

EXHAUST SYSTEM AND INTAKE MANIFOLD

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GENERAL INFORMATION

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EXHAUST SYSTEM

The exhaust system consists of a front exhaust downpipe, catalytic converter, intermediate pipe and muffler.

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

The Premier engines use a single muffler exhaust system with a single monolithic-type catalytic converter.

The exhaust system must be properly aligned to prevent stress, leakage, and body contact. If the system contacts any body panel, it may amplify objectionable noises originating from the engine or body.

When inspecting an exhaust system, critically inspect for cracked or loose joints, stripped screw/bolt threads, corrosion damage, and worn, cracked or broken hangers. Replace all components that are badly corroded or damaged. Do not attempt to repair.

CATALYTIC CONVERTERS

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 excessive heat will not be the fault of the converter. A fuel system, air injection system or

ignition system malfunction that permits unburned fuel to enter the converter will usually cause overheating. 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 poisoning the catalyst core.

HEAT SHIELDS

Heat shields are needed to protect both the car and the environment from the high temperatures developed in the vicinity of the catalytic converter. The combustion reaction facilitated by the catalyst releases additional heat in the exhaust system. Under severe operating conditions, the temperature increases in the area of the reactor. Such conditions can exist when the engine misfires or otherwise does not operate at peak efficiency. Do not remove spark plug wires from plugs or by any other means short out cylinders. Failure of the catalytic converter can occur due to a temperature increase caused by unburned fuel passing through the converter.

Do not allow the engine to operate at fast idle for extended periods (over five (5) minutes). This condition may result in excessive temperatures in the exhaust system and on the floor pan.

EXHAUST GAS RECIRCULATION (EGR)

To assist in the control of oxides of nitrogen (NO_x) in engine exhaust, all engines are equipped with an exhaust gas recirculation (EGR) system (Fig. 1). The use of inert exhaust gas to dilute incoming air/fuel mixtures lowers peak flame temperature during combustion, thus limiting the formation of NO_x.

Exhaust gases are routed through a tube from the exhaust manifold to the intake manifold adaptor. Where they are metered by the EGR valve into the intake system. Refer to Section 25, "Emission Control Systems" for a complete description, diagnosis and the proper service procedures.

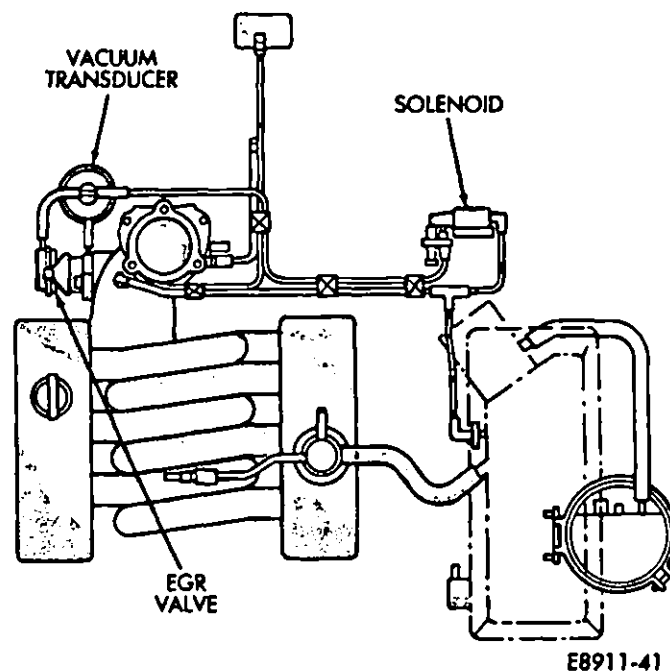


Fig. 1—EGR System (3.0L Engine) Automatic Transmission

SERVICE PROCEDURES

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EXHAUST MANIFOLDS—3.0L

Removal—3.0L

(1) Position the vehicle on a swing arm hoist. Position the arms under the vehicle on the points shown (Fig. 2).

(2) Disconnect the battery negative cable.

