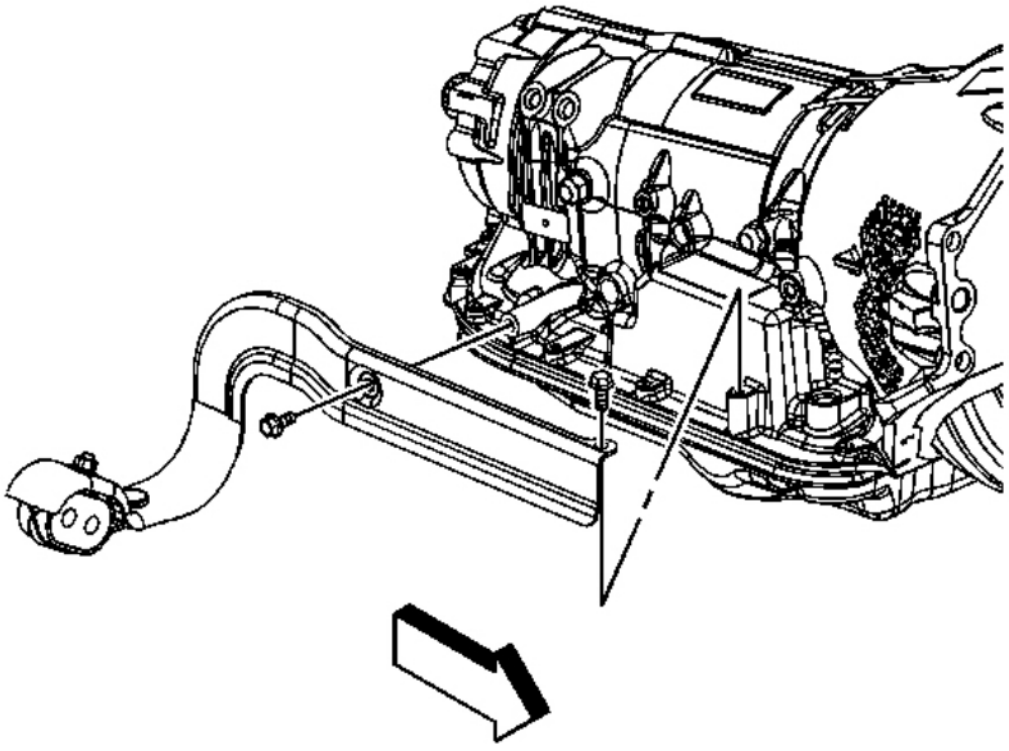


Fig. 32: View Of Exhaust Pipe Hanger Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

5. Position the exhaust pipe hanger bracket to the transmission.
6. Install the exhaust pipe hanger bracket bolts.

   Tighten: Tighten the bolts to 25 N.m (18 lb ft).

7. Remove the supports from the catalytic converter assemblies.

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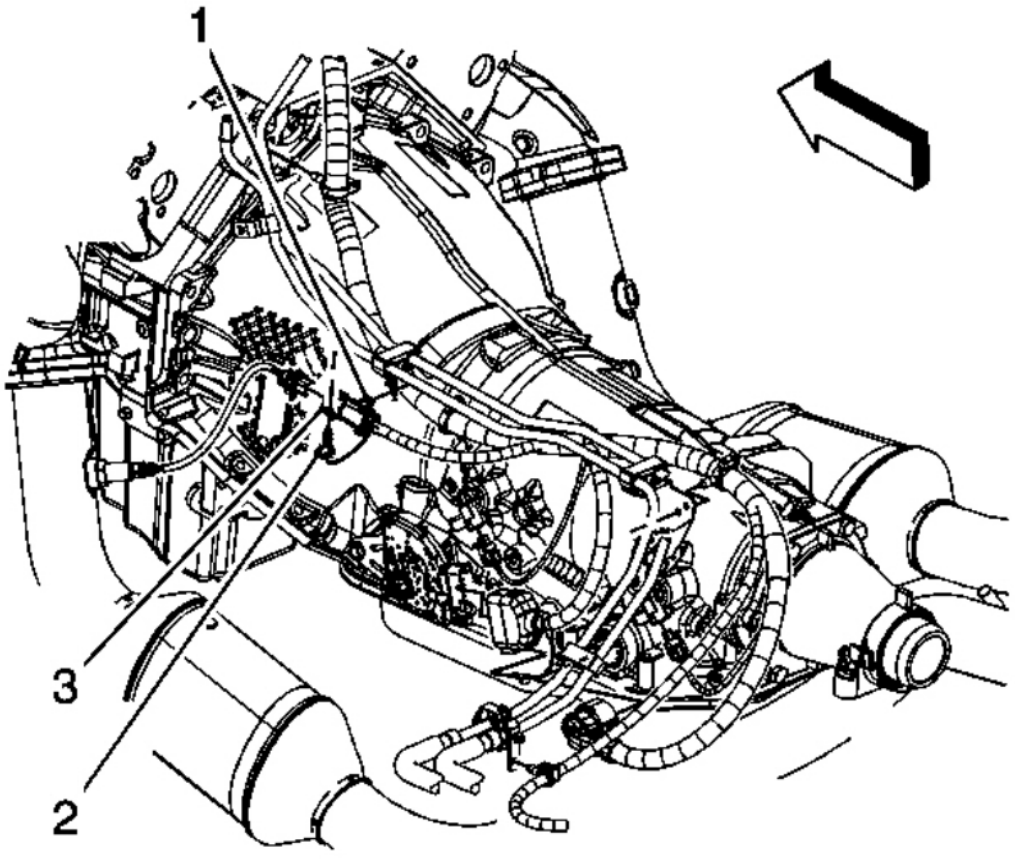


Fig. 33: View Of Left Front CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

8. Connect the left front HO2S electrical connector (2) to the engine wiring harness electrical connector (3).
9. Install the left front CPA retainer (2).

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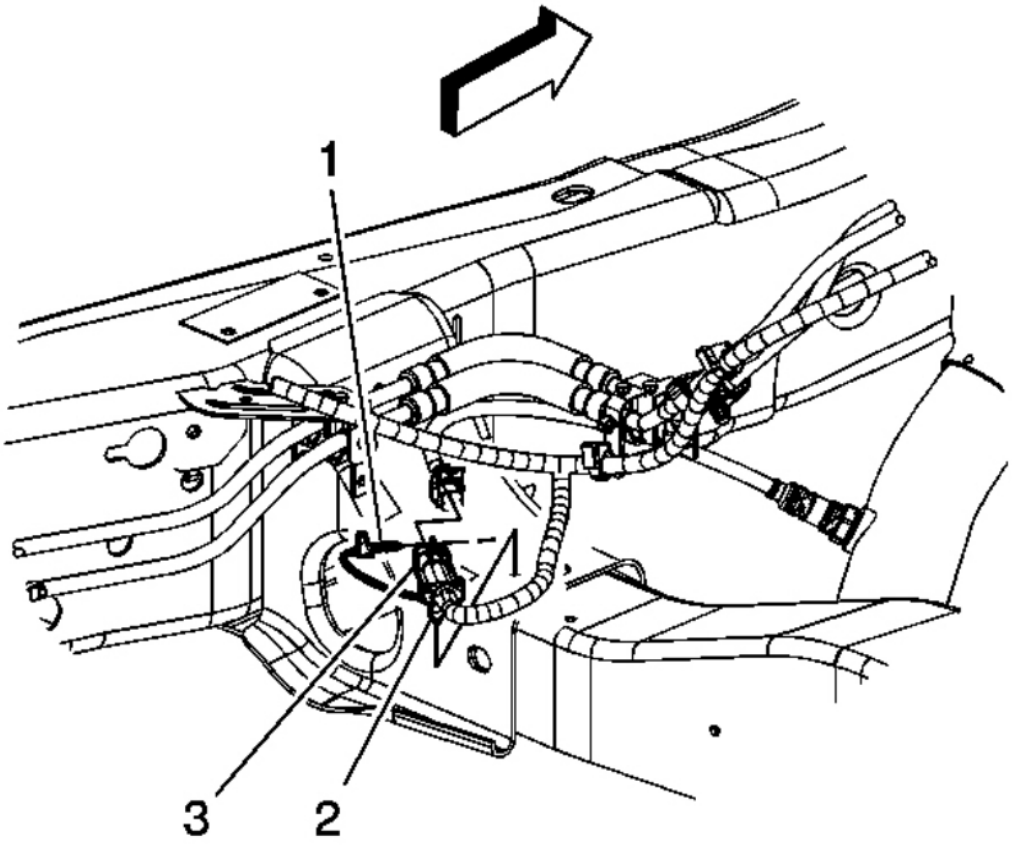


Fig. 34: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

10. Connect the left rear HO2S electrical connector to the engine wiring harness electrical connector (3).
11. Install the left rear CPA retainer (1).

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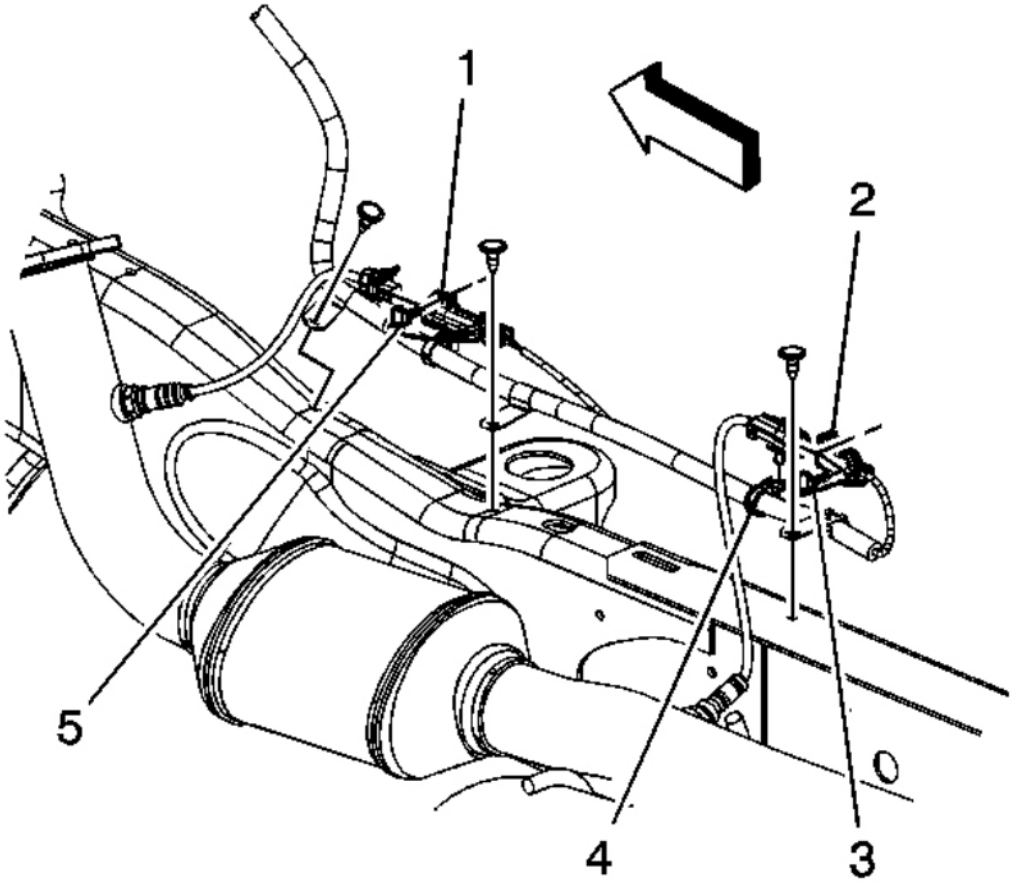


Fig. 35: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clip
Courtesy of GENERAL MOTORS CORP.

12. Install the right rear HO2S electrical connector clip to the engine harness clip (4).
13. Connect the engine wiring harness electrical connector (2) to the right rear HO2S electrical connector.
14. Install the right rear CPA retainer (3).
15. Connect the right front HO2S electrical connector to the engine wiring harness electrical connector (1).
16. Install the right front CPA retainer (5).

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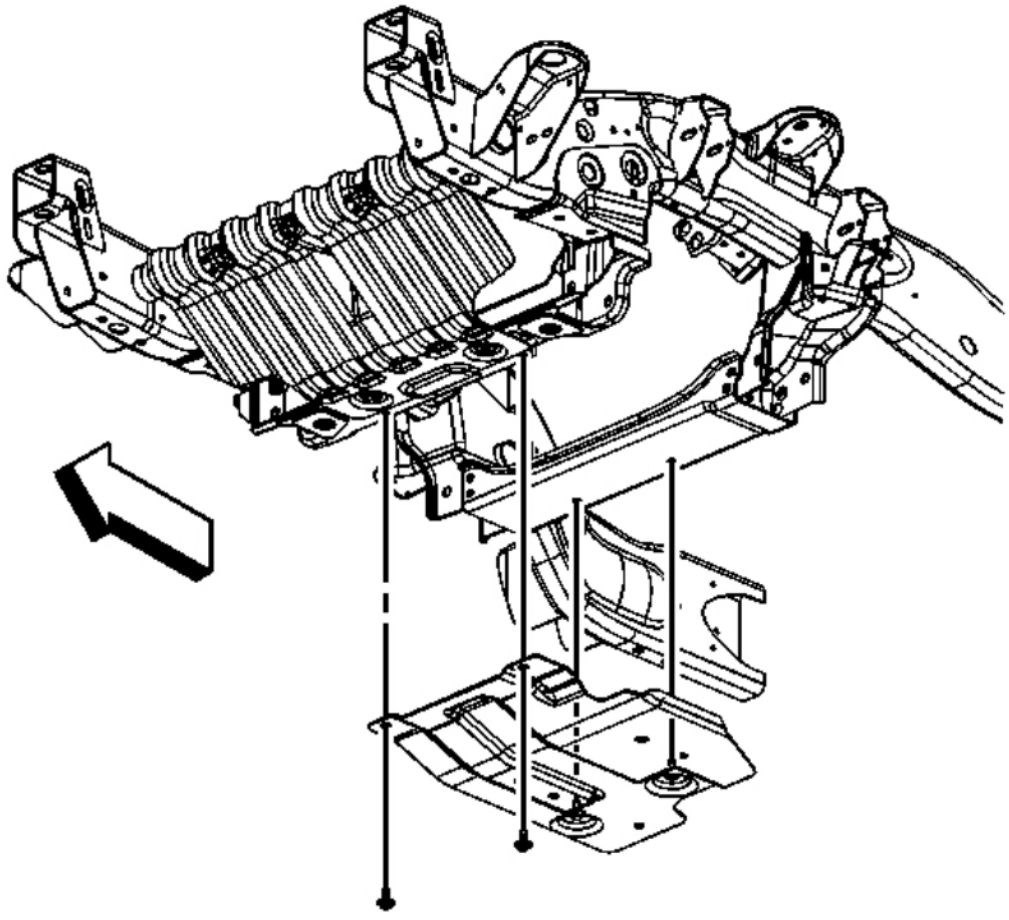


Fig. 36: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

17. Position the oil pan skid plate and tighten until snug the 2 rear oil pan skid plate bolts, install the 2 front oil pan skid plate bolts, if equipped.

    Tighten: Tighten the bolts to 28 N.m (21 lb ft).

18. Lower the vehicle.

CATALYTIC CONVERTER REPLACEMENT (1500 SERIES)

Removal Procedure

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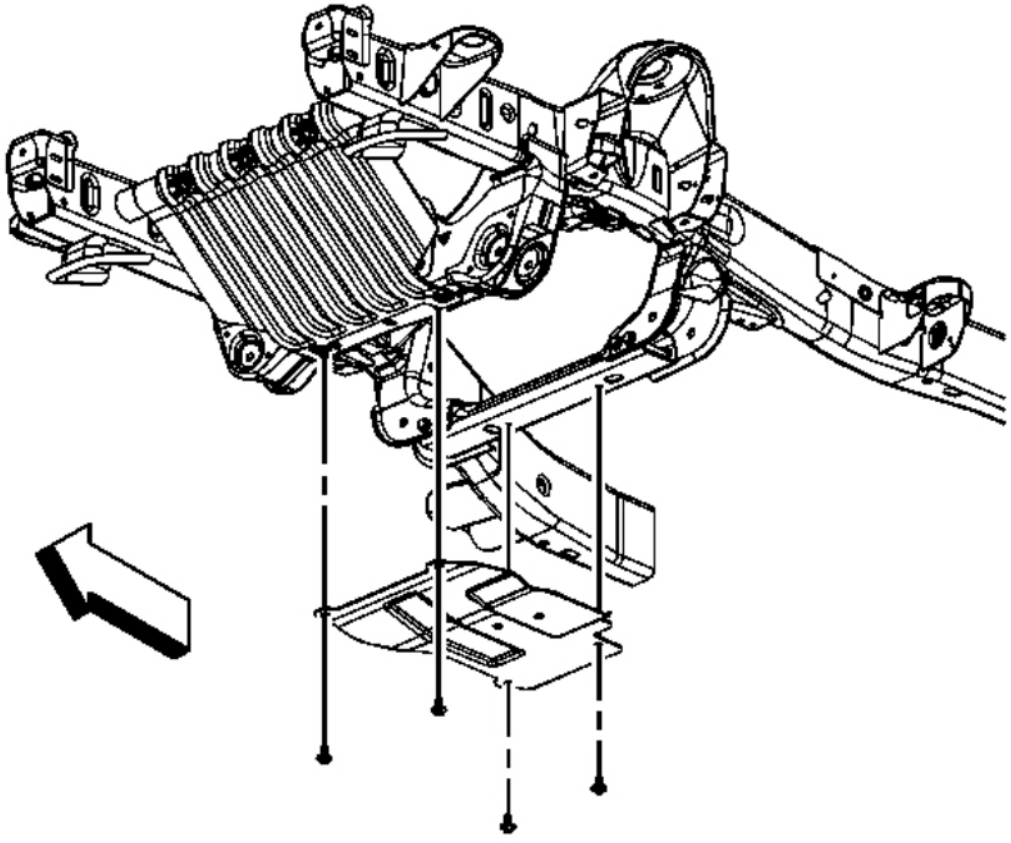


Fig. 37: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the oil pan skid plate bolts and skid plate, if equipped.
3. Remove the transmission crossmember. Refer to **Crossmember Replacement - Transmission (C1500 Series)** or **Crossmember Replacement - Transmission (C2500 Series)** or **Crossmember Replacement - Transmission (K1500 Series)** or **Crossmember Replacement - Transmission (K2500 series)** .

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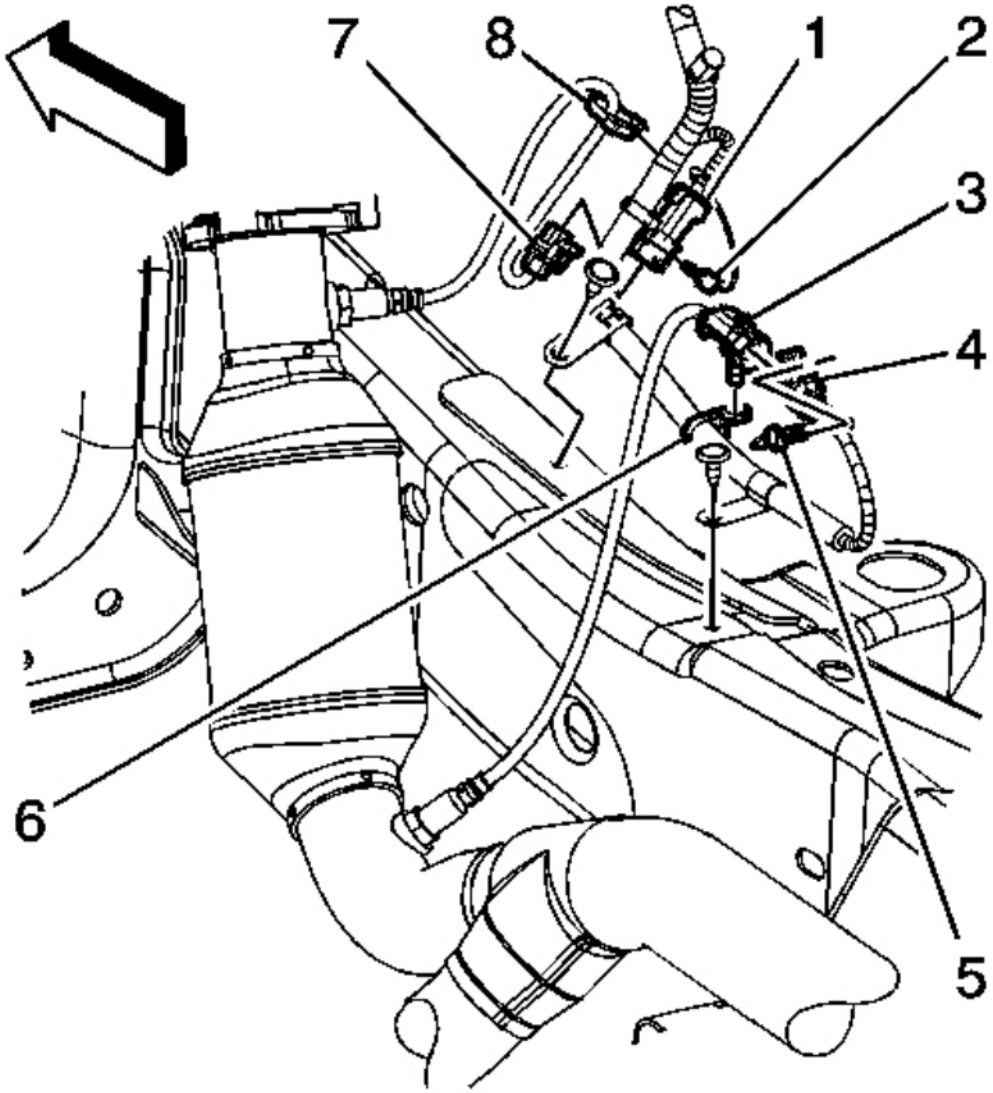


Fig. 38: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clips
Courtesy of GENERAL MOTORS CORP.

4. Remove the right front connector position assurance (CPA) retainer (2).
5. Disconnect the right front heated oxygen sensor (HO2S) electrical connector from the engine wiring harness electrical connector (1).
6. Remove the right rear CPA retainer (4).

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7. Disconnect the engine wiring harness electrical connector (3) from the right rear HO2S electrical connector.
8. Remove the right rear HO2S electrical connector clip from the engine harness clip (5).

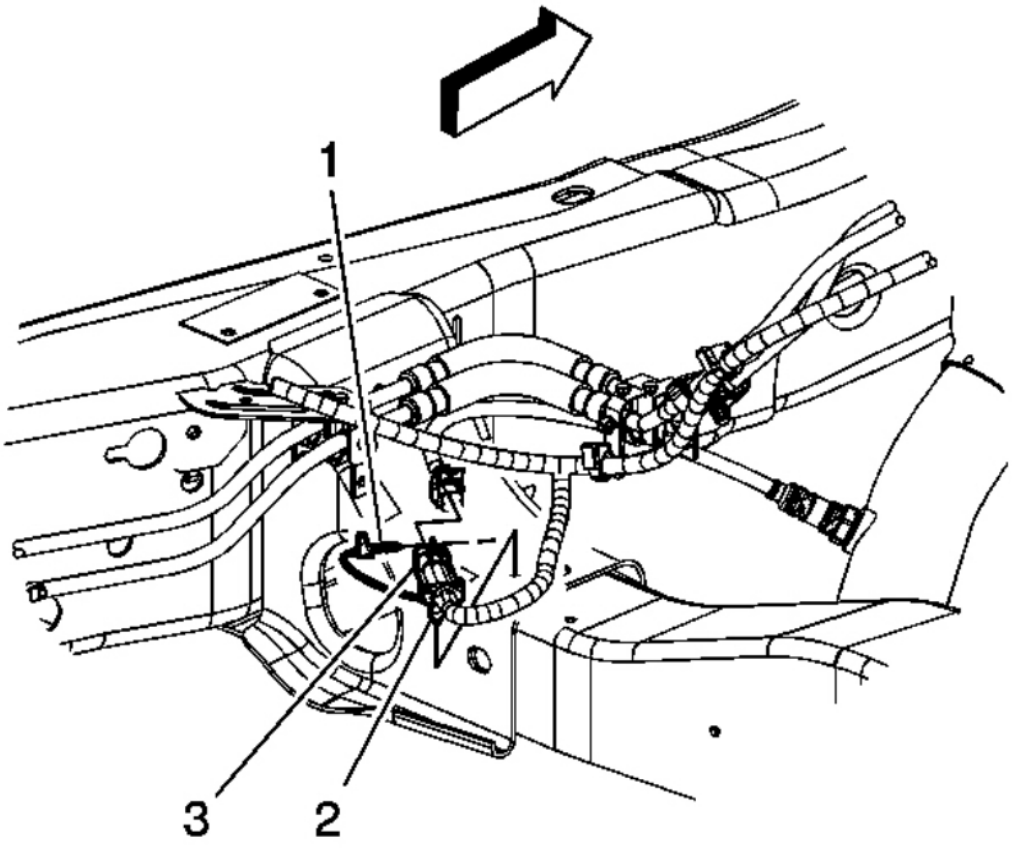


Fig. 39: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

9. Remove the left rear CPA retainer (1).
10. Disconnect the left rear HO2S electrical connector from the engine wiring harness electrical connector (3).

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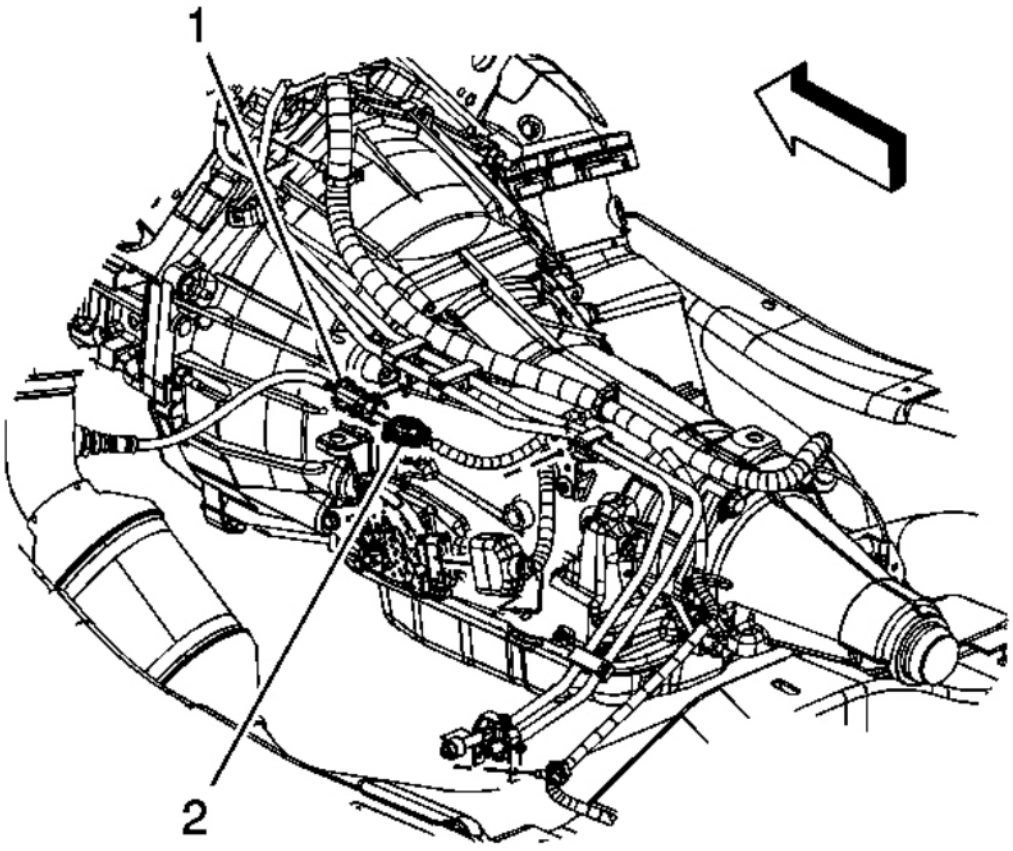


Fig. 40: View Of Left Front HO2S Electrical Connector Clip & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

11. For vehicles equipped with a 4L60-E/4L70-E automatic transmission perform the following steps, for vehicles equipped with a 6L80-E automatic transmission proceed to step 15.
12. Remove the left front CPA retainer.
13. Disconnect the engine wiring harness electrical connector (2) from the left front HO2S.
14. Remove the left front HO2S electrical connector clip (1) from the fuel line clip.

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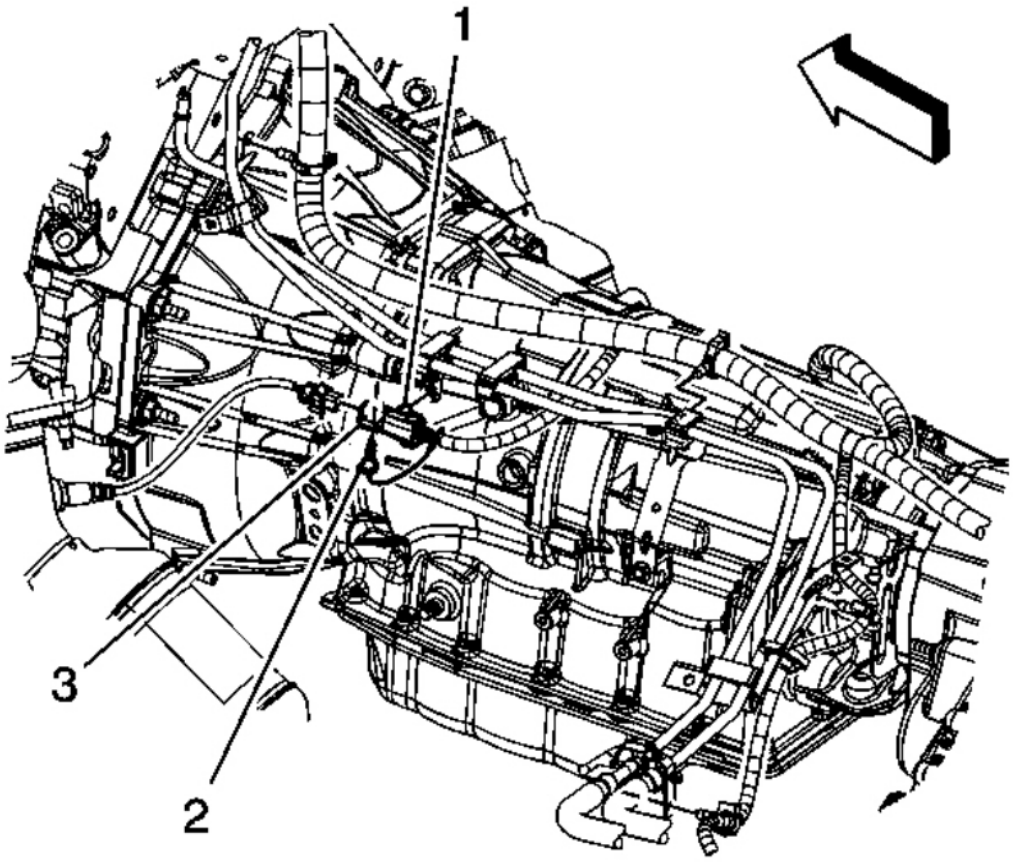


Fig. 41: View Of Engine Wiring Harness Electrical Connector Clip & Electrical Connector
Courtesy of GENERAL MOTORS CORP.

15. Remove the left front CPA retainer (2).
16. Remove the engine wiring harness electrical connector clip (1) from the fuel line clip.
17. Disconnect the engine wiring harness electrical connector (3) from the left front HO2S.

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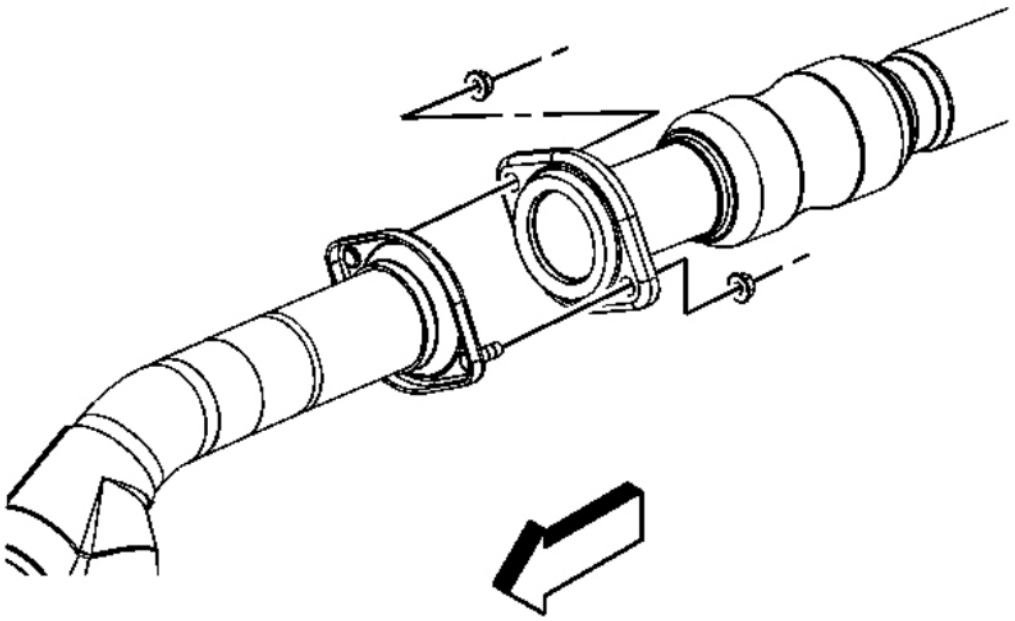


Fig. 42: View Of Catalytic Converter To Muffler Nuts
Courtesy of GENERAL MOTORS CORP.

18. If the vehicle is equipped with regular productions options (RPOs) LC9/LMG/LY5/L76/LY2, remove the catalytic converter to muffler nuts.

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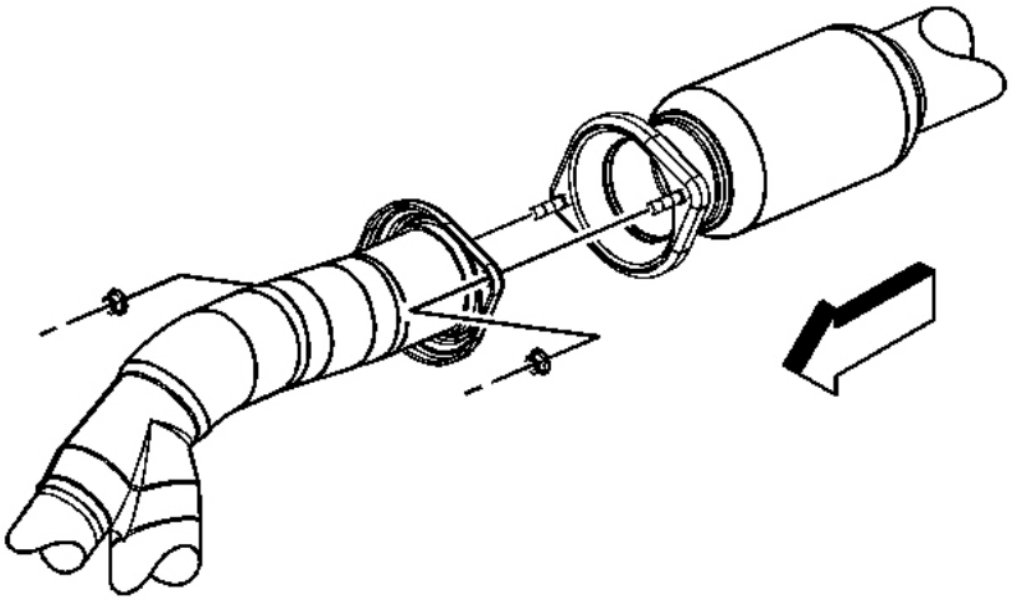


Fig. 43: View Of Catalytic Converter To Muffler Nuts (RPO L92)
Courtesy of GENERAL MOTORS CORP.

19. If the vehicle is equipped with RPO L92, remove the muffler to catalytic converter nuts.
20. Remove the HO2S. Refer to **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series)** .

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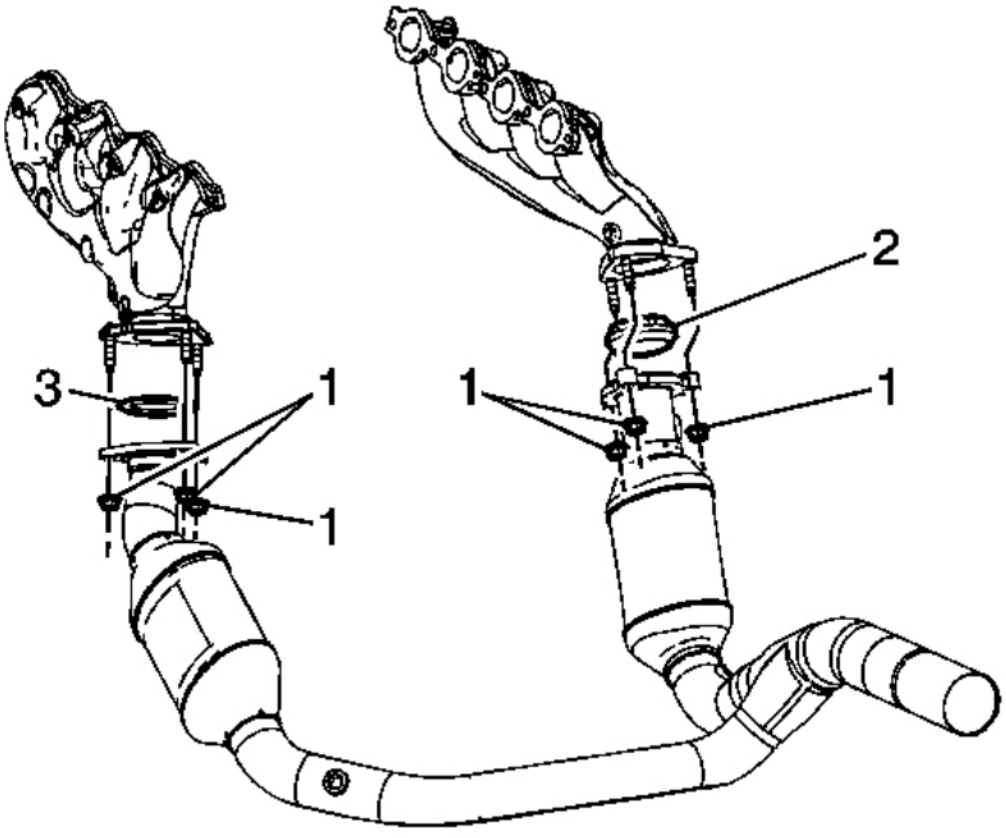


Fig. 44: View Of Catalytic Converter To Exhaust Manifold Nuts & Exhaust Seals
Courtesy of GENERAL MOTORS CORP.

21. Remove the catalytic converter to exhaust manifold nuts (1).
22. Separate the catalytic converter assembly from the exhaust manifolds.
23. Remove the catalytic converter assembly from the exhaust muffler.
24. If replacing the catalytic converter assembly, perform the following steps, otherwise proceed to step 4 in the installation procedure.
25. Remove the exhaust seals (2 and 3).

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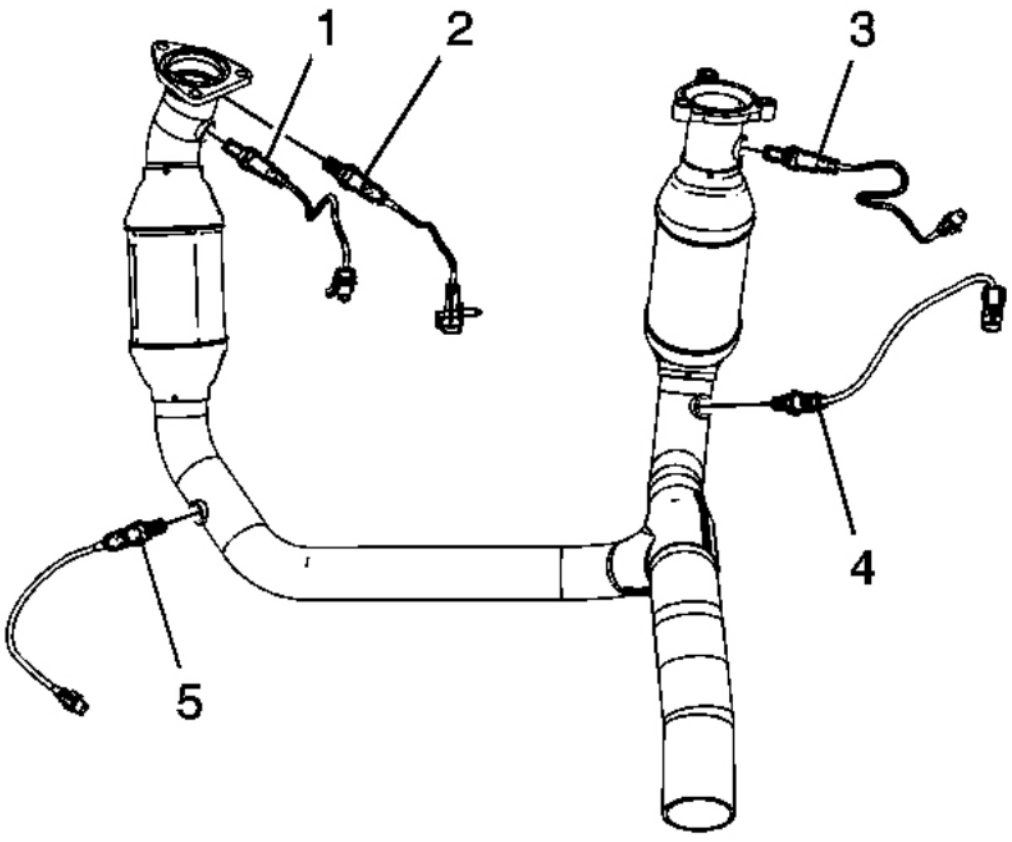


Fig. 45: View Of Catalytic Converter Assembly HO2S's
Courtesy of GENERAL MOTORS CORP.

26. Remove the HO2S's (1-5) from the catalytic converter assembly.

Installation Procedure

IMPORTANT: A special anti-seize compound is used on the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from as exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before the reinstallation.

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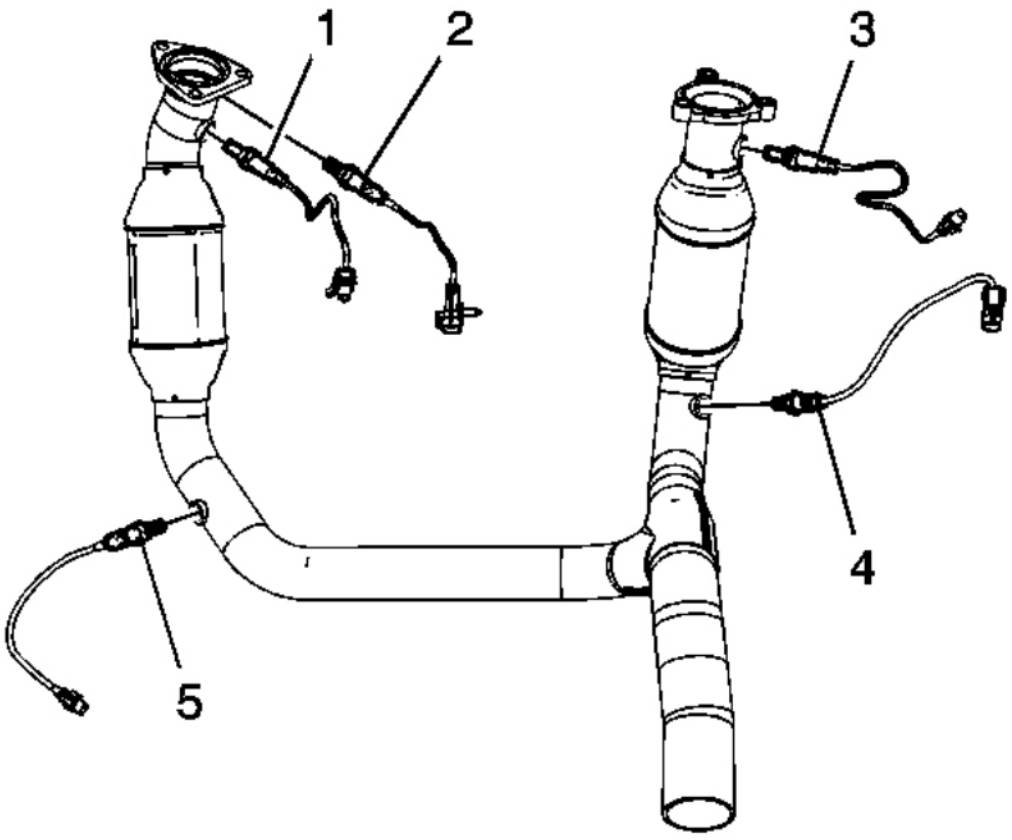


Fig. 46: View Of Catalytic Converter Assembly HO2S's
Courtesy of GENERAL MOTORS CORP.

1. If replacing the catalytic converter assembly, perform the following steps, otherwise proceed to step 4.
2. If reinstalling the old sensors, coat the threads with anti-seize compound GM P/N 12377953, or equivalent.

NOTE: **Replacement components must be the correct part number for the application. Components requiring the use of the thread locking compound, lubricants, corrosion inhibitors, or sealants are identified in the service procedure. Some replacement components may come with these coatings already applied. Do not use these coatings on components unless specified. These coatings can affect the final torque, which may affect the operation of the component. Use the correct torque specification when installing components in order to avoid damage.**

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NOTE: **Refer to Fastener Notice .**

3. Install the HO2S's (1-5) to the catalytic converter assembly.

   Tighten: Tighten the sensors to 42 N.m (31 lb ft).

