

# EXHAUST SYSTEM

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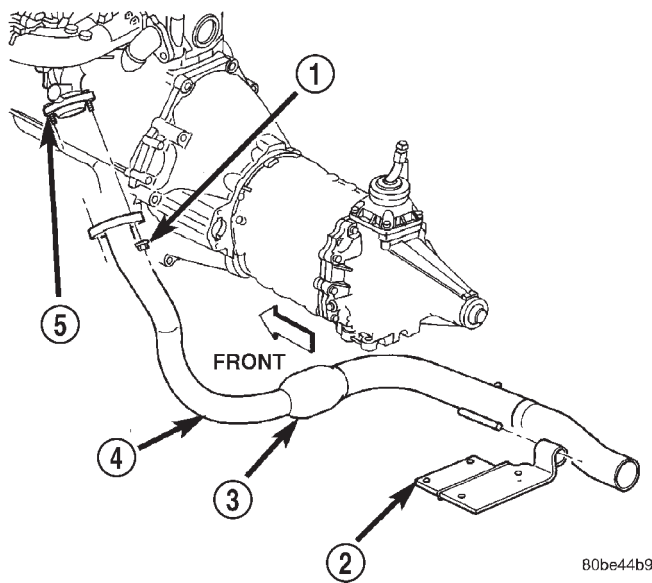
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## DESCRIPTION AND OPERATION

### EXHAUST SYSTEM

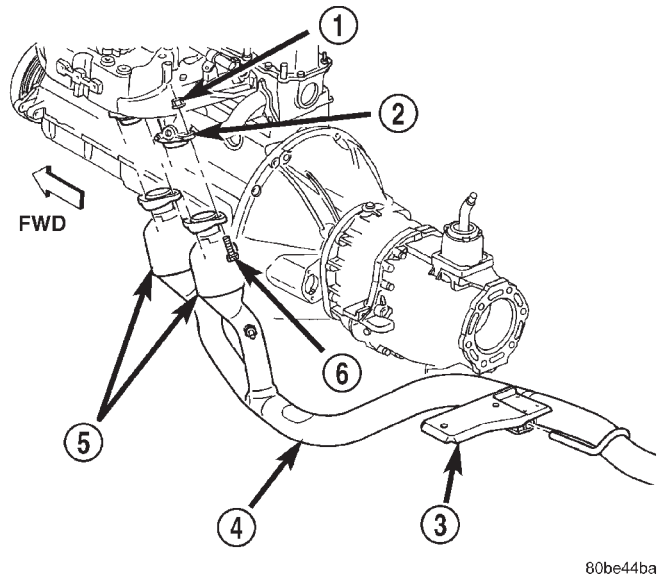
#### DESCRIPTION

The basic exhaust system consists of exhaust manifold(s), exhaust pipe with oxygen sensors, catalytic converter(s), heat shield(s), muffler and tailpipe (Fig. 1) (Fig. 2) (Fig. 3)