(3) Disconnect the EGR tube from the right hand side exhaust manifold. (If so equipped).

(4) Raise the vehicle on the hoist.

(5) Disconnect the catalytic converter from the Y-pipe by removing the mounting nuts (Fig. 10). Pull the converter back and out of the hanger.

(6) Disconnect the Oxygen (O_2) sensor electrical connector (Fig. 3).

(7) Remove the two (2) small bolts and the large through bolt securing the Y-pipe C-bracket to the transaxle rear mounting bracket.

(8) Remove the nuts securing the Y-pipe flanges to the exhaust manifolds. Pull the Y-pipe back and away from the exhaust manifolds.

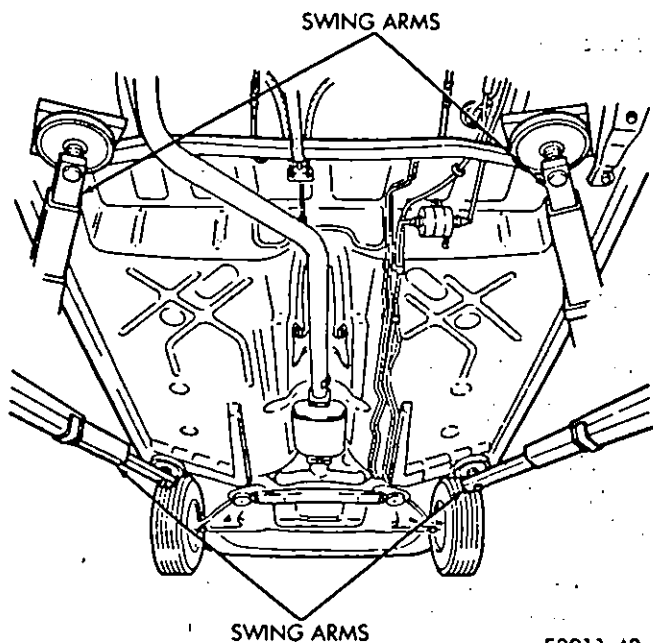


Fig. 2—Side Mounted Swing Arm Hoist

Removal—Right Side

(9) Remove exhaust manifold nut securing the dipstick tube to the exhaust manifold (Fig. 4).

(10) Grasp the dipstick tube and twist it gently back and forth. This will break the seal around the tube. Carefully pull the tube up and out of the lower casing.

(11) Remove the remaining exhaust manifold mounting nuts. Remove the manifold and gasket.

Removal—Left Side

(9) Remove hot air tube heat stove (Fig. 5).

(10) Disconnect the starter wires and ground cable (Fig. 5).

(11) Unscrew the lower exhaust manifold mounting nuts and remove starter heat shield (Fig. 5).

(12) Unscrew the remaining exhaust manifold mounting nuts.

(13) Remove the exhaust manifold and gaskets.