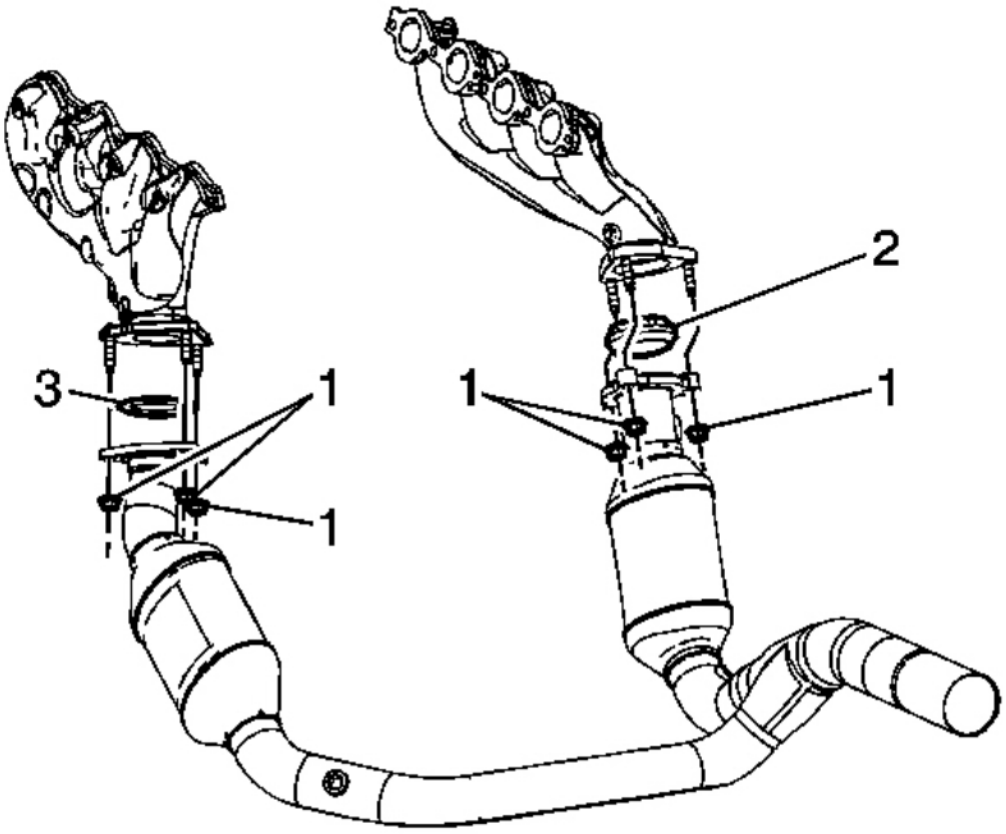


Fig. 47: View Of Catalytic Converter To Exhaust Manifold Nuts & Exhaust Seals
Courtesy of GENERAL MOTORS CORP.

4. Install the NEW exhaust seals (2 and 3) as required.
5. Install the catalytic converter assembly to the muffler.
6. Install the catalytic converter assembly to the exhaust manifolds.
7. Install the catalytic converter to exhaust manifold nuts (1).

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

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8. Install the HO2S. Refer to **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (1500 Series)** or **Heated Oxygen Sensor Replacement - Bank 2 Sensor 1 (2500 Series)** .

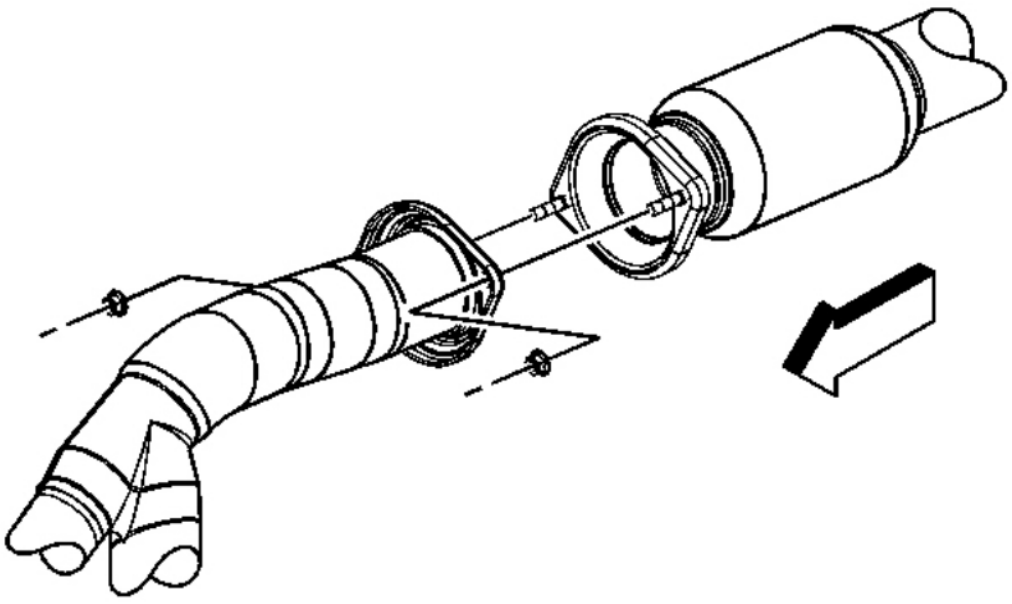


Fig. 48: View Of Catalytic Converter To Muffler Nuts (RPO L92)
Courtesy of GENERAL MOTORS CORP.

9. If the vehicle is equipped with RPO L92, install the muffler to catalytic converter nuts.

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

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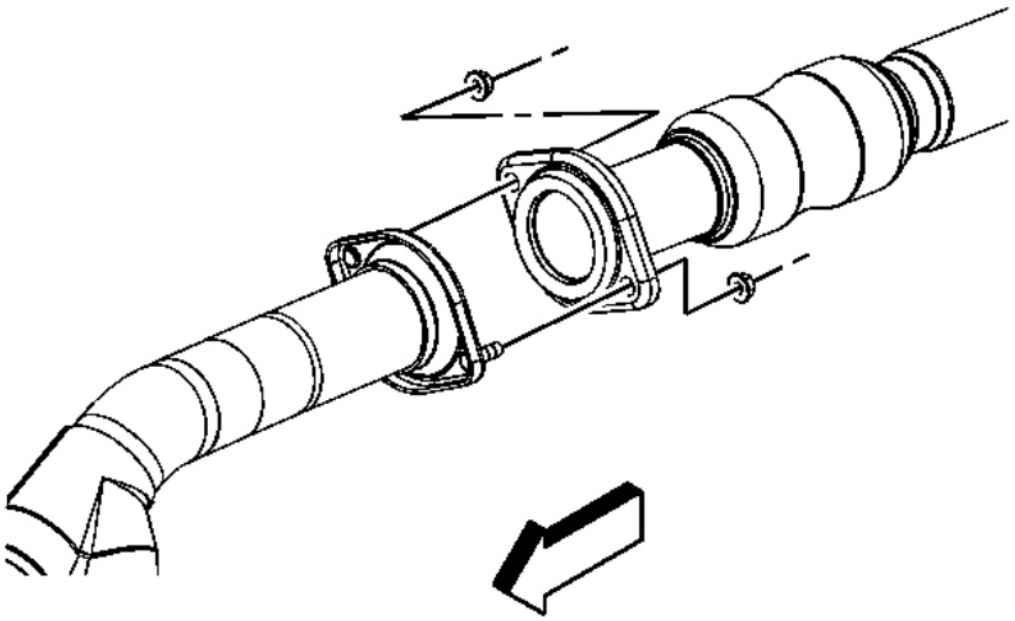


Fig. 49: View Of Catalytic Converter To Muffler Nuts
Courtesy of GENERAL MOTORS CORP.

10. If the vehicle is equipped with RPOs LC9/LMG/LY5/L76/LY2, install the catalytic converter to muffler nuts.

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

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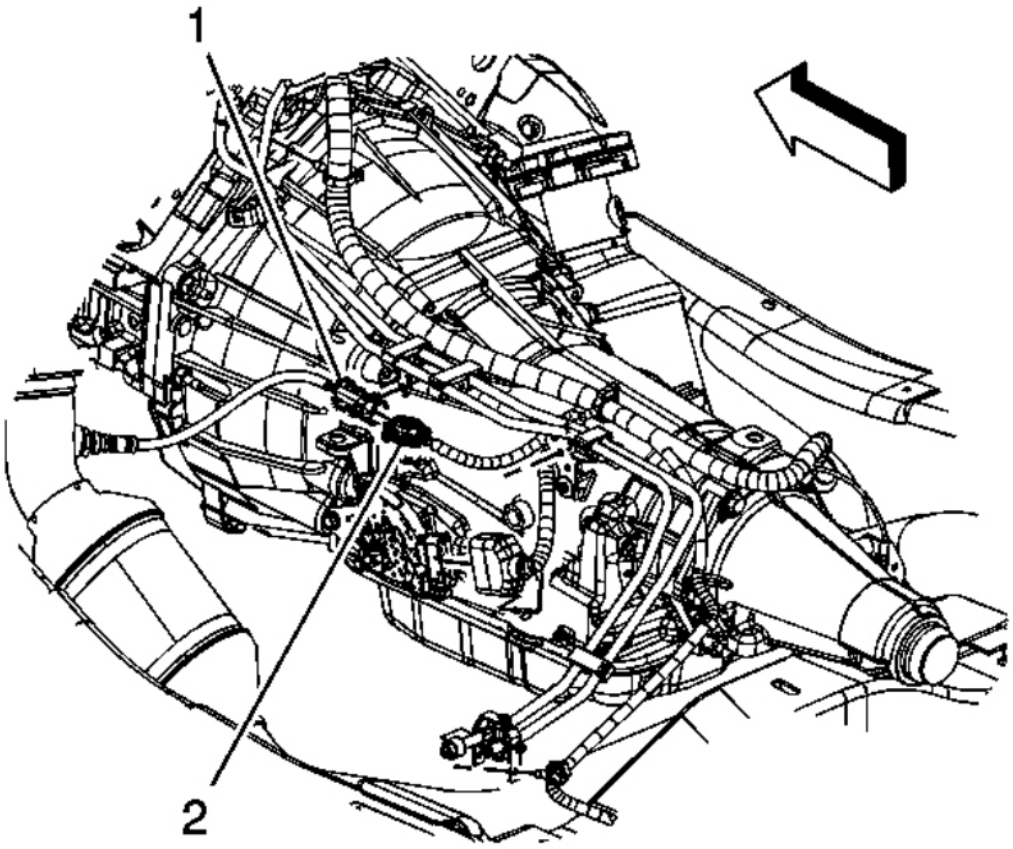


Fig. 50: View Of Left Front HO2S Electrical Connector Clip & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

11. For vehicles equipped with a 4L60-E/4L70-E automatic transmission perform the following steps, for vehicles equipped with a 6L80-E automatic transmission proceed to step 13.
12. Install the HO2S electrical connector clip (1) to the fuel line clip.
13. Connect the engine wiring harness electrical connector (2) to the HO2S.
14. Install the CPA retainer.

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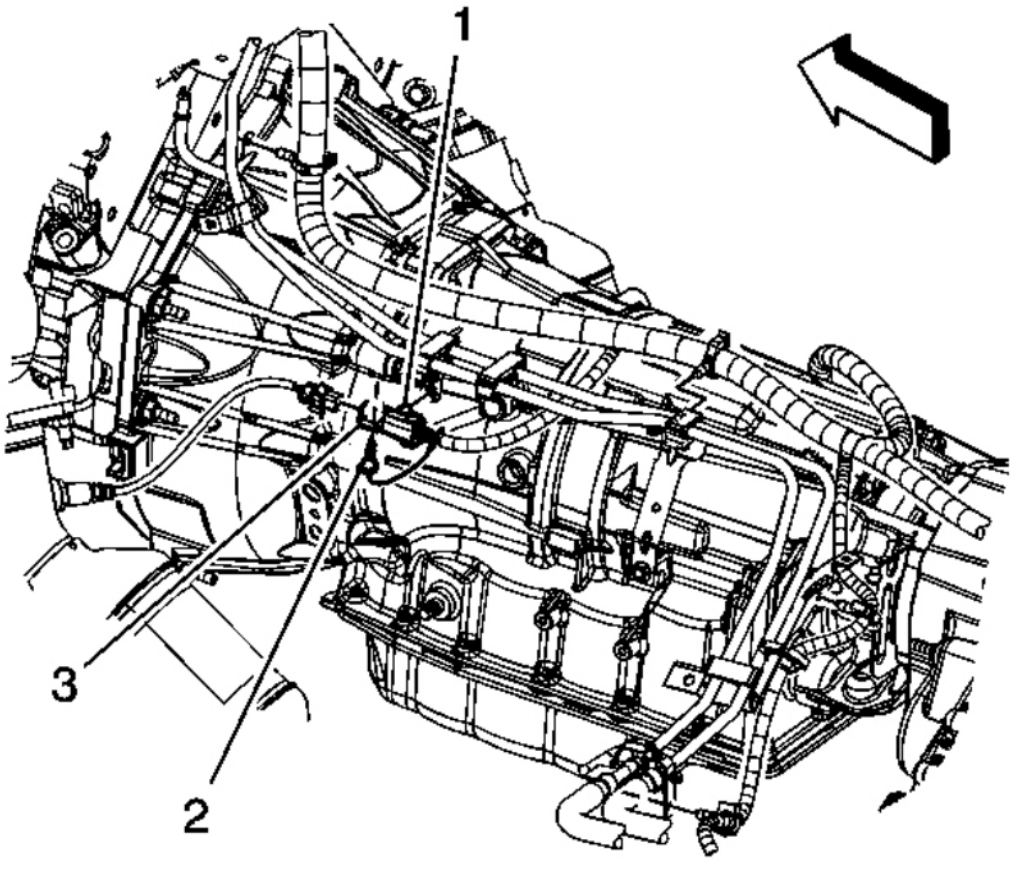


Fig. 51: View Of Engine Wiring Harness Electrical Connector Clip & Electrical Connector
Courtesy of GENERAL MOTORS CORP.

15. Connect the engine wiring harness electrical connector (3) to the HO2S.
16. Install the engine wiring harness electrical connector clip (1) to the fuel line clip.
17. Install the CPA retainer (2).

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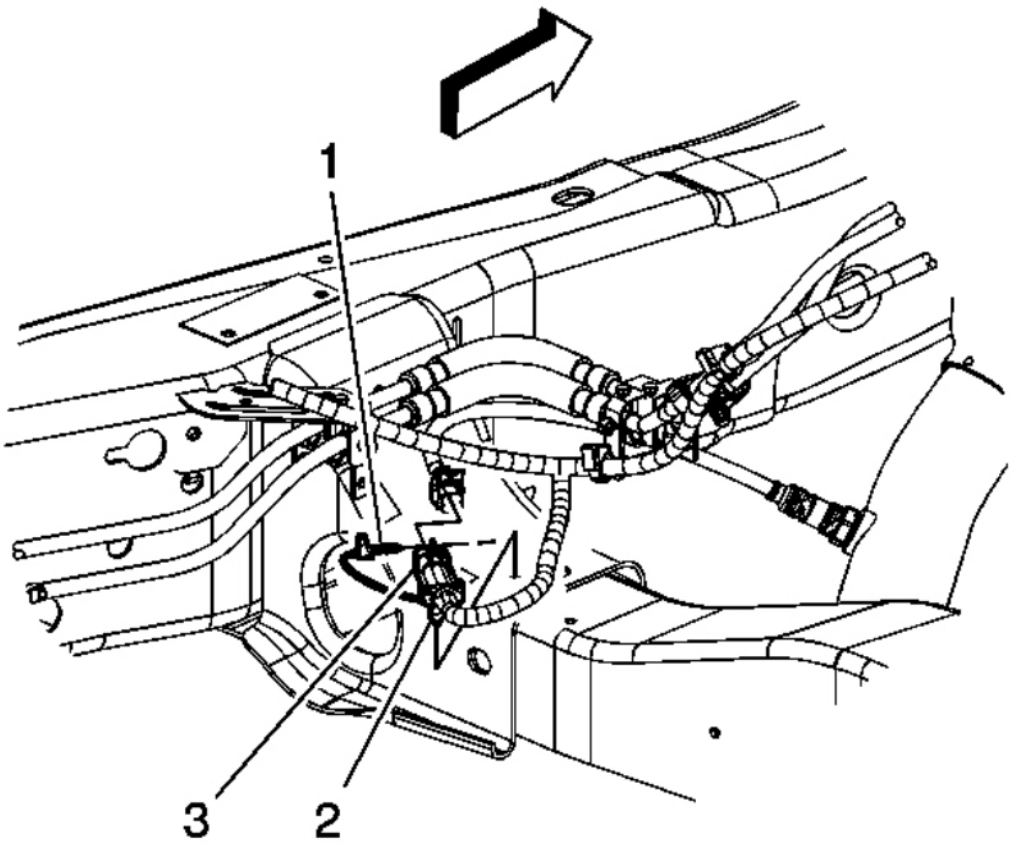


Fig. 52: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

18. Connect the left rear HO2S electrical connector to the engine wiring harness electrical connector (3).
19. Install the left rear CPA retainer (1).

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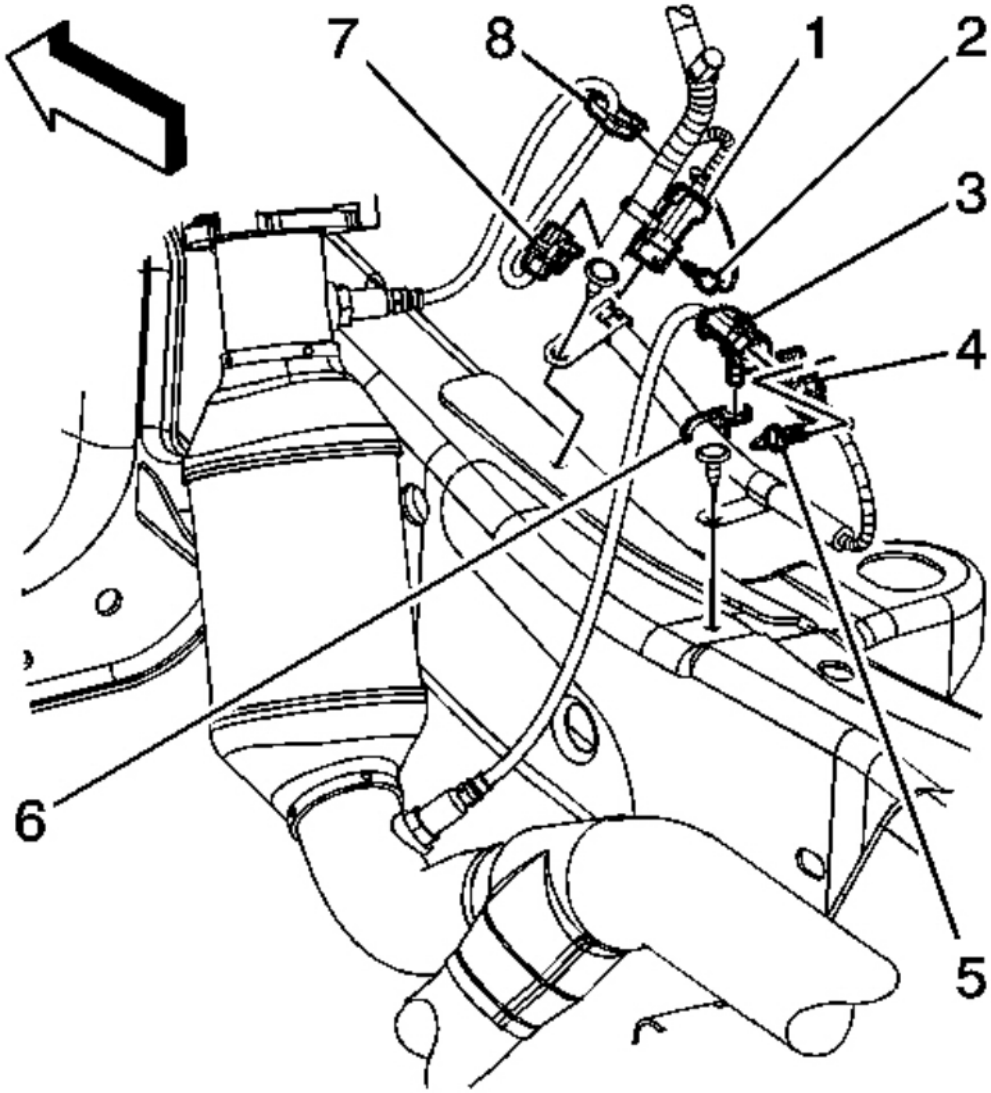


Fig. 53: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clips
Courtesy of GENERAL MOTORS CORP.

20. Install the right rear HO2S electrical connector clip to the engine harness clip (5).
21. Connect the engine wiring harness electrical connector (3) to the right rear HO2S electrical connector.
22. Install the right rear CPA retainer (4).
23. Connect the right front HO2S electrical connector to the engine wiring harness electrical connector (1).

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24. Install the right front CPA retainer (2).

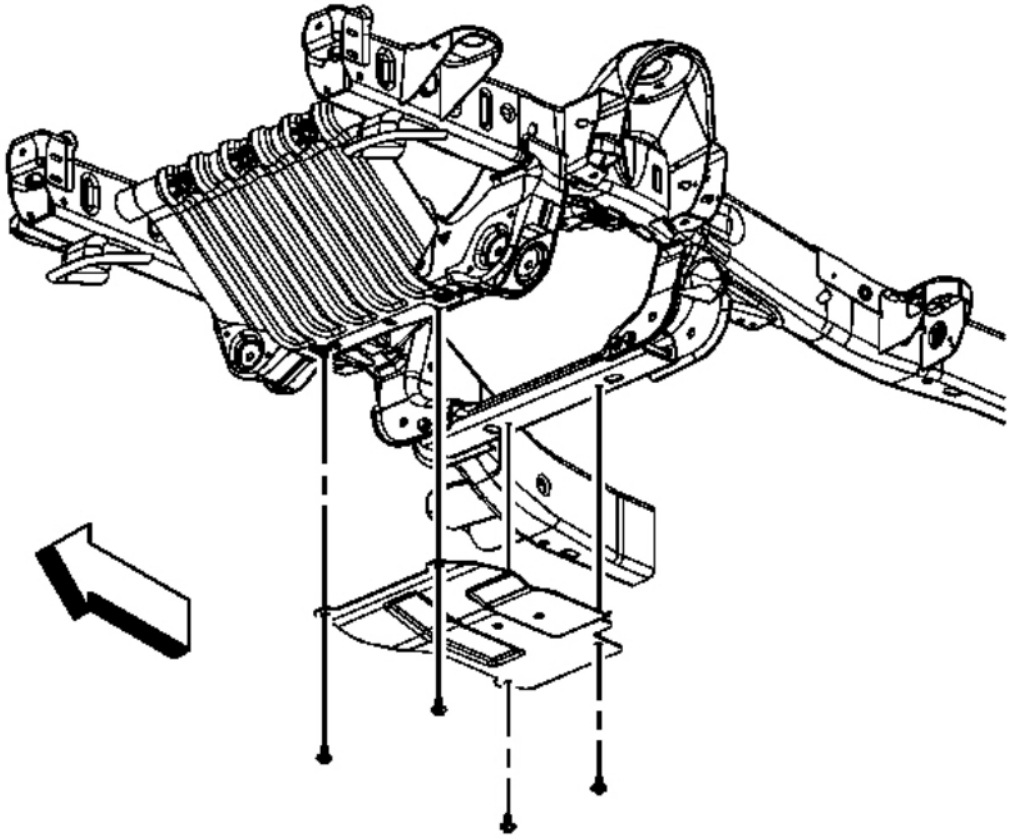


Fig. 54: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

25. Install the transmission crossmember. Refer to **Crossmember Replacement - Transmission (C1500 Series)** or **Crossmember Replacement - Transmission (C2500 Series)** or **Crossmember Replacement - Transmission (K1500 Series)** or **Crossmember Replacement - Transmission (K2500 series)** .
26. Position the oil pan skid plate and install the oil pan skid plate bolts, if equipped.

    Tighten: Tighten the bolts to 28 N.m (21 lb ft).

27. Lower the vehicle.

CATALYTIC CONVERTER REPLACEMENT - LEFT SIDE (2500 SERIES)

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Removal Procedure

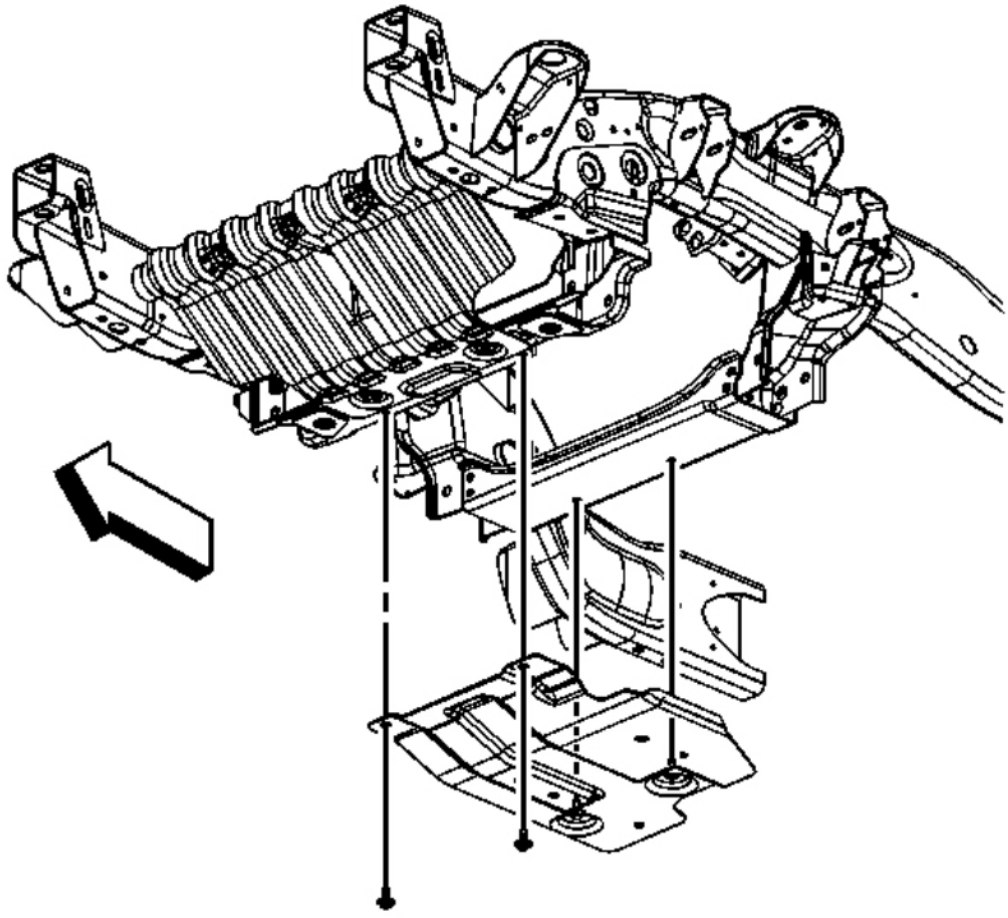


Fig. 55: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Loosen the 2 rear oil pan skid plate bolts, remove the 2 front oil pad skid plate bolts and skid plate, if equipped.
3. Remove the muffler. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.

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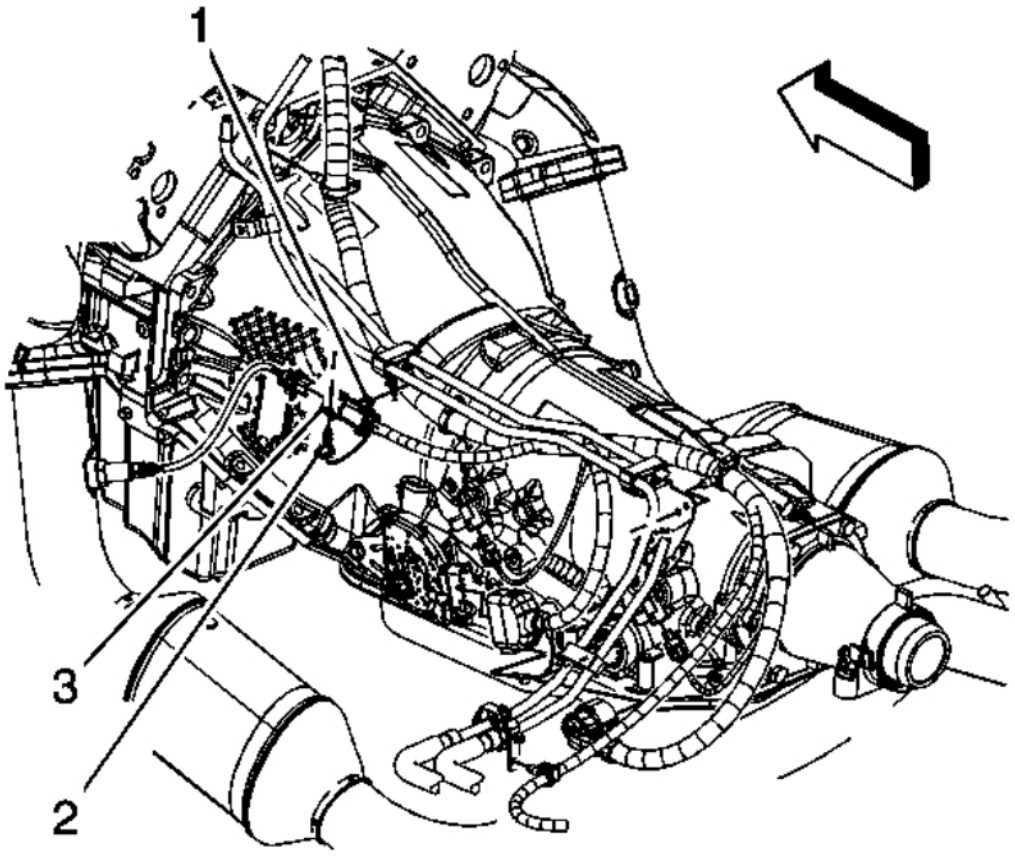


Fig. 56: View Of Left Front CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

4. Remove the left front connector position assurance (CPA) retainer (2).
5. Disconnect the left front heated oxygen sensor (HO2S) electrical connector (2) from the engine wiring harness electrical connector (3).

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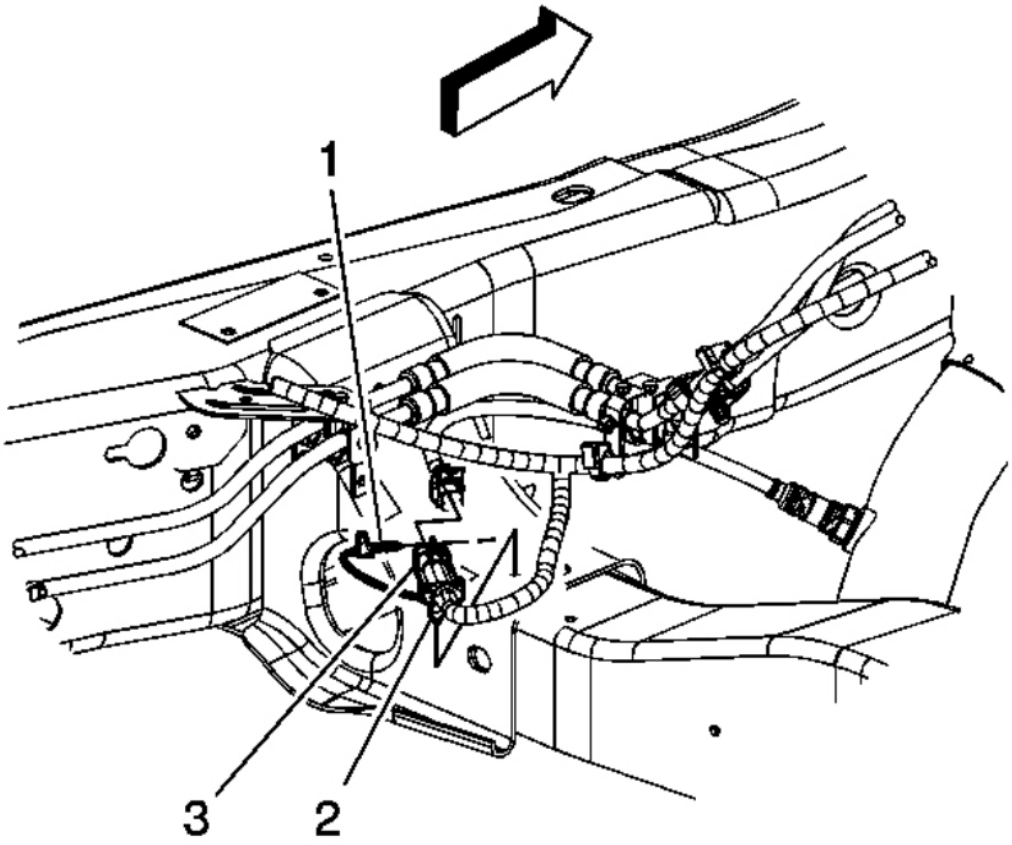


Fig. 57: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

6. Remove the left rear CPA retainer (1).
7. Disconnect the left rear HO2S electrical connector from the engine wiring harness electrical connector (3).

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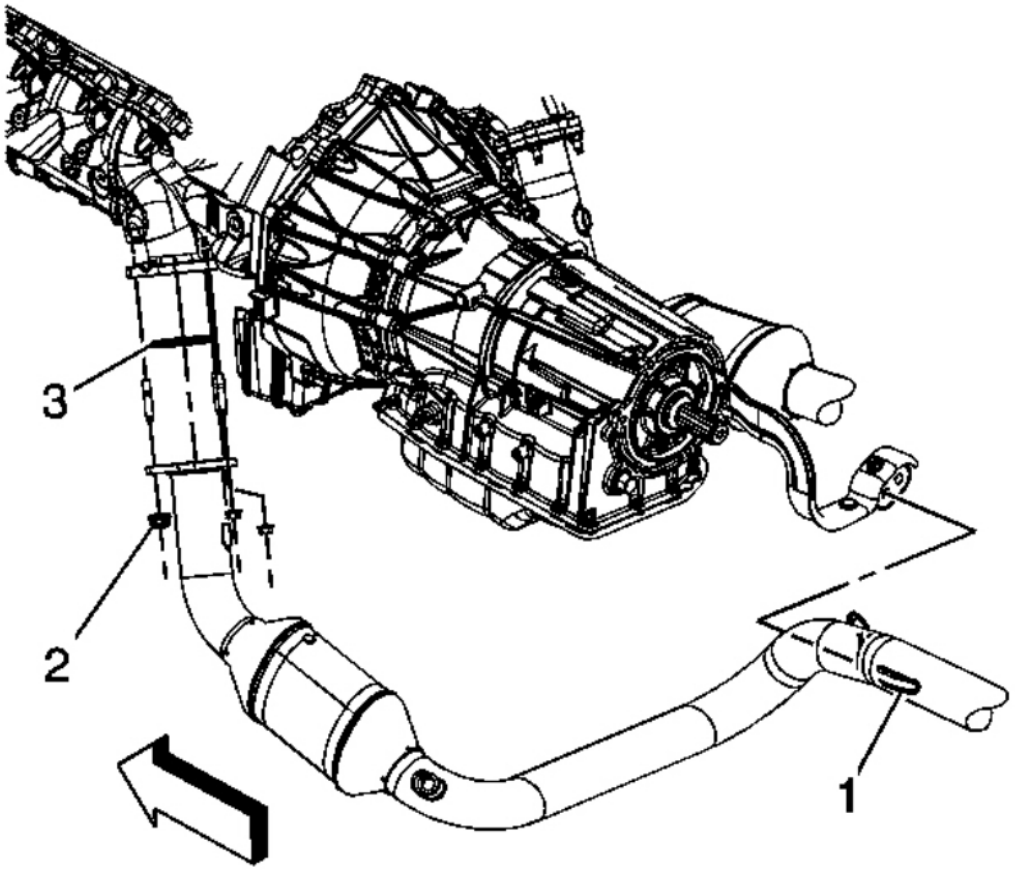


Fig. 58: View Of Catalytic Converter Hanger, Exhaust Manifold Nuts & Exhaust Seal
Courtesy of GENERAL MOTORS CORP.

8. Remove the catalytic converter to exhaust manifold nuts (2).
9. Separate the catalytic converter from the exhaust manifold studs.
10. Slide the catalytic converter hanger (1) out from the hanger bracket.
11. If replacing the catalytic converter perform the following steps, otherwise proceed to step 4 in the installation procedure.
12. Remove the exhaust seal (3) as required.

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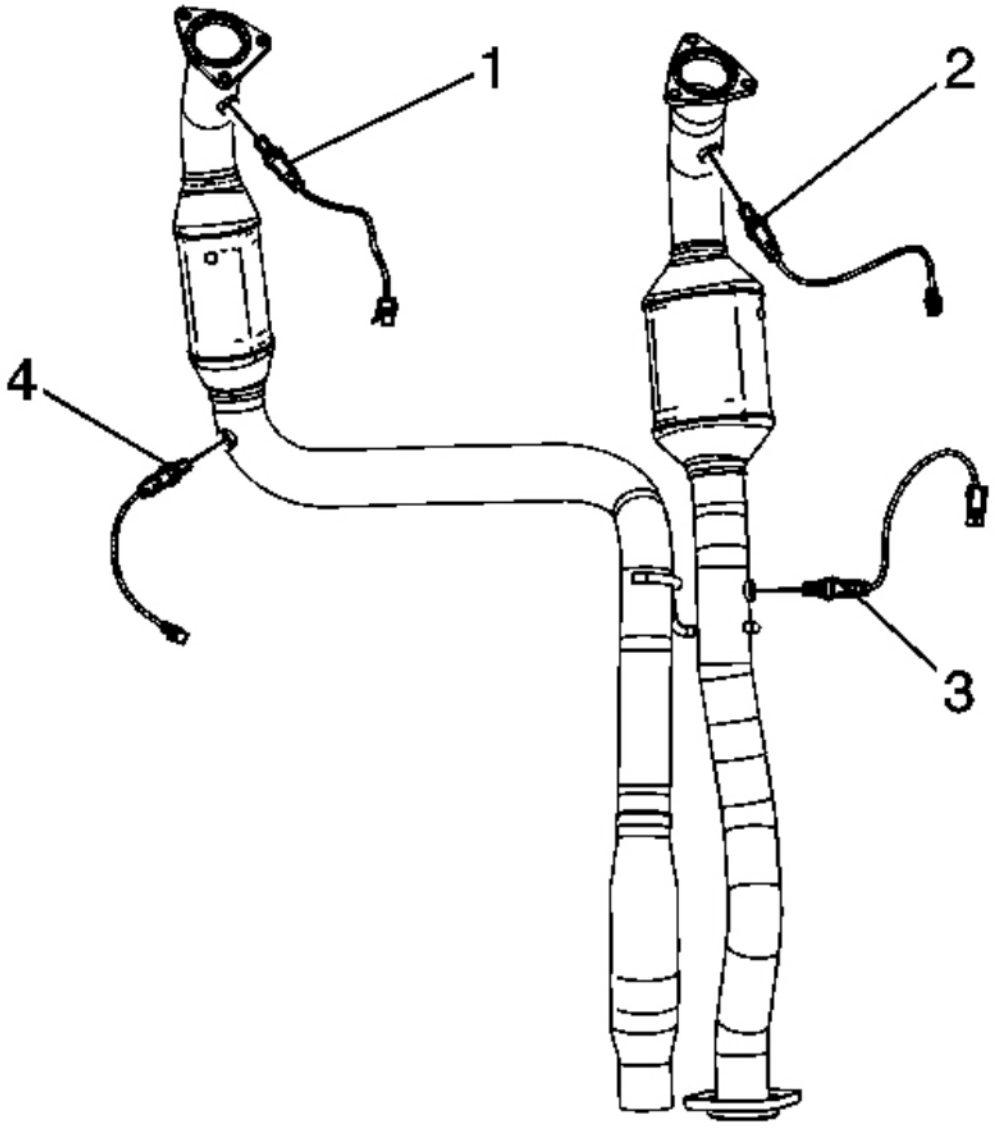


Fig. 59: View Of Catalytic Converter Assembly HO2S's
Courtesy of GENERAL MOTORS CORP.

13. Remove the HO2S's (1 and 4).

Installation Procedure

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IMPORTANT: A special anti-seize compound is used on the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from as exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before the reinstallation.

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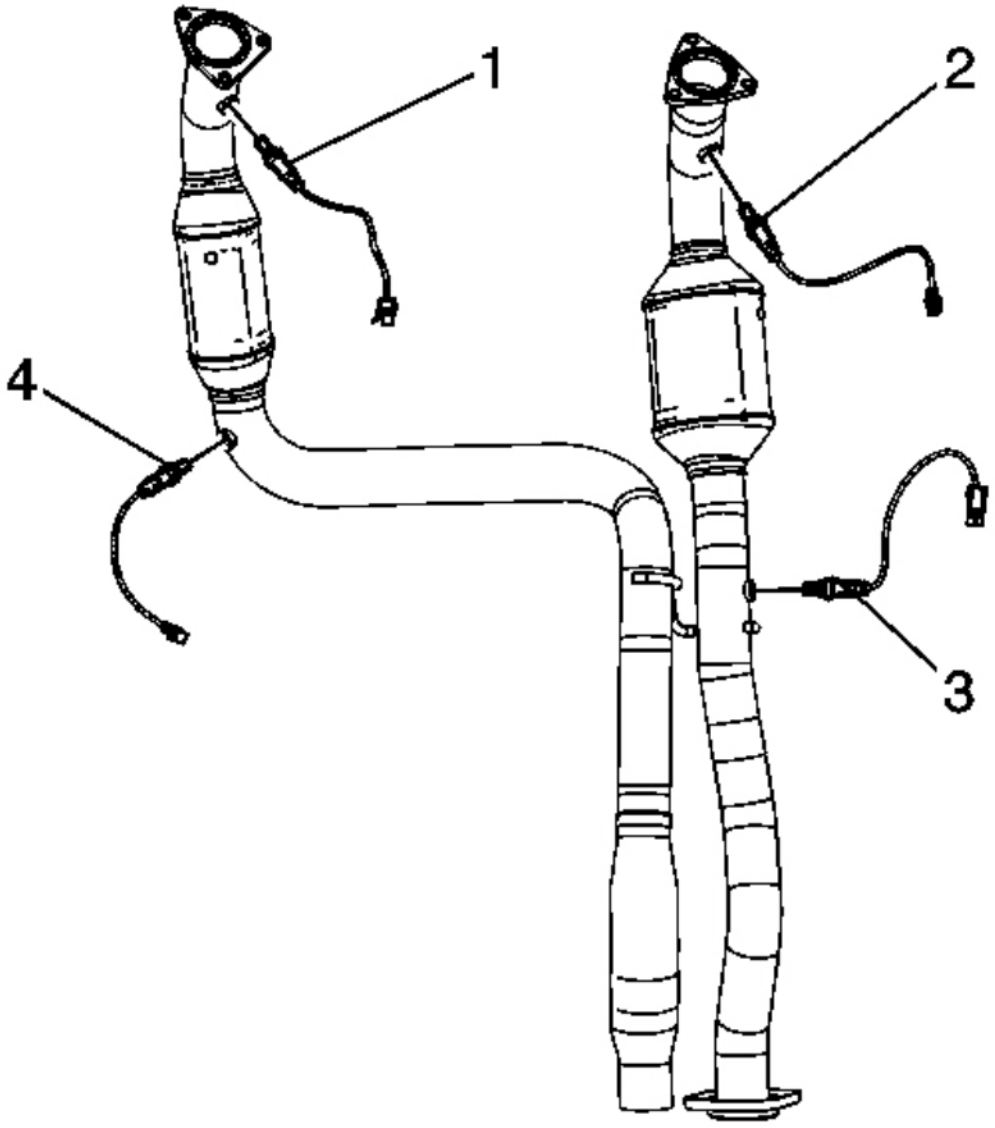


Fig. 60: View Of Catalytic Converter Assembly HO2S's
Courtesy of GENERAL MOTORS CORP.

1. If replacing the catalytic converter assembly, perform the following steps, otherwise proceed to step 4.
2. If reinstalling the old sensors, coat the threads with anti-seize compound GM P/N 12377953, or equivalent.