**Fig. 1 Exhaust Pipe—2.5L**

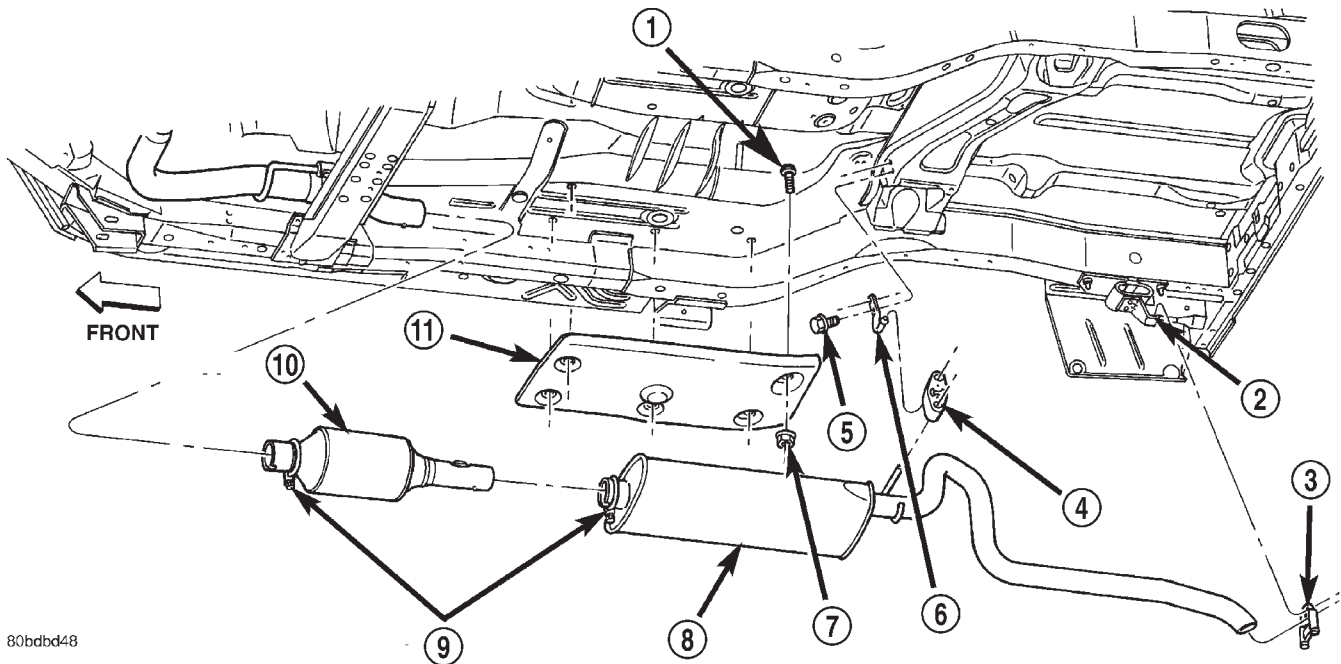
- 1 - NUT
- 2 - TRANSMISSION SUPPORT
- 3 - MINI CATALYTIC CONVERTER
- 4 - EXHAUST PIPE
- 5 - EXHAUST MANIFOLD



**Fig. 2 Exhaust Pipe—4.0L**

- 1 - NUT
- 2 - EXHAUST MANIFOLD
- 3 - TRANSMISSION SUPPORT
- 4 - EXHAUST PIPE
- 5 - MINI CATALYTIC CONVERTER
- 6 - BOLT

## DESCRIPTION AND OPERATION (Continued)



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**Fig. 3 Exhaust System—Typical**

- |                      |                          |
|----------------------|--------------------------|
| 1 - STUD             | 7 - NUT                  |
| 2 - TAIL PIPE HANGER | 8 - MUFFLER              |
| 3 - CLAMP            | 9 - CLAMP                |
| 4 - ISOLATOR         | 10 - CATALYTIC CONVERTER |
| 5 - BOLT             | 11 - HEAT SHIELD         |
| 6 - TAIL PIPE HANGER |                          |