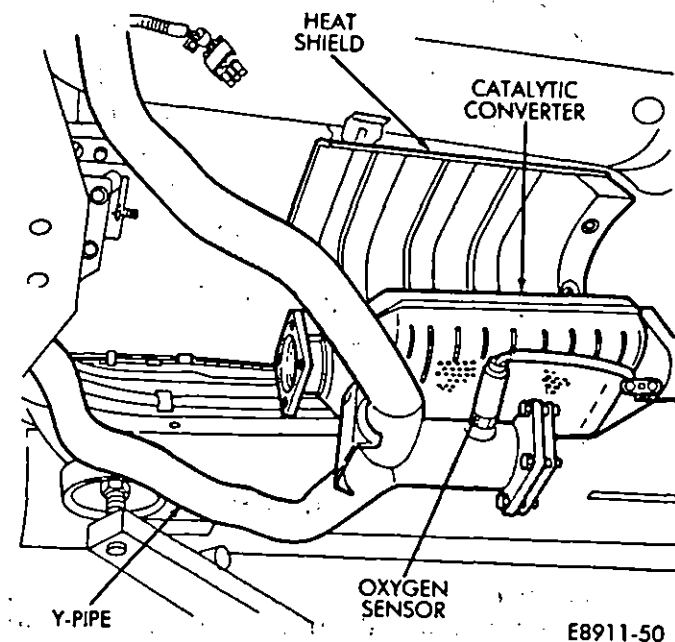


Fig. 3—Catalytic Converter and Y-pipe

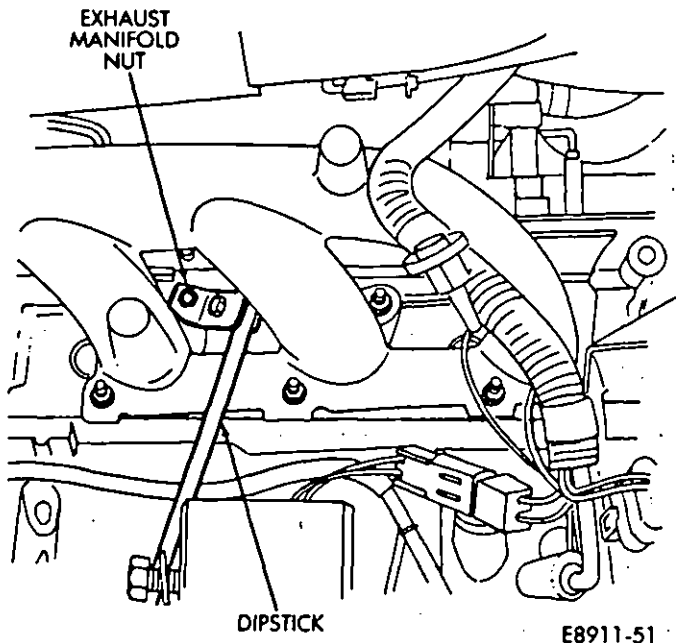


Fig. 4—Dipstick Removal/Installation

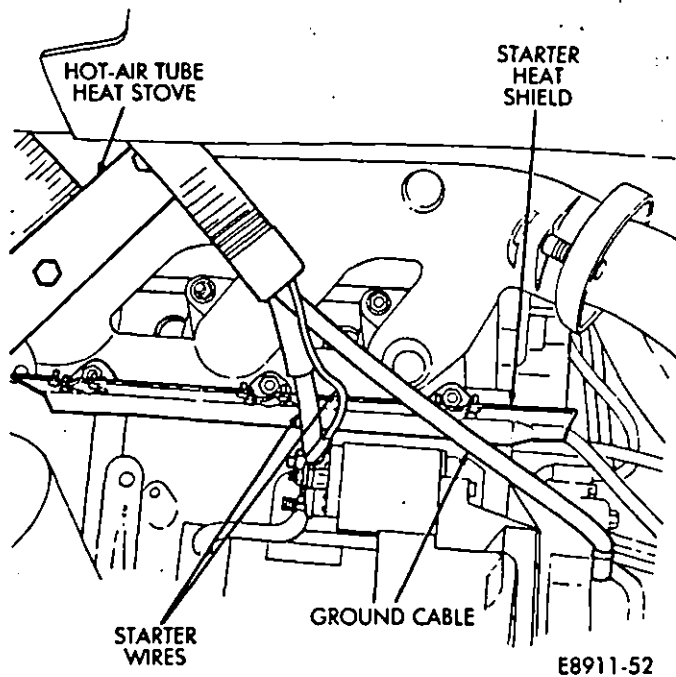


Fig. 5—Starter Heat Shield

Installation—3.0L

Exhaust manifold gaskets have a ring on one side. Install the gaskets with the ring towards the cylinder head and the tabs towards the oil pan (Fig. 6).

Installation—Left Side

(1) Install the exhaust manifold and gasket over the studs.