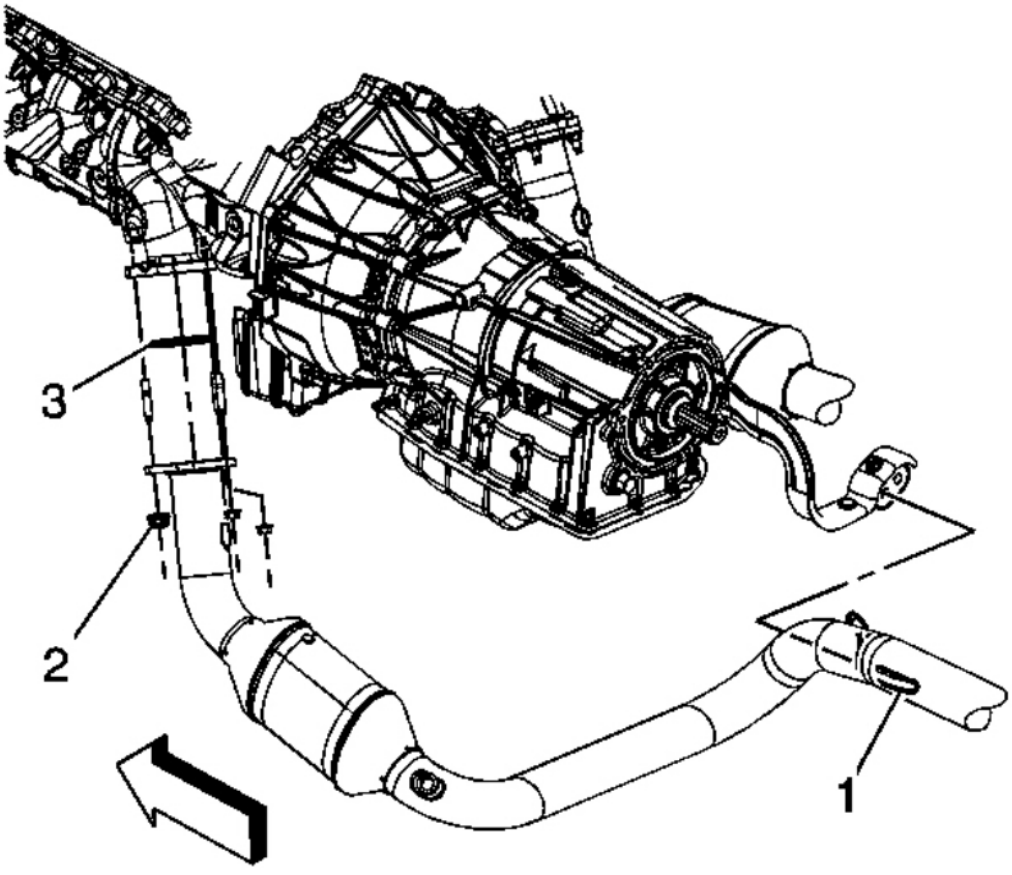
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NOTE: **Replacement components must be the correct part number for the application. Components requiring the use of the thread locking compound, lubricants, corrosion inhibitors, or sealants are identified in the service procedure. Some replacement components may come with these coatings already applied. Do not use these coatings on components unless specified. These coatings can affect the final torque, which may affect the operation of the component. Use the correct torque specification when installing components in order to avoid damage.**

NOTE: **Refer to Fastener Notice .**

3. Install the HO2S's (1 and 4) to the catalytic converter assembly.

   Tighten: Tighten the sensors to 42 N.m (31 lb ft).



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Fig. 61: View Of Catalytic Converter Hanger, Exhaust Manifold Nuts & Exhaust Seal
Courtesy of GENERAL MOTORS CORP.

4. Install the NEW exhaust seal (3) as required.
5. Slide the catalytic converter hanger (1) into the hanger bracket.
6. Install the catalytic converter to the exhaust manifold studs.
7. Install the catalytic converter to exhaust manifold nuts (2).

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

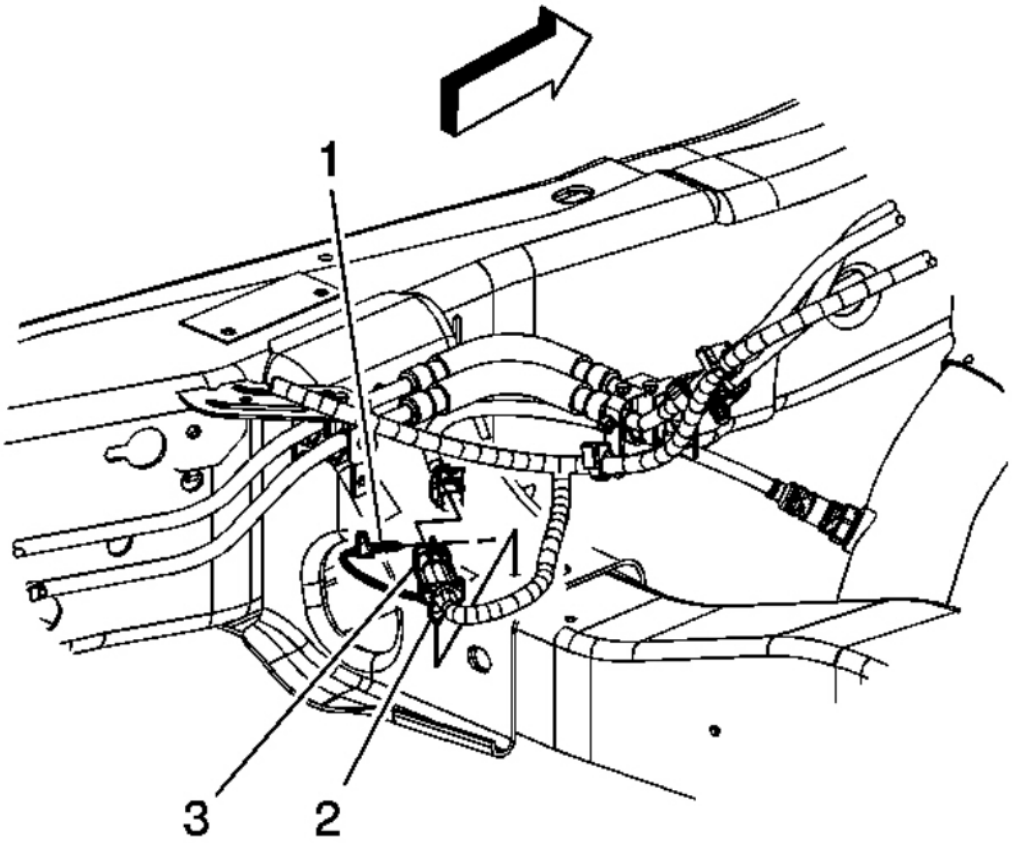


Fig. 62: View Of Left Rear CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

8. Connect the left rear HO2S electrical connector to the engine wiring harness electrical connector (3).
9. Install the left rear CPA retainer (1).

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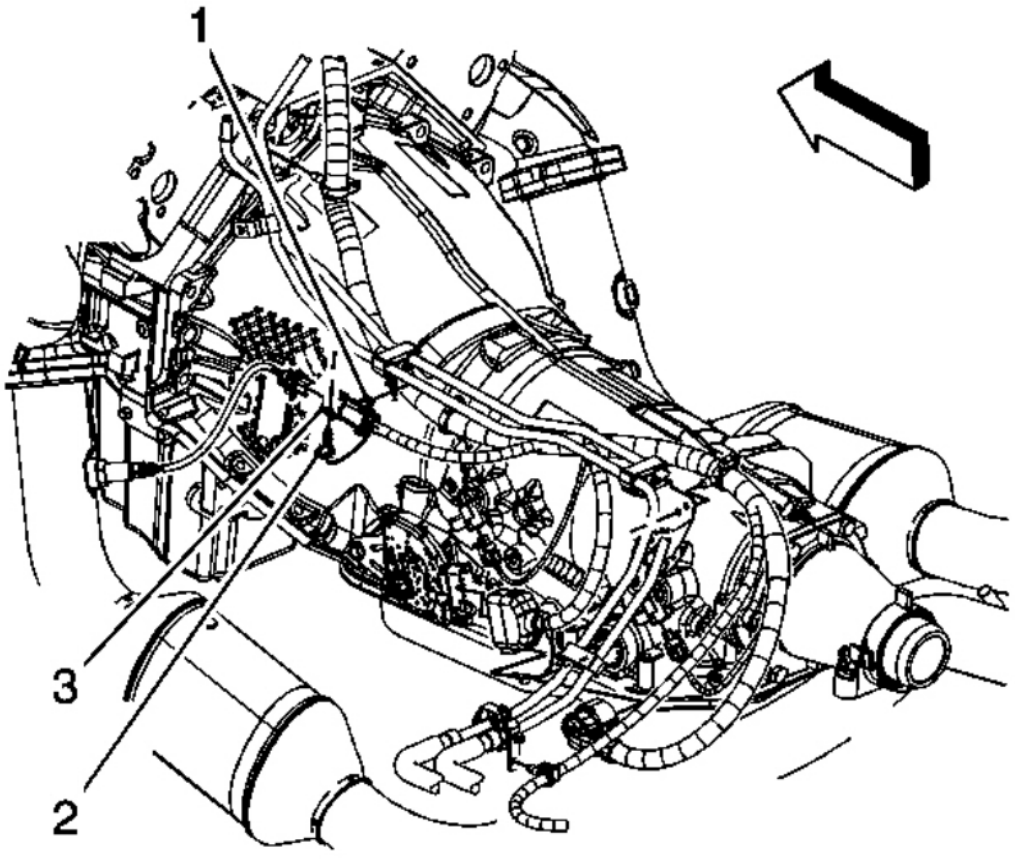


Fig. 63: View Of Left Front CPA Retainer & Engine Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

10. Connect the left front HO2S electrical connector (2) to the engine wiring harness electrical connector (3).
11. Install the left front CPA retainer (2).

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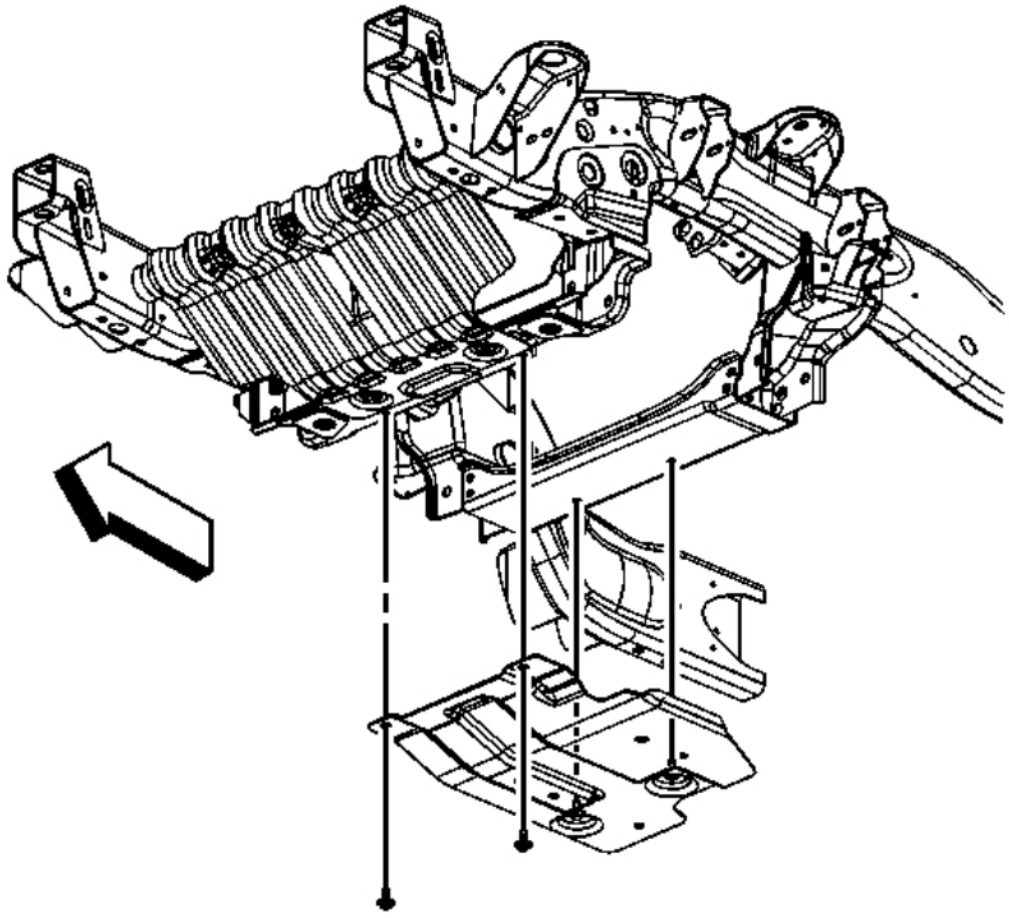


Fig. 64: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

12. Install the muffler. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
13. Position the oil pan skid plate and tighten until snug the 2 rear oil pan skid plate bolts, install the 2 front oil pan skid plate bolts, if equipped.

    Tighten: Tighten the bolts to 28 N.m (21 lb ft).

14. Lower the vehicle.

CATALYTIC CONVERTER REPLACEMENT - RIGHT SIDE (2500 SERIES)

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Removal Procedure

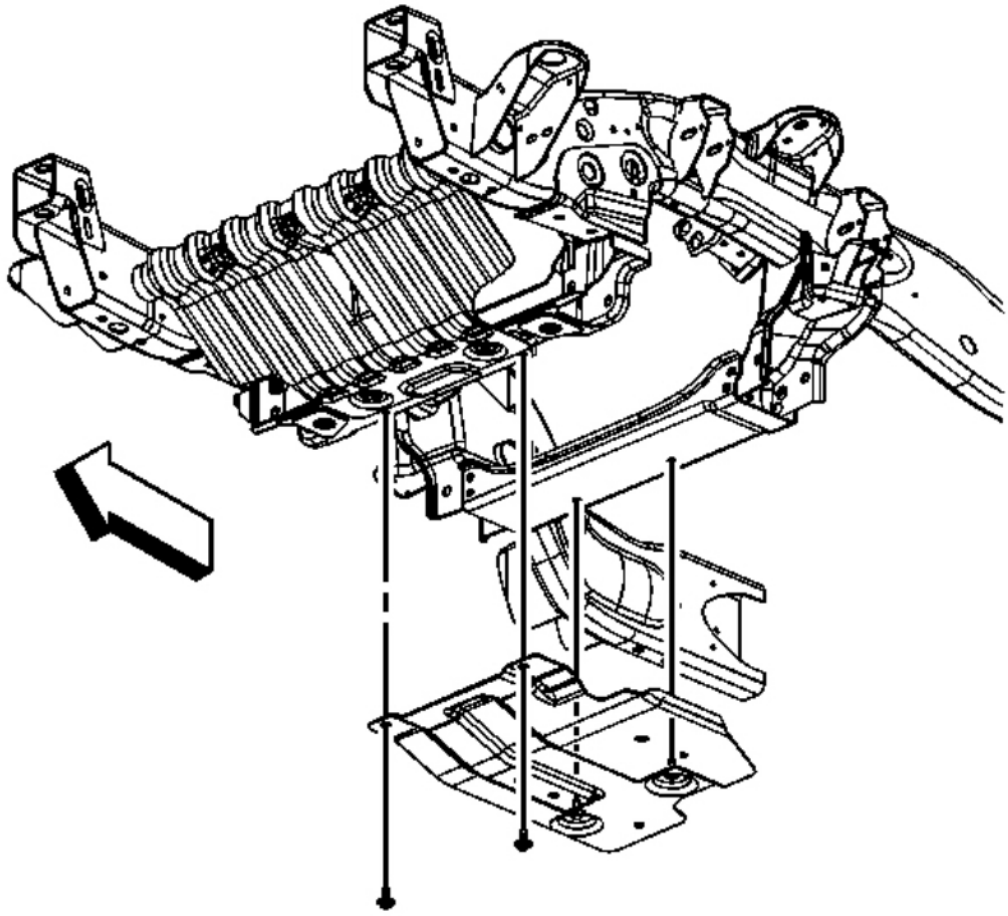


Fig. 65: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Loosen the 2 rear oil pan skid plate bolts, remove the 2 front oil pad skid plate bolts and skid plate, if equipped.
3. Remove the muffler. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
4. Remove the transmission crossmember. Refer to **Crossmember Replacement - Transmission (C1500 Series)** or **Crossmember Replacement - Transmission (C2500 Series)** or **Crossmember Replacement - Transmission (K1500 Series)** or **Crossmember Replacement - Transmission (K2500 series)** .

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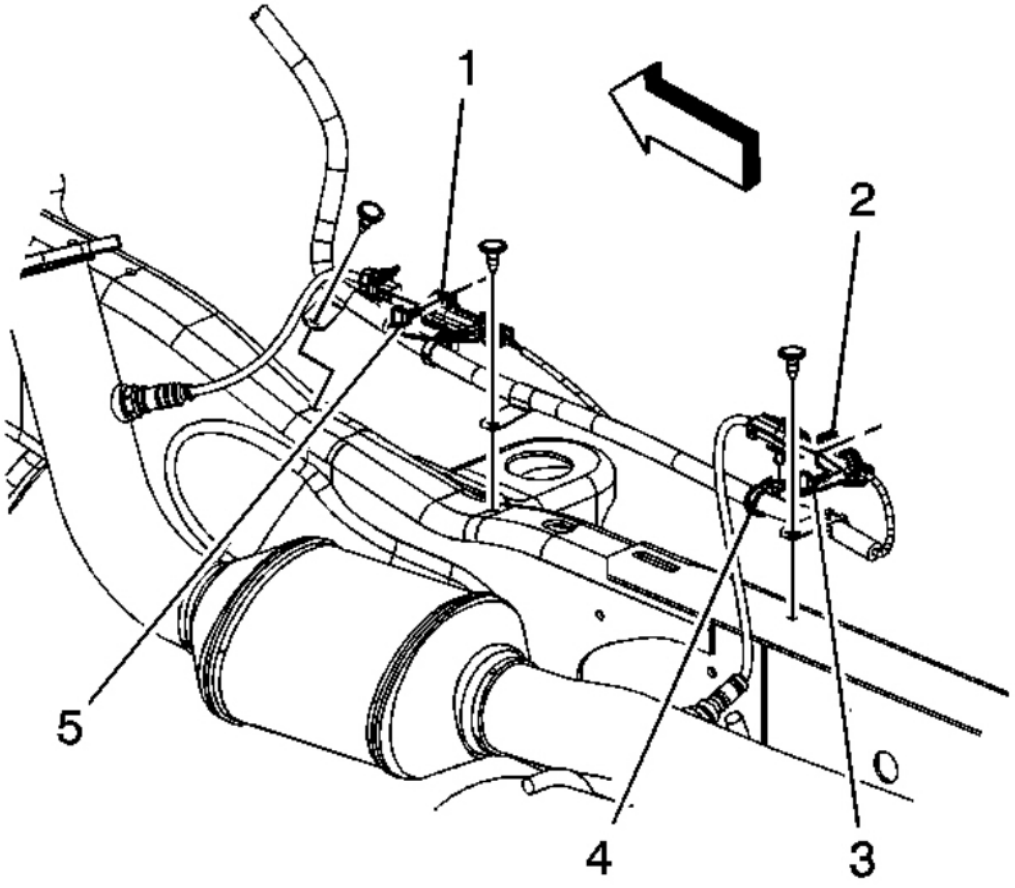


Fig. 66: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clip
Courtesy of GENERAL MOTORS CORP.

5. Remove the right front connector position assurance (CPA) retainer (5).
6. Disconnect the right front heated oxygen sensor (HO2S) electrical connector from the engine wiring harness electrical connector (1).
7. Remove the right rear CPA retainer (3).
8. Disconnect the engine wiring harness electrical connector (2) from the right rear HO2S electrical connector.
9. Remove the right rear HO2S electrical connector clip from the engine harness clip (4).

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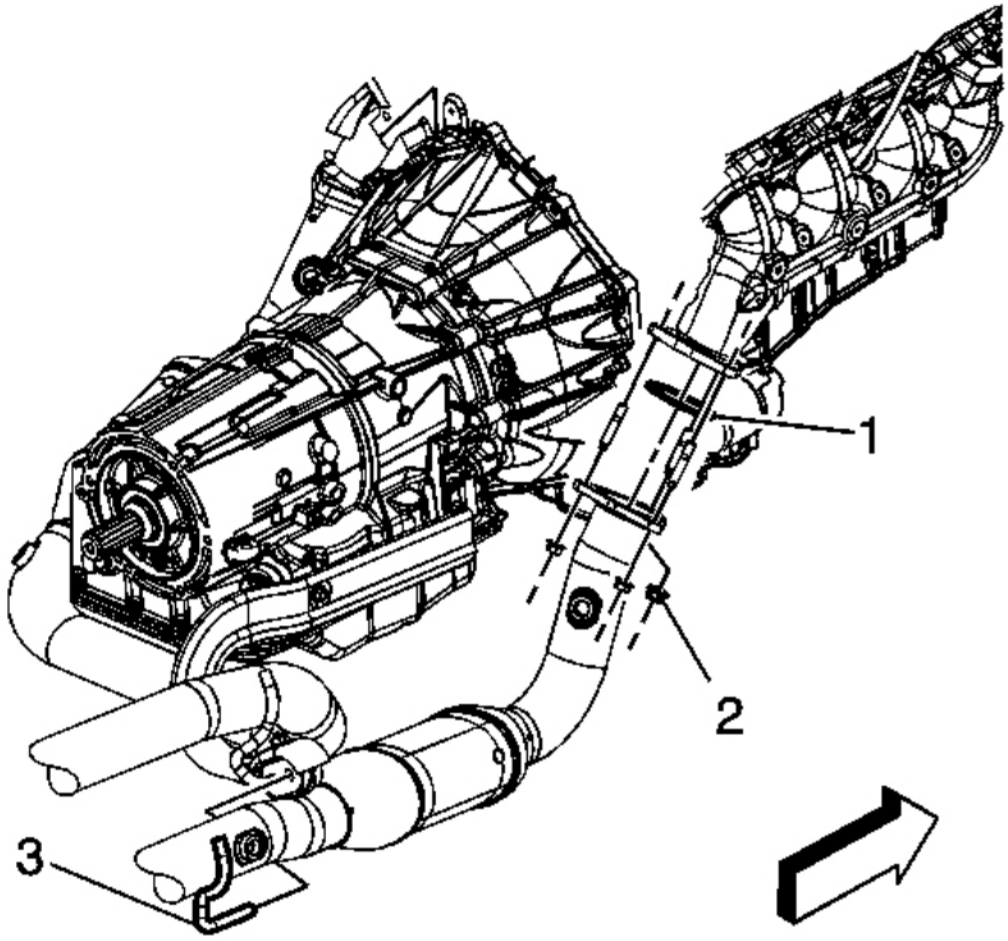


Fig. 67: View Of Exhaust Seal, Exhaust Manifold Nuts & Catalytic Converter Hanger
Courtesy of GENERAL MOTORS CORP.

10. Remove the catalytic converter to exhaust manifold nuts (2).
11. Separate the catalytic converter from the exhaust manifold studs.
12. Slide the catalytic converter hanger (3) out from the hanger bracket.
13. If replacing the catalytic converter perform the following steps, otherwise proceed to step 4 in the installation procedure.
14. Remove the exhaust seal (1) as required.

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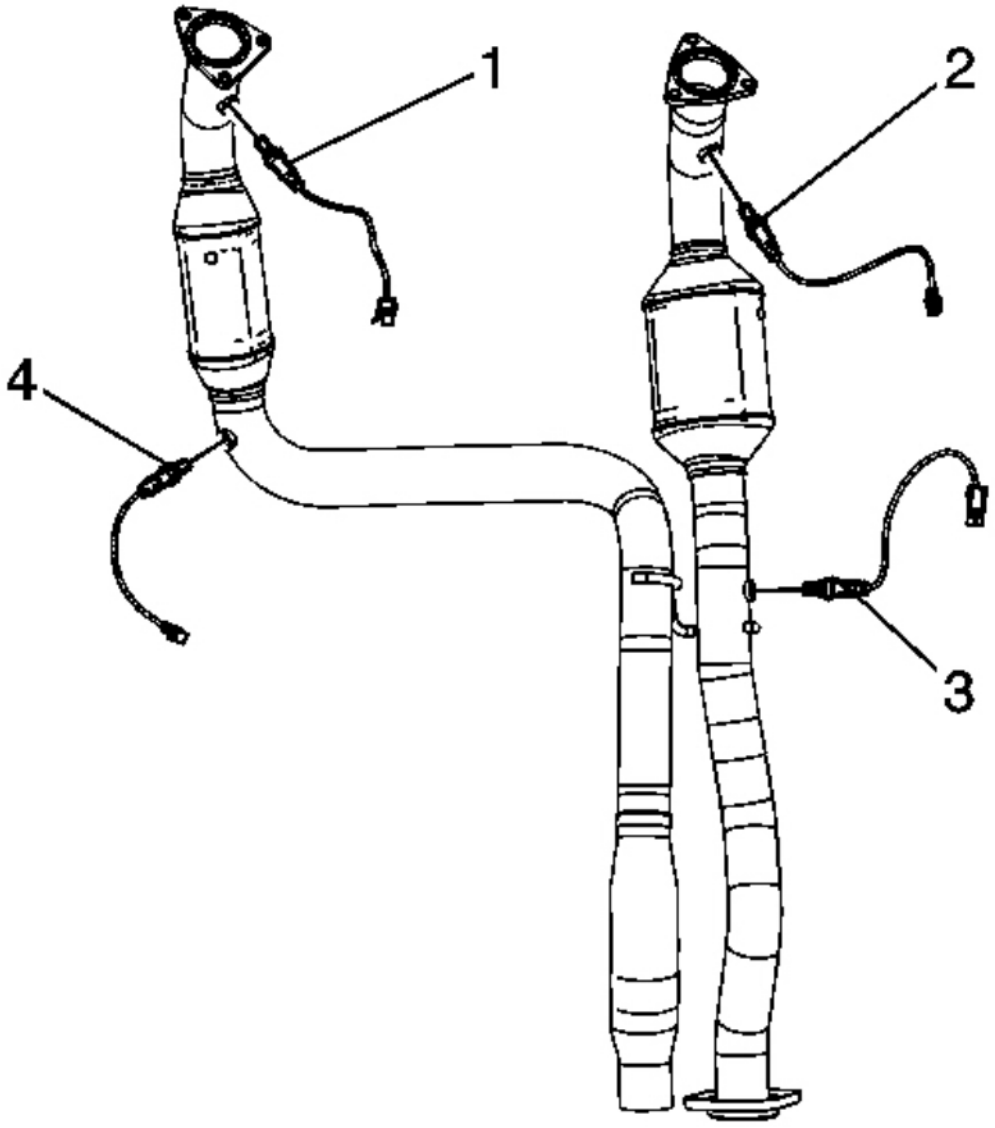


Fig. 68: View Of Catalytic Converter Assembly HO2S's
Courtesy of GENERAL MOTORS CORP.

15. Remove the HO2S's (2 and 3).

Installation Procedure

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IMPORTANT: A special anti-seize compound is used on the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from as exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before the reinstallation.

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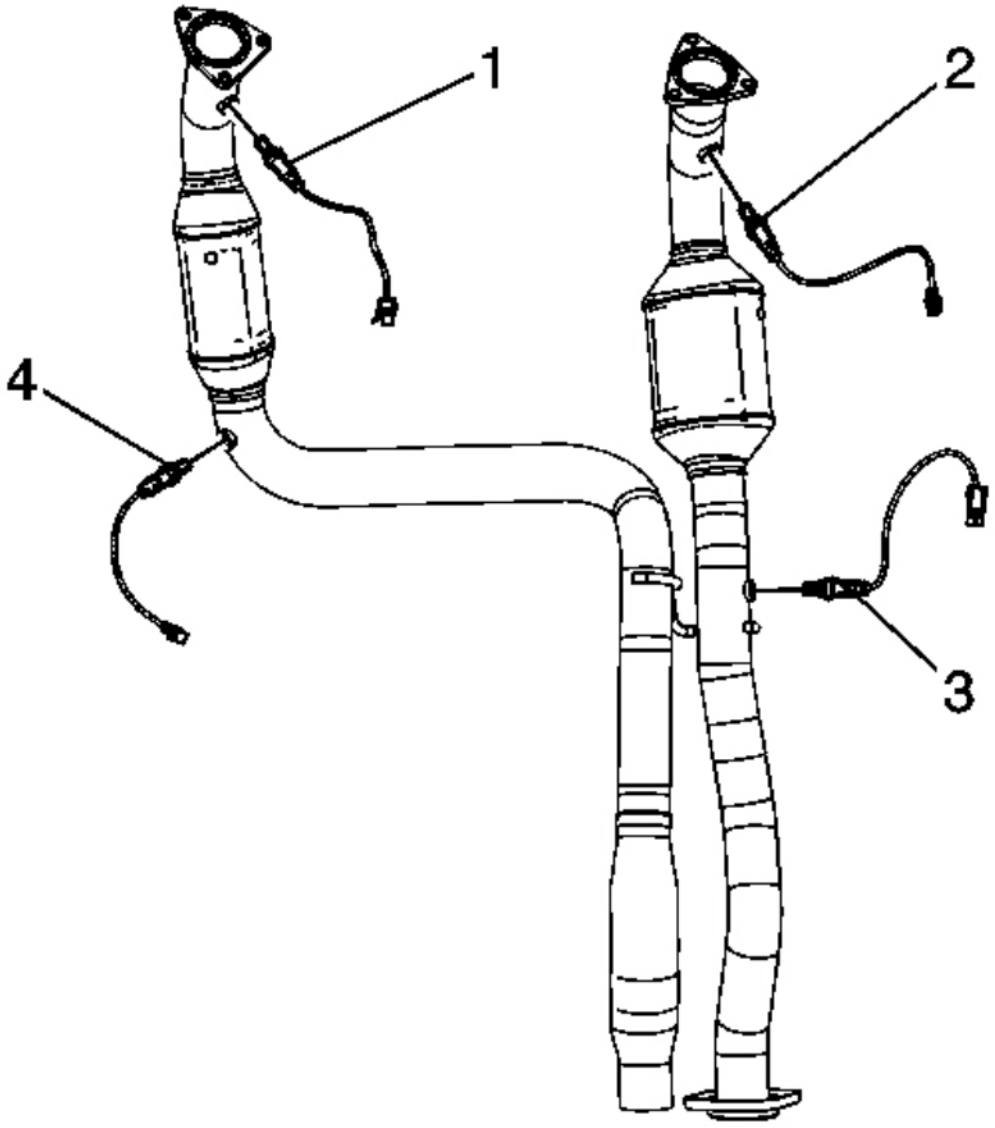


Fig. 69: View Of Catalytic Converter Assembly HO2S's
Courtesy of GENERAL MOTORS CORP.

1. If replacing the catalytic converter assembly, perform the following steps, otherwise proceed to step 4.
2. If reinstalling the old sensors, coat the threads with anti-seize compound GM P/N 12377953, or equivalent.

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NOTE: **Replacement components must be the correct part number for the application. Components requiring the use of the thread locking compound, lubricants, corrosion inhibitors, or sealants are identified in the service procedure. Some replacement components may come with these coatings already applied. Do not use these coatings on components unless specified. These coatings can affect the final torque, which may affect the operation of the component. Use the correct torque specification when installing components in order to avoid damage.**

NOTE: **Refer to Fastener Notice .**

3. Install the HO2S's (2 and 3) to the catalytic converter assembly.

   Tighten: Tighten the sensors to 42 N.m (31 lb ft).

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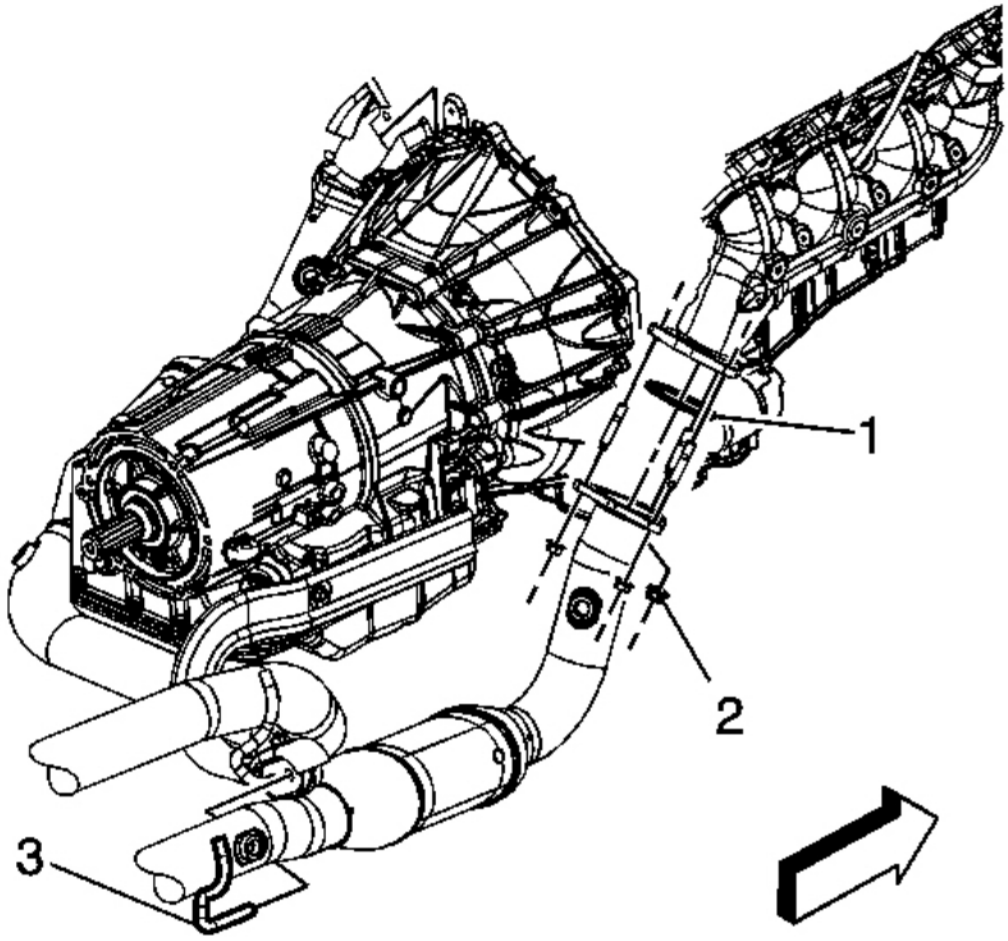


Fig. 70: View Of Exhaust Seal, Exhaust Manifold Nuts & Catalytic Converter Hanger
Courtesy of GENERAL MOTORS CORP.

4. Install the NEW exhaust seal (1) as required.
5. Slide the catalytic converter hanger (3) into the hanger bracket.
6. Install the catalytic converter to the exhaust manifold studs.
7. Install the catalytic converter to exhaust manifold nuts (2).

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

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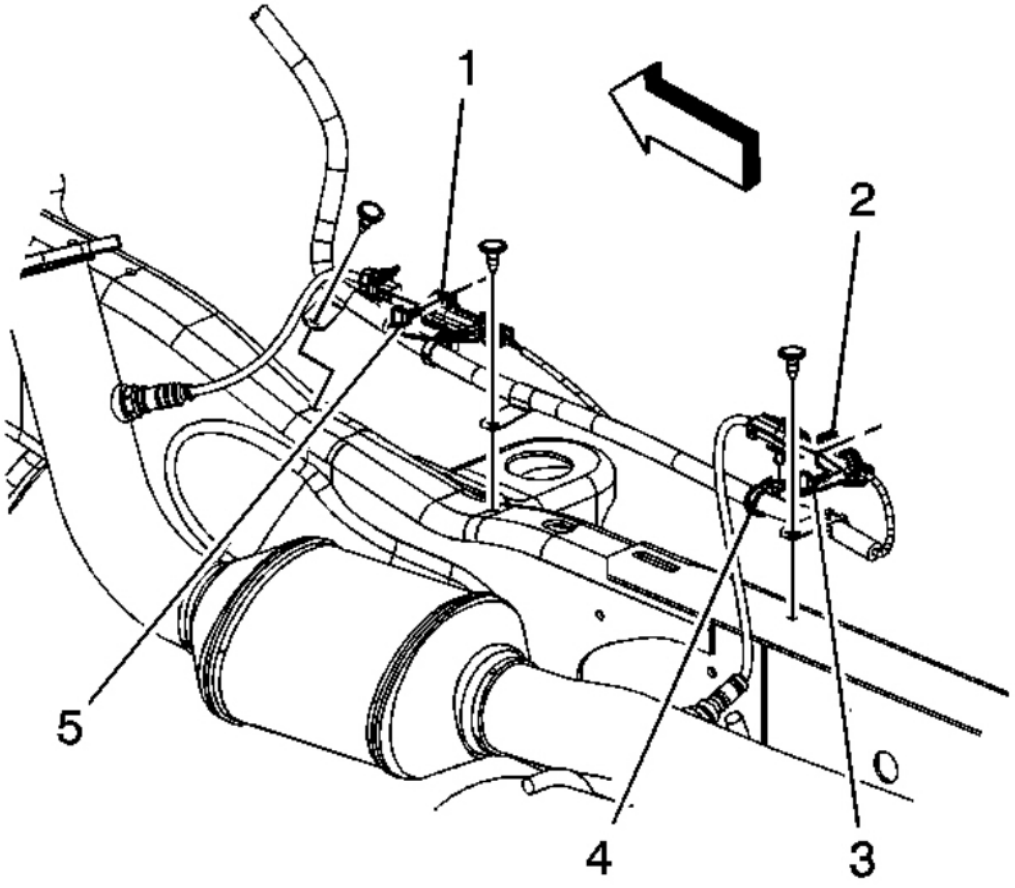


Fig. 71: View Of Engine Wiring Harness Electrical Connectors, (CPA) Retainers & Engine Harness Clip
Courtesy of GENERAL MOTORS CORP.

8. Install the right rear HO2S electrical connector clip to the engine harness clip (4).
9. Connect the engine wiring harness electrical connector (2) to the right rear HO2S electrical connector.
10. Install the right rear CPA retainer (3).
11. Connect the right front HO2S electrical connector to the engine wiring harness electrical connector (1).
12. Install the right front CPA retainer (5).
13. Install the muffler. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.

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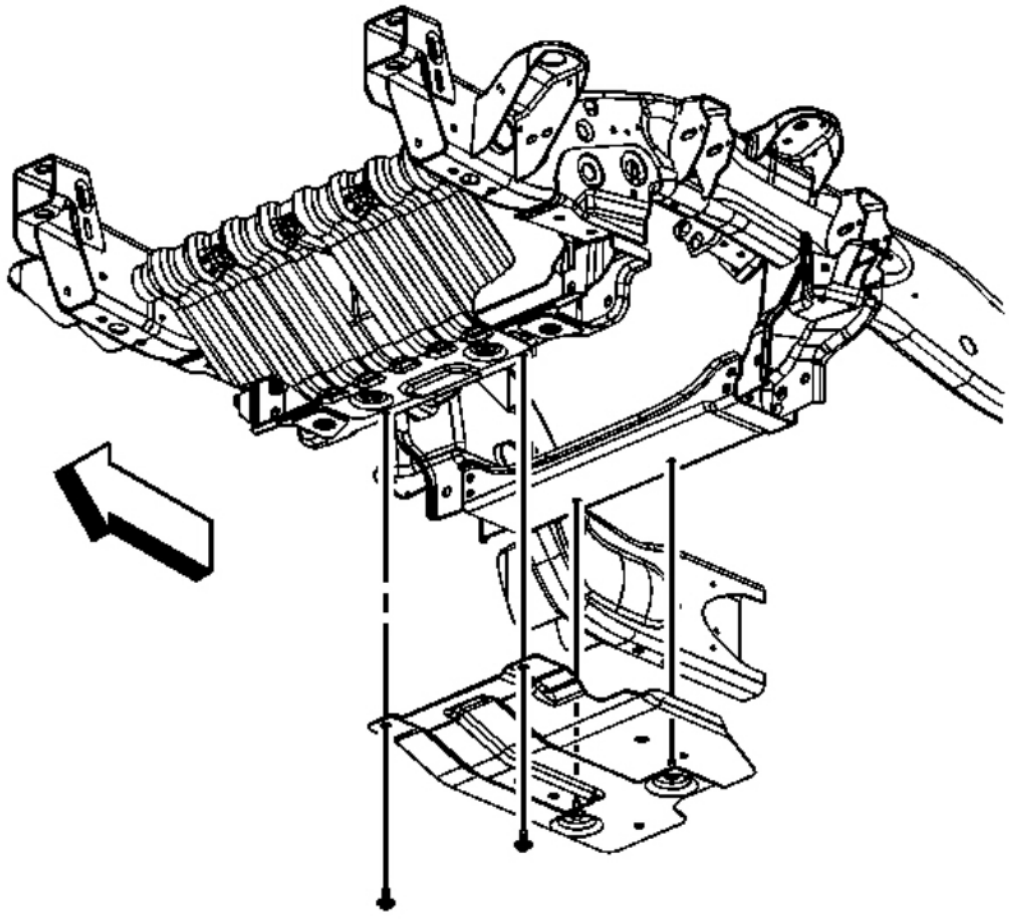


Fig. 72: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

14. Install the transmission crossmember. Refer to **Crossmember Replacement - Transmission (C1500 Series)** or **Crossmember Replacement - Transmission (C2500 Series)** or **Crossmember Replacement - Transmission (K1500 Series)** or **Crossmember Replacement - Transmission (K2500 series)** .
15. Position the oil pan skid plate and tighten until snug the 2 rear oil pan skid plate bolts, install the 2 front oil pan skid plate bolts, if equipped.

    Tighten: Tighten the bolts to 28 N.m (21 lb ft).

16. Lower the vehicle.

EXHAUST HANGER MOUNTING BRACKET REPLACEMENT

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Removal Procedure

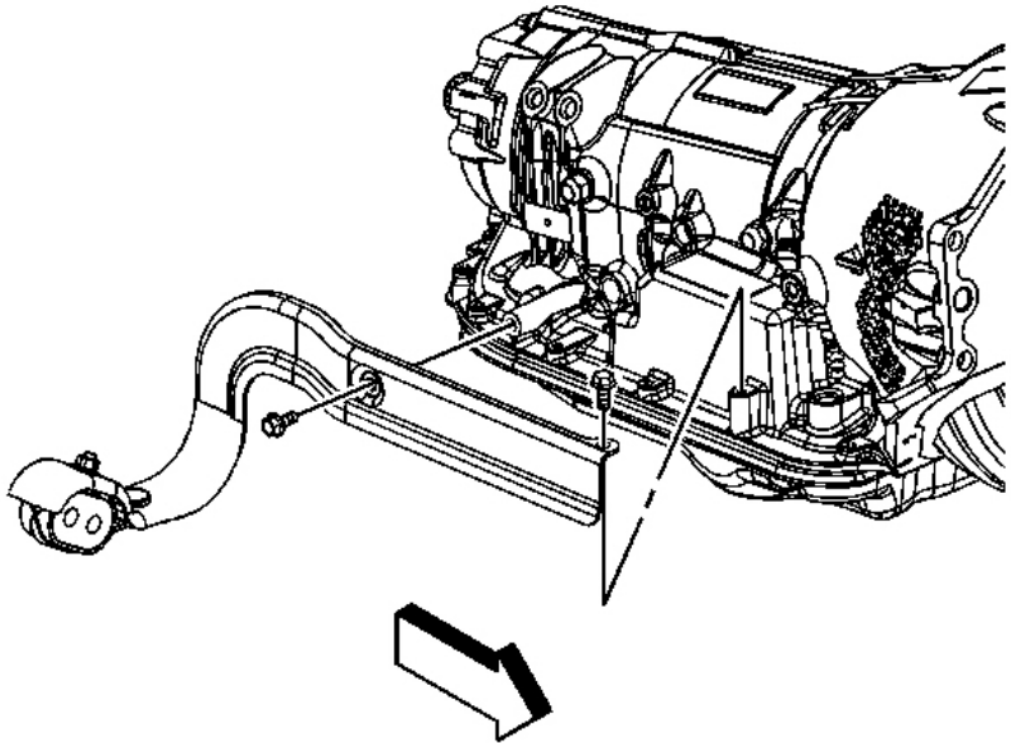


Fig. 73: View Of Exhaust Pipe Hanger Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the left and right catalytic converters. Refer to **Catalytic Converter Replacement - Left Side (2500 Series)** and **Catalytic Converter Replacement - Right Side (2500 Series)**.
2. Remove the exhaust pipe hanger bracket bolts and hanger.

Installation Procedure

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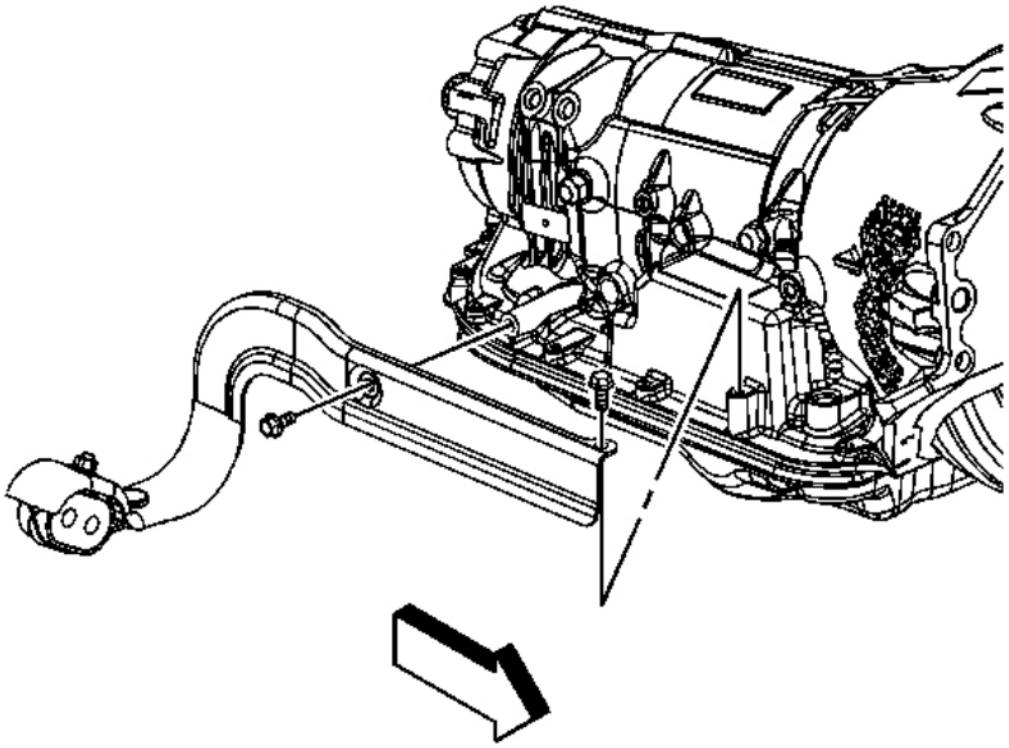


Fig. 74: View Of Exhaust Pipe Hanger Bracket & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Position the exhaust pipe hanger bracket to the transmission.