**CATALYTIC CONVERTERS****DESCRIPTION**

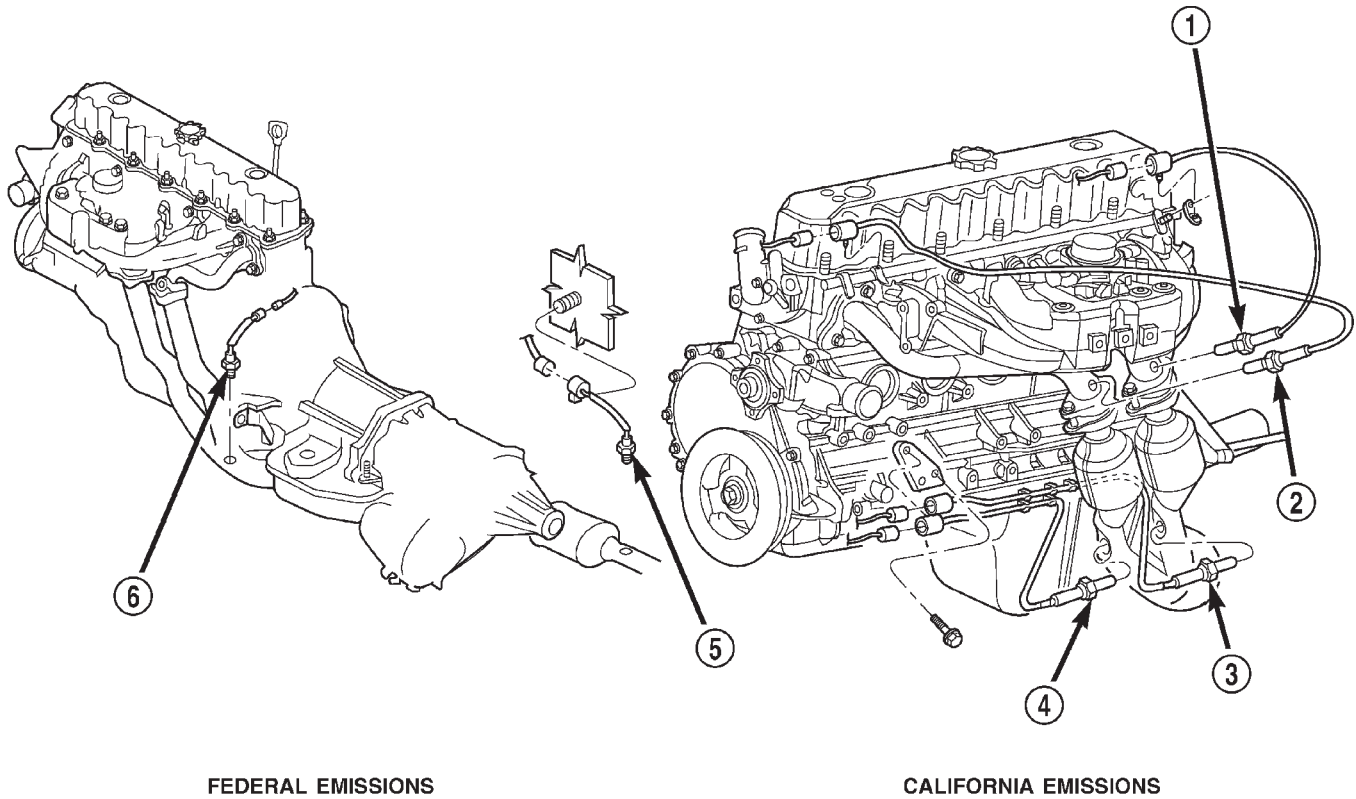
California emissions vehicles incorporate two mini catalytic converters into the exhaust system. These catalytic converters are made of stainless steel designed to operate at extremely high temperatures.

The stainless steel catalytic converter body is designed to last the life of the vehicle. Excessive heat can result in bulging or other distortion, but exces-

sive heat will not be the fault of the converter. If unburned fuel enters the converter, overheating may occur. If a converter is heat-damaged, correct the cause of the damage at the same time the converter is replaced. Also, inspect all other components of the exhaust system for heat damage.

**Unleaded gasoline must be used to avoid contaminating the catalyst core.**

DESCRIPTION AND OPERATION (Continued)



FEDERAL EMISSIONS

CALIFORNIA EMISSIONS

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**Fig. 4 4.0L Catalytic Converter and O2 Sensor Configuration—(California Emissions only)**

- 1 - O2 SENSOR
- 2 - O2 SENSOR
- 3 - O2 SENSOR

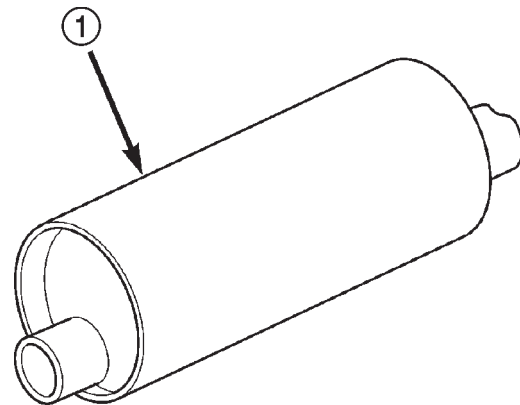
- 4 - O2 SENSOR
- 5 - O2 SENSOR
- 6 - O2 SENSOR

Federal emission vehicles use only one catalytic converter; However, California emission vehicles incorporate two mini catalytic converters located after the exhaust manifolds and before the inline catalytic converter (Fig. 4).

**MUFFLER**

**DESCRIPTION**

Both the 2.5L and 4.0L engines use a galvanized steel muffler to control exhaust noise levels and exhaust back pressure.