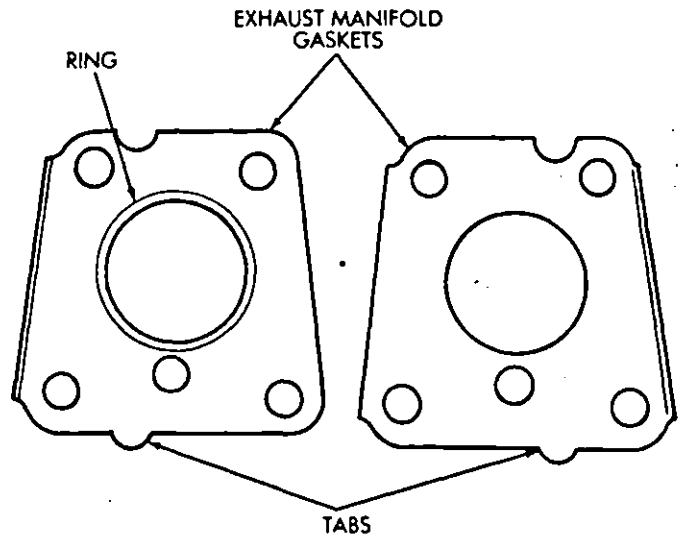


Fig. 6—Exhaust Manifold Gaskets

(2) Install the starter heat shield over the bottom stud (Fig. 5).

(3) Install washers and nuts. Tighten the nuts to 17.5 N·m (13 ft-lbs) torque.

(4) Install the starter motor wires and ground cable.

(5) Install the hot air tube heat stove. Tighten the bolts to 19 N·m (14 ft-lbs).

Installation—Right Side

(1) Install the exhaust manifold and gaskets.

(2) Tighten the nuts to 17.5 N·m (13 ft-lbs) torque.

(3) Apply Loctite 290™ or equivalent to the stop on the dipstick tube. Install it in the hole in the lower case.

(4) Connect the dipstick holddown bracket to the manifold stud (Fig. 4).

(5) Tighten the nut to 17.5 N·m (13 ft-lbs) torque.

Installation (Continued)

(6) Position the Y-pipe in place at the manifolds with the Y-pipe C-bracket positioned over the transaxle rear mounting bracket. Install the C-bracket through bolt to hold the Y-pipe in place, but do not tighten at this time.

(7) Place the collars over the manifold studs and install the nuts. Alternately tighten one nut and then the other until the Y-pipe is secure. Ensure that the nuts are tightened to 34 N·m (25 ft-lbs) torque.

(8) Clean both mating surfaces of the catalytic converter and the Y-pipe. Replace the gasket that goes between the catalytic converter and the Y-pipe.

- (9) Connect the catalytic converter to the Y-pipe. Tighten the nuts to 34 N·m (25 ft-lbs) torque.
- (10) Tighten the through bolt (C-bracket to transaxle mount) to 68 N·m (50 ft-lbs) torque and the two (2) small bolts to 34 N·m (25 ft-lbs) torque.
- (11) Connect the O₂ sensor electrical connector.
- (12) Lower the vehicle.
- (13) Replace the EGR tube to manifold gasket. Clean both mating surfaces. (If so equipped.)
- (14) Connect the EGR tube to the right hand side exhaust manifold with new gasket. Tighten the mounting bolts to 19 N·m (14 ft-lbs) torque.
- (15) Connect the battery negative cable.
- (16) Start the vehicle and check for leaks.

FRONT EXHAUST DOWNPIPE—3.0L

The front exhaust downpipe is held in place by a welded bracket that connects it to the transmission crossmember. Collars on each arm of the downpipe keep the flared ends of the downpipe secured to the exhaust manifold.

Removal—3.0L

- (1) Disconnect the Oxygen (O₂) sensor connector. Remove the O₂ sensor from the front exhaust downpipe (Fig. 7).
- (2) Remove the nuts holding the catalytic converter to the front exhaust downpipe (Fig. 7). Pull the converter back and discard the gasket.