NOTE: **Refer to Fastener Notice .**

2. Install the exhaust pipe hanger bracket bolts.

Tighten: Tighten the bolts to 25 N.m (18 lb ft).

3. Install the left and right catalytic converters. Refer to **Catalytic Converter Replacement - Left Side (2500 Series)** and **Catalytic Converter Replacement - Right Side (2500 Series)**.

MUFFLER REPLACEMENT (1500 - W/RPO L92)

Tools Required

J 38185 Hose Clamp Pliers

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Removal Procedure

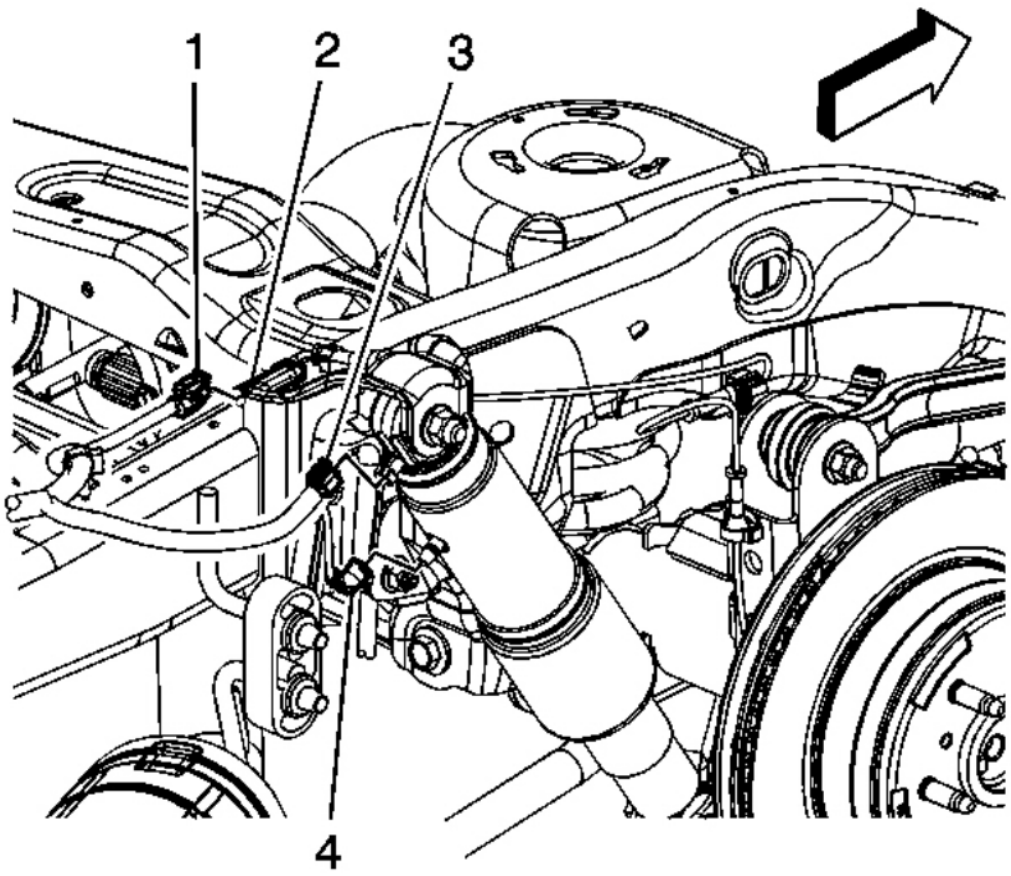


Fig. 75: View Of Chassis Wiring Harness Electrical Connectors & Right Rear Wheel Speed Sensor Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Remove the right rear wheel and tire. Refer to **Tire and Wheel Removal and Installation** .
2. Disconnect the chassis wiring harness electrical connector (1) from the right rear wheel speed sensor wiring harness electrical connector (2).
3. If the vehicle is equipped with regular production option (RPO) Z55, disconnect the chassis wiring harness electrical connector (3) from the right rear shock absorber.
4. If the vehicle is equipped with RPO Z55, disconnect the right rear air line from the shock absorber.
5. Remove the right rear wheel speed sensor wiring harness electrical connector clip from the frame.

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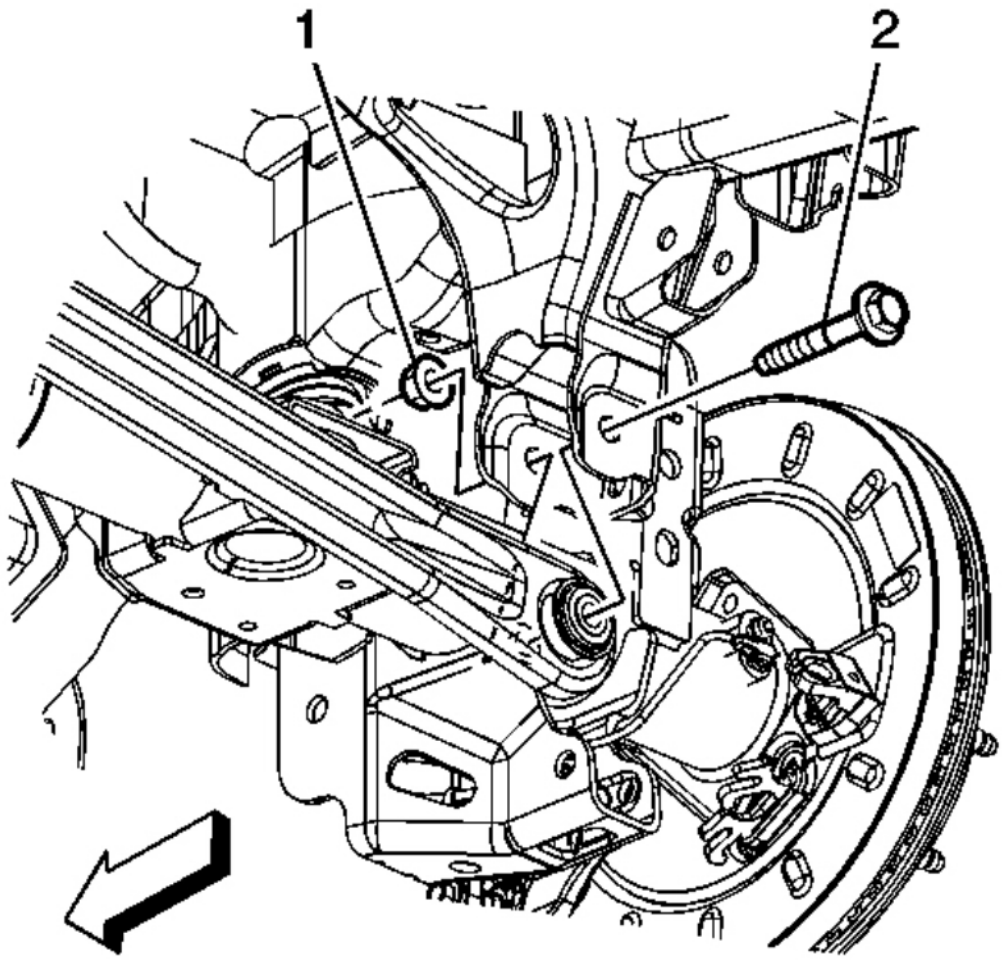


Fig. 76: View Of Right Axle Tie Rod Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The rear axle wiring harness clip is a one way clip with a D-shape section. The clip can only be installed and/or removed in only one direction.

6. Remove the right rear wheel speed sensor wiring harness clips from the frame and the control arm bracket.

IMPORTANT: Do not attempt to pry the rear suspension sensor link rod from the rear position sensor ball stud.

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7. Disconnect the right rear automatic level control sensor link rod from the sensor. Perform the following:
    1. Support the sensor lever with your hand.
    2. Twist the link rod ball in order to separate it from the ball stud.
8. Install a suitable adjustable jack under the rear axle.
9. Remove the right axle tie rod bolt (2) and nut (1).

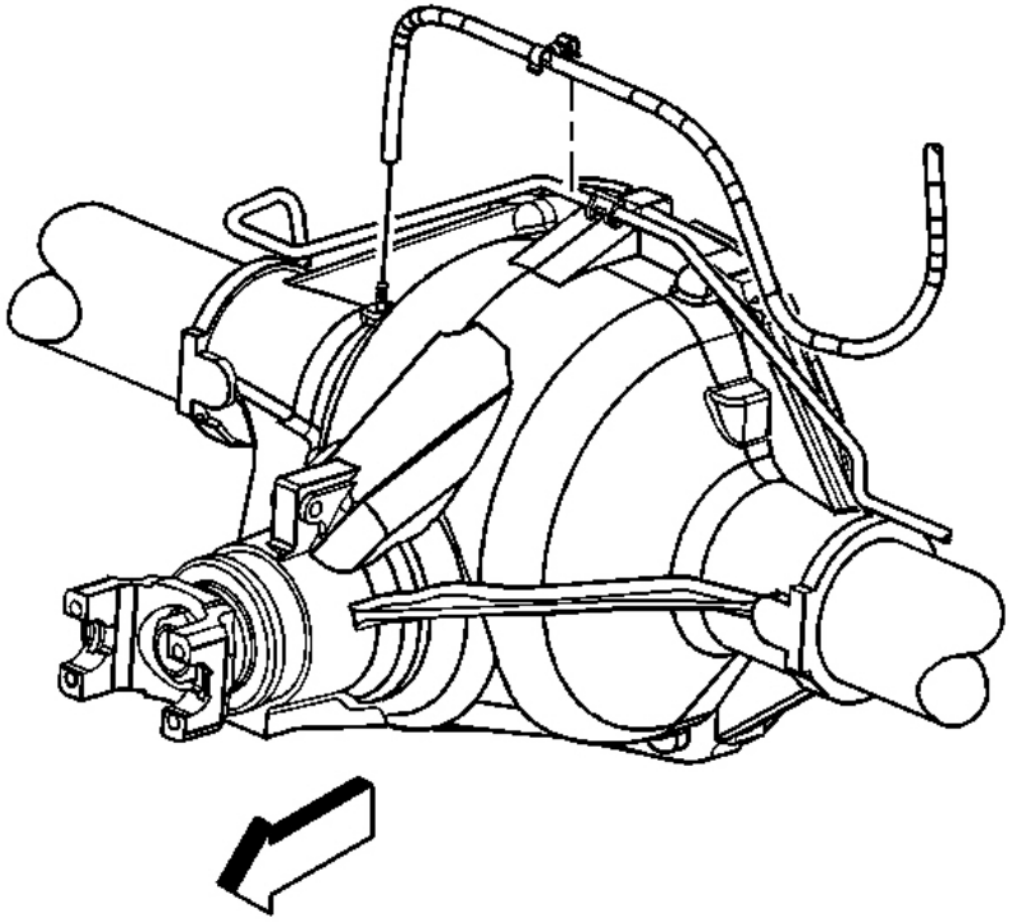


Fig. 77: Rear Axle Vent Hose (8.6 or 9.5 Inch Ring Gear)
Courtesy of GENERAL MOTORS CORP.

10. Remove the rear axle vent hose from the rear axle, if necessary.
11. Remove the vent hose swivel clip from the rear brake crossover pipe, if necessary.
12. Remove the right rear stabilizer shaft link to frame bolt and nut.

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13. Remove the right rear stabilizer shaft link from the frame.
14. Remove the right rear shock absorber lower bolt (4) and nut (3).
15. Lower the right side of the rear axle using the adjustable jack in order to remove the muffler.

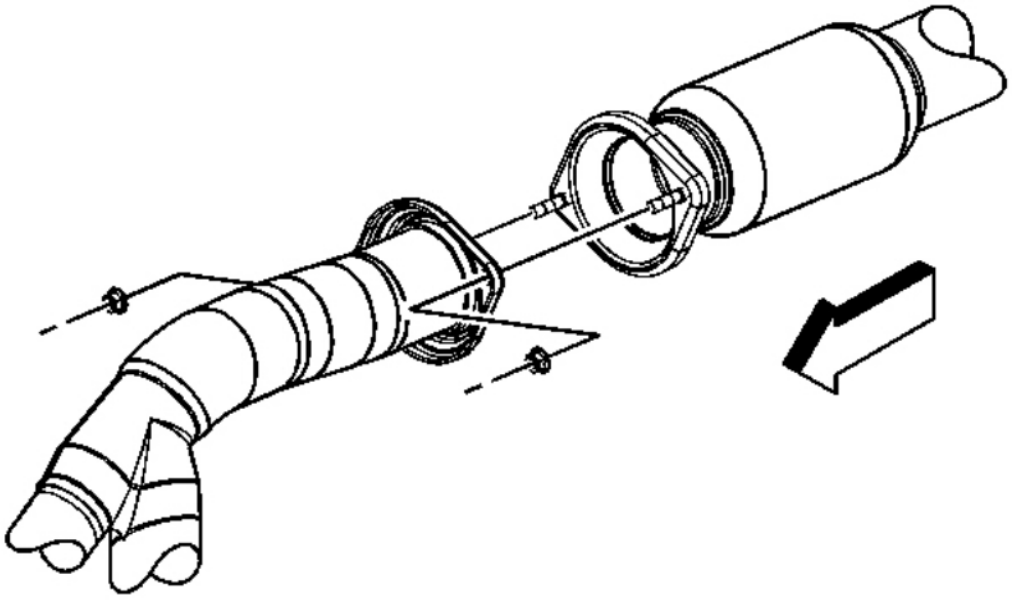


Fig. 78: View Of Catalytic Converter To Muffler Nuts (RPO L92)
Courtesy of GENERAL MOTORS CORP.

16. Remove the muffler to catalytic converter nuts.
17. Separate the hanger.

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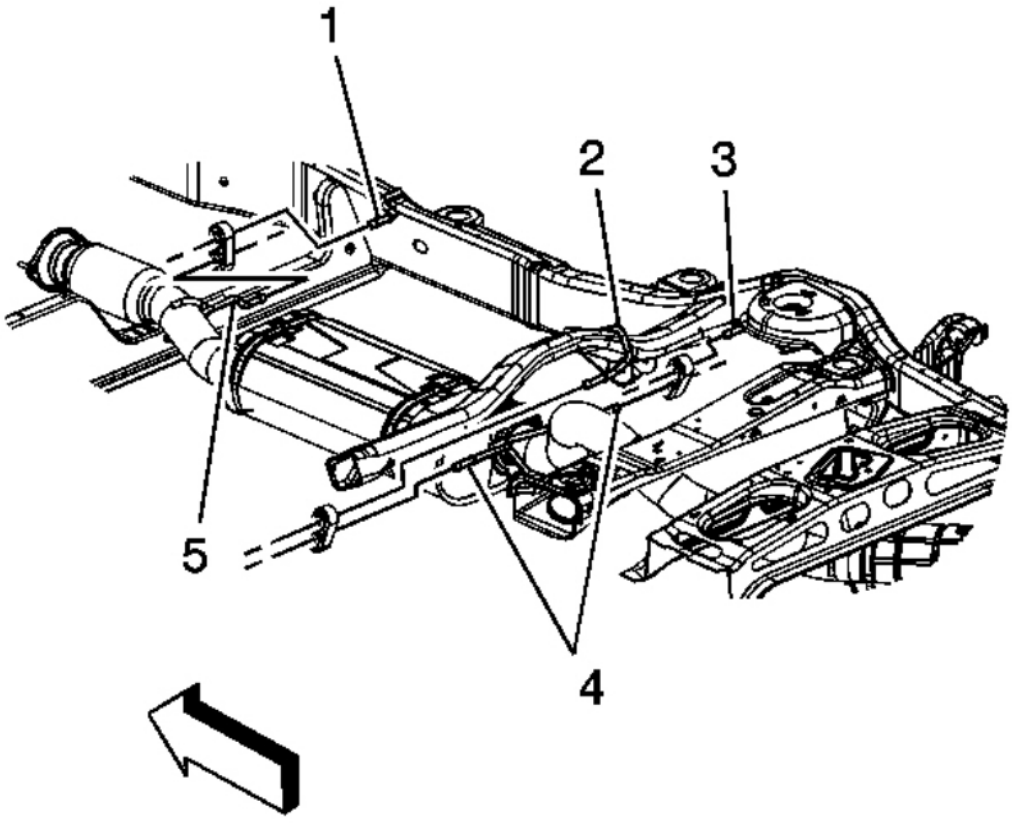


Fig. 79: View Of Muffler Assembly Hangers, Insulators & Exhaust System Hangers
Courtesy of GENERAL MOTORS CORP.

18. If the vehicle is a Yukon Denali or Escalade perform the following steps, otherwise proceed to step 26.
19. Lubricate the insulators where the muffler assembly hangers are inserted in order to ease in removal.
20. With the aid of an assistant, remove the insulators from the exhaust system hangers (4, and 5).

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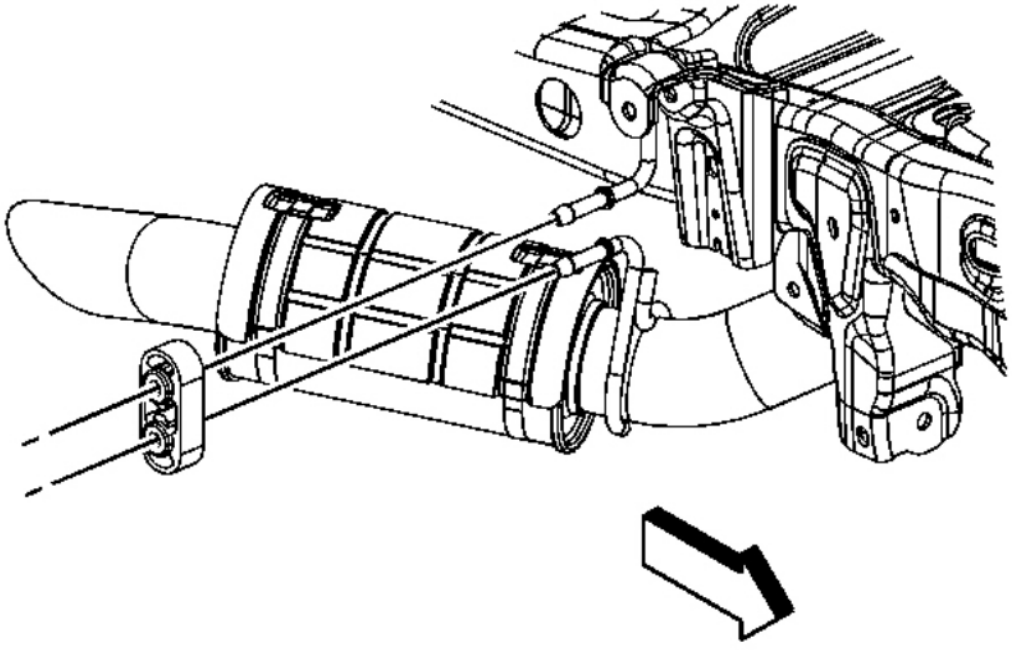


Fig. 80: View Of Exhaust System Hangers & Insulator
Courtesy of GENERAL MOTORS CORP.

21. With the aid of an assistant, remove the insulator from the exhaust system hanger near the resonator.
22. Remove the muffler assembly.

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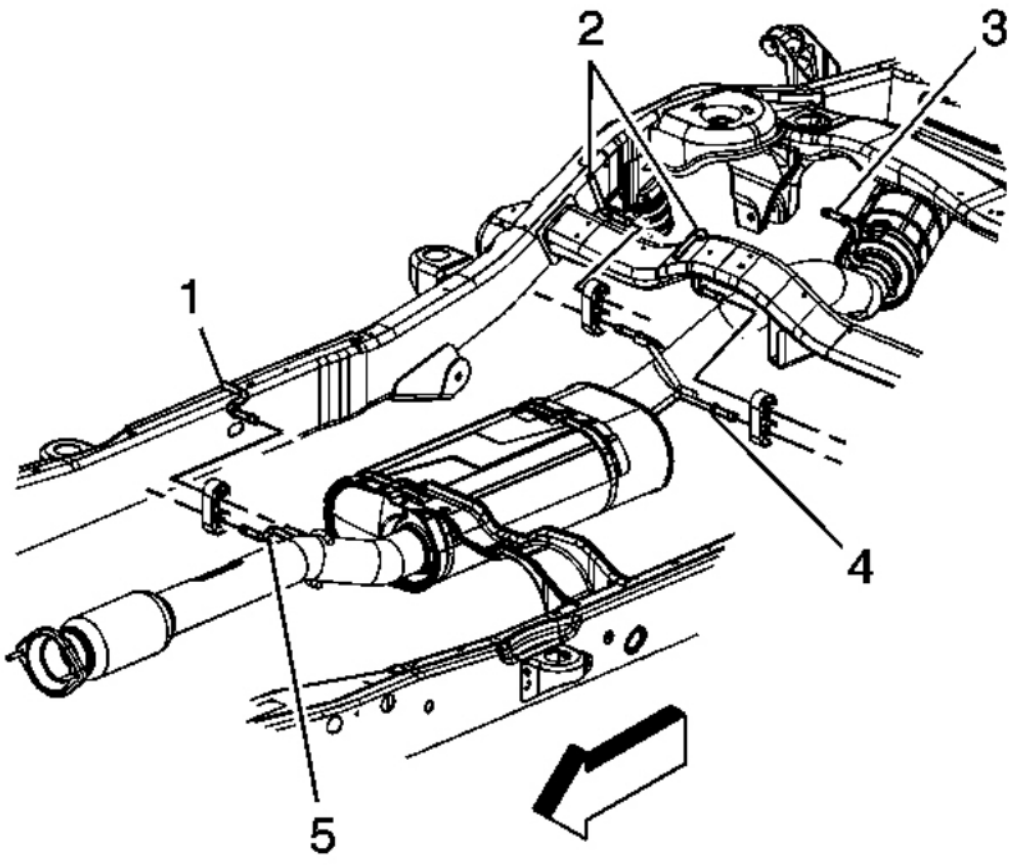


Fig. 81: View Of Exhaust System Hangers & Insulators
Courtesy of GENERAL MOTORS CORP.

23. If the vehicle is a Yukon XL, Yukon Denali XL, Escalade ESV, or Escalade EXT perform the following steps.
24. Lubricate the insulators where the muffler assembly hangers are inserted in order to ease in removal.
25. With the aid of an assistant, remove the insulators from the exhaust system hangers (3, 4, and 5).

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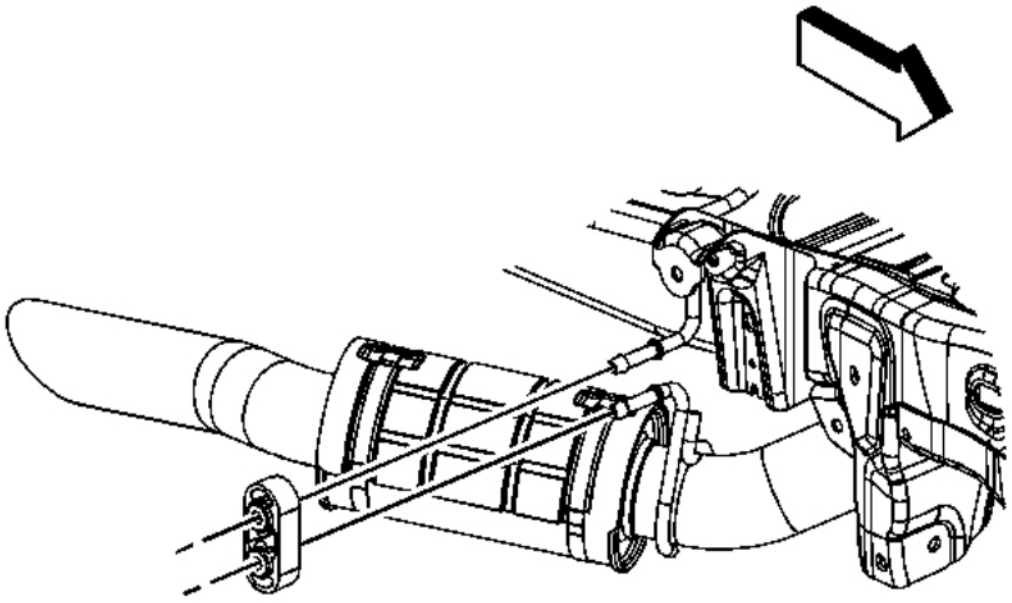


Fig. 82: View Of Exhaust System Hangers & Insulator
Courtesy of GENERAL MOTORS CORP.

26. With the aid of an assistant, remove the insulator from the exhaust system hanger near the resonator.

IMPORTANT: During removal, do not over extend the flex coupler as internal damage may occur.

27. Remove the muffler assembly.

Installation Procedure

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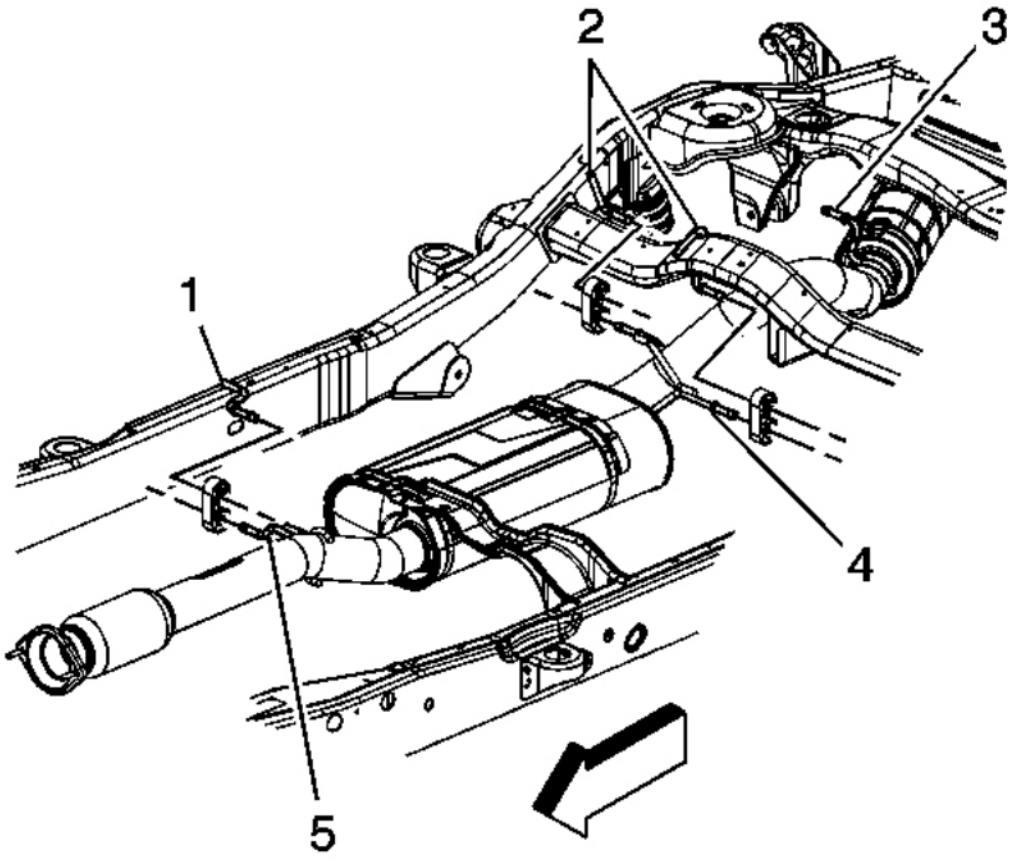


Fig. 83: View Of Exhaust System Hangers & Insulators
Courtesy of GENERAL MOTORS CORP.

1. If the vehicle is a Yukon XL, Yukon Denali XL, Escalade ESV, or Escalade EXT perform the following steps, otherwise proceed to step 6.
2. Lubricate the insulators where the muffler assembly hangers are inserted for ease of installation.

IMPORTANT: During installation, do not over extend the flex coupler as internal damage may occur.

3. With the aid of an assistant, install the muffler assembly.
4. With the aid of an assistant, install the insulators to the exhaust system hangers (3, 4, and 5).

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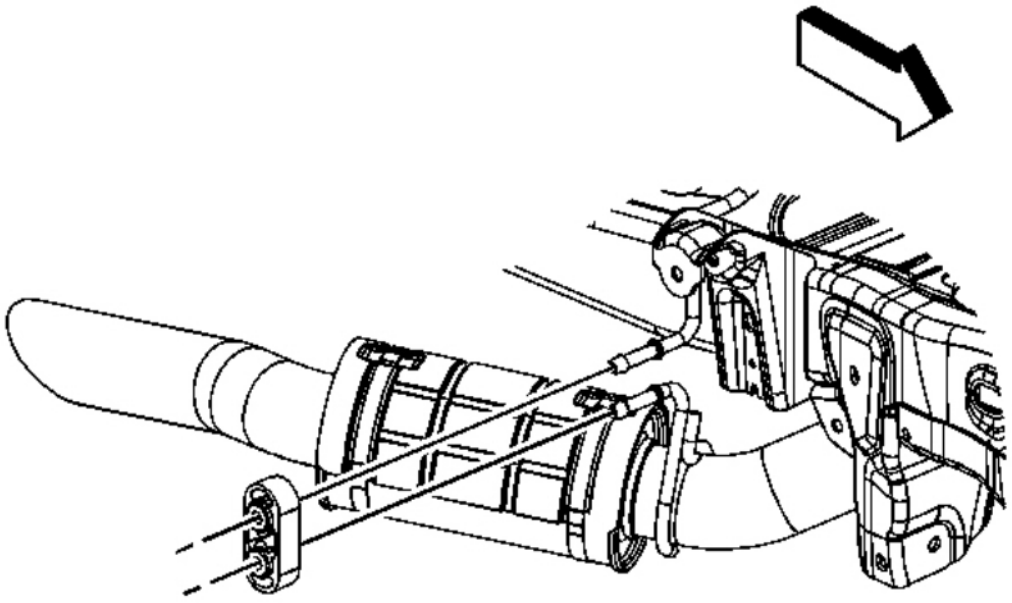


Fig. 84: View Of Exhaust System Hangers & Insulator
Courtesy of GENERAL MOTORS CORP.

5. With the aid of an assistant, Install the insulator to the exhaust system hanger near the resonator.

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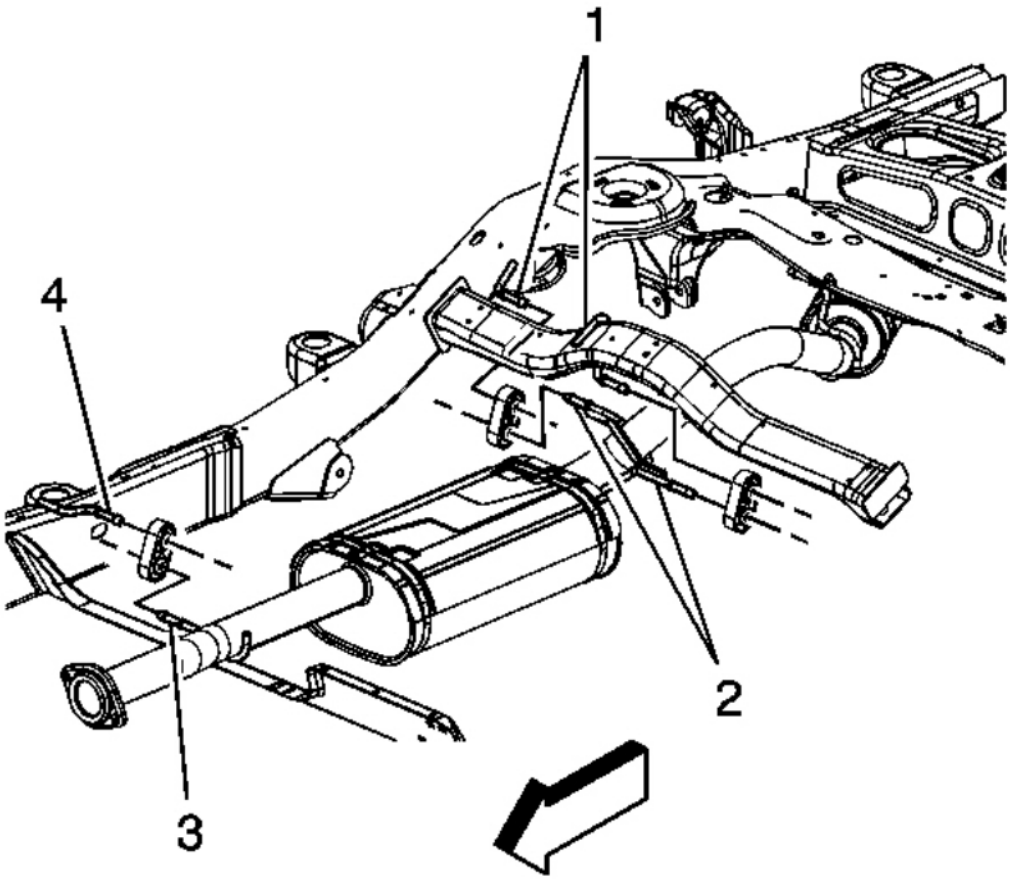


Fig. 85: View Of Exhaust System Hangers & Insulators
Courtesy of GENERAL MOTORS CORP.

6. If the vehicle is a Yukon Denali or Escalade perform the following.
7. Lubricate the insulators where the muffler assembly hangers are inserted for ease of installation.
8. With the aid of an assistant, install the muffler assembly.
9. With the aid of an assistant, install the insulators to the exhaust system hangers (2, and 3).

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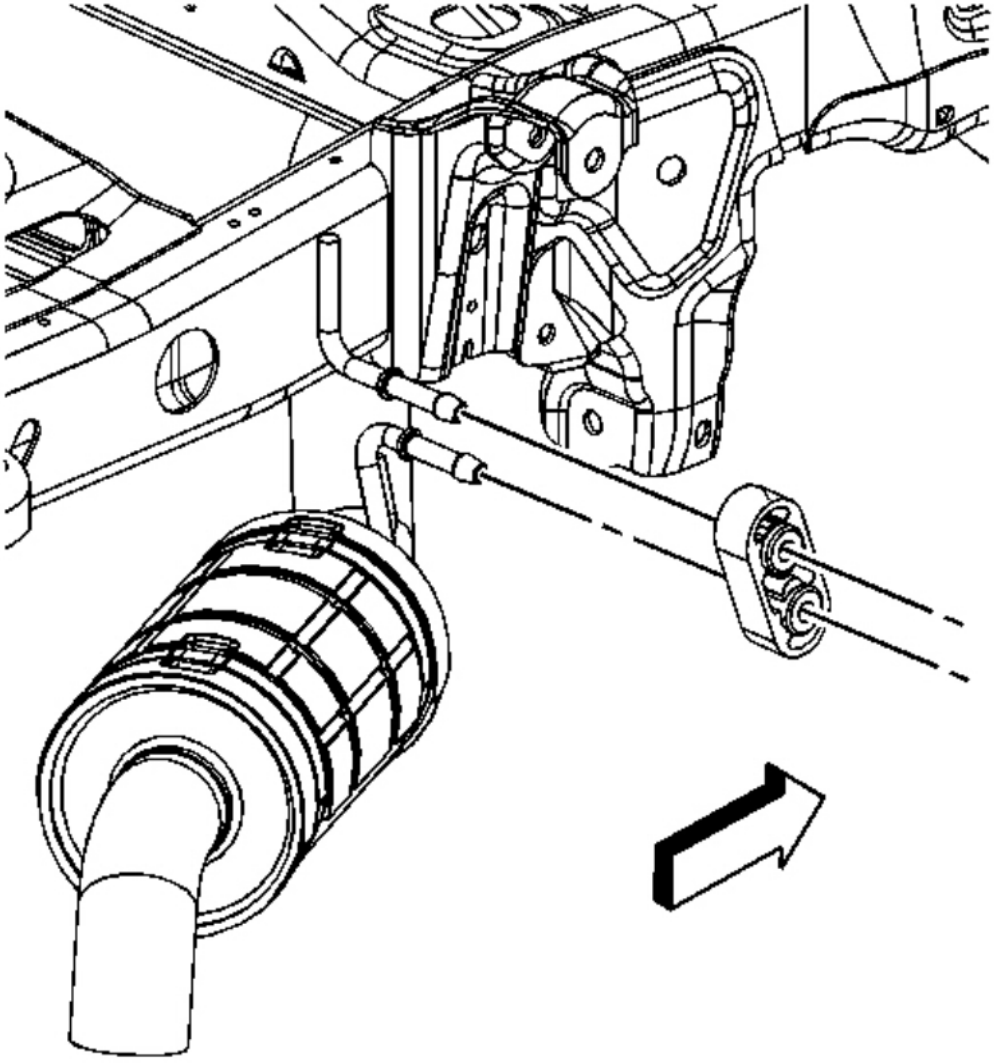


Fig. 86: View Of Exhaust System Hangers & Insulator
Courtesy of GENERAL MOTORS CORP.

10. Install the insulator to the exhaust system hanger near the resonator.

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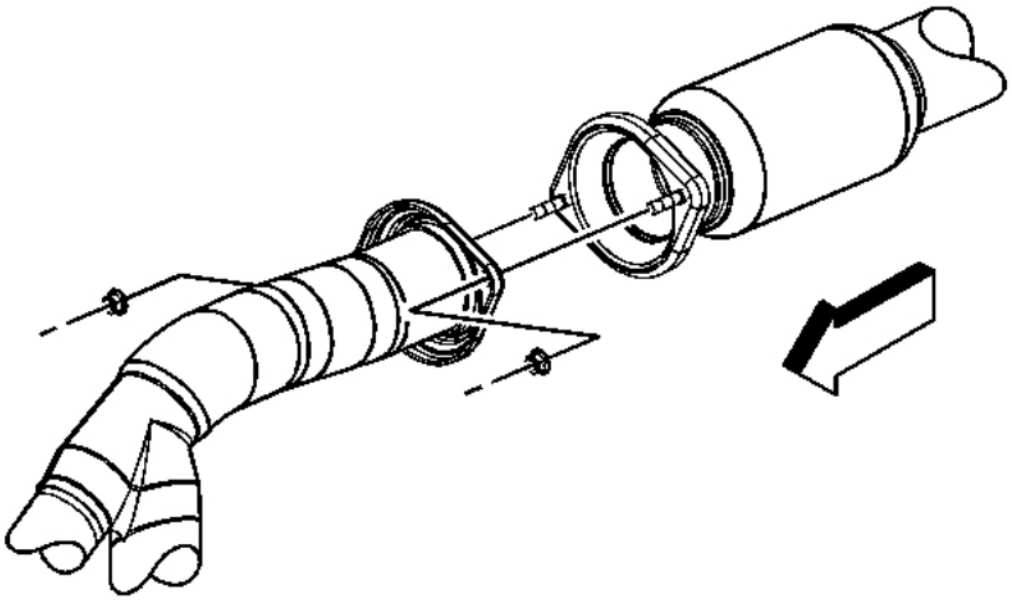


Fig. 87: View Of Catalytic Converter To Muffler Nuts (RPO L92)
Courtesy of GENERAL MOTORS CORP.

NOTE: **Refer to Fastener Notice .**

11. Install the muffler to catalytic converter nuts.

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

12. Install the insulator to the hanger.
13. Raise the rear axle into position using the adjustable jack.

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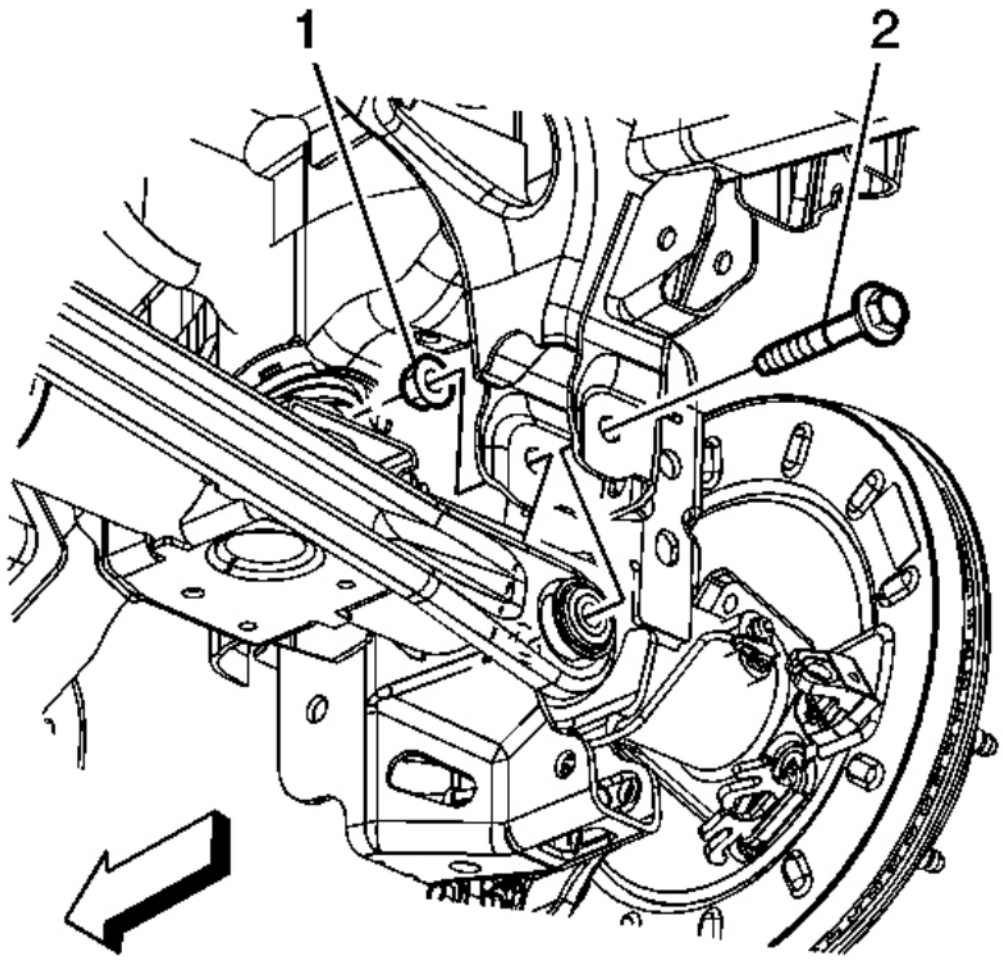


Fig. 88: View Of Right Axle Tie Rod Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

14. Install the right rear shock absorber lower bolt and nut.

    Tighten: Tighten the bolt/nut to 95 N.m (70 lb ft).

15. Install the right rear stabilizer shaft link to the frame.
16. Install the right rear stabilizer shaft link to frame bolt and nut.

    Tighten: Tighten the bolt/nut to 65 N.m (48 lb ft).

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17. Install the right rear axle tie rod bolt (2) and nut (1).

    Tighten: Tighten the bolt/nut to 105 N.m (77 lb ft).

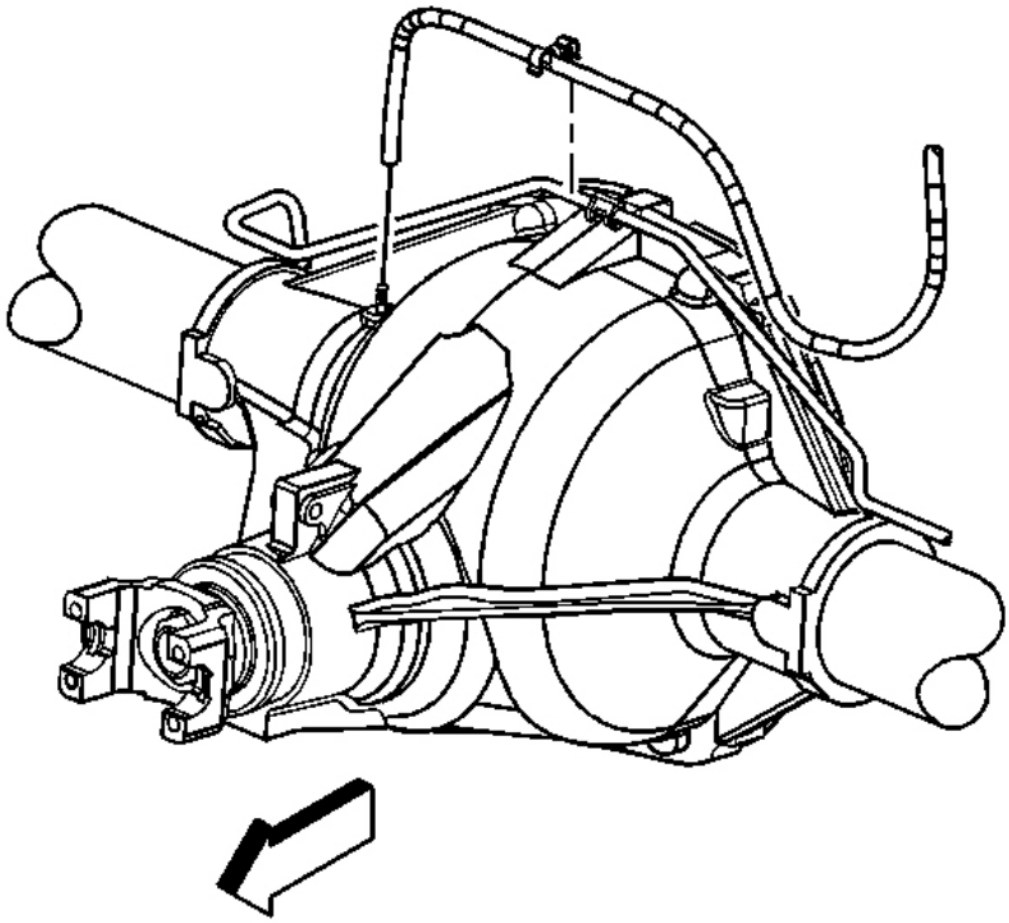


Fig. 89: Rear Axle Vent Hose (8.6 or 9.5 Inch Ring Gear)
Courtesy of GENERAL MOTORS CORP.

18. Install the rear axle vent hose to the rear axle, if necessary.
19. Install the vent hose swivel clip to the rear brake crossover pipe, if necessary.
20. Using the **J 38185** install the right rear link rod to the ball studs on the sensors.