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**Fig. 5 Muffler—Typical**

- 1 - MUFFLER

DESCRIPTION AND OPERATION (Continued)

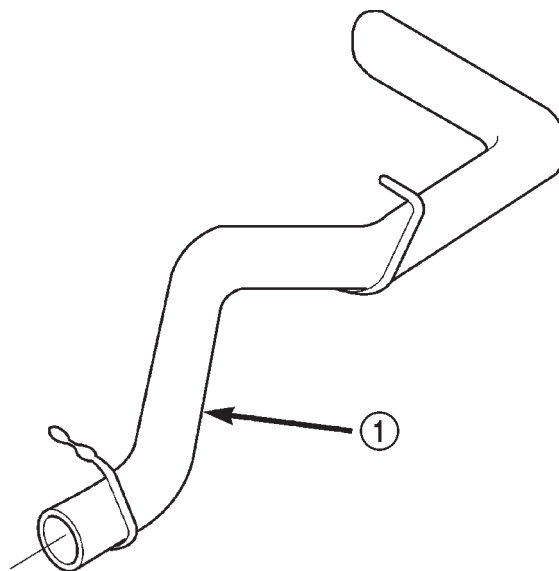
**TAILPIPE**

**DESCRIPTION**

The tail pipe is also made of galvanized steel.

**OPERATION**

The tailpipe channels the exhaust out of the muffler and out from under the vehicle to control noise and prevent exhaust gas fumes from entering the passenger compartment.



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**Fig. 6 Tailpipe—Typical**

1 - TAILPIPE

**DIAGNOSIS AND TESTING**

**EXHAUST SYSTEM**

*EXHAUST SYSTEM DIAGNOSIS CHART*

CONDITION	POSSIBLE CAUSE	CORRECTION
EXCESSIVE EXHAUST NOISE OR LEAKING EXHAUST GASES	1. Leaks at pipe joints. 2. Rusted or blown out muffler. 3. Broken or rusted out exhaust pipe. 4. Exhaust pipe leaking at manifold flange. 5. Exhaust manifold cracked or broken. 6. Leak between exhaust manifold and cylinder head. 7. Catalytic converter rusted or blown out. 8. Restriction in exhaust system.	1. Tighten clamps/bolts at leaking joints. 2. Replace muffler. Inspect exhaust system. 3. Replace exhaust pipe. 4. Tighten/replace flange attaching nuts/bolts. 5. Replace exhaust manifold. 6. Tighten exhaust manifold to cylinder head bolts. 7. Replace catalytic converter assy. 8. Remove restriction, if possible. Replace restricted part if necessary.

When servicing and replacing exhaust system components, disconnect the oxygen sensor connector(s). Allowing the exhaust to hang by the oxygen sensor wires will damage the harness and/or sensor.

## REMOVAL AND INSTALLATION

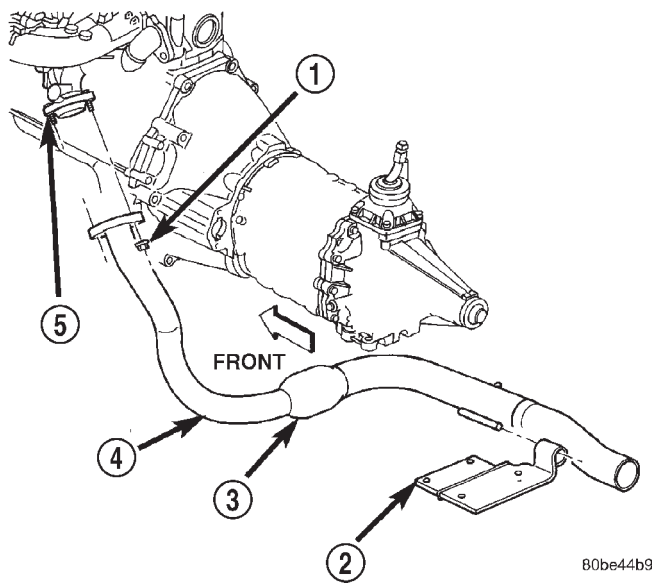
### EXHAUST PIPE

**WARNING:** IF TORCHES ARE USED WHEN WORKING ON THE EXHAUST SYSTEM, DO NOT ALLOW THE FLAME NEAR THE FUEL LINES.

**CAUTION:** When servicing exhaust system components, disconnect the oxygen sensor connector. Allowing the exhaust system to hang by the oxygen sensor harness will damage the wiring and/or sensor.

### REMOVAL

- (1) Raise and support the vehicle.
- (2) Saturate the bolts and nuts with Mopar® Rust Penetrant (Fig. 7) (Fig. 8). Allow 5 minutes for penetration.