IMPORTANT: The rear axle wiring harness clip (1) is a one way clip with a D-shape section. The clip can only be installed and/or removed in only one

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direction.

21. Install the right rear wheel speed sensor wiring harness clips to the frame and the control arm bracket.
22. Install the right rear wheel speed sensor wiring harness electrical connector clip to the frame.

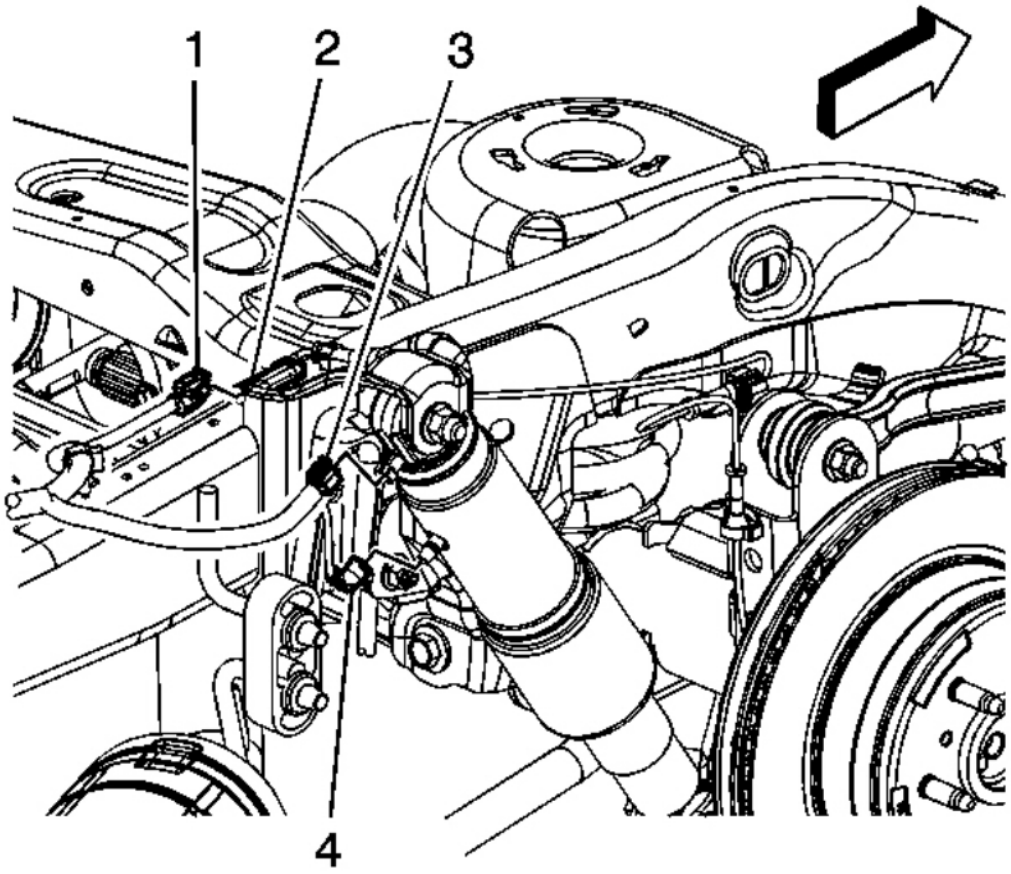


Fig. 90: View Of Chassis Wiring Harness Electrical Connectors & Right Rear Wheel Speed Sensor Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

23. If the vehicle is equipped with RPO Z55, connect the right rear air line to the shock absorber.
24. If the vehicle is equipped with RPO Z55, connect the chassis wiring harness electrical connector (3) to the right rear shock absorber.
25. Connect the chassis wiring harness electrical connector (1) to the right rear wheel speed sensor wiring harness electrical connector (2).

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26. Install the right rear wheel and tire. Refer to **Tire and Wheel Removal and Installation** .

MUFFLER REPLACEMENT (1500 - W/RPOS LC9/LMG/LY5/L76)

Tools Required

J 38185 Hose Clamp Pliers

Removal Procedure

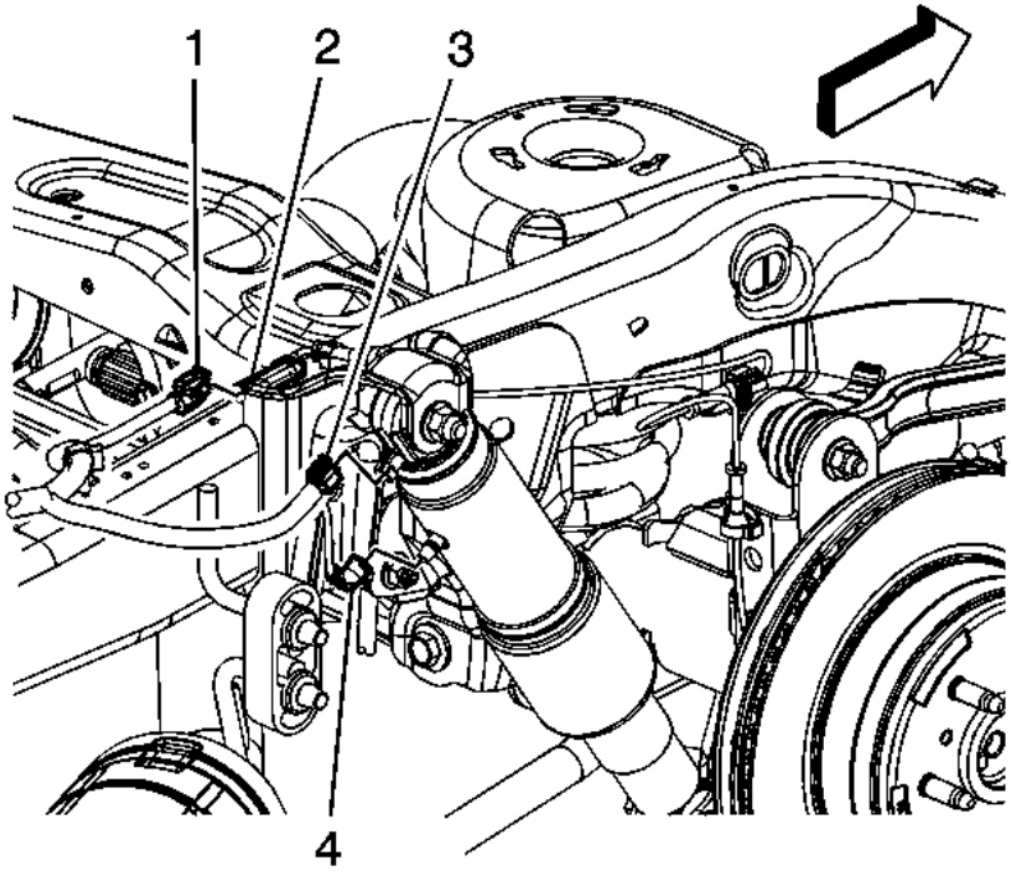


Fig. 91: View Of Chassis Wiring Harness Electrical Connectors & Right Rear Wheel Speed Sensor Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

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

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2. Disconnect the chassis wiring harness electrical connector (1) from the right rear wheel speed sensor wiring harness electrical connector (2).
3. If the vehicle is equipped with regular production option (RPO) Z55, disconnect the chassis wiring harness electrical connector (3) from the right rear shock absorber.
4. If the vehicle is equipped with RPO Z55, disconnect the right rear air line from the shock absorber.
5. Remove the right rear wheel speed sensor wiring harness electrical connector clip from the frame.

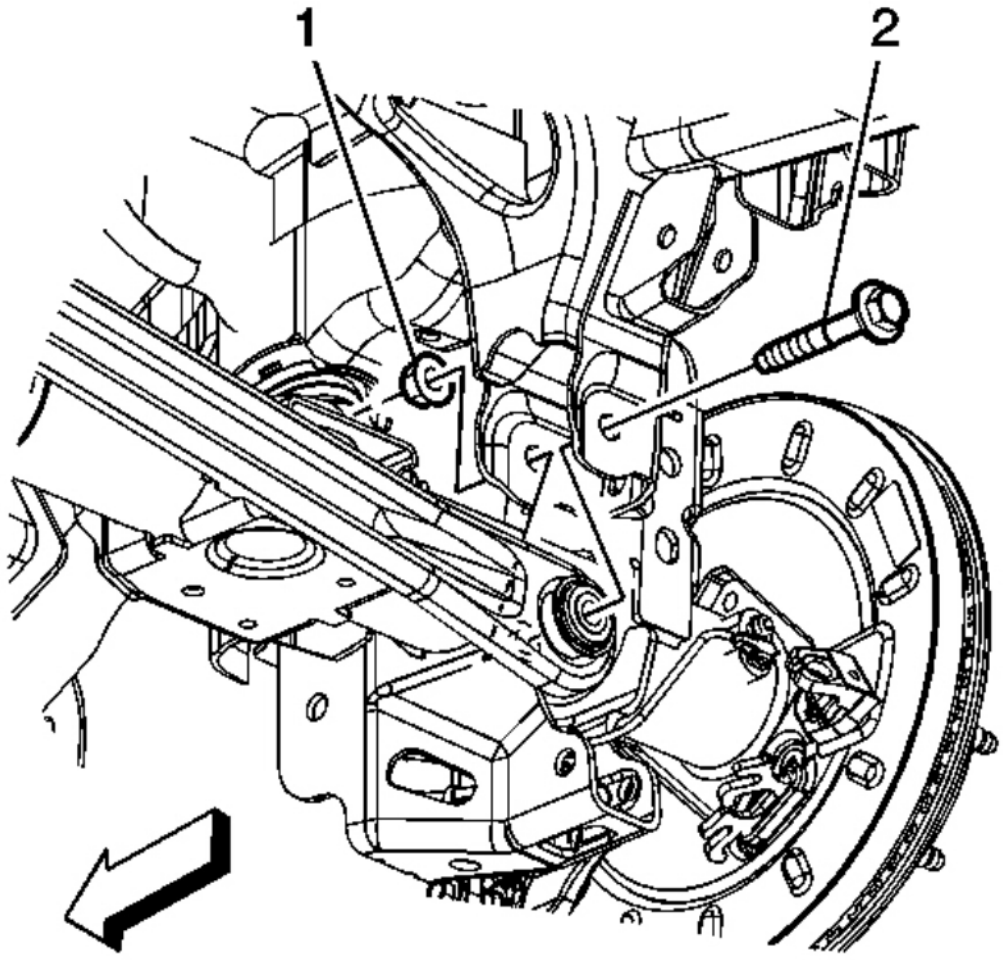


Fig. 92: View Of Right Axle Tie Rod Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The rear axle wiring harness clip is a one way clip with a D-shape section.

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The clip can only be installed and/or removed in only one direction.

6. Remove the right rear wheel speed sensor wiring harness clips from the frame and the control arm bracket.

IMPORTANT: Do not attempt to pry the rear suspension sensor link rod from the rear position sensor ball stud.

7. Disconnect the right rear automatic level control sensor link rod from the sensor. Perform the following:
    1. Support the sensor lever with your hand.
    2. Twist the link rod ball in order to separate it from the ball stud.
8. Install a suitable adjustable jack under the rear axle.
9. Remove the right axle tie rod bolt (2) and nut (1).

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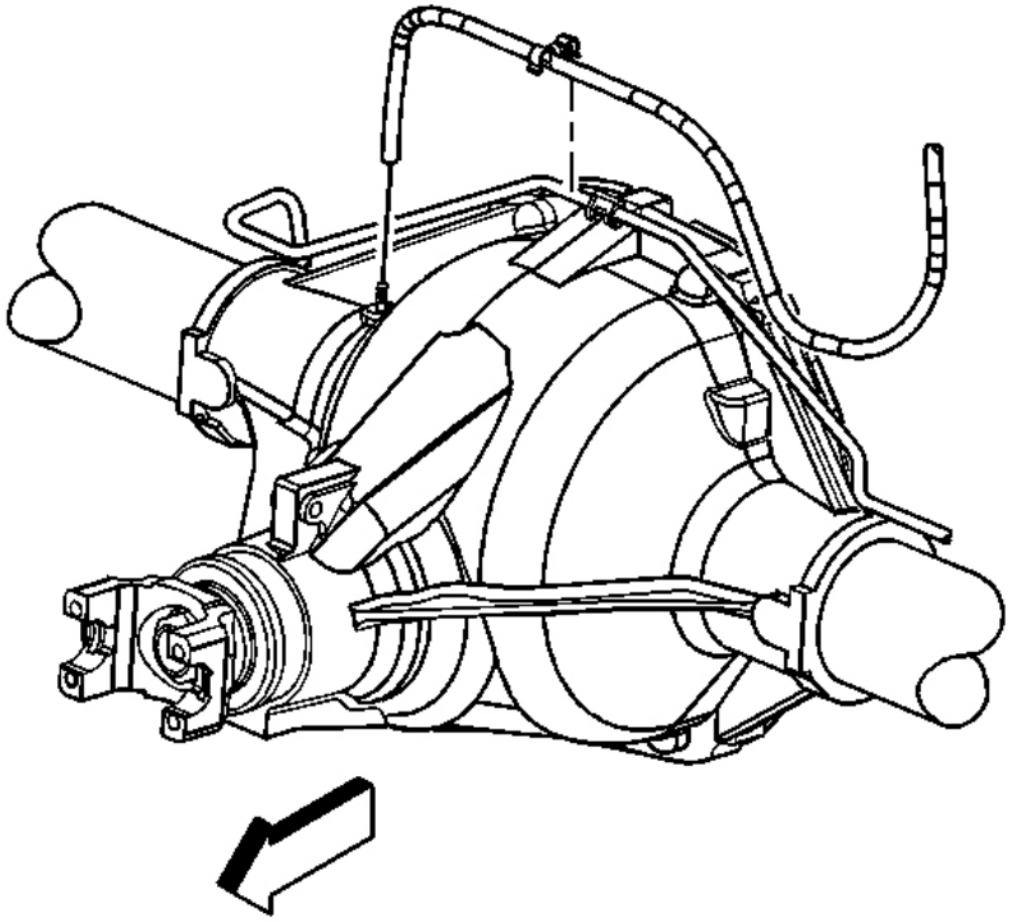


Fig. 93: Rear Axle Vent Hose (8.6 or 9.5 Inch Ring Gear)
Courtesy of GENERAL MOTORS CORP.

10. Remove the rear axle vent hose from the rear axle, if necessary.
11. Remove the vent hose swivel clip from the rear brake crossover pipe, if necessary.
12. Remove the right rear stabilizer shaft link to frame bolt and nut.
13. Remove the right rear stabilizer shaft link from the frame.
14. Remove the right rear shock absorber lower bolt (4) and nut (3).
15. Lower the right side of the rear axle using the adjustable jack in order to remove the muffler.

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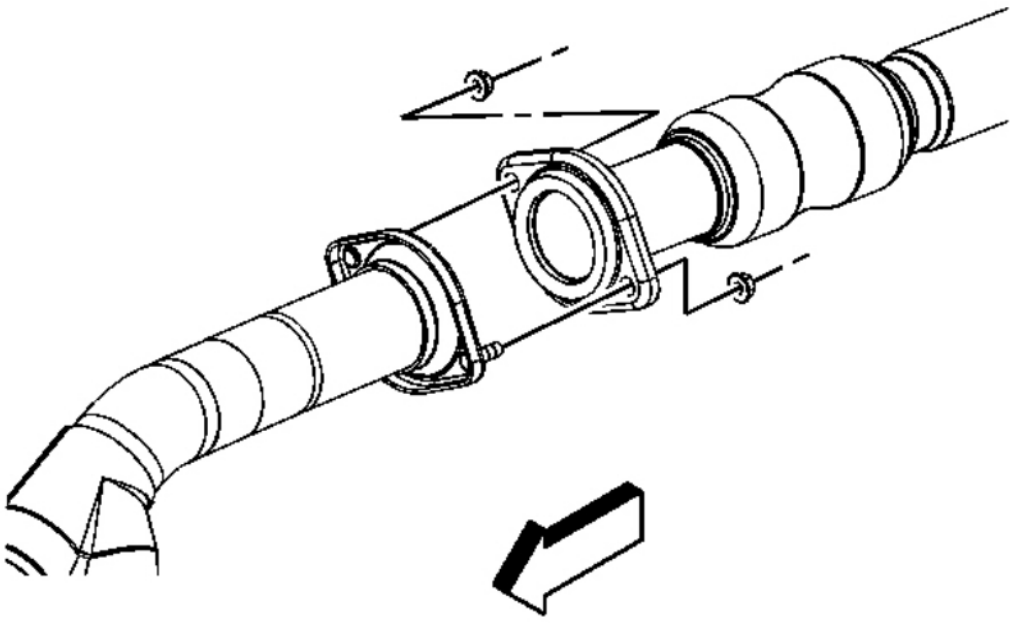


Fig. 94: View Of Catalytic Converter To Muffler Nuts
Courtesy of GENERAL MOTORS CORP.

16. Remove the catalytic converter to muffler nuts.

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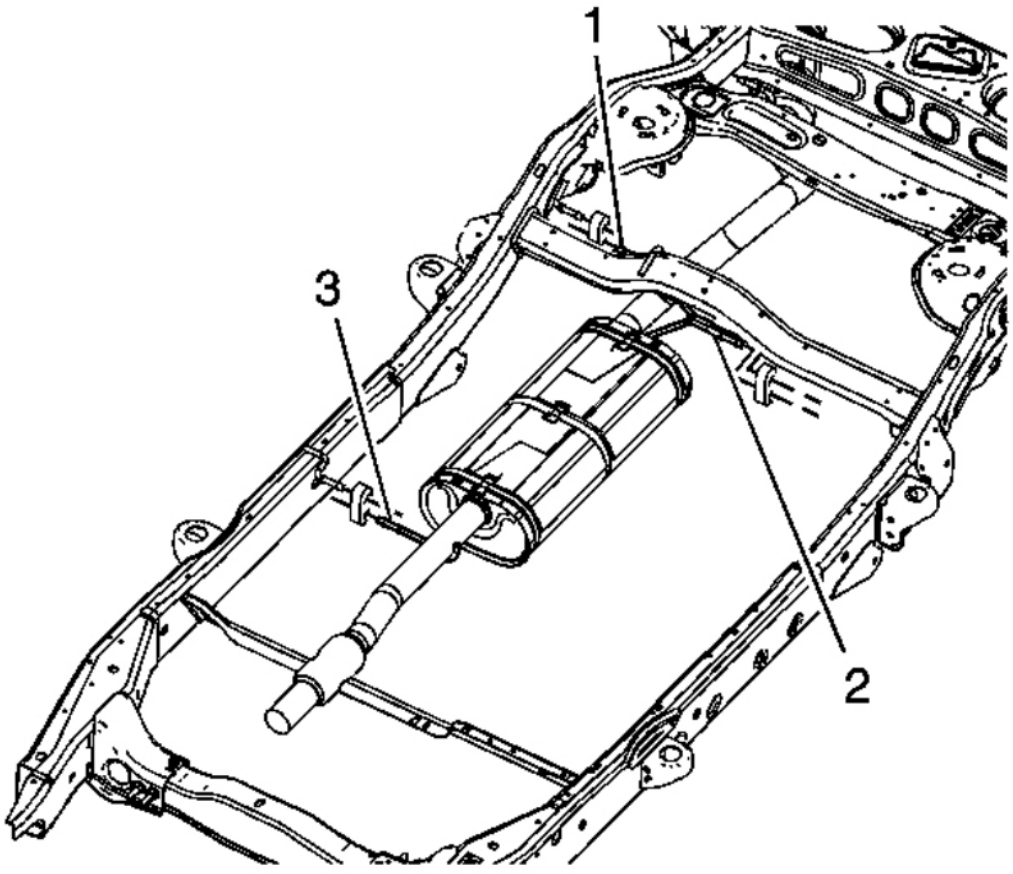


Fig. 95: View Of Exhaust System Hangers
Courtesy of GENERAL MOTORS CORP.

17. Lubricate the insulators where the muffler assembly hangers are inserted in order to ease in removal.
18. With the aid of an assistant, remove the insulators from the exhaust system hangers (1, 2, and 3).

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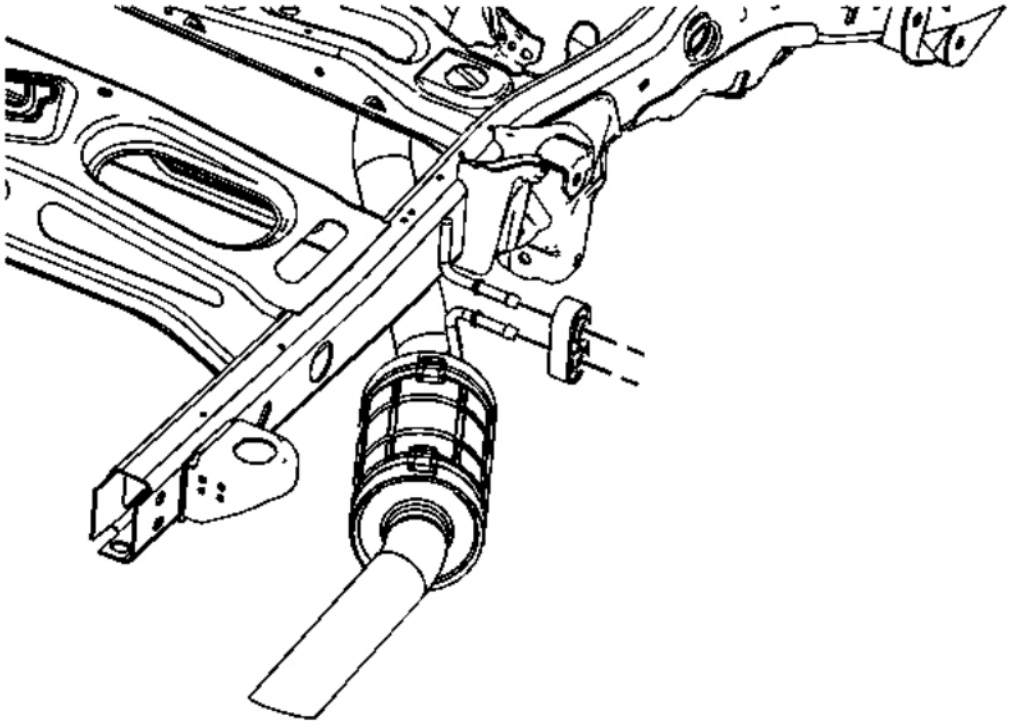


Fig. 96: View Of Exhaust System Hanger & Insulator
Courtesy of GENERAL MOTORS CORP.

19. With the aid of an assistant, remove the insulator from the exhaust system hanger near the resonator.

IMPORTANT: During removal, do not over extend the flex coupler as internal damage may occur.

20. Remove the muffler assembly.

Installation Procedure

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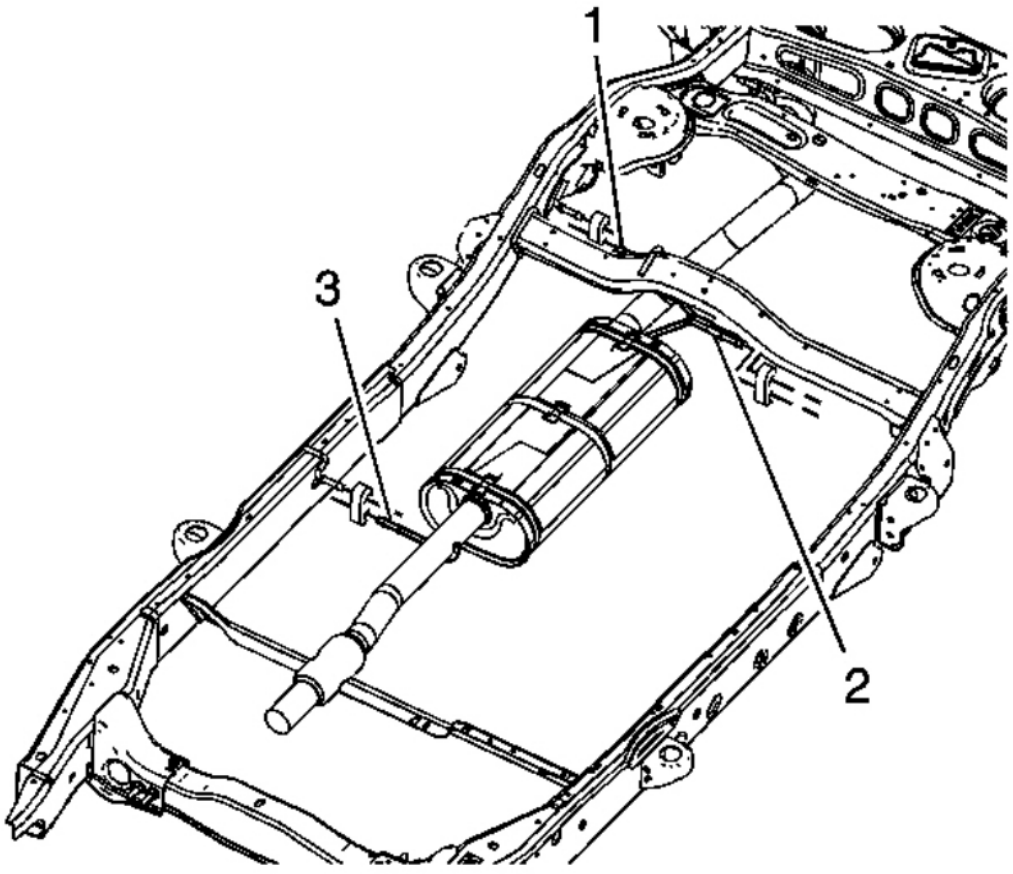


Fig. 97: View Of Exhaust System Hangers
Courtesy of GENERAL MOTORS CORP.

1. Lubricate the insulators where the muffler assembly hangers are inserted for ease of installation.

IMPORTANT: During installation, do not over extend the flex coupler as internal damage may occur.

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

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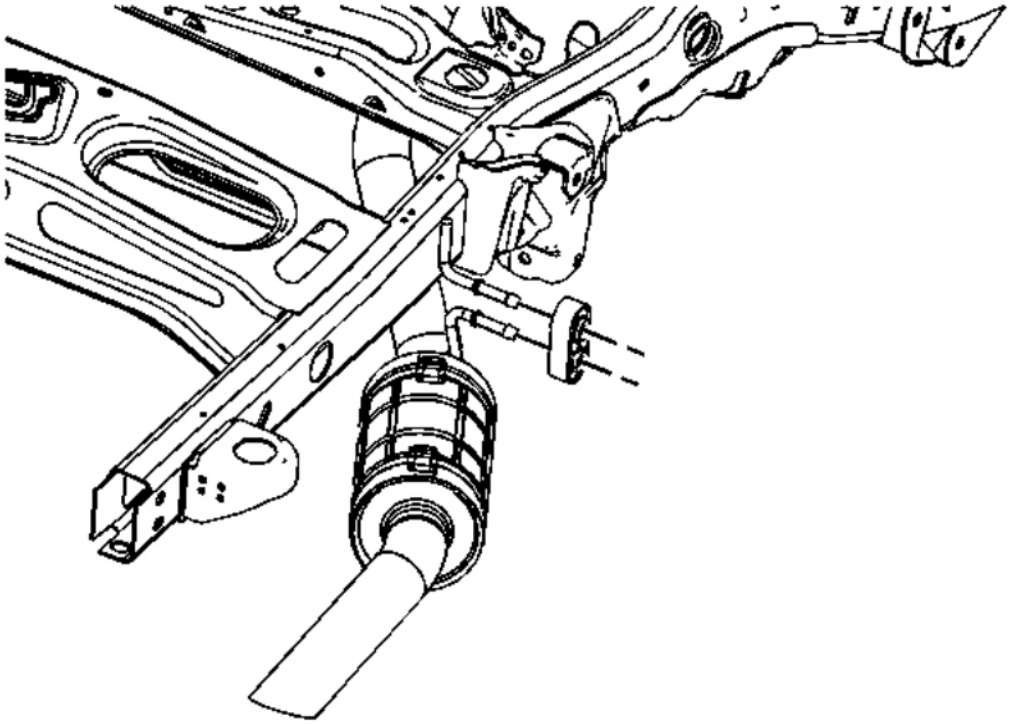


Fig. 98: View Of Exhaust System Hanger & Insulator
Courtesy of GENERAL MOTORS CORP.

4. Install the insulator to the exhaust system hanger near the resonator.

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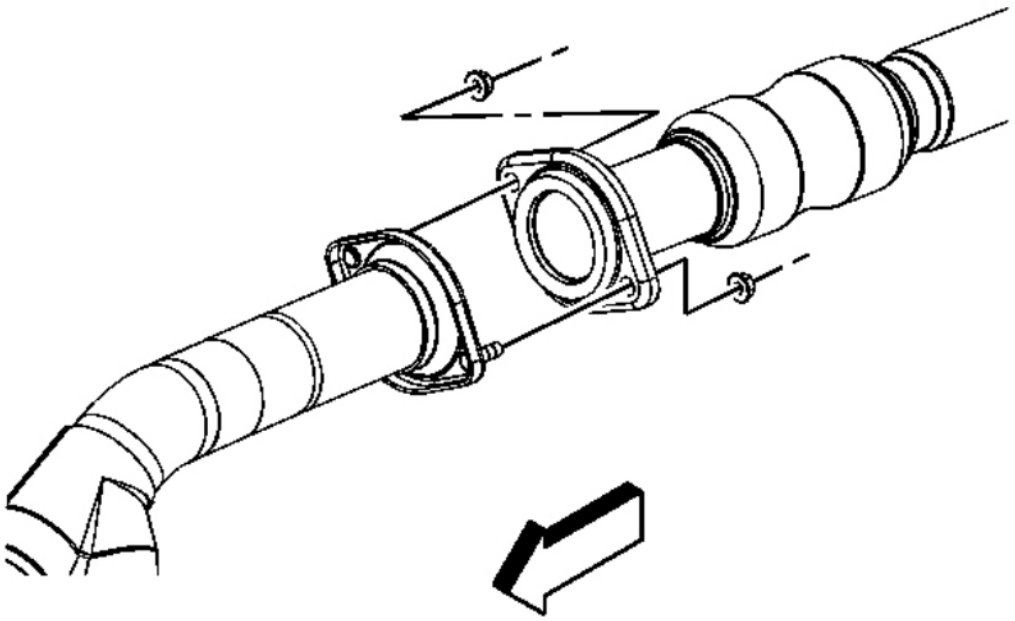


Fig. 99: View Of Catalytic Converter To Muffler Nuts
Courtesy of GENERAL MOTORS CORP.

NOTE: **Refer to Fastener Notice .**

5. Install the catalytic converter to muffler nuts.

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

6. Raise the rear axle into position using the adjustable jack.

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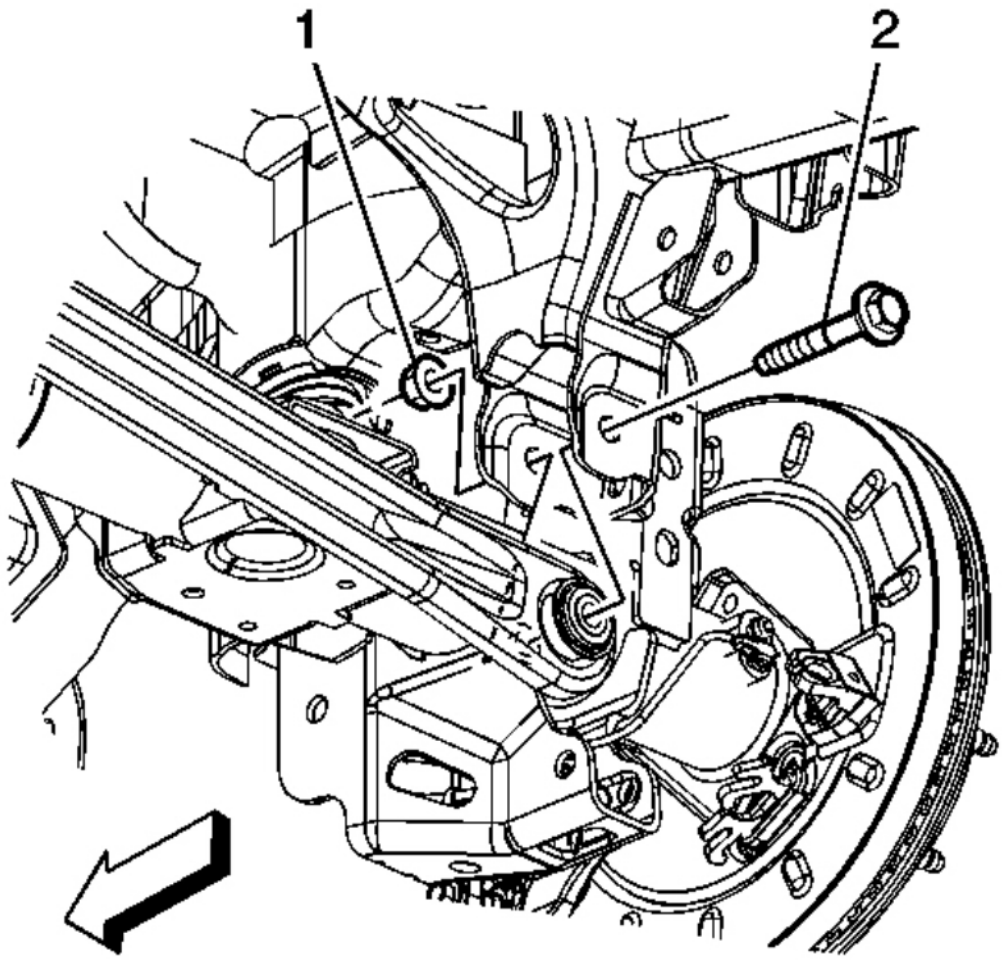


Fig. 100: View Of Right Axle Tie Rod Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

7. Install the right rear shock absorber lower bolt and nut.

   Tighten: Tighten the bolt/nut to 95 N.m (70 lb ft).

8. Install the right rear stabilizer shaft link to the frame.
9. Install the right rear stabilizer shaft link to frame bolt and nut.

   Tighten: Tighten the bolt/nut to 65 N.m (48 lb ft).

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10. Install the right rear axle tie rod bolt (2) and nut (1).

    Tighten: Tighten the bolt/nut to 105 N.m (77 lb ft).

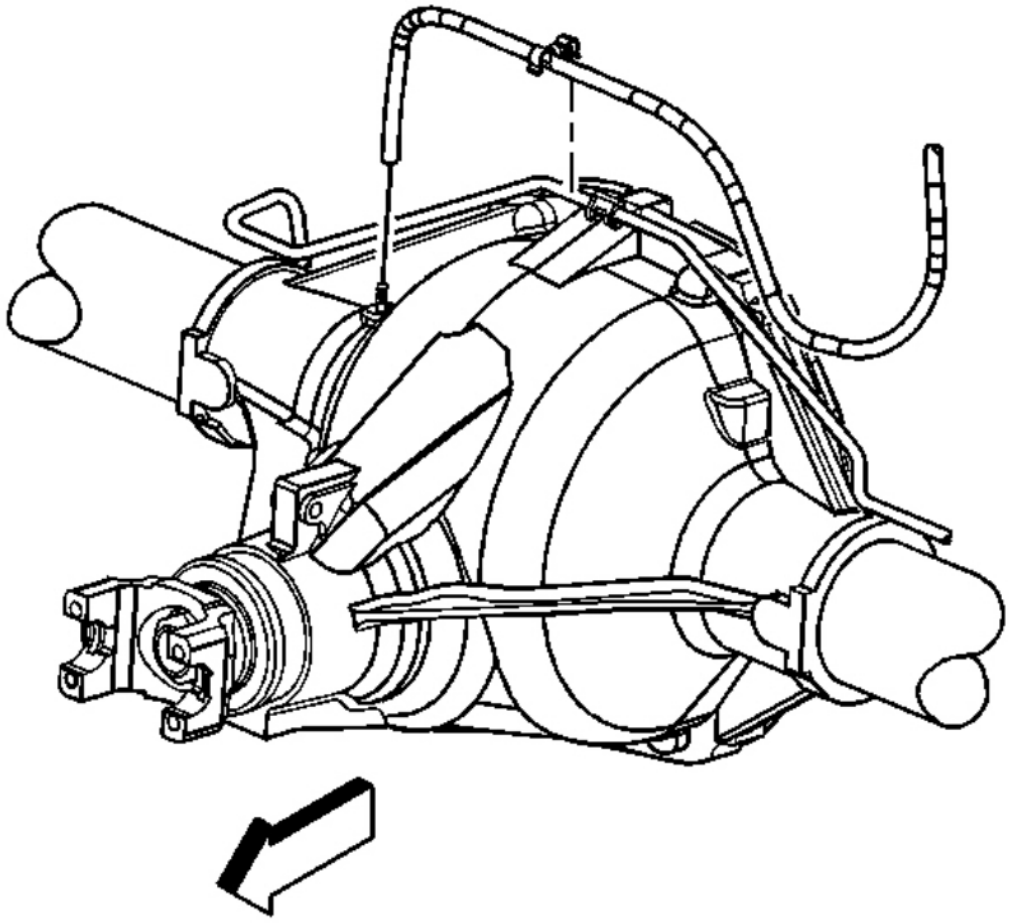


Fig. 101: Rear Axle Vent Hose (8.6 or 9.5 Inch Ring Gear)
Courtesy of GENERAL MOTORS CORP.

11. Install the rear axle vent hose to the rear axle, if necessary.
12. Install the vent hose swivel clip to the rear brake crossover pipe, if necessary.
13. Using the **J 38185** install the right rear link rod to the ball studs on the sensors.

IMPORTANT: The rear axle wiring harness clip is a one way clip with a D-shape section. The clip can only be installed and/or removed in only one direction.

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14. Install the right rear wheel speed sensor wiring harness clips to the frame and the control arm bracket.
15. Install the right rear wheel speed sensor wiring harness electrical connector clip to the frame.

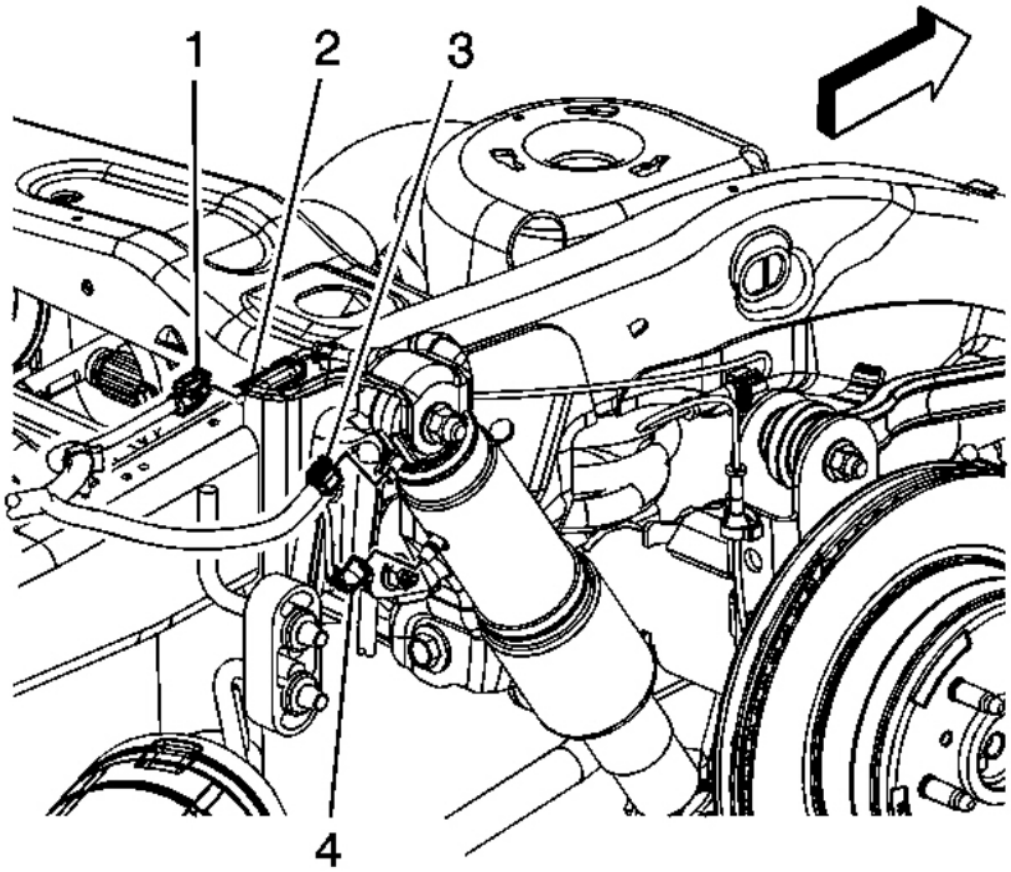


Fig. 102: View Of Chassis Wiring Harness Electrical Connectors & Right Rear Wheel Speed Sensor Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

16. If the vehicle is equipped with RPO Z55, connect the right rear air line to the shock absorber.
17. If the vehicle is equipped with RPO Z55, connect the chassis wiring harness electrical connector (3) to the right rear shock absorber.
18. Connect the chassis wiring harness electrical connector (1) to the right rear wheel speed sensor wiring harness electrical connector (2).
19. Lower the vehicle.

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MUFFLER REPLACEMENT (1500 - W/RPOS LMG/LY2/LY5)

Tools Required

J 38185 Hose Clamp Pliers

Removal Procedure

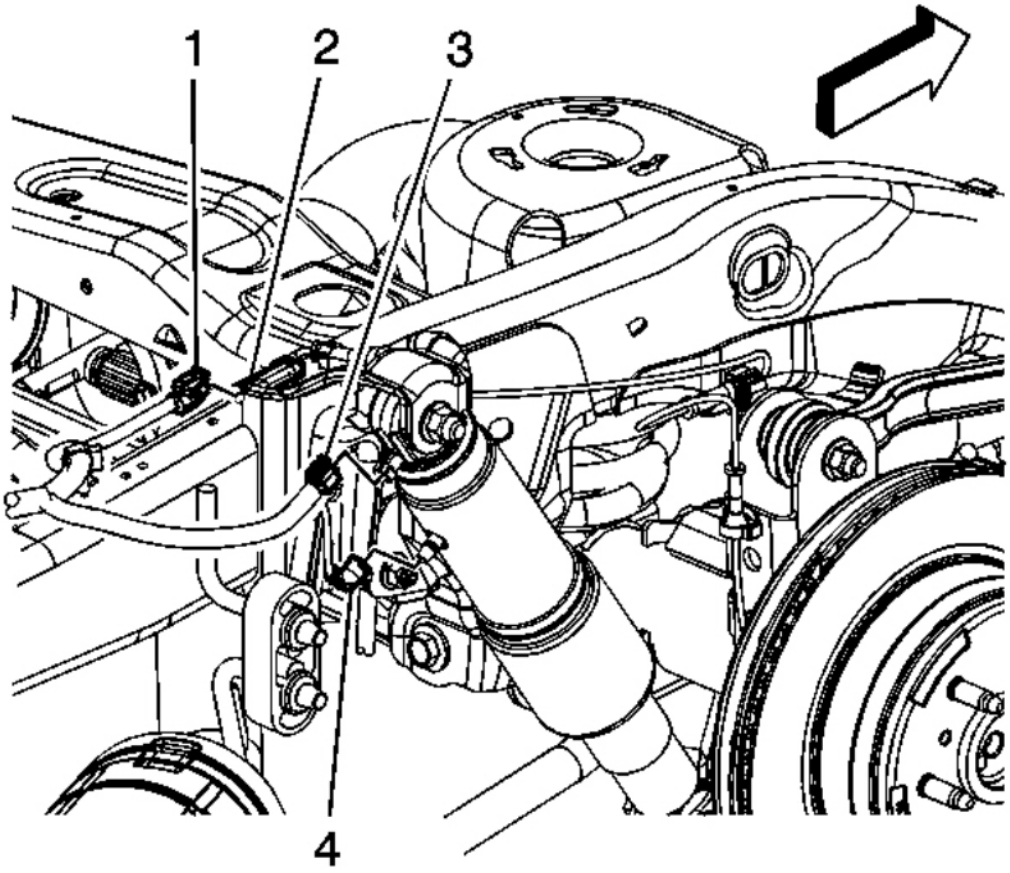


Fig. 103: View Of Chassis Wiring Harness Electrical Connectors & Right Rear Wheel Speed Sensor Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Disconnect the chassis wiring harness electrical connector (1) from the right rear wheel speed sensor wiring harness electrical connector (2).

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3. If the vehicle is equipped with regular production option (RPO) Z55, disconnect the chassis wiring harness electrical connector (3) from the right rear shock absorber.
4. If the vehicle is equipped with RPO Z55, disconnect the right rear air line from the shock absorber.
5. Remove the right rear wheel speed sensor wiring harness electrical connector clip from the frame.

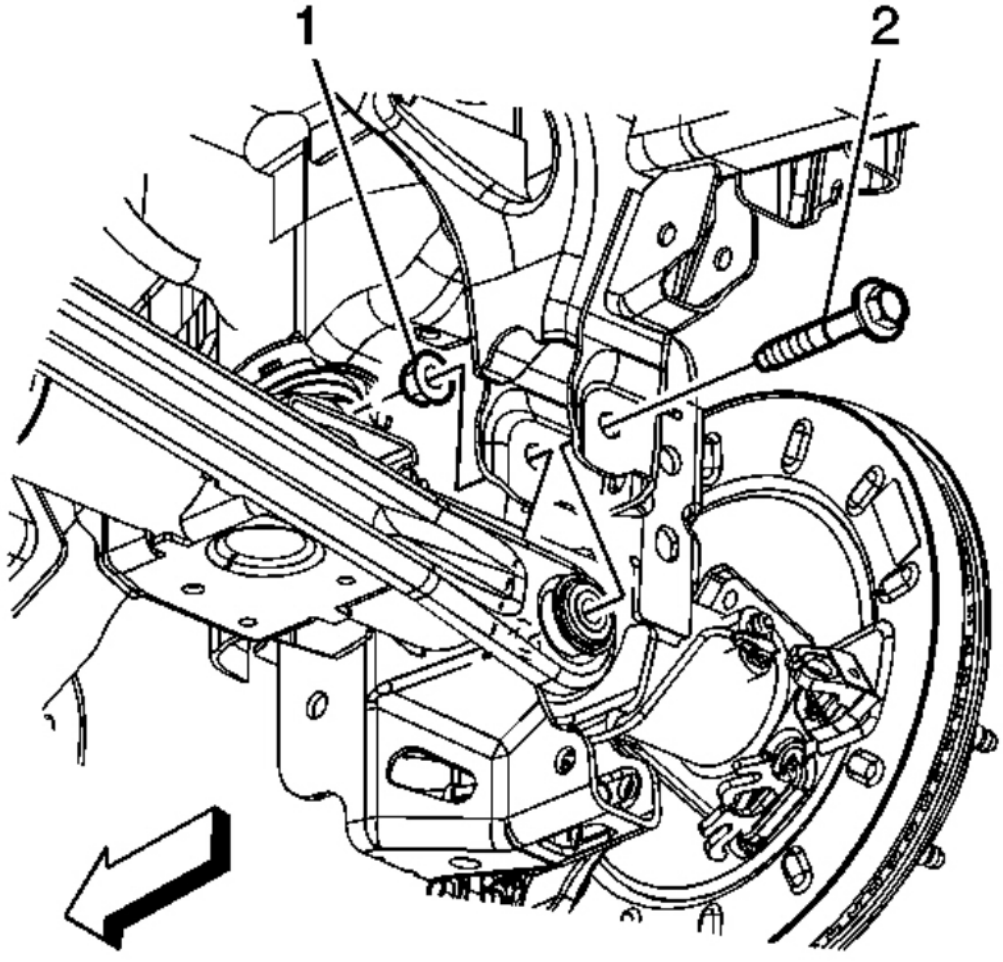


Fig. 104: View Of Right Axle Tie Rod Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The rear axle wiring harness clip is a one way clip with a D-shape section. The clip can only be installed and/or removed in only one direction.

6. Remove the right rear wheel speed sensor wiring harness clips from the frame and the control arm

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bracket.

IMPORTANT: Do not attempt to pry the rear suspension sensor link rod from the rear position sensor ball stud.

7. Disconnect the right rear automatic level control sensor link rod from the sensor. Perform the following:
    1. Support the sensor lever with your hand.
    2. Twist the link rod ball in order to separate it from the ball stud.
8. Install a suitable adjustable jack under the rear axle.
9. Remove the right axle tie rod bolt (2) and nut (1).

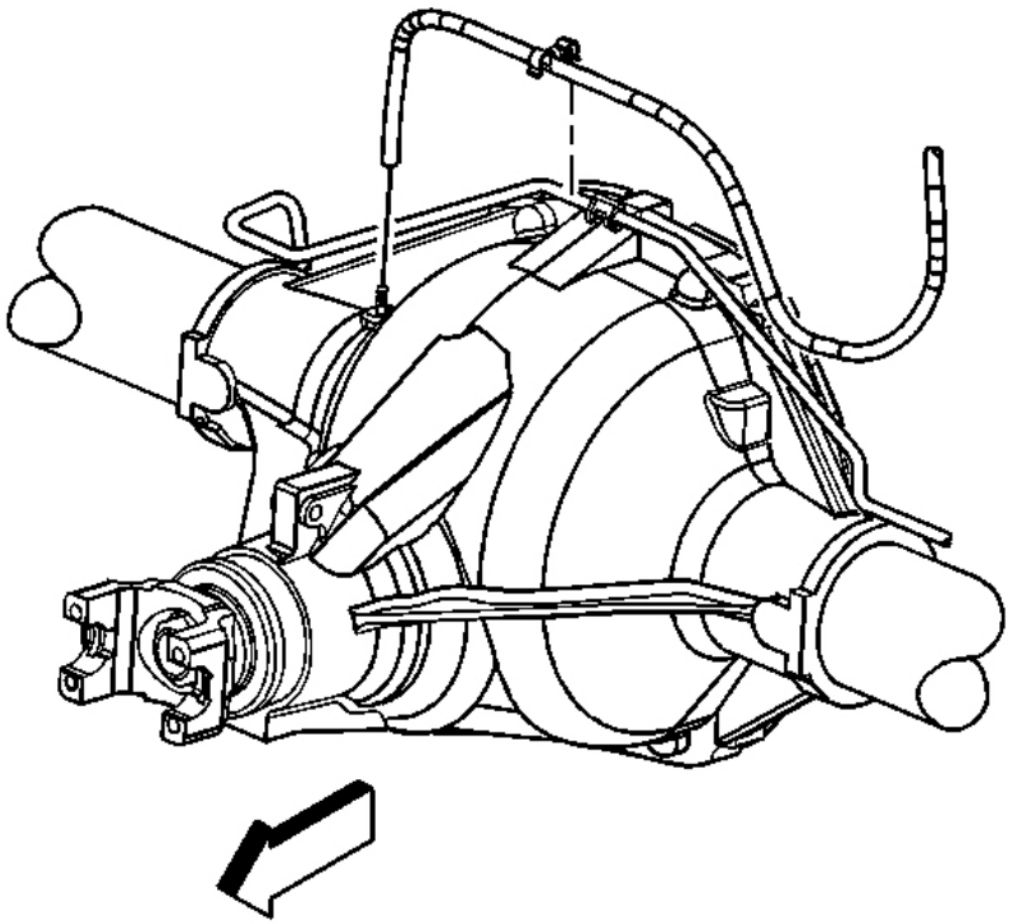


Fig. 105: Rear Axle Vent Hose (8.6 or 9.5 Inch Ring Gear)
Courtesy of GENERAL MOTORS CORP.

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10. Remove the rear axle vent hose from the rear axle, if necessary.
11. Remove the vent hose swivel clip from the rear brake crossover pipe, if necessary.
12. Remove the right rear stabilizer shaft link to frame bolt and nut.
13. Remove the right rear stabilizer shaft link from the frame.
14. Remove the right rear shock absorber lower bolt and nut.
15. Lower the right side of the rear axle using the adjustable jack in order to remove the muffler.

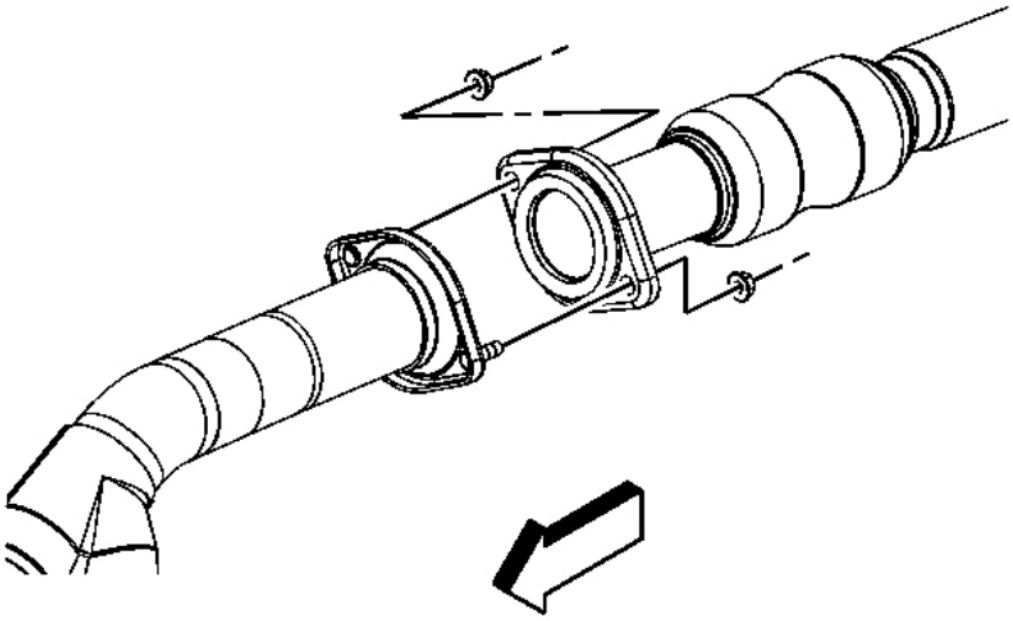


Fig. 106: View Of Catalytic Converter To Muffler Nuts
Courtesy of GENERAL MOTORS CORP.

16. Remove the catalytic converter to muffler nuts.

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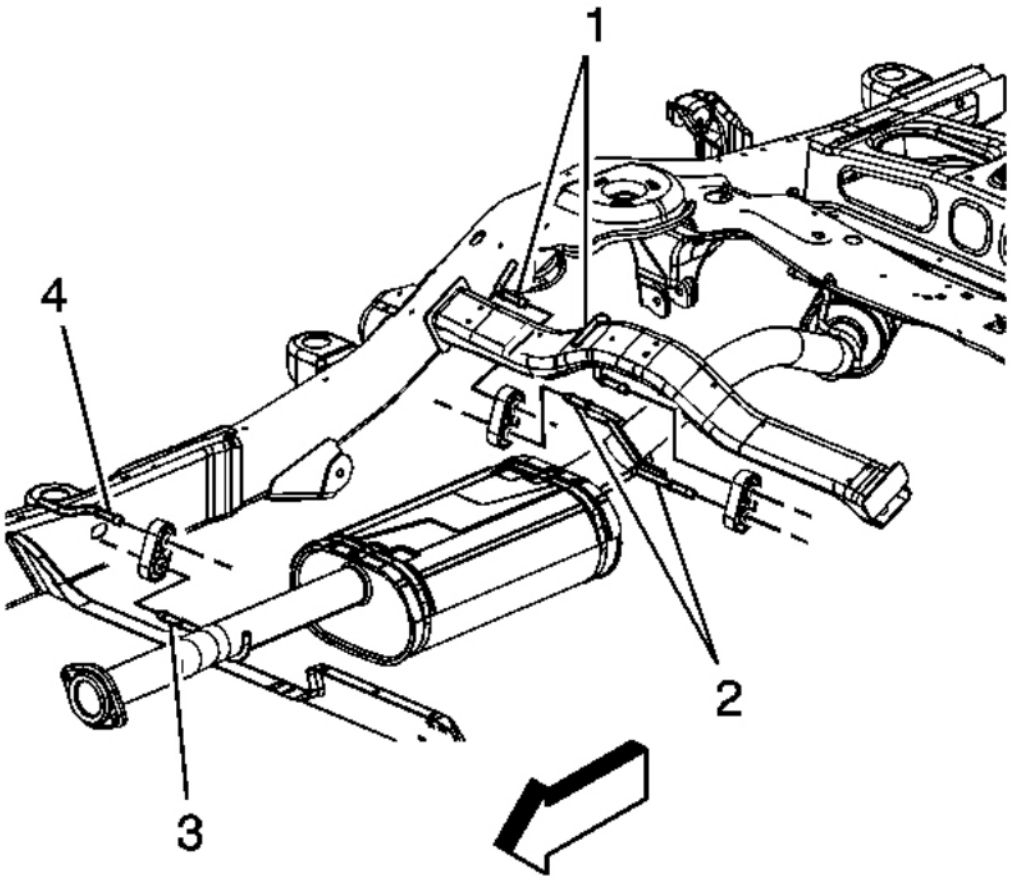


Fig. 107: View Of Exhaust System Hangers & Insulators
Courtesy of GENERAL MOTORS CORP.

17. Lubricate the insulators where the muffler assembly hangers are inserted in order to ease in removal.
18. With the aid of an assistant, remove the insulators from the exhaust system hangers (2 and 3).

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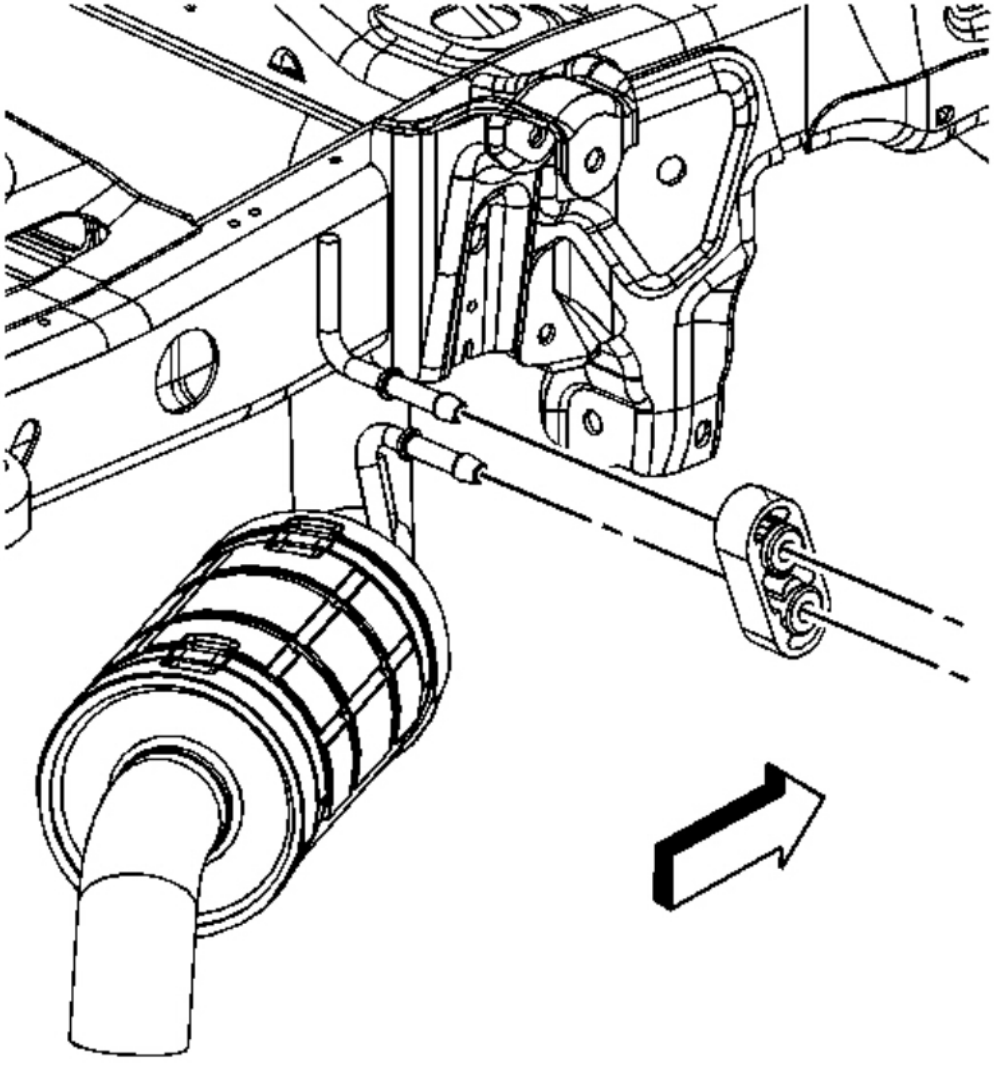


Fig. 108: View Of Exhaust System Hangers & Insulator
Courtesy of GENERAL MOTORS CORP.

19. With the aid of an assistant, remove the insulator from the exhaust system hanger near the resonator.

IMPORTANT: During removal, do not over extend the flex coupler as internal damage may occur.

20. Remove the muffler assembly.

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Installation Procedure

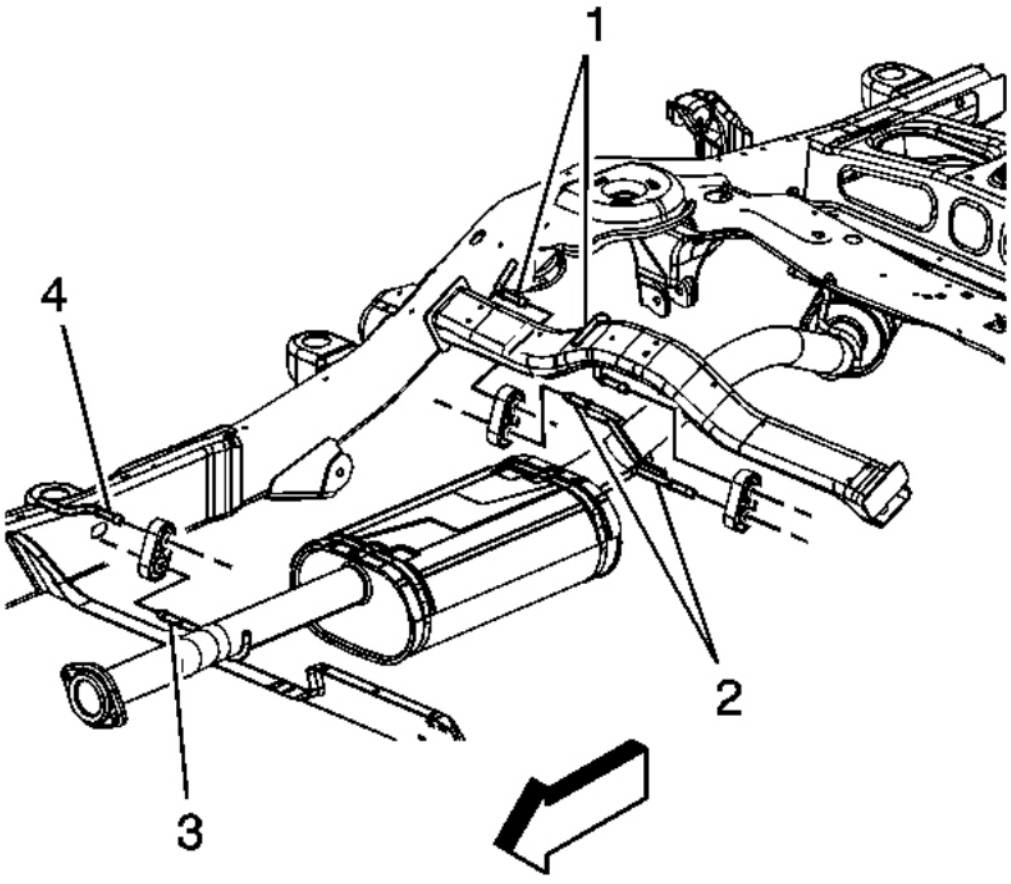


Fig. 109: View Of Exhaust System Hangers & Insulators
Courtesy of GENERAL MOTORS CORP.

1. Lubricate the insulators where the muffler assembly hangers are inserted for ease of installation.

NOTE: **To prevent internal damage to the flexible coupling of the catalytic converter assembly, the converter must be supported. The vertical movement at the rear of the catalytic converter assembly must not exceed 6 degrees up or down.**

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

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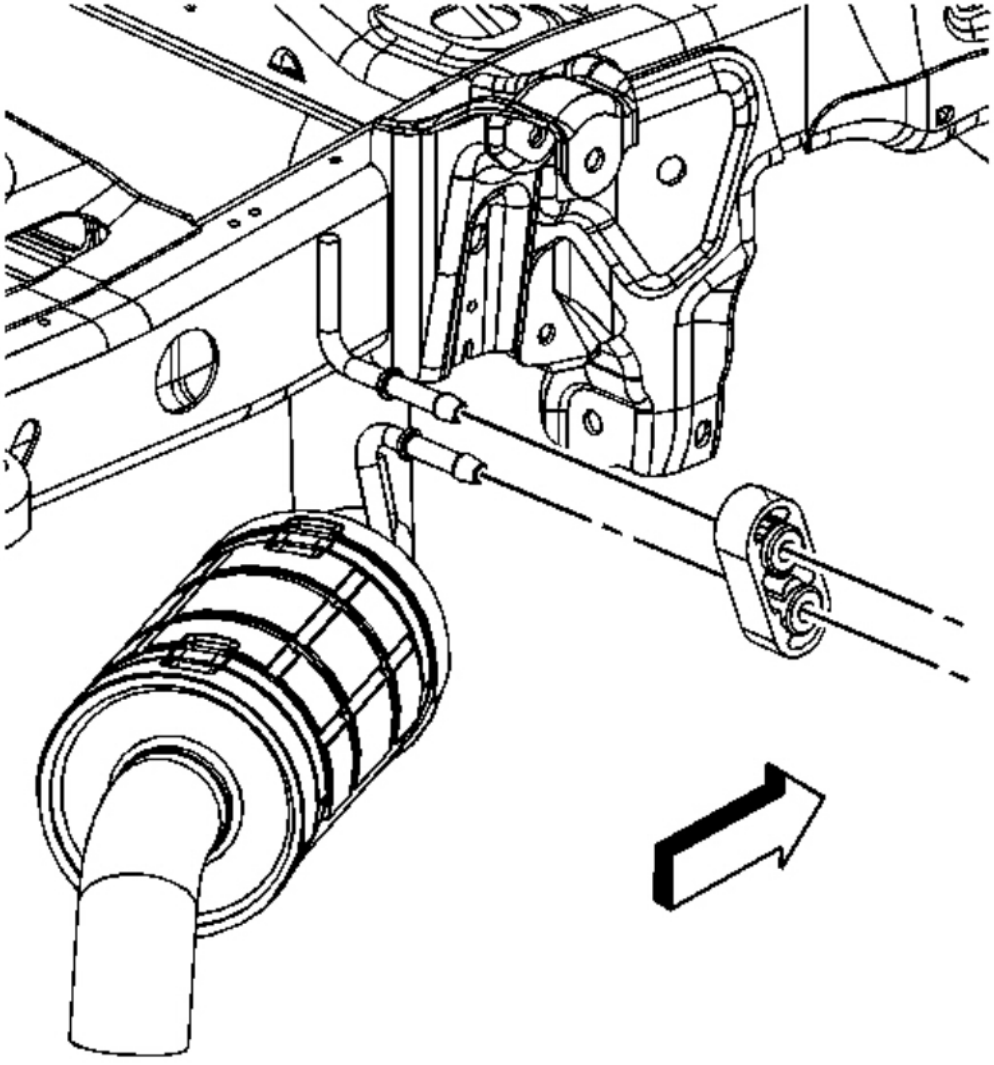


Fig. 110: View Of Exhaust System Hangers & Insulator
Courtesy of GENERAL MOTORS CORP.

4. Install the insulator to the exhaust system hanger near the resonator.

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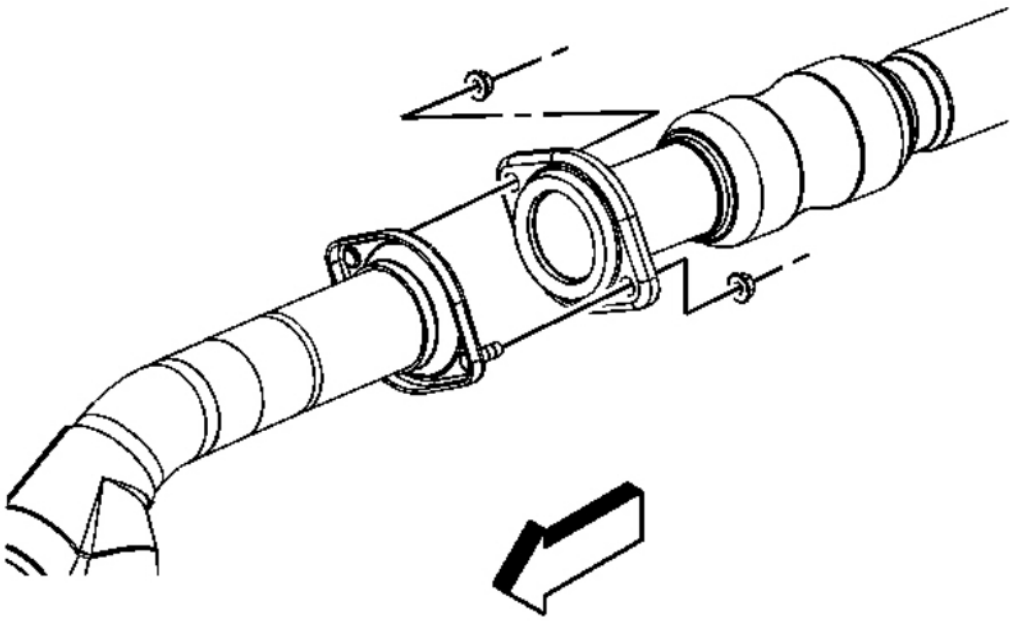


Fig. 111: View Of Catalytic Converter To Muffler Nuts
Courtesy of GENERAL MOTORS CORP.

NOTE: **Refer to Fastener Notice .**

5. Install the catalytic converter to muffler nuts.

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

6. Raise the right side of the rear axle into position using the adjustable jack.

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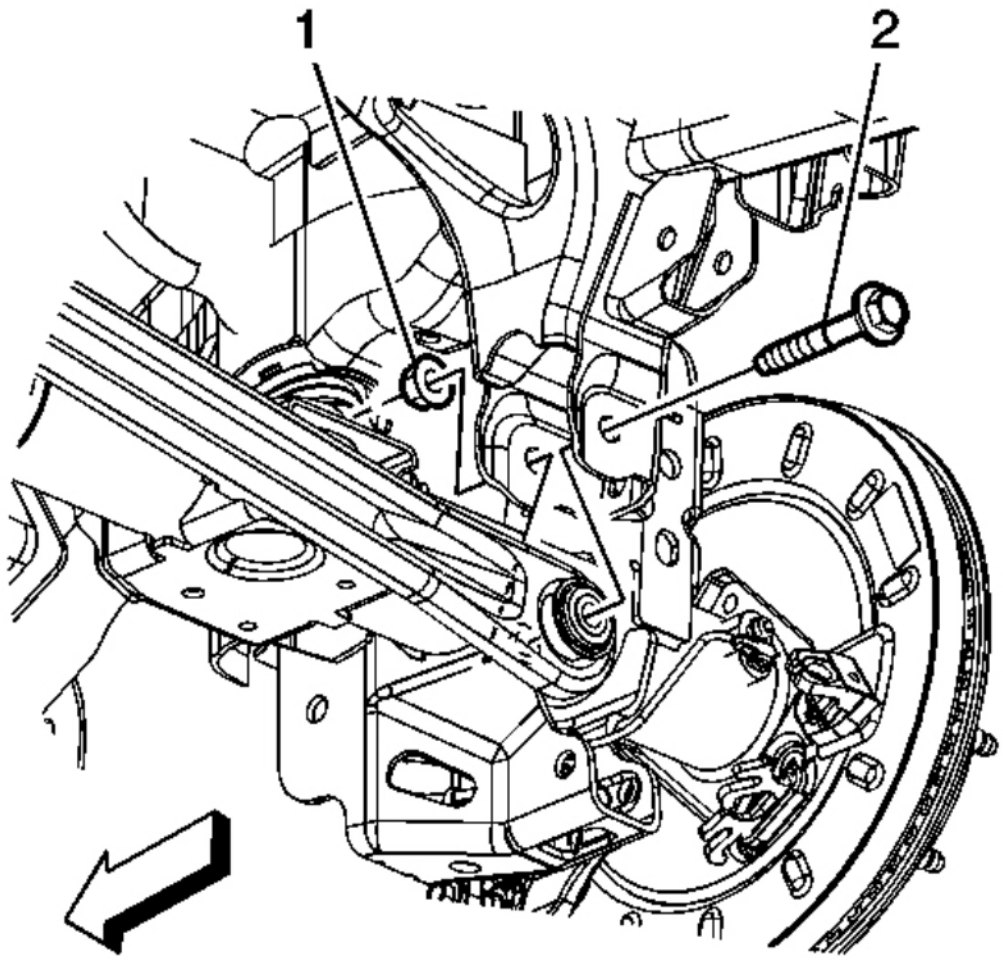


Fig. 112: View Of Right Axle Tie Rod Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

7. Install the right rear shock absorber lower bolt and nut.

   Tighten: Tighten the bolt/nut to 95 N.m (70 lb ft).

8. Install the right rear stabilizer shaft link to the frame.
9. Install the right rear stabilizer shaft link to frame bolt and nut.

   Tighten: Tighten the bolt/nut to 65 N.m (48 lb ft).

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10. Install the right rear axle tie rod bolt (2) and nut (1).

    Tighten: Tighten the bolt/nut to 105 N.m (77 lb ft).

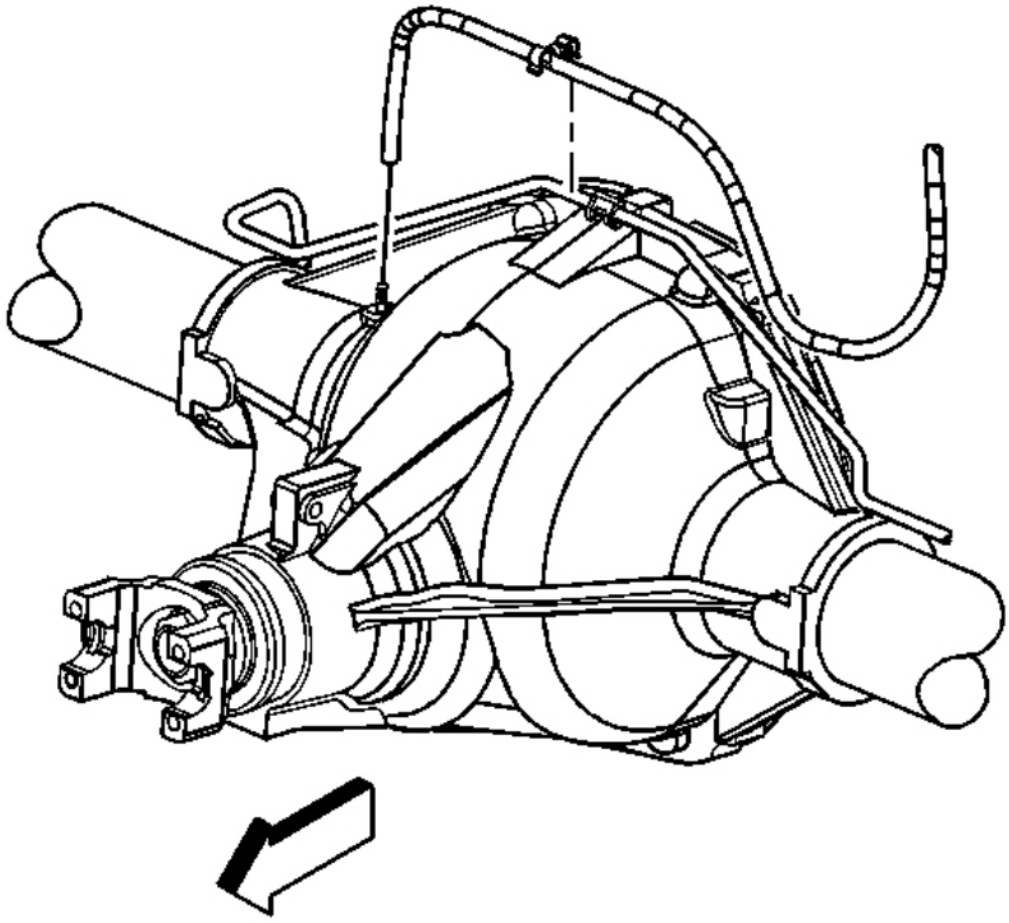


Fig. 113: Rear Axle Vent Hose (8.6 or 9.5 Inch Ring Gear)
Courtesy of GENERAL MOTORS CORP.

11. Install the rear axle vent hose to the rear axle, if necessary.
12. Install the vent hose swivel clip to the rear brake crossover pipe, if necessary.
13. Using the **J 38185** install the right rear link rod to the ball studs on the sensors.

IMPORTANT: The rear axle wiring harness clip is a one way clip with a D-shape section. The clip can only be installed and/or removed in only one direction.

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14. Install the right rear wheel speed sensor wiring harness clips to the frame and the control arm bracket.
15. Install the right rear wheel speed sensor wiring harness electrical connector clip to the frame.

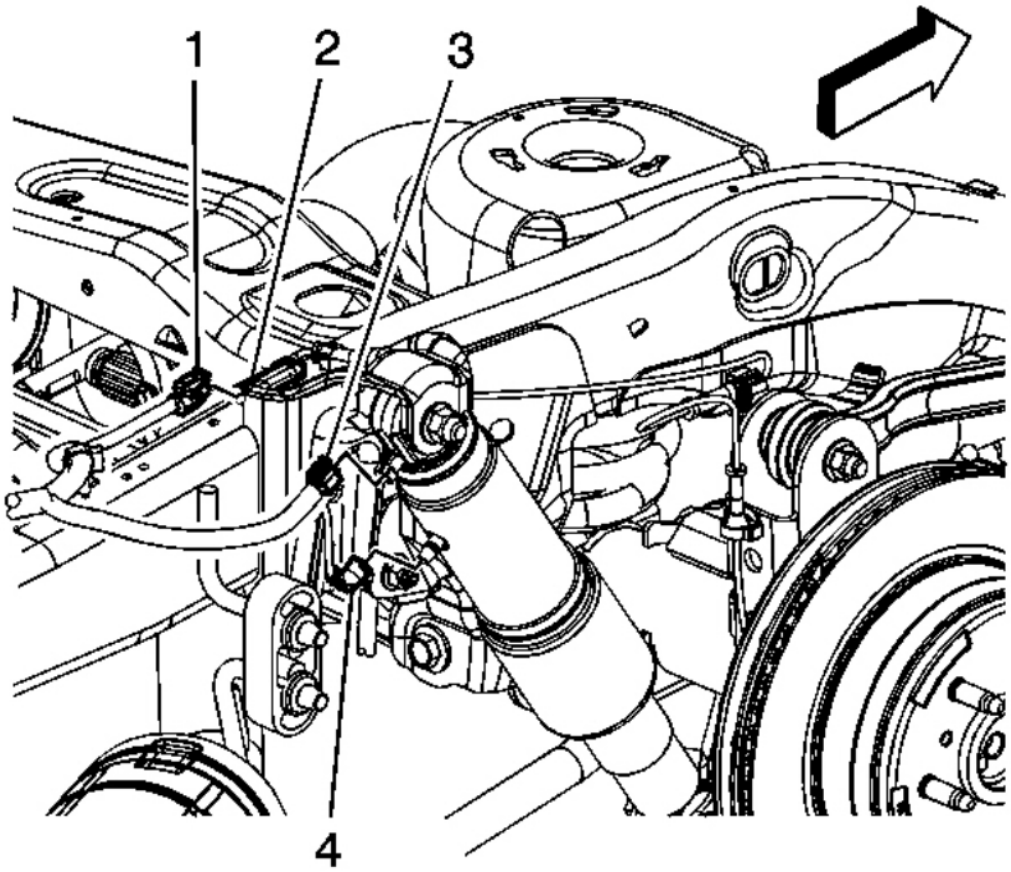


Fig. 114: View Of Chassis Wiring Harness Electrical Connectors & Right Rear Wheel Speed Sensor Wiring Harness Electrical Connector
Courtesy of GENERAL MOTORS CORP.

16. If the vehicle is equipped with RPO Z55, connect the right rear air line to the shock absorber.
17. If the vehicle is equipped with RPO Z55, connect the chassis wiring harness electrical connector (3) to the right rear shock absorber.
18. Connect the chassis wiring harness electrical connector (1) to the right rear wheel speed sensor wiring harness electrical connector (2).
19. Lower the vehicle.

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MUFFLER REPLACEMENT (2500)

Removal Procedure

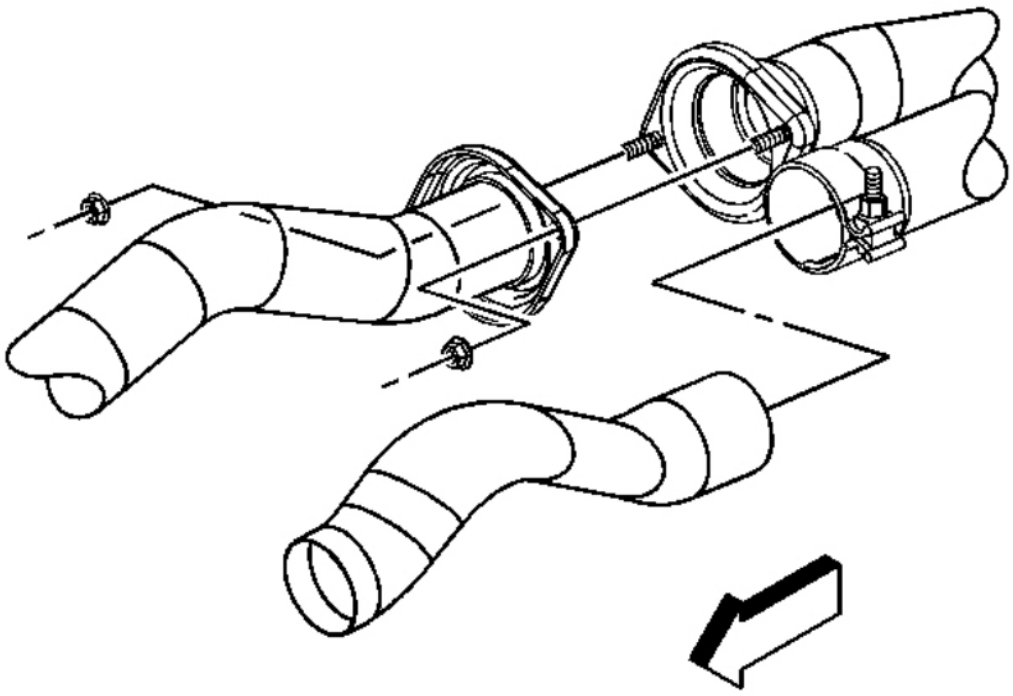


Fig. 115: View Of Exhaust Muffler To Right Catalytic Converter Nuts & Exhaust Pipe Clamp
Courtesy of GENERAL MOTORS CORP.

1. Raise and suitably support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the exhaust muffler to right catalytic converter nuts.
3. Loosen the exhaust pipe clamp at the left catalytic converter.

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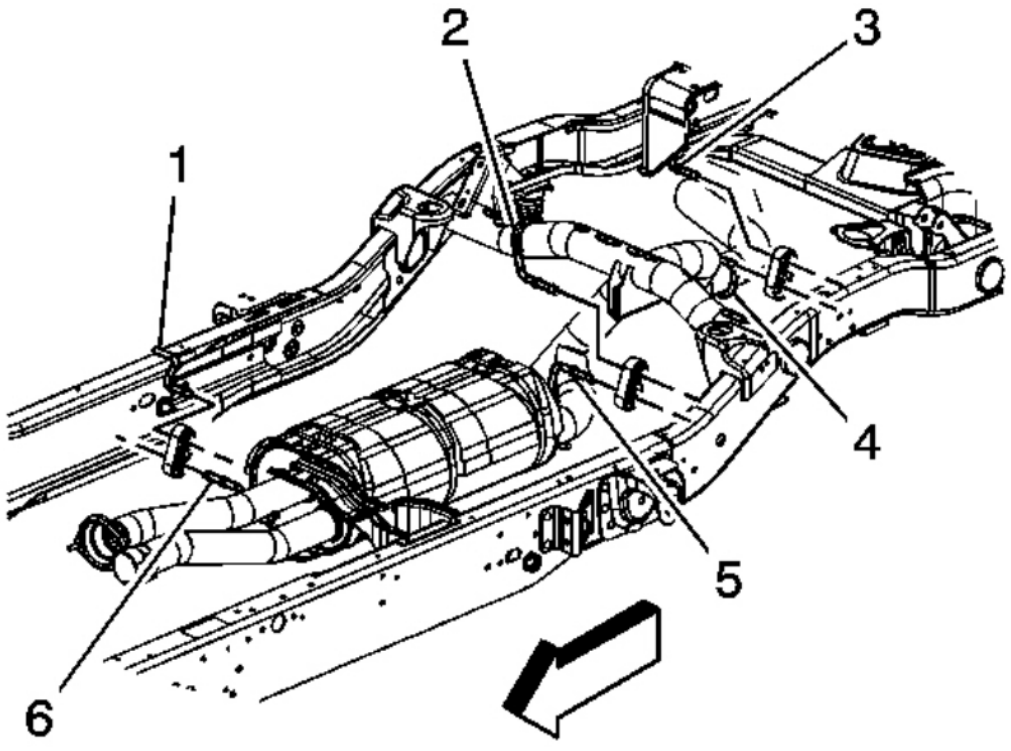


Fig. 116: Locating Exhaust System Hangers & Insulators
Courtesy of GENERAL MOTORS CORP.

4. Lubricate the insulators where the muffler assembly hangers are inserted in order to ease in removal.
5. With the aid of an assistant, remove the insulators from the exhaust system hangers (4, 5, and 6).
6. Pull the muffler assembly rearward in order to separate the muffler from the catalytic converters. Once the muffler is separated from the converters, move and rotate the muffler towards the front of the vehicle, removing the muffler from the vehicle.

Installation Procedure

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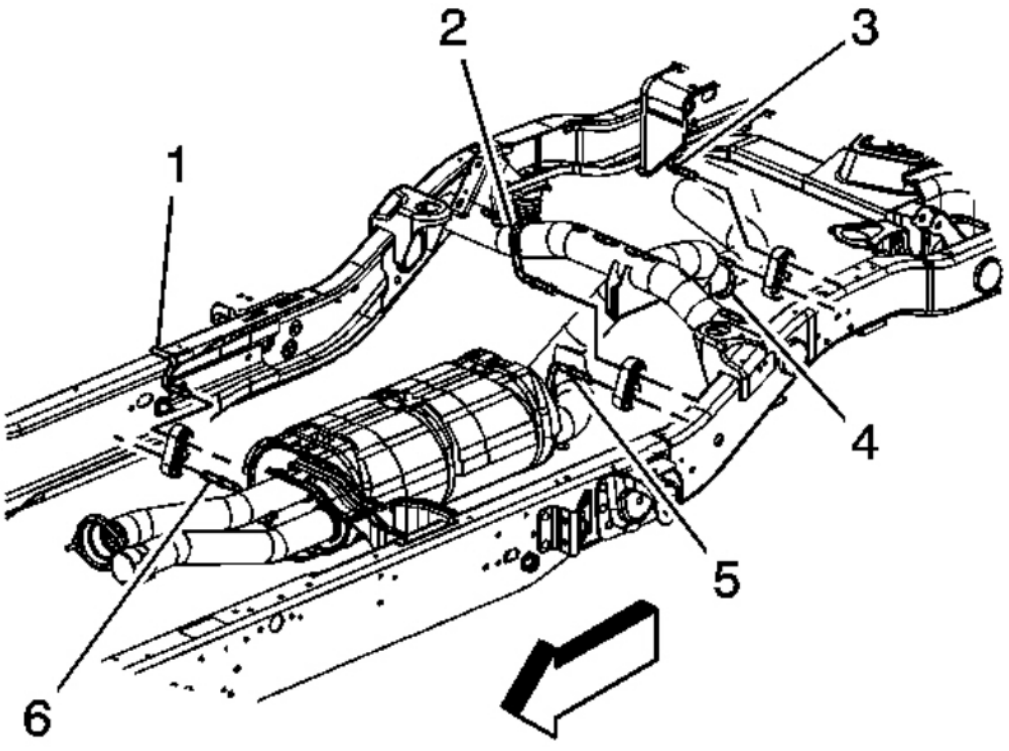


Fig. 117: Locating Exhaust System Hangers & Insulators
Courtesy of GENERAL MOTORS CORP.

1. Lubricate the insulators where the muffler assembly hangers are inserted in order to ease installation.
2. With the aid of an assistant, install the muffler assembly. Rotate the muffler into position over the rear axle, move the muffler rearward, then forward installing the muffler to the catalytic converters.
3. Install the insulators to the exhaust system hangers (4, 5, and 6).

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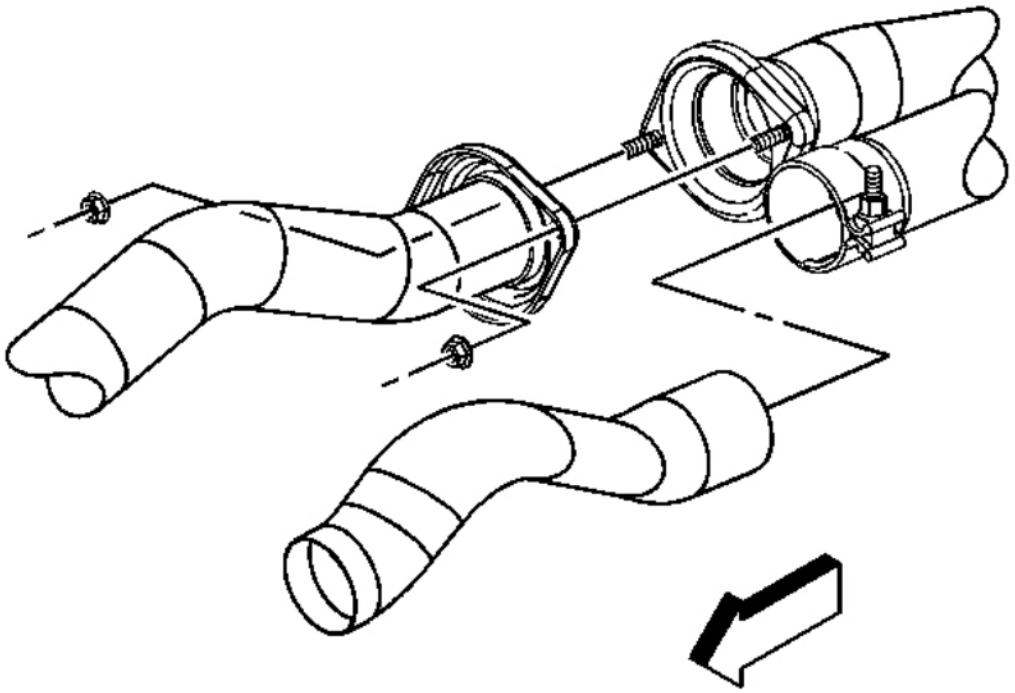


Fig. 118: View Of Exhaust Muffler To Right Catalytic Converter Nuts & Exhaust Pipe Clamp
Courtesy of GENERAL MOTORS CORP.