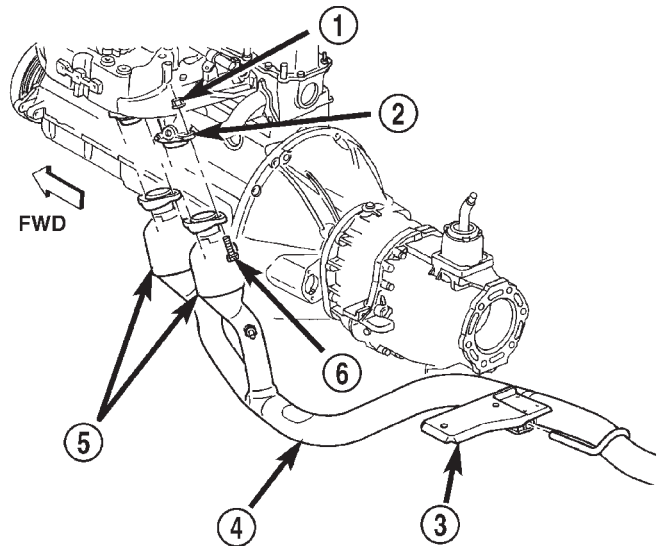
**Fig. 7 Exhaust Pipe Removal—2.5L**

- 1 - NUT
- 2 - TRANSMISSION SUPPORT
- 3 - MINI CATALYTIC CONVERTER
- 4 - EXHAUST PIPE
- 5 - EXHAUST MANIFOLD

- (3) Disconnect the oxygen sensor connector(s).
- (4) Disconnect the exhaust pipe from the engine exhaust manifold. Discard the seal (4.0L engine, only).

(5) Support the transmission and remove the rear crossmember.

(6) Remove the clamp nuts and clamp. To remove the exhaust pipe from the catalytic converter, apply heat until the metal becomes cherry red. Disconnect



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**Fig. 8 Exhaust Pipe Removal—4.0L**

- 1 - NUT
- 2 - EXHAUST MANIFOLD
- 3 - TRANSMISSION SUPPORT
- 4 - EXHAUST PIPE
- 5 - MINI CATALYTIC CONVERTER
- 6 - BOLT

the exhaust pipe from the catalytic converter. Remove the exhaust pipe.

### INSTALLATION

(1) Assemble exhaust pipe to manifold and catalytic converter loosely to permit proper alignment of all parts.

(2) Use a new clamp and tighten the nuts to 61 N·m (45 ft. lbs.) torque.

(3) Connect the exhaust pipe to the engine exhaust manifold (Fig. 7) (Fig. 8). Install a new seal between the exhaust manifold and the exhaust pipe (4.0L engine only). Tighten the nuts to 31 N·m (23 ft. lbs.) torque.

(4) Install the rear crossmember. Install and tighten the four (4) crossmember to rear mount nuts to 22 N·m (16 ft. lbs.) Install and tighten the crossmember to sill bolts to 42 N·m (31 ft. lbs.) torque. Remove the support from the transmission.

(5) Carefully coat the threads on the oxygen sensor(s) with anti-seize compound. Install the sensor and tighten the nut to 27 N·m (20 ft. lbs.) torque.

(6) Lower the vehicle.

(7) Start the engine and inspect for exhaust leaks and exhaust system contact with the body panels. Adjust the alignment, if needed.

## REMOVAL AND INSTALLATION (Continued)

## CATALYTIC CONVERTER

**WARNING: IF TORCHES ARE USED WHEN WORKING ON THE EXHAUST SYSTEM, DO NOT ALLOW THE FLAME NEAR THE FUEL LINES.**

**CAUTION: When servicing exhaust system components, disconnect the oxygen sensor connector. Allowing the exhaust system to hang by the oxygen sensor harness will damage the wiring and/or sensor.**