NOTE: **Refer to Fastener Notice .**

4. Tighten the exhaust pipe clamp at the left catalytic converter.

   Tighten: Tighten the clamp to 44 N.m (32 lb ft).

5. Install the exhaust muffler to right catalytic converter nuts.

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

6. Lower the vehicle.

EXHAUST MUFFLER INSULATOR, HANGER, AND BRACKET REPLACEMENT (1500 - W/RPO L92)

Removal Procedure

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CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

IMPORTANT:

- **Service the exhaust system insulators individually in order to retain the support for the exhaust system.**
- **Do not use oil base lubricants.**

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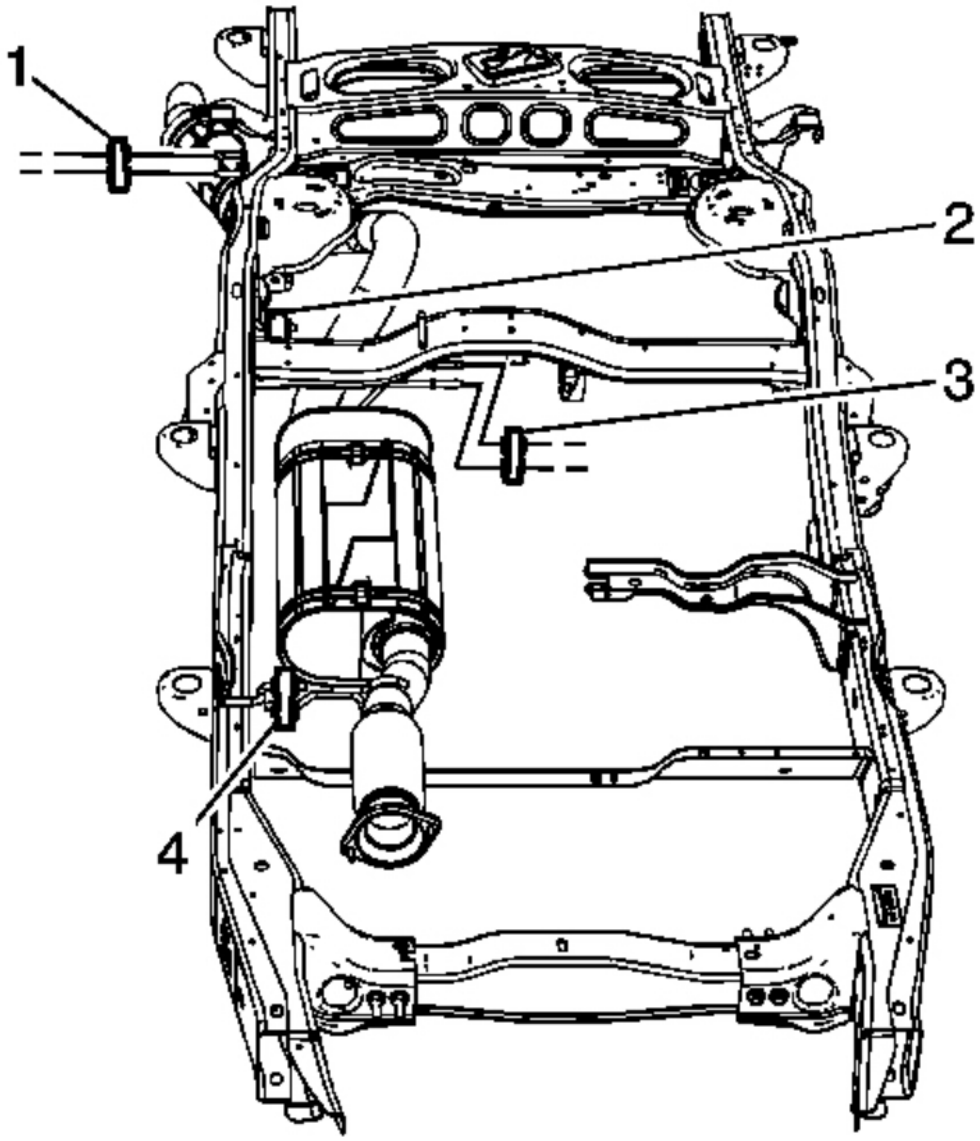


Fig. 119: View Of Exhaust System Insulators
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Spray lubricant if necessary, onto the exhaust system insulator holes where the frame hanger and the exhaust hanger are inserted.
3. Remove the exhaust system insulator (1 or 3), as required.

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4. If replacing the exhaust system insulator (2 or 4), remove the exhaust muffler assembly. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
5. Spray lubricant if necessary, onto the exhaust system insulator hole where the frame hanger is inserted.
6. Remove the exhaust system insulator (2 or 4) from the frame hanger, as required.

Installation Procedure

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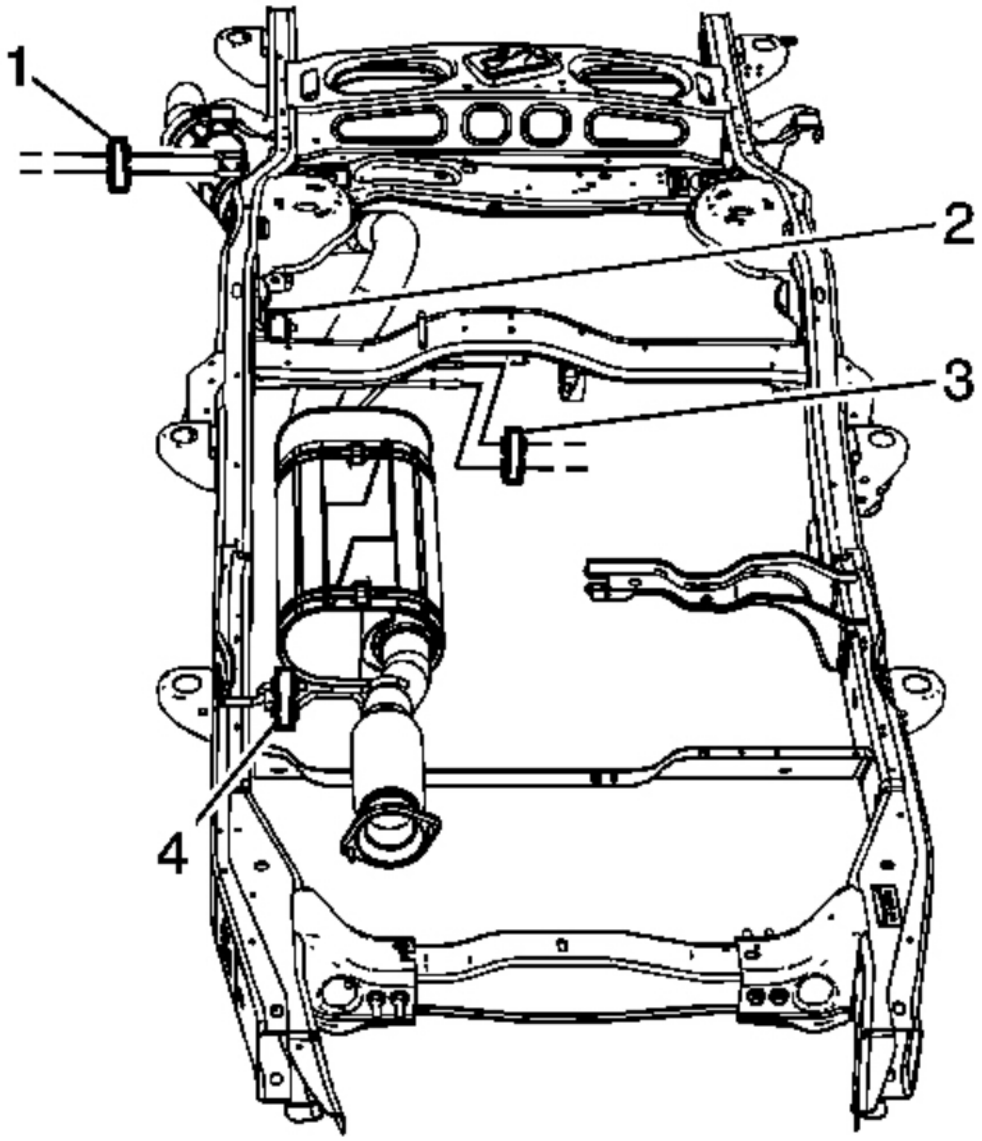


Fig. 120: View Of Exhaust System Insulators
Courtesy of GENERAL MOTORS CORP.

1. Spray lubricant if necessary, onto the exhaust system insulator hole where the frame hanger will be inserted.
2. Install the exhaust system insulator (2 or 4) to the frame hanger, as required.
3. If the exhaust system insulator (2 or 4) was replaced, install the exhaust muffler assembly. Refer to

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Muffler Replacement (1500 - w/RPO L92) or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.

4. Spray lubricant if necessary, onto the exhaust system insulator holes where the frame hanger and the exhaust hanger will be inserted.
5. Install the exhaust system insulator (1 or 3), as required.
6. Lower the vehicle.

EXHAUST MUFFLER INSULATOR, HANGER, AND BRACKET REPLACEMENT (1500 - W/RPOS LC9/LMG/LY5/L76)

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.

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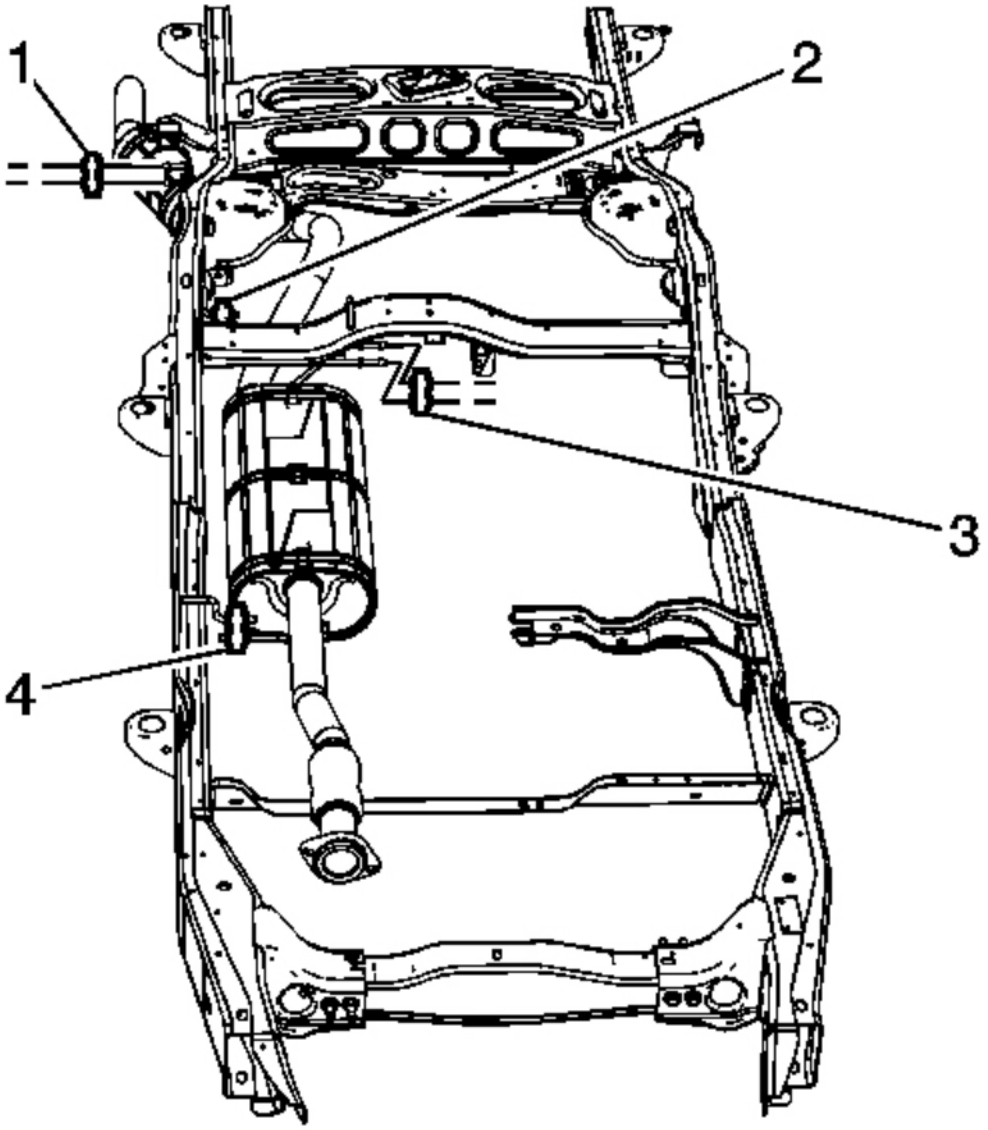


Fig. 121: View Of Exhaust System Insulators
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Do not use oil base lubricants.

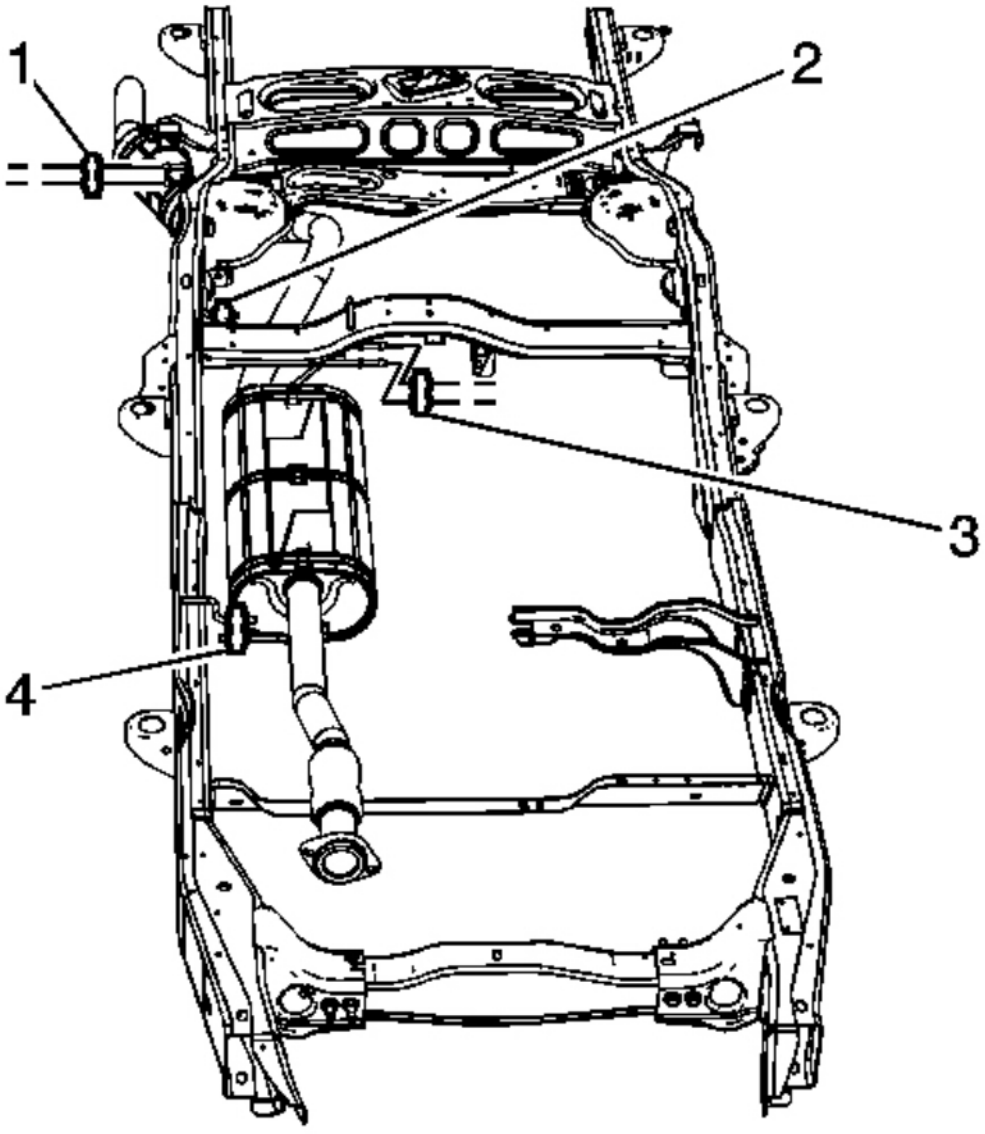
2. Apply a soapy solution to the following in order to ease the removal of the hanger (1):
   - The frame support bracket rod (2)

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- 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



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Fig. 122: View Of Exhaust System Insulators
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.

EXHAUST MUFFLER INSULATOR, HANGER, AND BRACKET REPLACEMENT (1500 - W/RPOS LMG/LY2/LY5)

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

IMPORTANT:
- **Service the exhaust system insulators individually in order to retain the support for the exhaust system.**
- **Do not use oil base lubricants.**

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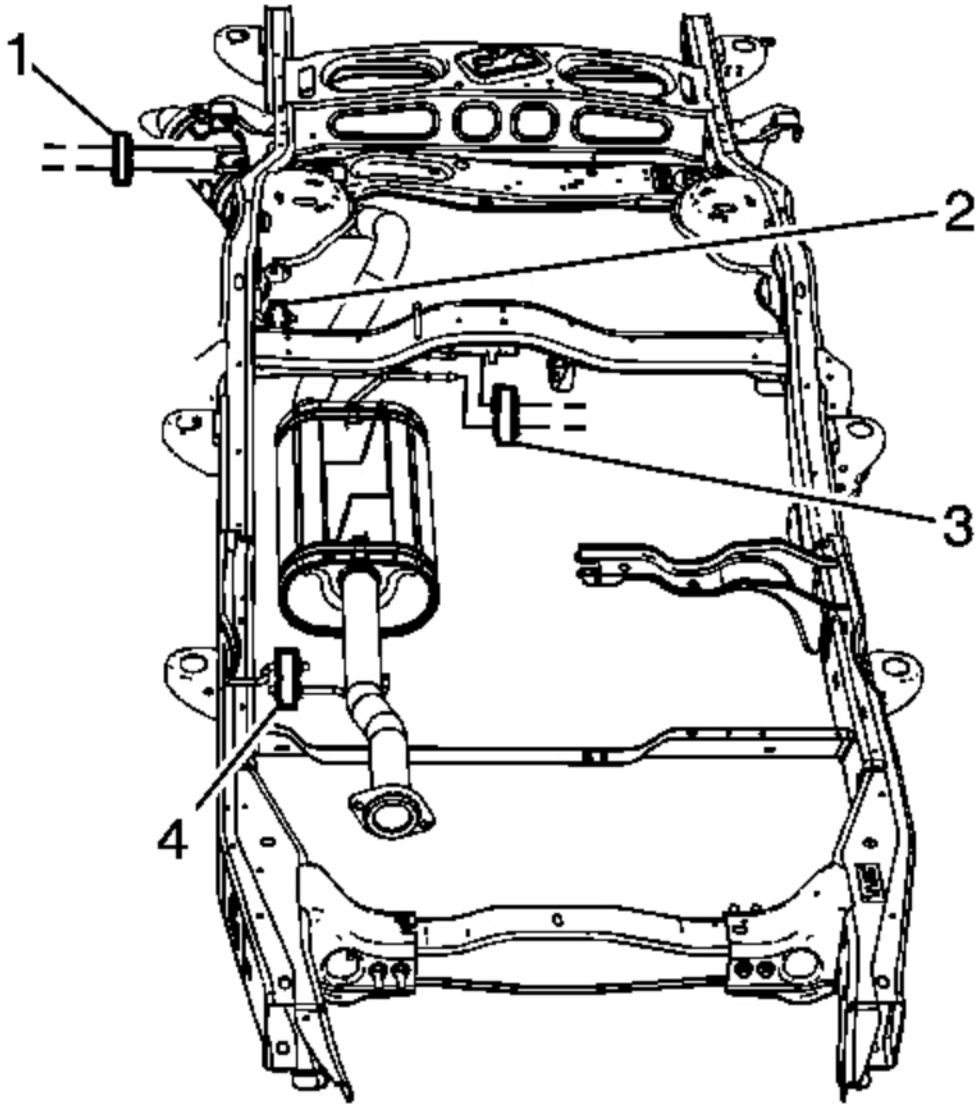


Fig. 123: View Of Exhaust System Insulators
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Spray lubricant if necessary, onto the exhaust system insulator holes where the frame hanger and the exhaust hanger are inserted.
3. Remove the exhaust system insulator (1 or 3), as required.

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4. If replacing the exhaust system insulator (2 or 4), remove the exhaust muffler assembly. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
5. Spray lubricant if necessary, onto the exhaust system insulator hole where the frame hanger is inserted.
6. Remove the exhaust system insulator (2 or 4) from the frame hanger, as required.

Installation Procedure

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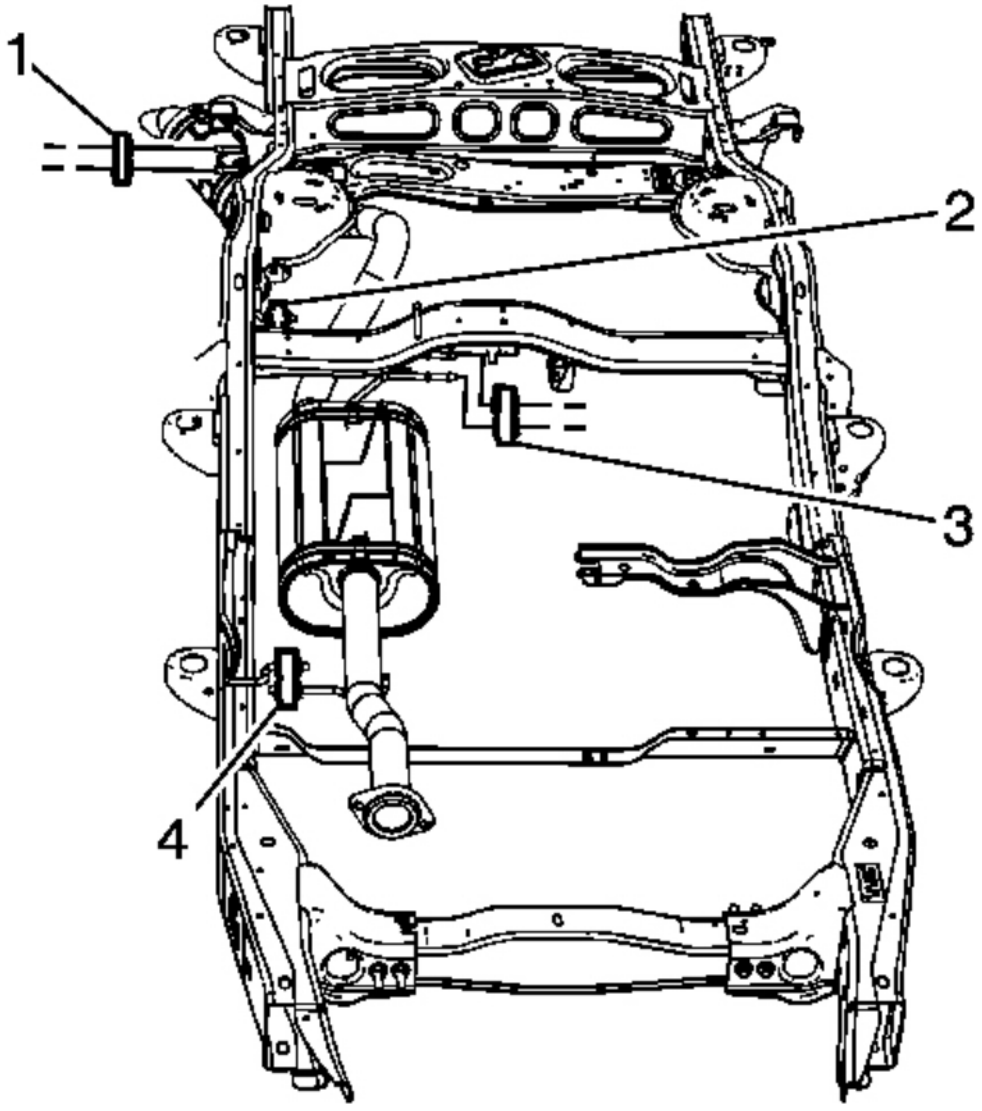


Fig. 124: View Of Exhaust System Insulators
Courtesy of GENERAL MOTORS CORP.

1. Spray lubricant if necessary, onto the exhaust system insulator hole where the frame hanger will be inserted.
2. Install the exhaust system insulator (2 or 4) to the frame hanger, as required.
3. If the exhaust system insulator (2 or 4) was replaced, install the exhaust muffler assembly. Refer to

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Muffler Replacement (1500 - w/RPO L92) or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.

4. Spray lubricant if necessary, onto the exhaust system insulator holes where the frame hanger and the exhaust hanger will be inserted.
5. Install the exhaust system insulator (1 or 3), as required.
6. Lower the vehicle.

EXHAUST MUFFLER INSULATOR, HANGER, AND BRACKET REPLACEMENT (2500)

Removal Procedure

CAUTION: Refer to Exhaust Service Caution .

CAUTION: Refer to Protective Goggles and Glove Caution .

IMPORTANT:

- **Service the exhaust system insulators individually in order to retain the support for the exhaust system.**
- **Do not use oil base lubricants.**

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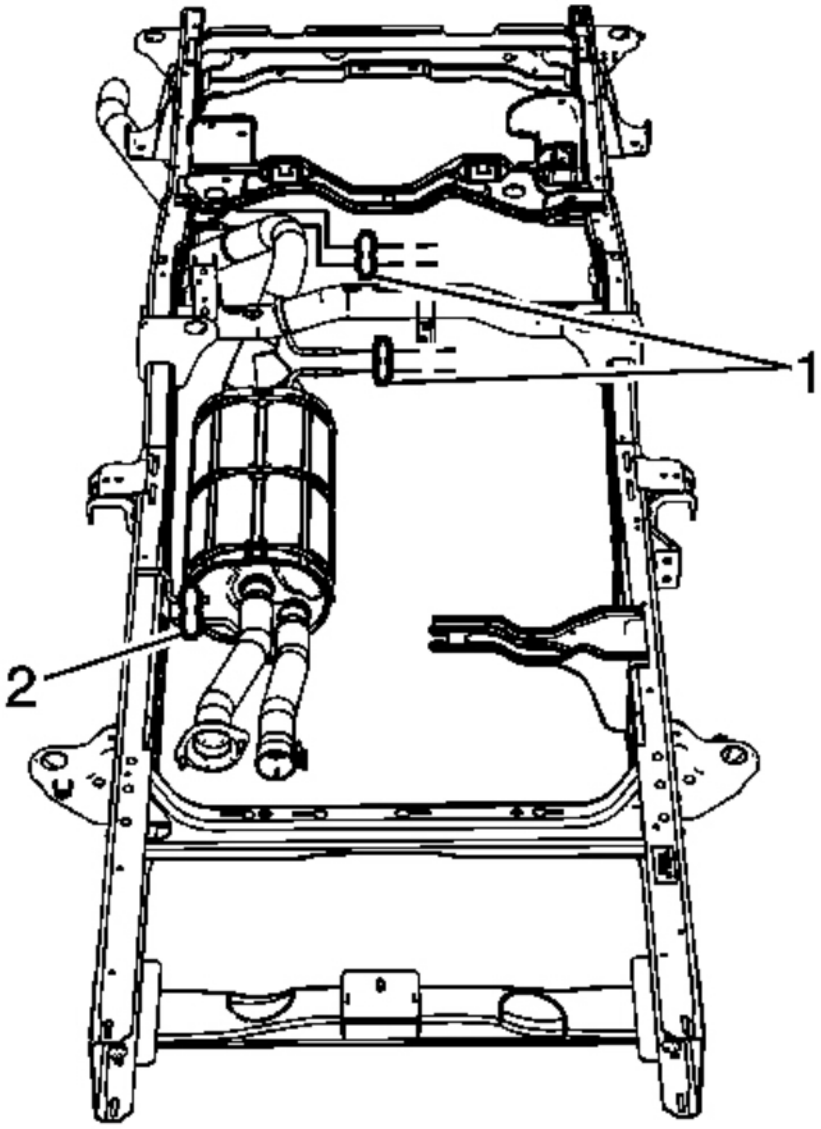


Fig. 125: View Of Exhaust System Insulators
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Spray lubricant if necessary, onto the exhaust system insulator holes where the frame hanger and the exhaust hanger are inserted.
3. Remove the exhaust system insulator (1), as required.

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4. If replacing the exhaust system insulator (2), remove the exhaust muffler assembly. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
5. Spray lubricant if necessary, onto the exhaust system insulator hole where the frame hanger is inserted.
6. Remove the exhaust system insulator (2) from the frame hanger, as required.

Installation Procedure

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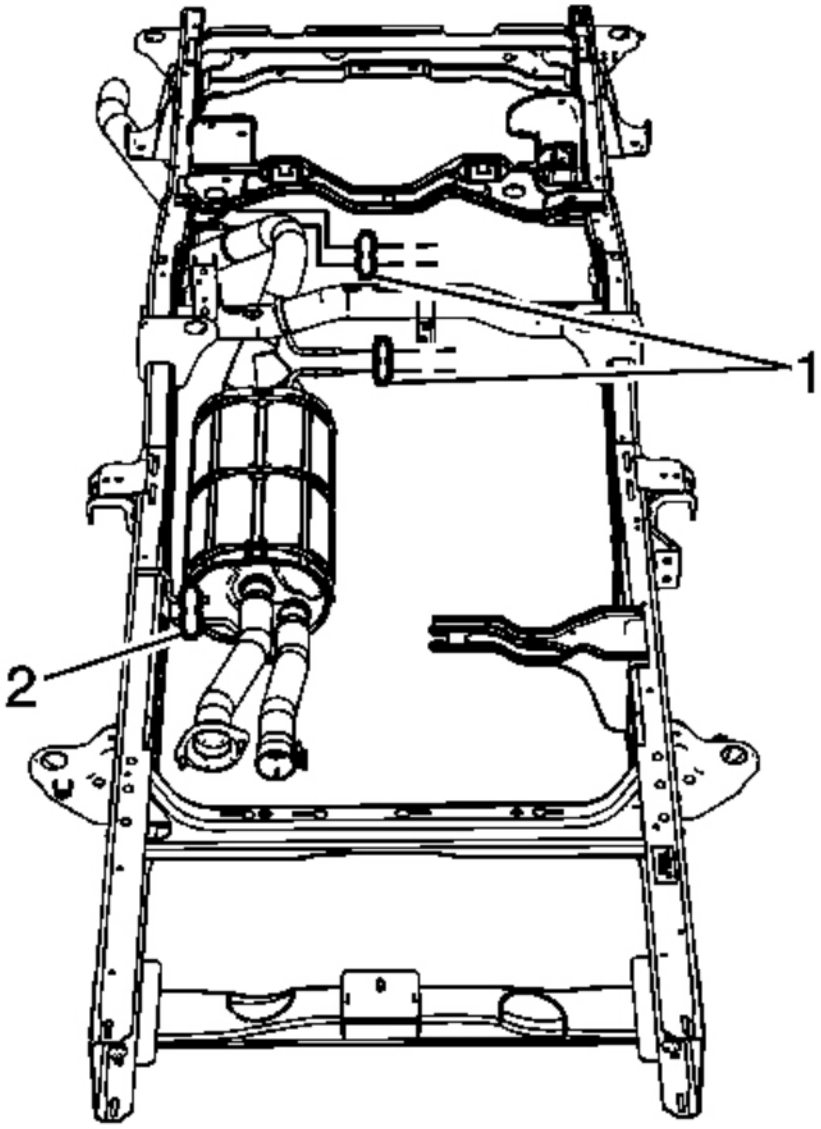


Fig. 126: View Of Exhaust System Insulators
Courtesy of GENERAL MOTORS CORP.

1. Spray lubricant if necessary, onto the exhaust system insulator hole where the frame hanger will be inserted.
2. Install the exhaust system insulator (2) to the frame hanger, as required.
3. If the exhaust system insulator (2) was replaced, install the exhaust muffler assembly. Refer to **Muffler**

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Replacement (1500 - w/RPO L92) or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.

4. Spray lubricant if necessary, onto the exhaust system insulator holes where the frame hanger and the exhaust hanger will be inserted.
5. Install the exhaust system insulator (1), as required.
6. Lower the vehicle.

FLOOR PANEL HEAT SHIELD REPLACEMENT

Removal Procedure

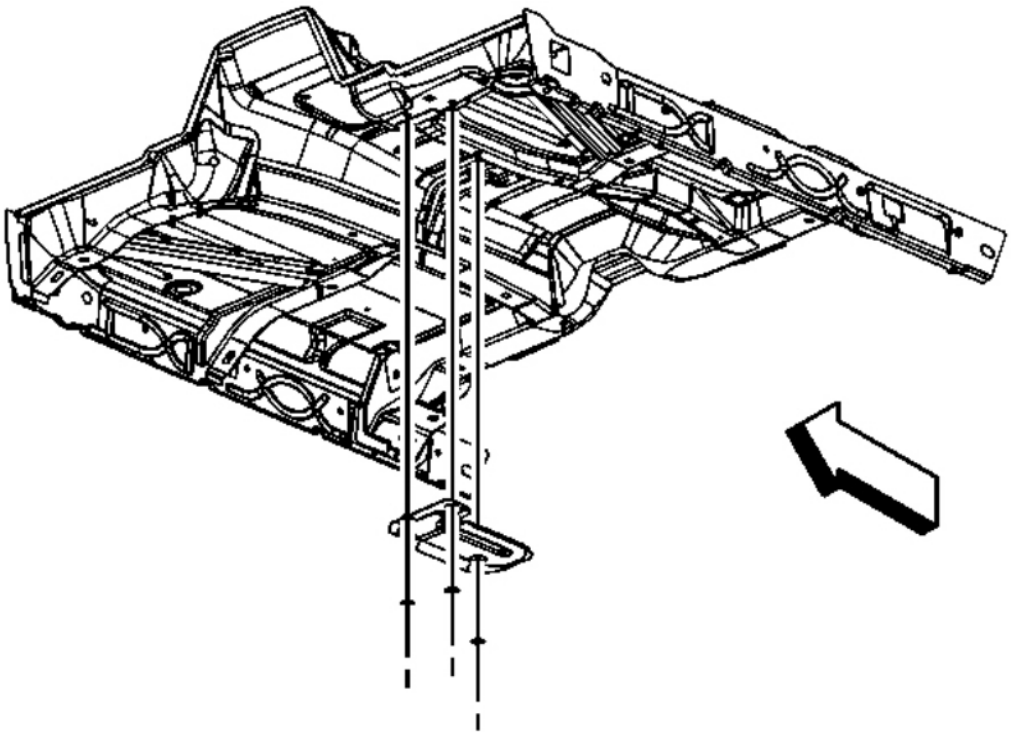


Fig. 127: View Of Left Front Floor Panel Exhaust Heat Shield Nuts & Heat Shield
Courtesy of GENERAL MOTORS CORP.

1. Remove the catalytic converter, as required. Refer to one of the following:
   - **Catalytic Converter Replacement (1500 Series)**
   - **Catalytic Converter Replacement - Left Side (2500 Series)**
   - **Catalytic Converter Replacement - Right Side (2500 Series)**

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2. Remove the muffler assembly, as required. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
3. Remove the left front floor panel exhaust heat shield nuts and heat shield, as required.

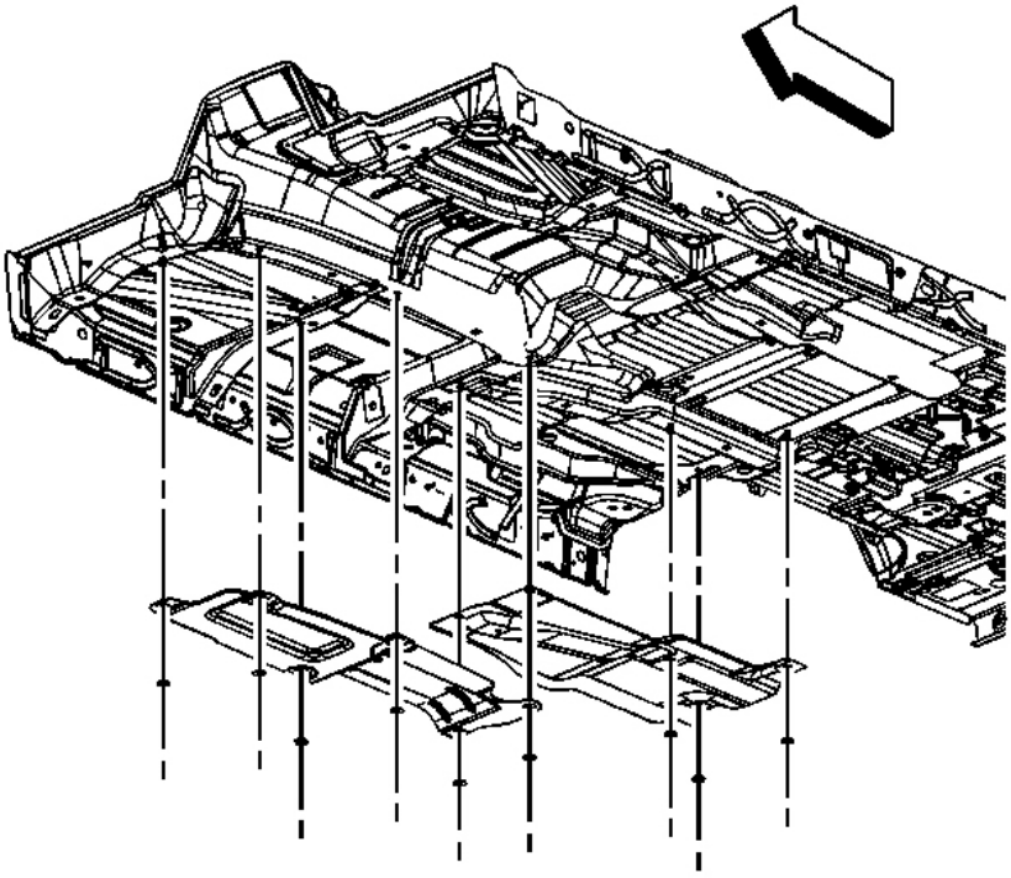


Fig. 128: View Of Floor Panel Exhaust Heat Shield Nuts & Heat Shields
Courtesy of GENERAL MOTORS CORP.

4. If the vehicle is a Tahoe, Yukon, Yukon Denali, or a Escalade, remove the exhaust heat shield nuts and heat shields, as required.

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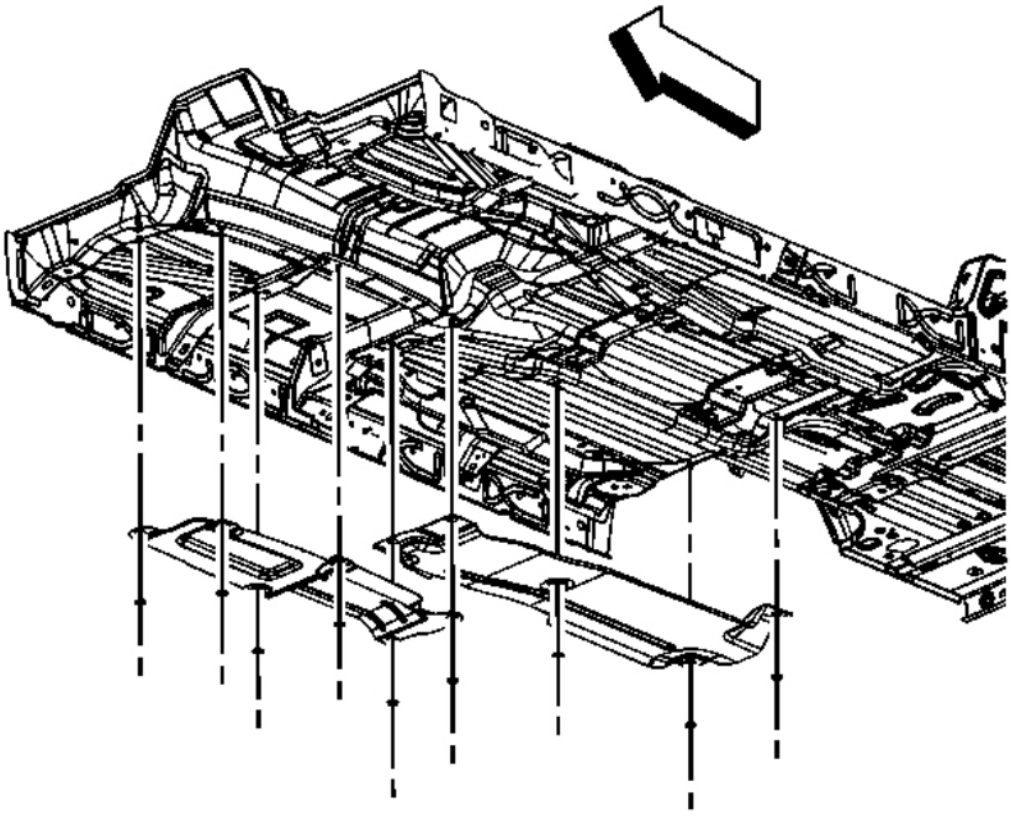


Fig. 129: View Of Floor Panel Exhaust Heat Shield Nuts & Heat Shields
Courtesy of GENERAL MOTORS CORP.

5. If the vehicle is a Suburban, Yukon XL, Yukon Denali XL, Escalade ESV, Escalade EXT or a Avalanche, remove the exhaust heat shield nuts and heat shields, as required.

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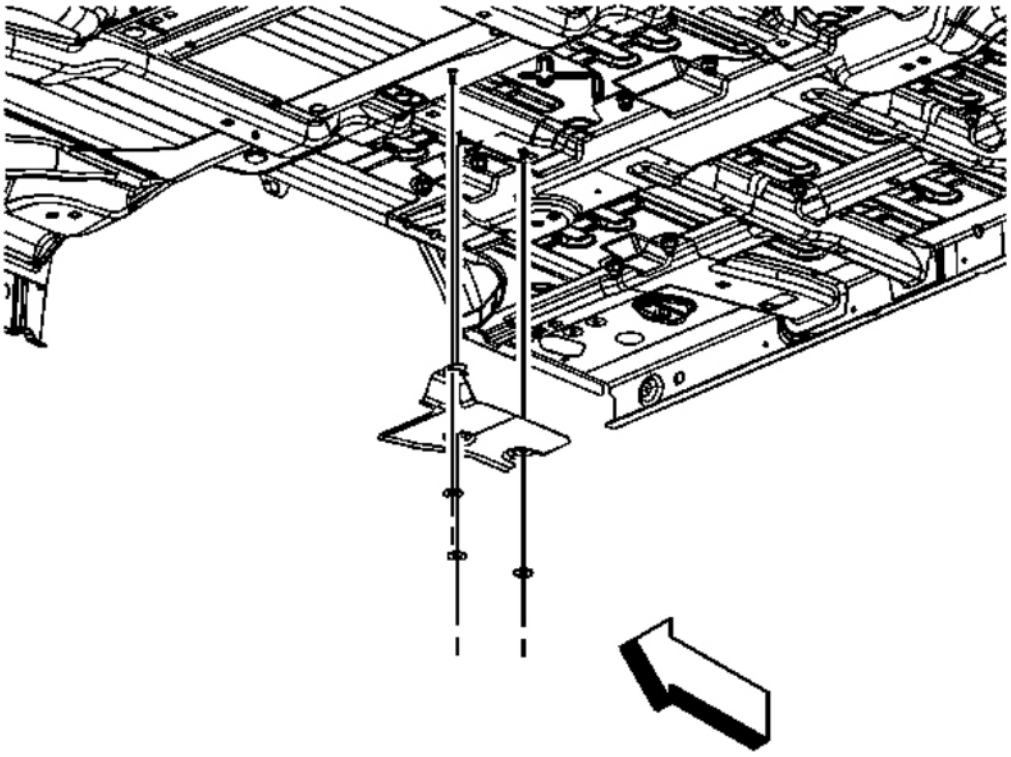


Fig. 130: View Of Rear Floor Panel Exhaust Heat Shield Nuts & Heat Shield
Courtesy of GENERAL MOTORS CORP.

6. Remove the rear floor panel exhaust heat shield nuts and heat shield, as required

Installation Procedure

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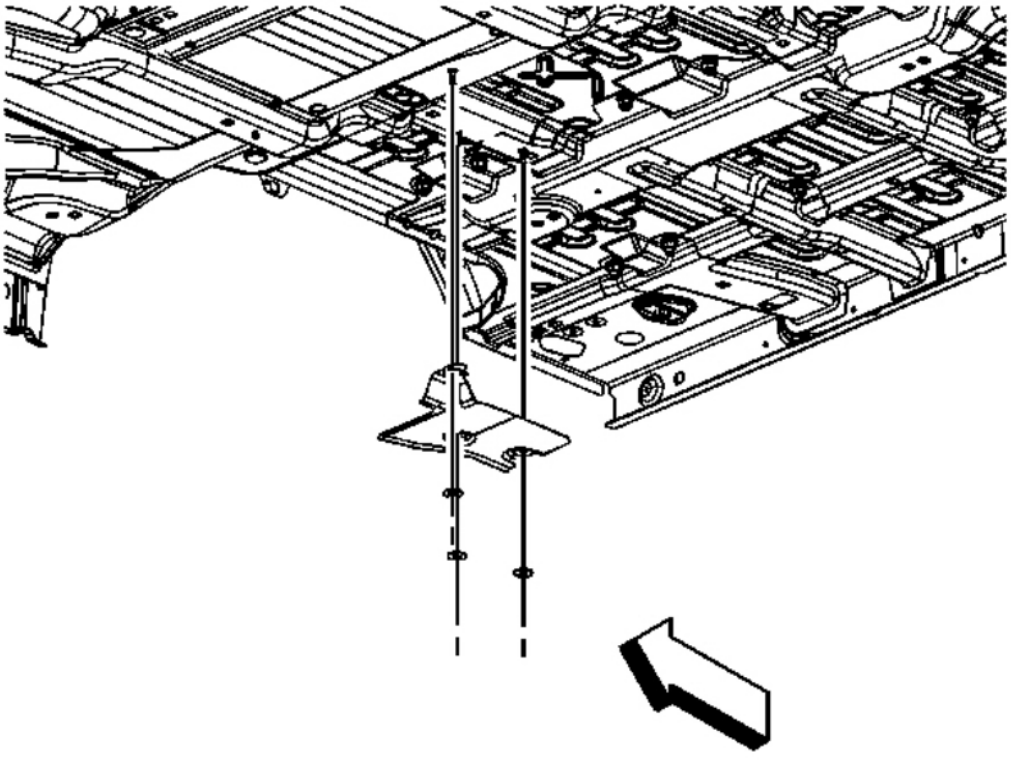


Fig. 131: View Of Rear Floor Panel Exhaust Heat Shield Nuts & Heat Shield
Courtesy of GENERAL MOTORS CORP.

NOTE: **Refer to Fastener Notice .**

1. Position the rear floor panel exhaust heat shield to the studs and install the heat shield nuts.

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

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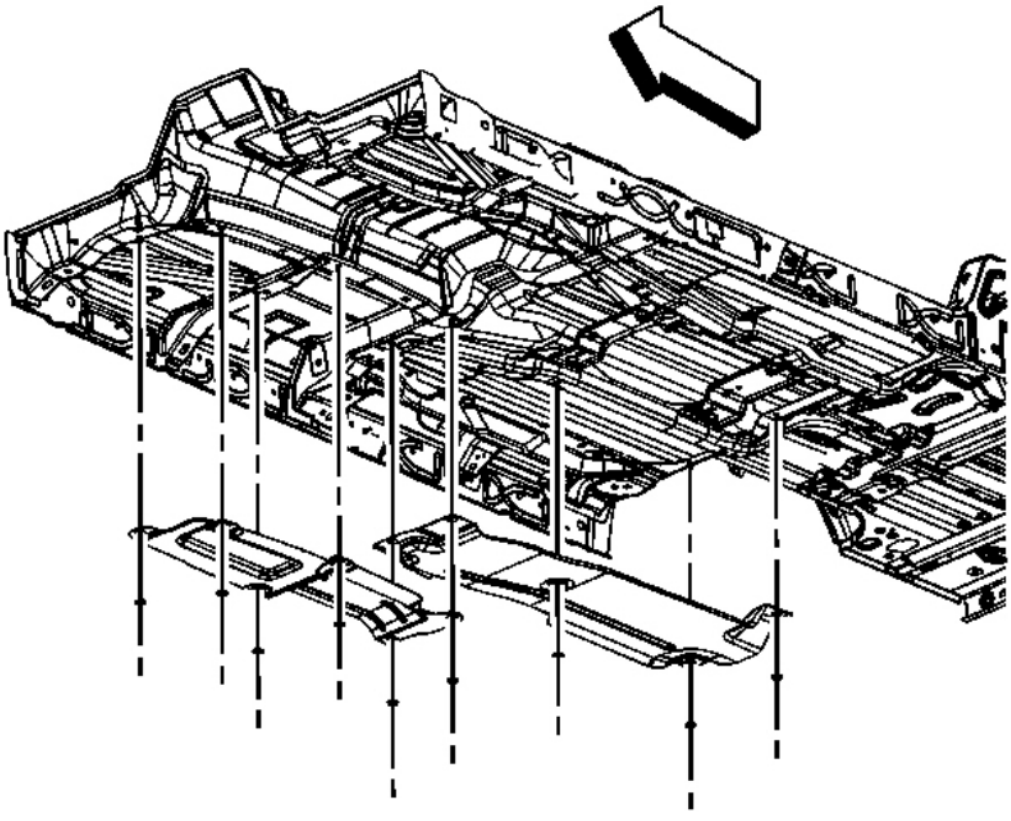


Fig. 132: View Of Floor Panel Exhaust Heat Shield Nuts & Heat Shields
Courtesy of GENERAL MOTORS CORP.

2. If the vehicle is a Suburban, Yukon XL, Yukon Denali XL, Escalade ESV, Escalade EXT or a Avalanche, position the exhaust heat shield to the studs and install the heat shield nuts, as required.

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

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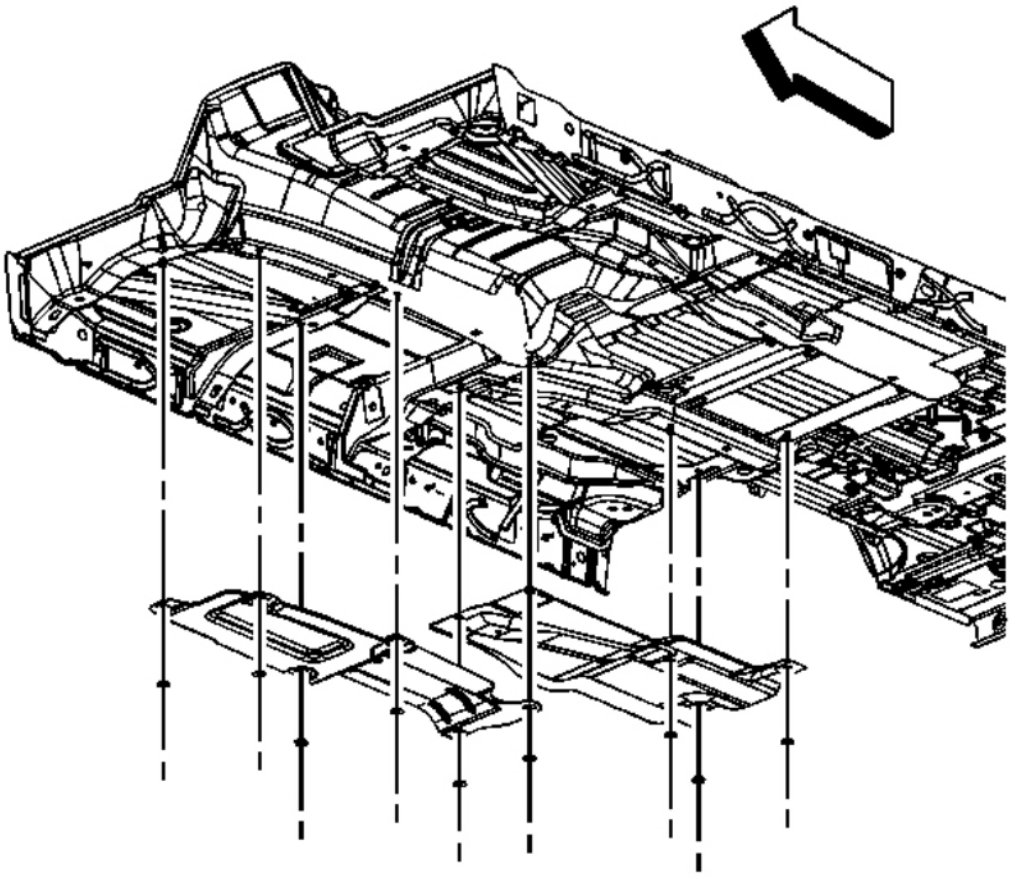


Fig. 133: View Of Floor Panel Exhaust Heat Shield Nuts & Heat Shields
Courtesy of GENERAL MOTORS CORP.

3. If the vehicle is a Tahoe, Yukon, Yukon Denali, or a Escalade, position the exhaust heat shield to the studs and install the heat shield nuts, as required.

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

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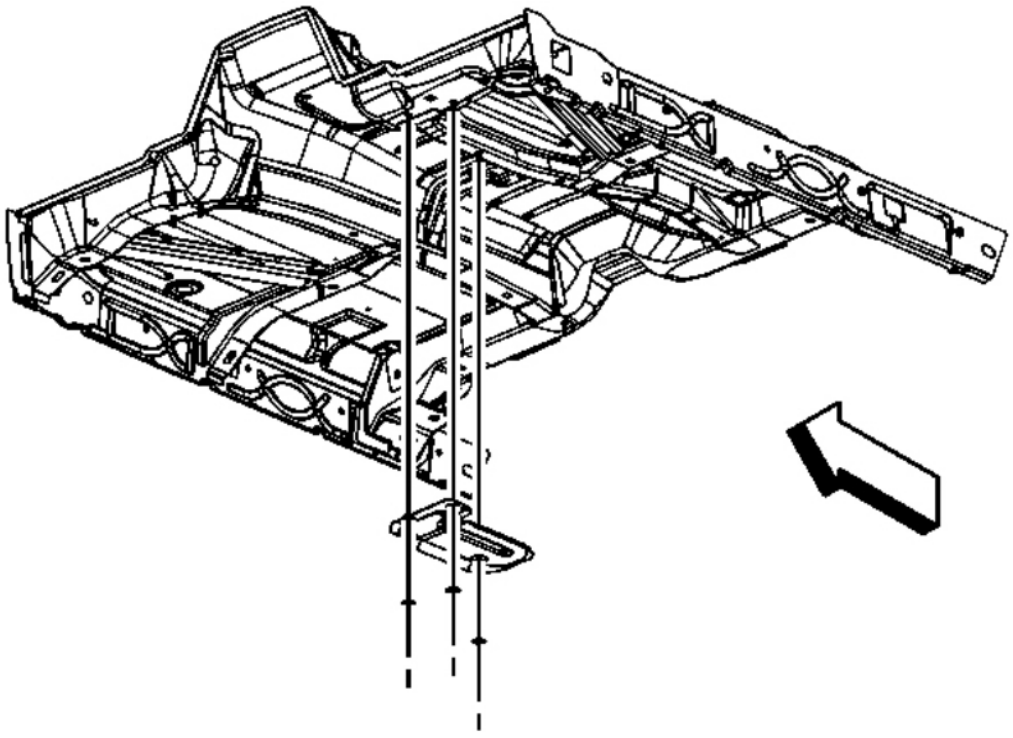


Fig. 134: View Of Left Front Floor Panel Exhaust Heat Shield Nuts & Heat Shield
Courtesy of GENERAL MOTORS CORP.

4. Position the left front floor panel exhaust heat shield to the studs and install the heat shield nuts.

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

5. Install the muffler assembly, as required. Refer to **Muffler Replacement (1500 - w/RPO L92)** or **Muffler Replacement (1500 - w/RPOs LC9/LMG/LY5/L76)** or **Muffler Replacement (1500 - w/RPOs LMG/LY2/LY5)** or **Muffler Replacement (2500)**.
6. Install the catalytic converter, if necessary. Refer to one of the following:
   - **Catalytic Converter Replacement (1500 Series)**
   - **Catalytic Converter Replacement - Left Side (2500 Series)**
   - **Catalytic Converter Replacement - Right Side (2500 Series)**

EXHAUST HEAT SHIELD REPLACEMENT - DASH PANEL

Removal Procedure

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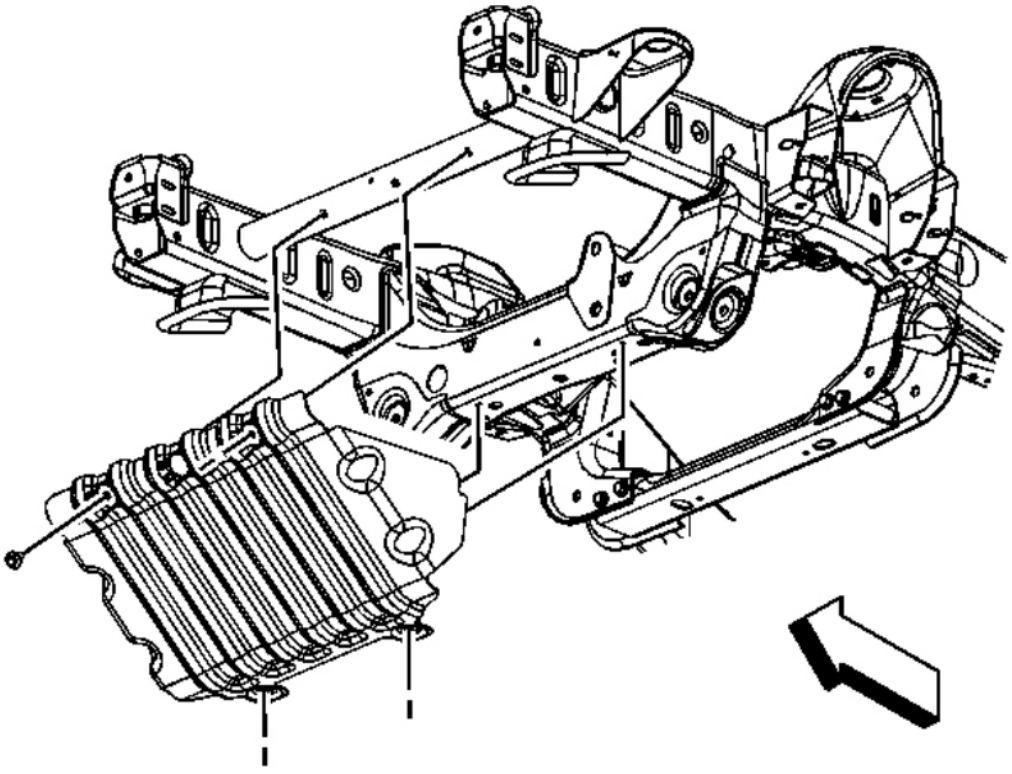


Fig. 135: View Of Engine Shield & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the engine shield bolts and shield, if necessary.

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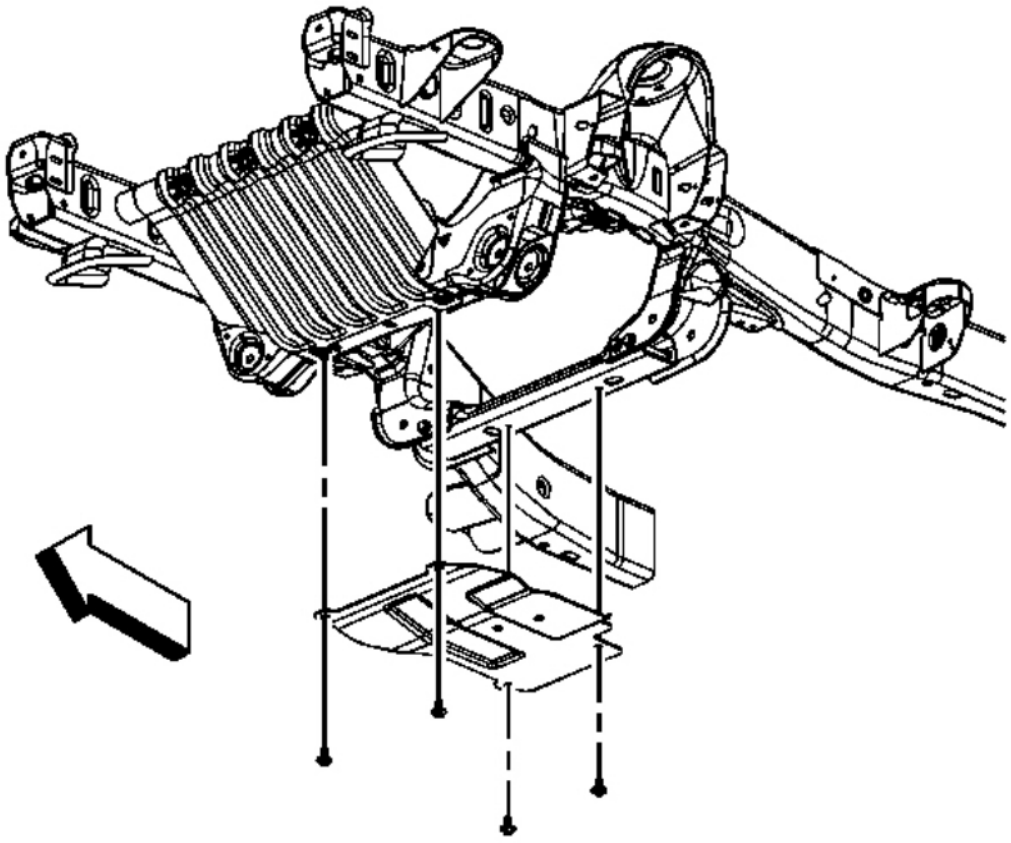


Fig. 136: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

3. For 1500 series vehicles, remove the oil pan skid plate bolts and skid plate, if equipped.

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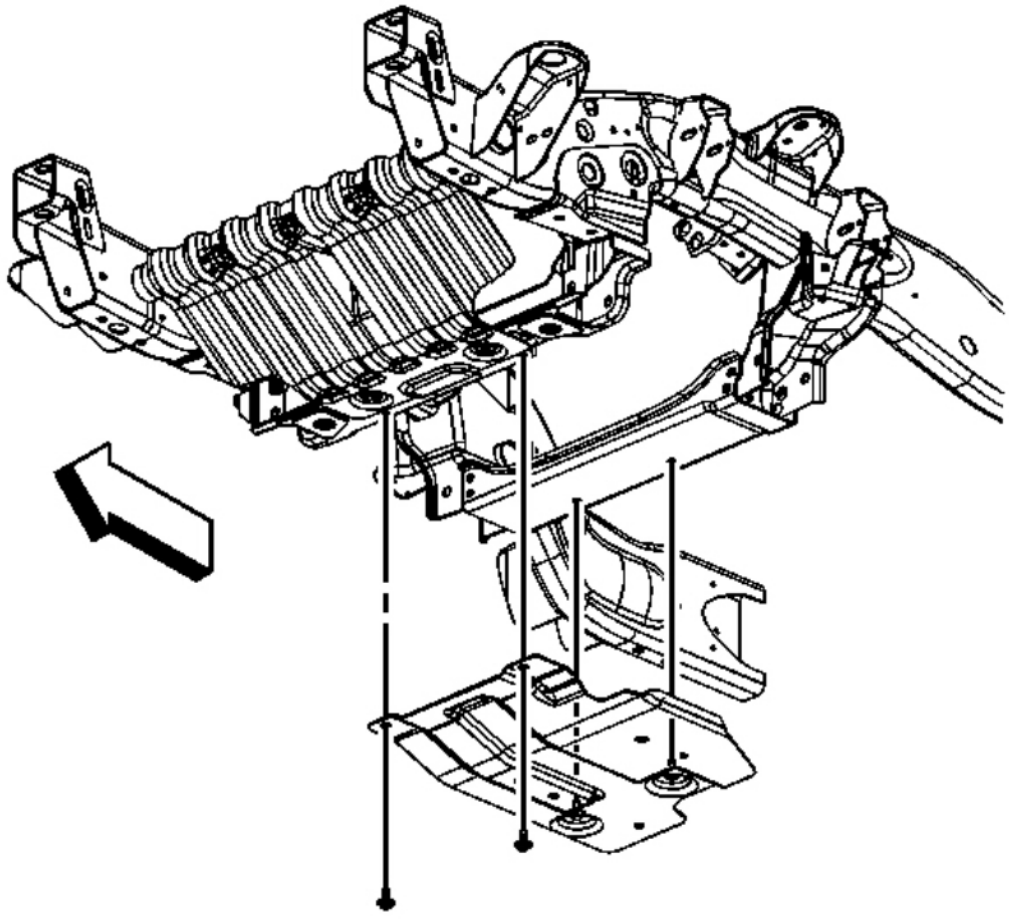


Fig. 137: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

4. For 2500 series vehicles, loosen the 2 rear oil pan skid plate bolts, remove the 2 front oil pan skid plate bolts and skid plate, if equipped.
5. Remove the catalytic converter, if required. Refer to one of the following:
   - **Catalytic Converter Replacement (1500 Series)**
   - **Catalytic Converter Replacement - Left Side (2500 Series)**
   - **Catalytic Converter Replacement - Right Side (2500 Series)**

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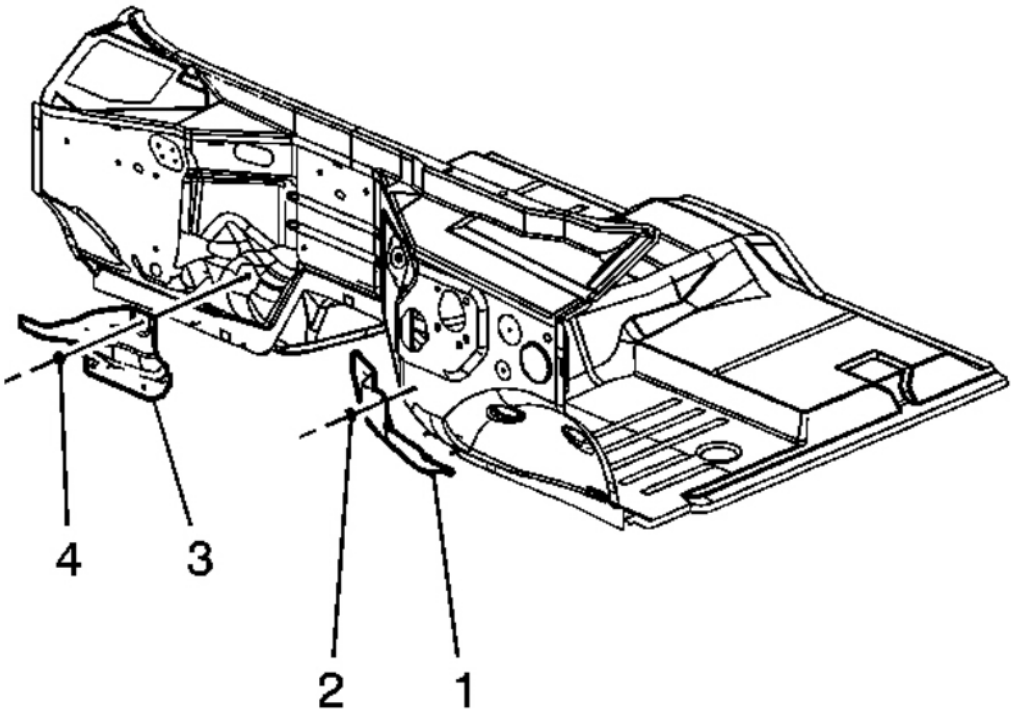


Fig. 138: View Of Dash Panel Exhaust Heat Shield & Nuts
Courtesy of GENERAL MOTORS CORP.

6. Remove the dash panel exhaust heat shield nuts (2 or 4).
7. Remove the dash panel exhaust heat shield (1 or 3) from the dash panel studs.

Installation Procedure

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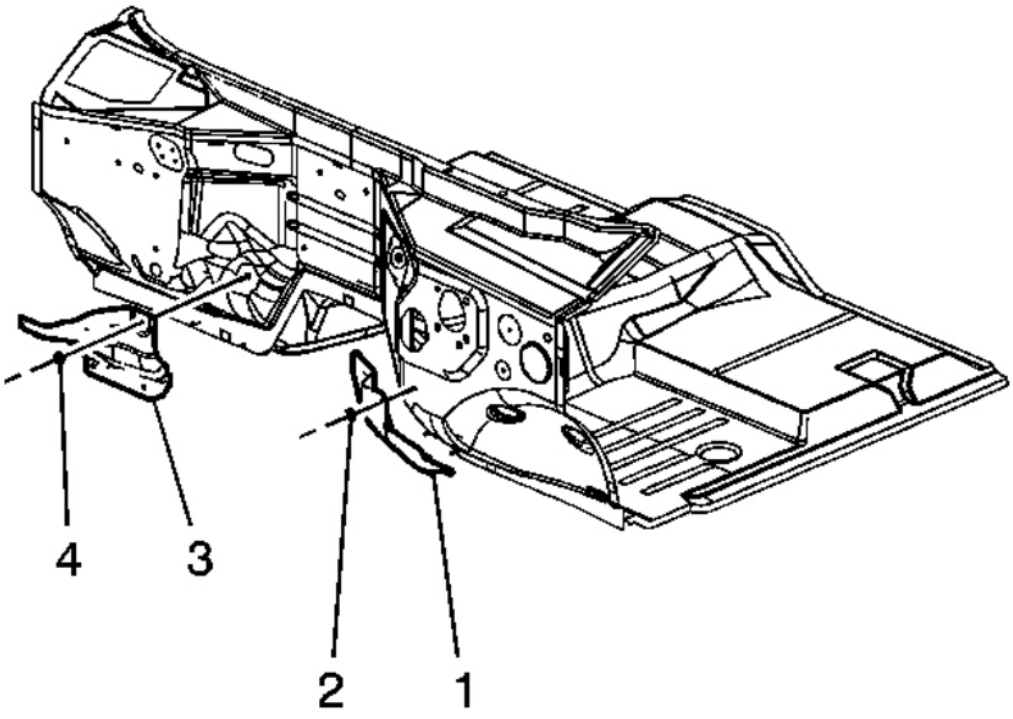


Fig. 139: View Of Dash Panel Exhaust Heat Shield & Nuts
Courtesy of GENERAL MOTORS CORP.

1. Install the dash panel exhaust heat shield (1 or 3) to the dash panel studs.
2. Install the dash panel exhaust heat shield nuts (2 or 4).

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

3. Install the catalytic converter, if required. Refer to one of the following:
   - **Catalytic Converter Replacement (1500 Series)**
   - **Catalytic Converter Replacement - Left Side (2500 Series)**
   - **Catalytic Converter Replacement - Right Side (2500 Series)**

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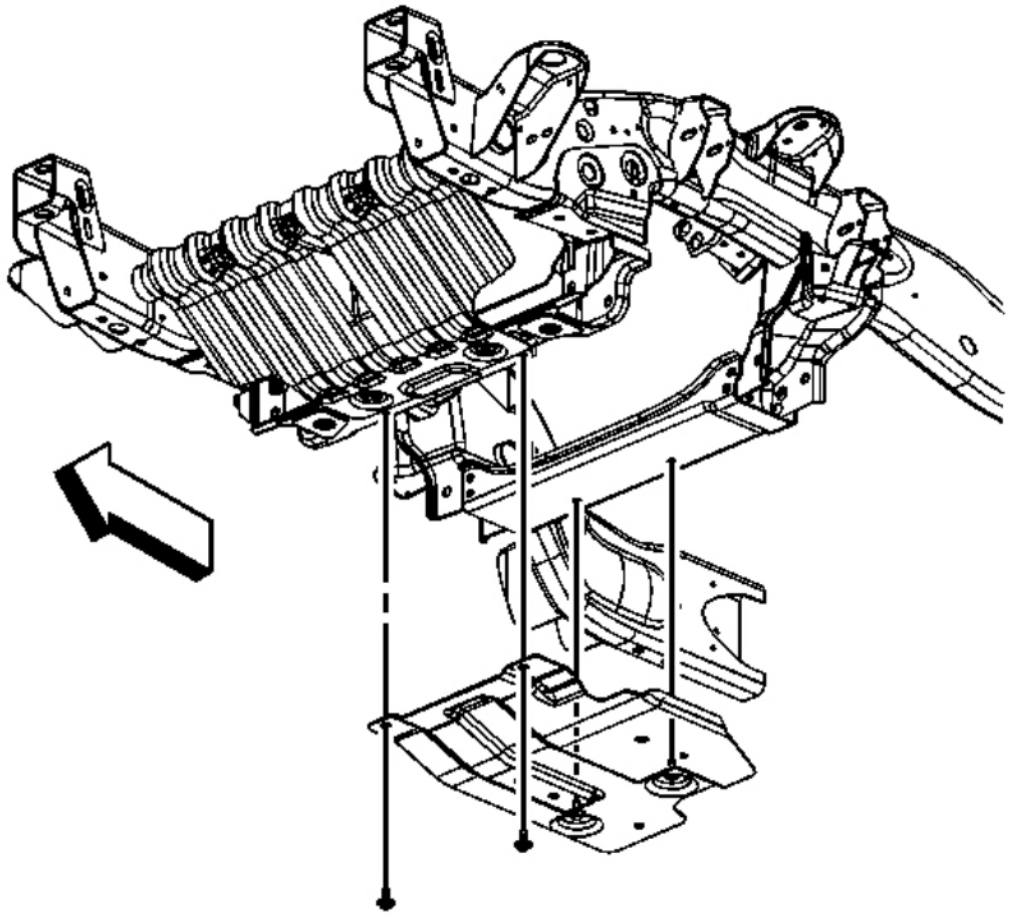


Fig. 140: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

4. For 2500 series vehicles, position the oil pan skid plate and tighten until snug the 2 rear oil pan skid plate bolts, install the 2 front oil pan skid plate bolts, if equipped.

   Tighten: Tighten the bolts to 28 N.m (21 lb ft).

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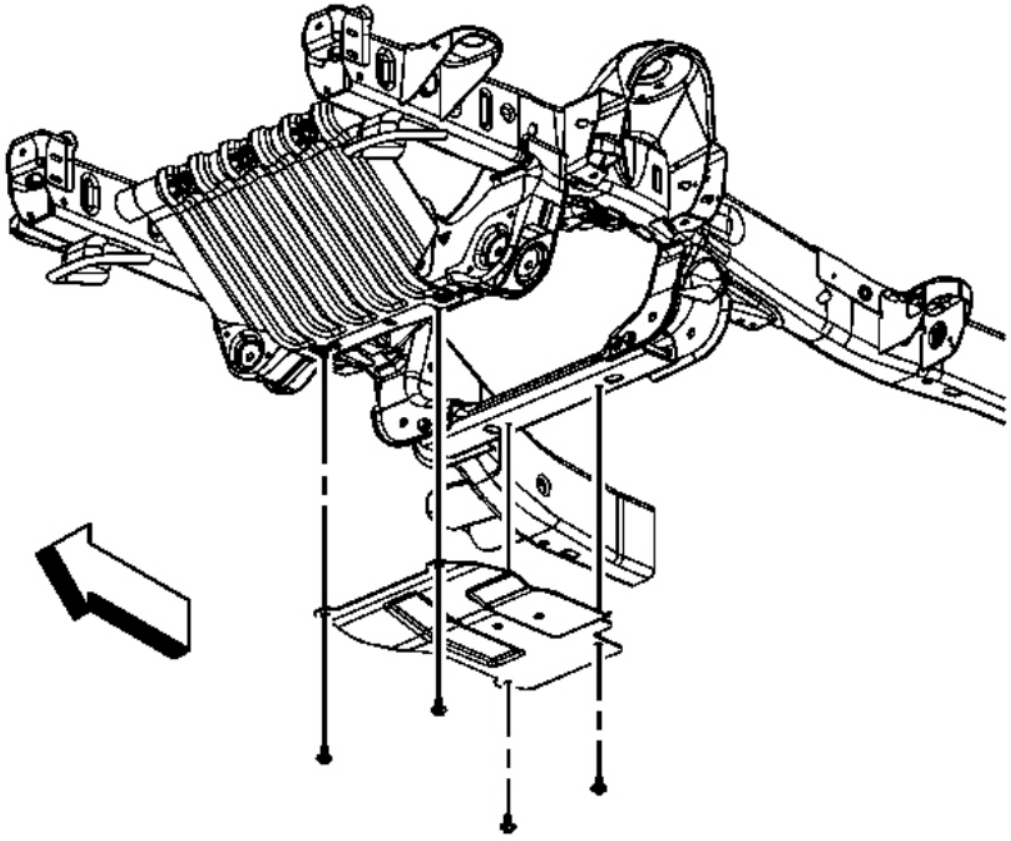


Fig. 141: View Of Oil Pan Skid Plate & Bolts
Courtesy of GENERAL MOTORS CORP.

5. For 1500 series vehicles, position the oil pan skid plate and install the oil pan skid plate bolts, if equipped.

   Tighten: Tighten the bolts to 28 N.m (21 lb ft).

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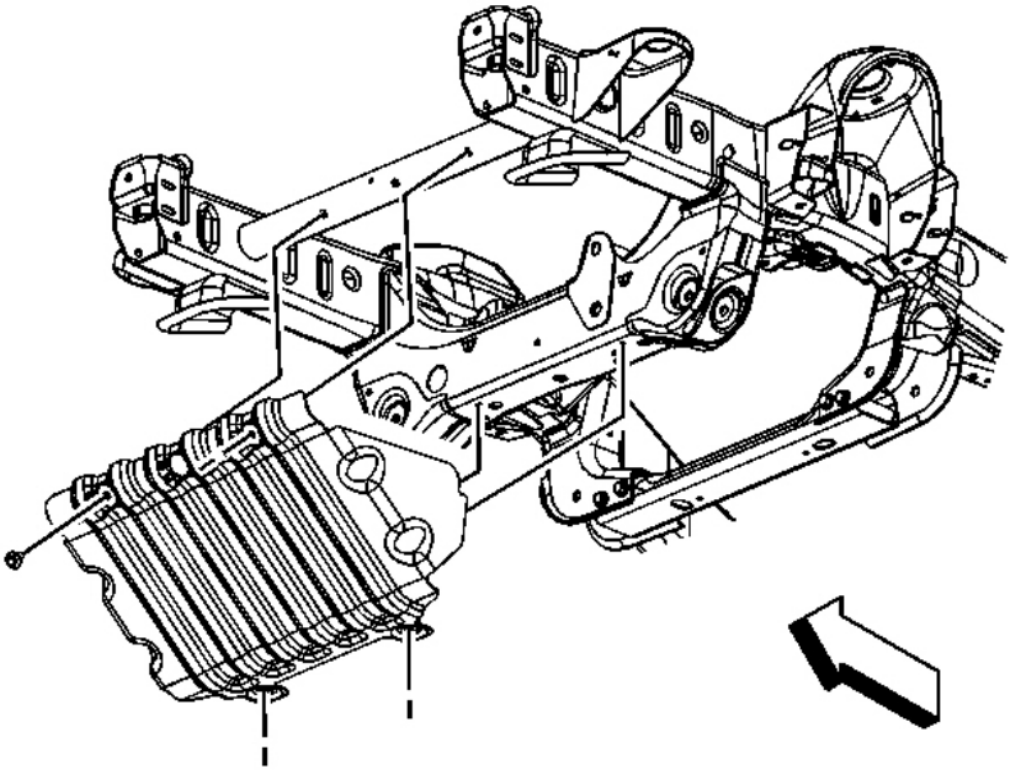


Fig. 142: View Of Engine Shield & Bolts
Courtesy of GENERAL MOTORS CORP.

6. Position the engine shield to the frame.
7. Install and tighten the engine shield bolts.

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

8. Lower the vehicle.

EXHAUST MANIFOLD HEAT SHIELD REPLACEMENT - RIGHT SIDE

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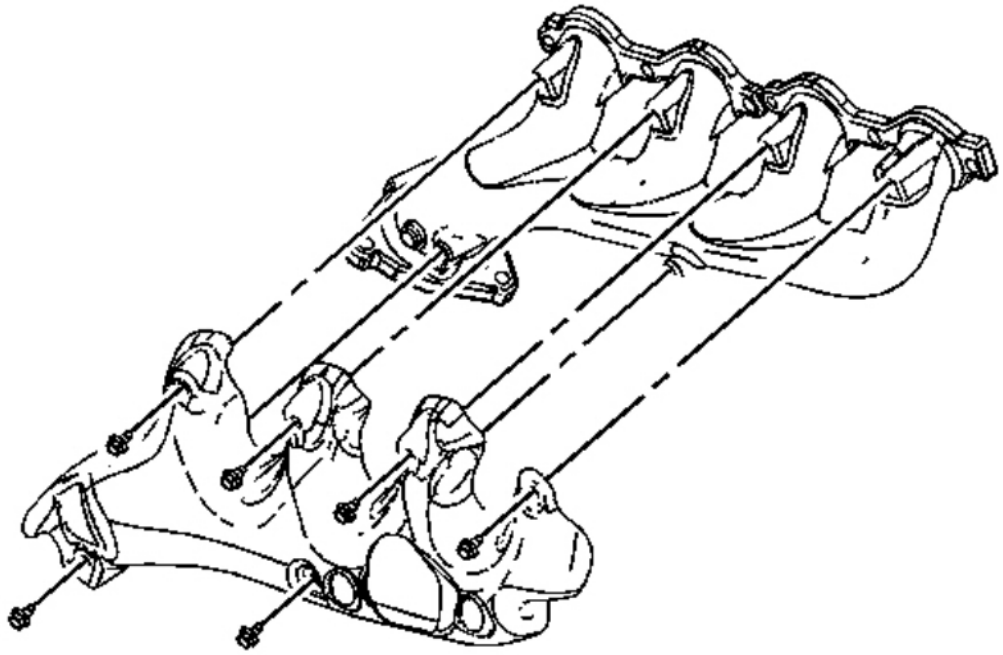


Fig. 143: View Of Exhaust Manifold Heat Shield & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the spark plug wires. Refer to **Spark Plug Replacement** .
2. Remove the exhaust manifold heat shield bolts and heat shield from the exhaust manifold.

Installation Procedure

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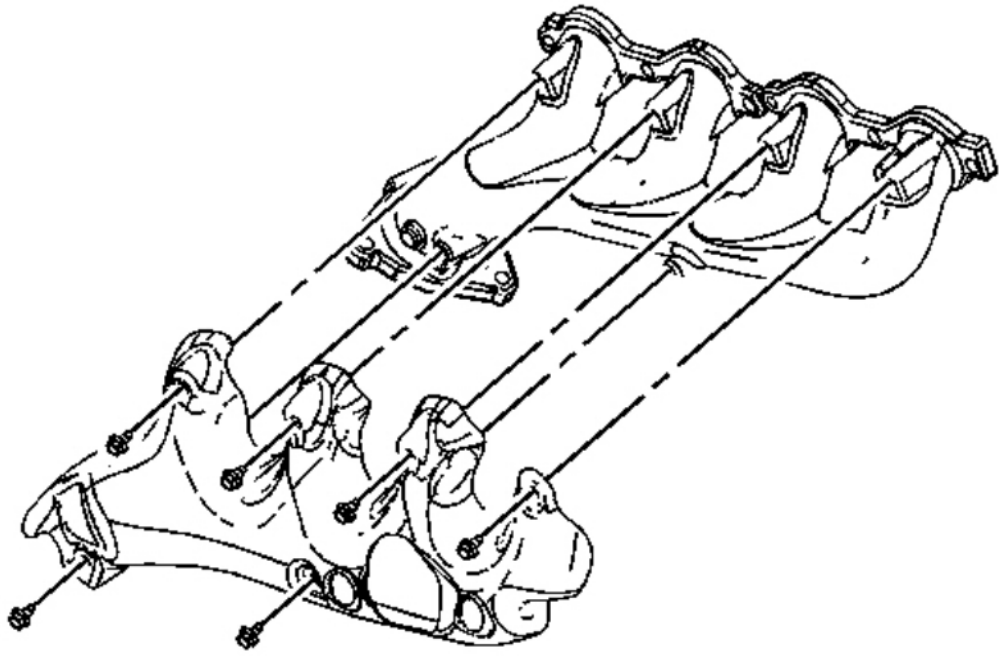


Fig. 144: View Of Exhaust Manifold Heat Shield & Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: **Refer to Fastener Notice .**

1. Position the exhaust manifold heat shield to the exhaust manifold and install the heat shield bolts.

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

2. Install the spark plug wires. Refer to **Spark Plug Replacement** .

EXHAUST MANIFOLD HEAT SHIELD REPLACEMENT - LEFT SIDE

Removal Procedure

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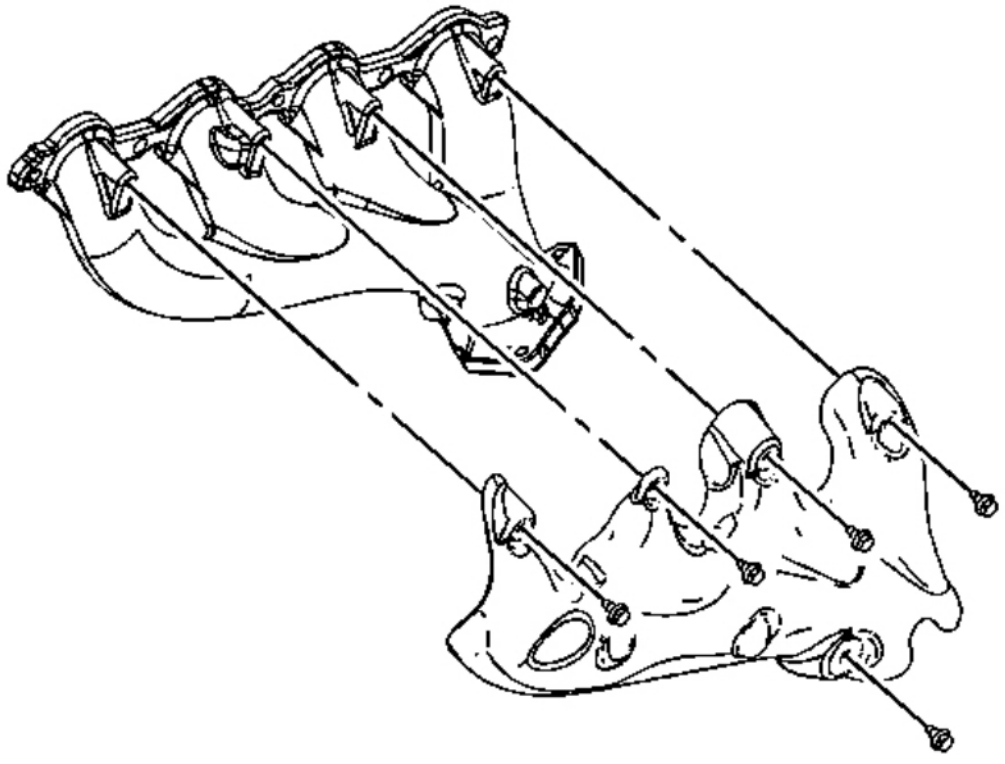


Fig. 145: View Of Exhaust Manifold Heat Shield & Bolts
Courtesy of GENERAL MOTORS CORP.

1. Remove the spark plug wires. Refer to **Spark Plug Replacement** .
2. Remove the exhaust manifold heat shield bolts and heat shield from the exhaust manifold.

Installation Procedure

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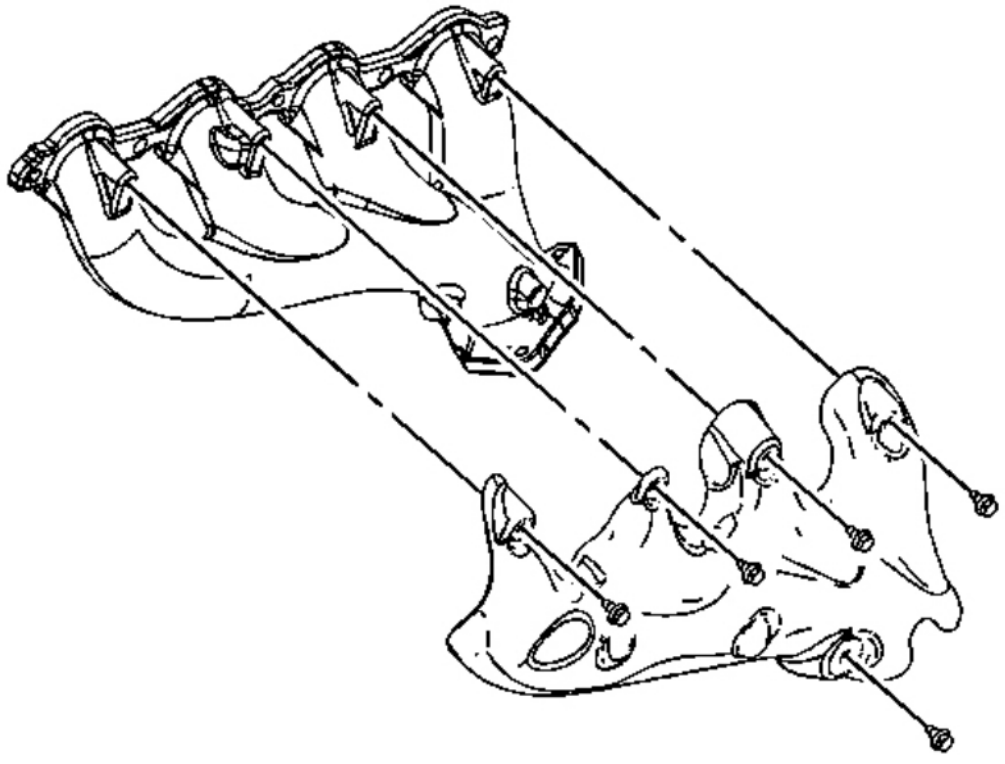


Fig. 146: View Of Exhaust Manifold Heat Shield & Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

1. Position the exhaust manifold heat shield to the exhaust manifold and install the heat shield bolts.

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

2. Install the spark plug wires. Refer to **Spark Plug Replacement** .

DESCRIPTION AND OPERATION

EXHAUST SYSTEM DESCRIPTION

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

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

In order to secure the exhaust muffler assembly 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 system 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 underbody and other components from damage due to the heat from the exhaust system.

The exhaust system may be comprised of the following components:

- Catalytic converter
- Exhaust hanger
- Exhaust heat shield
- Exhaust insulator
- Exhaust manifold
- Exhaust muffler
- Exhaust pipe
- Exhaust resonator, if equipped
- Exhaust tail pipe, if equipped

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:

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

The catalyst in the converter is not serviceable.

Muffler

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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.

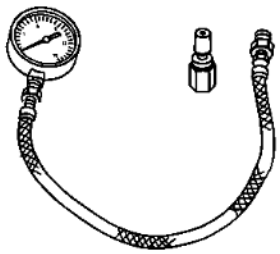
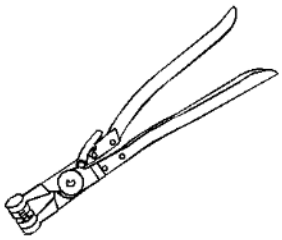
Resonator

Some exhaust systems may be 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.

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/ Description
	J 35314-A/BT-8515/BT-8515A Exhaust Back Pressure Tester
	J 38185 Hose Clamp Pliers

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