## REMOVAL

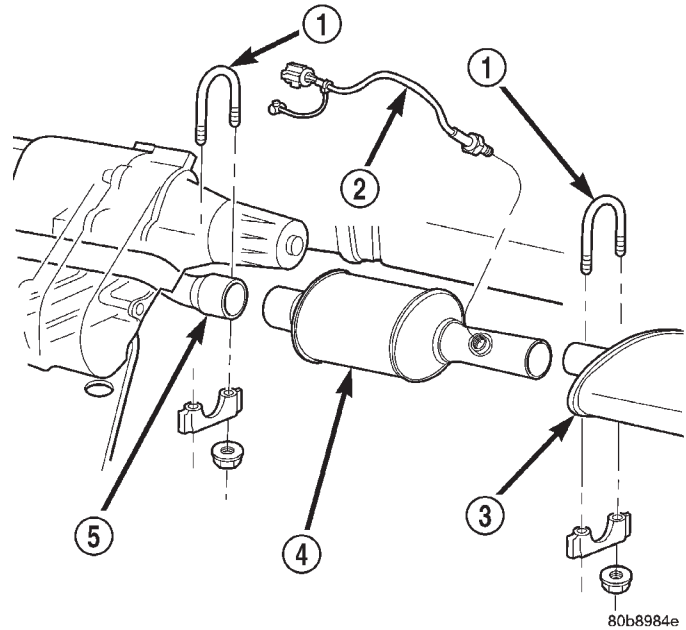
- (1) Raise and support the vehicle.
- (2) Remove the clamps from the catalytic converter and muffler connection (Fig. 9).
- (3) Disconnect and remove the oxygen sensor from the catalytic converter.
- (4) Heat the catalytic converter and muffler connection with an oxyacetylene torch until the metal becomes cherry red.
- (5) While the metal is still cherry red, twist the muffler assembly back and forth to separate it from the catalytic converter.
- (6) Disconnect the exhaust pipe from the catalytic converter (Fig. 9). If needed, heat up the pipes to separate.

## INSTALLATION

- (1) Connect the catalytic converter to the exhaust pipe and the muffler/tailpipe assy. (Fig. 9). Use a new clamp and tighten the nuts to 61 N·m (45 ft. lbs.) torque.
- (2) Install the muffler onto the catalytic converter until the alignment tab is inserted into the alignment slot.
- (3) Install a new clamp at the muffler and catalytic converter connection (Fig. 9). Tighten the clamp nut to 61 N·m (45 ft. lbs.) torque.
- (4) Coat the oxygen sensor with anti-seize compound. Install the sensor and tighten the nut to 27 N·m (20 ft. lbs.) torque.
- (5) Lower the vehicle.
- (6) Start the engine and inspect for exhaust leaks and exhaust system contact with the body panels. Adjust the alignment, if needed.

## MUFFLER AND TAILPIPE

All original equipment exhaust systems are manufactured with the exhaust tailpipe welded to the muffler. Service replacement mufflers and exhaust tailpipes are either clamped together or welded together.



**Fig. 9 Catalytic Converter to Muffler and Exhaust Pipe Connection**

- 1 - EXHAUST CLAMP ASSEMBLY
- 2 - OXYGEN SENSOR
- 3 - MUFFLER
- 4 - CATALYTIC CONVERTER
- 5 - EXHAUST PIPE

**WARNING: IF TORCHES ARE USED WHEN WORKING ON THE EXHAUST SYSTEM, DO NOT ALLOW THE FLAME NEAR THE FUEL LINE.**

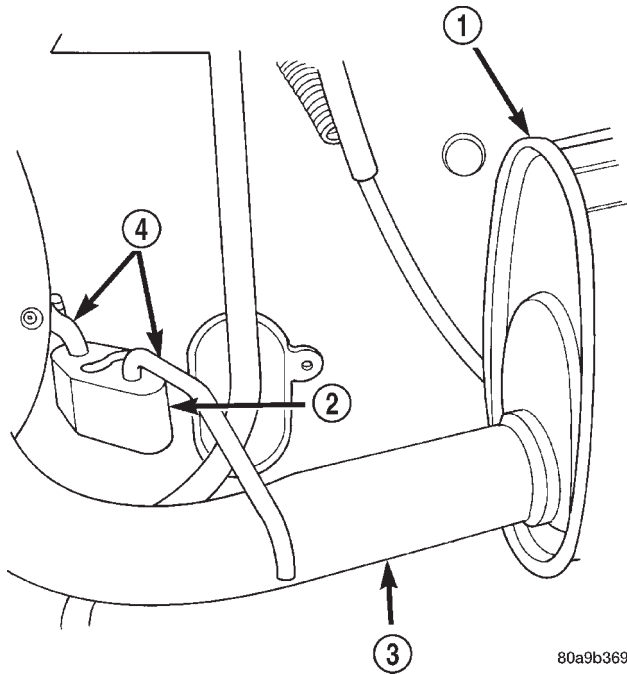
**CAUTION: When servicing exhaust system components, disconnect the oxygen sensor connector. Allowing the exhaust system to hang by the oxygen sensor harness will damage the wiring and/or sensor.**

## REMOVAL

- (1) Raise and support the vehicle.
- (2) Disconnect front tailpipe hanger from the insulator (Fig. 10).
- (3) Remove the front exhaust clamp from the catalytic converter and muffler connection (Fig. 11).
- (4) Heat the catalytic converter-to-muffler connection with an oxyacetylene torch until the metal becomes cherry red.
- (5) While the metal is still cherry red, remove the exhaust muffler/tailpipe assembly from the catalytic converter.
- (6) Slide the muffler/tailpipe assy. rearward and out of the rear exhaust tailpipe mounting bracket (Fig. 11).



REMOVAL AND INSTALLATION (Continued)



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**Fig. 10 Front Exhaust Tailpipe Hanger**

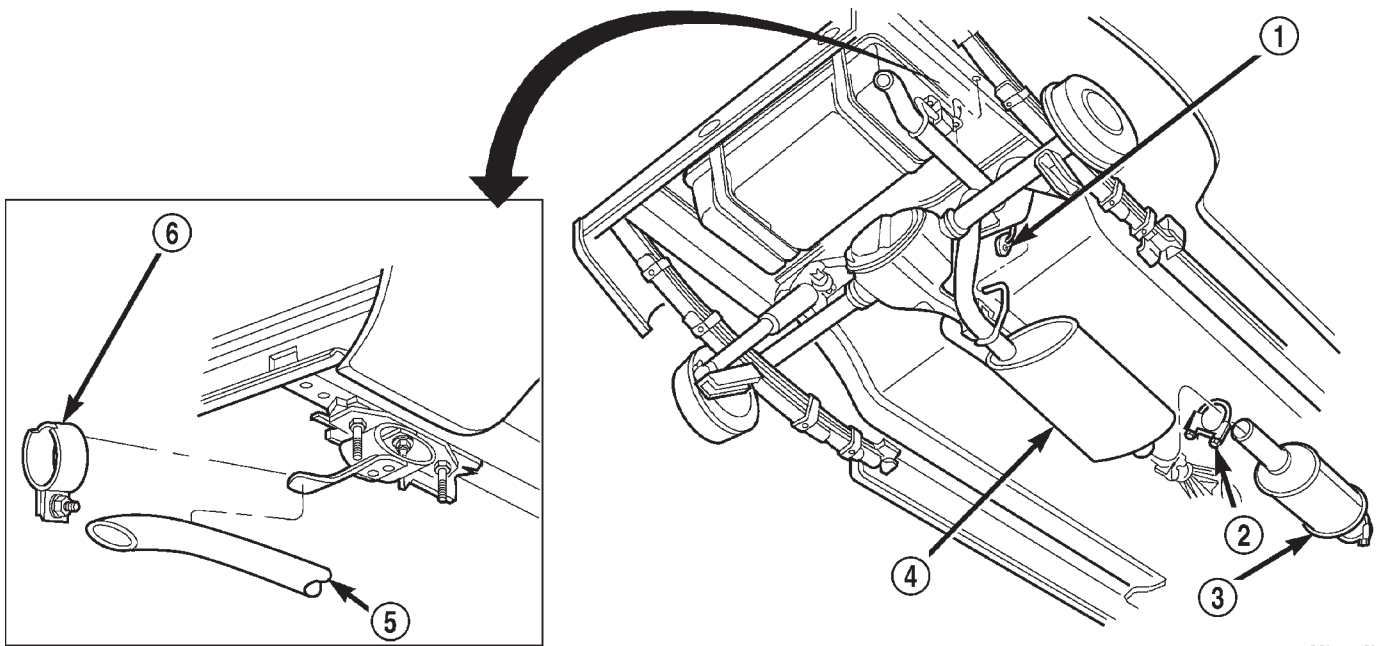
- 1 - MUFFLER
- 2 - INSULATOR
- 3 - TAILPIPE
- 4 - FRONT TAILPIPE HANGER

- To remove an original equipment exhaust muffler/tailpipe combination, cut the exhaust tailpipe close to the muffler. Collapse the part remaining in the muffler and remove.
- To remove a service exhaust tailpipe/muffler combination, apply heat until the metal becomes cherry red. Remove the exhaust tailpipe/muffler clamp and twist the exhaust tailpipe out of the muffler.

**INSTALLATION**

- (1) Install the muffler onto the catalytic converter. Install the clamp and tighten the nut finger tight.
- (2) Install the exhaust tailpipe into the rear of the muffler.
- (3) Install the exhaust tailpipe/muffler assembly on the rear exhaust tailpipe mounting bracket. Make sure that the exhaust tailpipe has sufficient clearance from the floor pan.
- (4) Install front tailpipe hanger into the insulator (Fig. 10).
- (5) Align the muffler and tighten the nuts on the muffler-to-catalytic converter clamp to 61 N·m (45 ft. lbs.) torque (Fig. 11).
- (6) Align the tailpipe and install a new clamp at the tailpipe to muffler connection.
- (7) Tighten the muffler to tailpipe clamp to 61 N·m (45 ft. lbs.)
- (8) Lower the vehicle.

(7) Remove the muffler from the exhaust tailpipe:



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**Fig. 11 Muffler/Tailpipe Removal and Installation**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1 - MUFFLER AND TAIL PIPE HANGER</li> <li>2 - CLAMP</li> <li>3 - CATALYTIC CONVERTER</li> </ul> | <ul style="list-style-type: none"> <li>4 - MUFFLER AND TAIL PIPE ASSEMBLY</li> <li>5 - TAIL PIPE</li> <li>6 - TAIL PIPE HANGER CLAMP</li> </ul> |
|--|---|

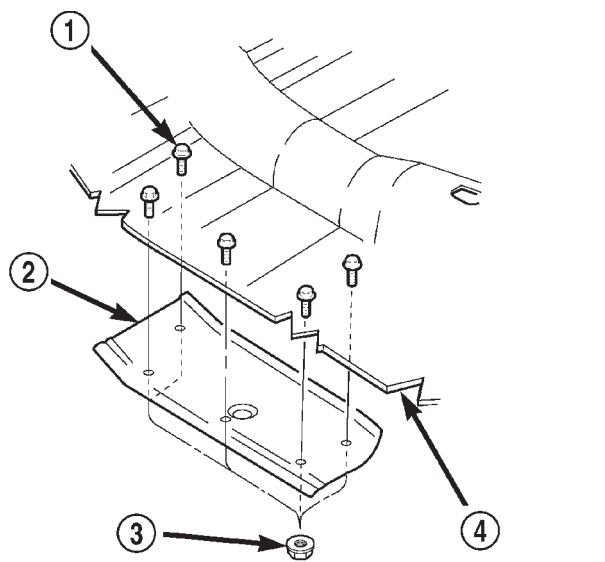
REMOVAL AND INSTALLATION (Continued)

(9) Start the engine and inspect for exhaust leaks and exhaust system contact with the body panels. Adjust the alignment, if needed.

HEAT SHIELDS

REMOVAL

- (1) Raise and support the vehicle.
- (2) Remove the screws and/or nuts holding the heat shields to the frame and/or floor pan (Fig. 12).



**Fig. 12 Heat Shield Removal/Installation**

- 1 - BOLTS
- 2 - MUFFLER HEAT SHIELD
- 3 - NUTS
- 4 - FLOOR PAN

- (3) When removing muffler heat shield, the muffler front support bracket must be removed first.
- (4) Slide the shields out around the exhaust system.

INSTALLATION

- (1) Position the heat shields to the floor pan or the frame and install the screws and/or nuts.
- (2) Tighten the nuts and/or screws to 45 N·m (33 ft. lbs.) (Fig. 12).
- (3) Lower the vehicle.

SPECIFICATIONS

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Catalytic Converter/Exhaust Pipe			
Exhaust Clamp—Nuts	61	45	—
Crossmember to Sill—Bolts	42	31	—
Crossmember to Transmission Mount—Nuts	22	16	—
Exhaust Pipe to Manifold—Nuts	31	23	—
Exhaust Manifold to Engine 2.5L			
Engine—			
Bolt #1	41	40	—
Bolts #2–5	31	23	—
Nuts #6&7	31	23	—
Exhaust Manifold to Engine 4.0L			
Engine—			
Nuts #6&7	31	23	—
Nuts/Bolts #1,2,3,4,5,8,9,10&11	33	24	—
Muffler to Catalytic Converter—			
Exhaust Clamp Nut	61	45	—
Oxygen Sensors	27	20	—
Rear Tail Pipe Hanger—Nuts	54	40	—