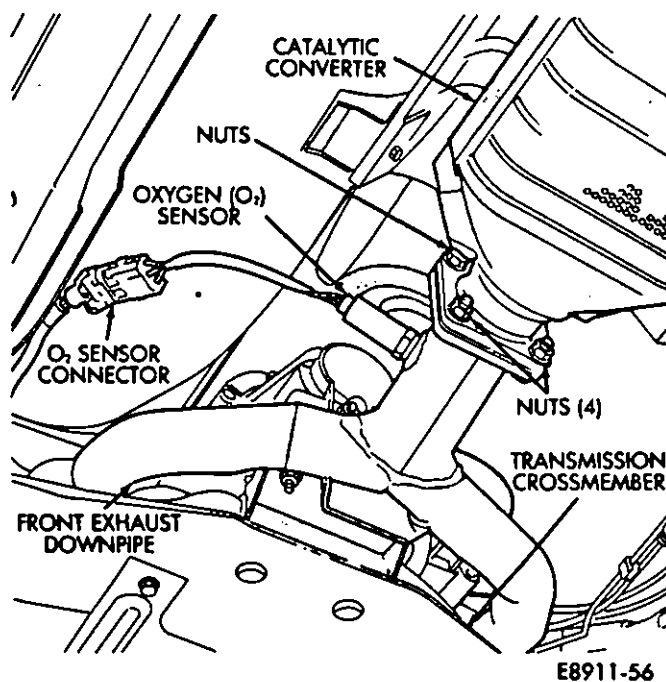


Fig. 7—O₂ Sensor/Catalytic Converter/Exhaust Downpipe

- (3) Remove the nuts securing the front exhaust downpipe to the transmission crossmember (Fig. 8).
- (4) To remove the front exhaust downpipe it will be necessary to lower the rear of the engine/transaxle/cradle assembly. Place the transmission jack under the transmission crossmember to support the assembly while removing the exhaust downpipe (Fig. 9).
- (5) Remove the two rear cradle mounting bolts (Fig. 9).
- (6) Lower the transmission jack about 57 mm (2-1/4 inches).
- (7) Remove the nuts securing the front exhaust downpipe to the exhaust manifold.
- (8) Carefully remove the front exhaust downpipe.

Installation—3.0L

- (1) Position the front exhaust downpipe in place at the manifolds and position the support bracket to the transmission crossmember (Figs. 8 and 9).
- (2) Tighten the support bracket bolts to 40 N·m (30 ft-lbs) torque.
- (3) Tighten the nuts at the collars until the downpipe is secure.
- (4) Raise the transmission jack. Install the two rear cradle mounting bolts. Tighten the bolts to 125 N·m (92 ft-lbs) torque.

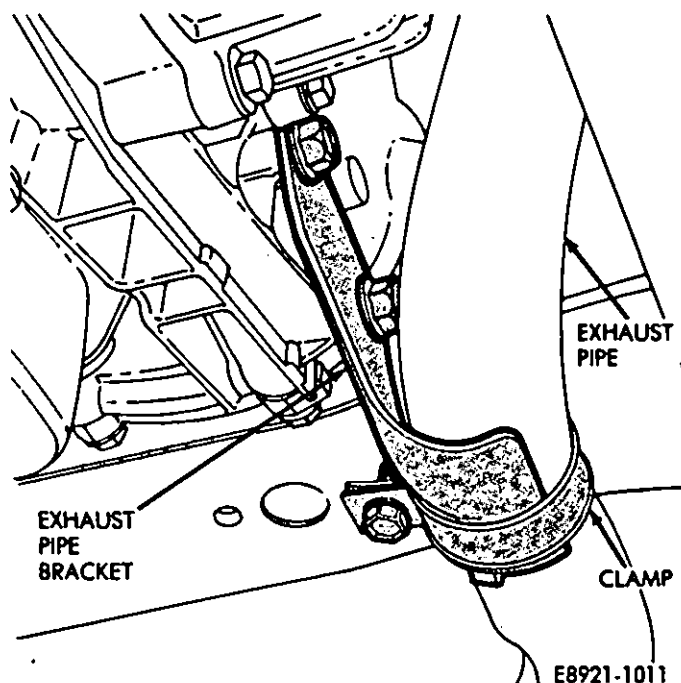
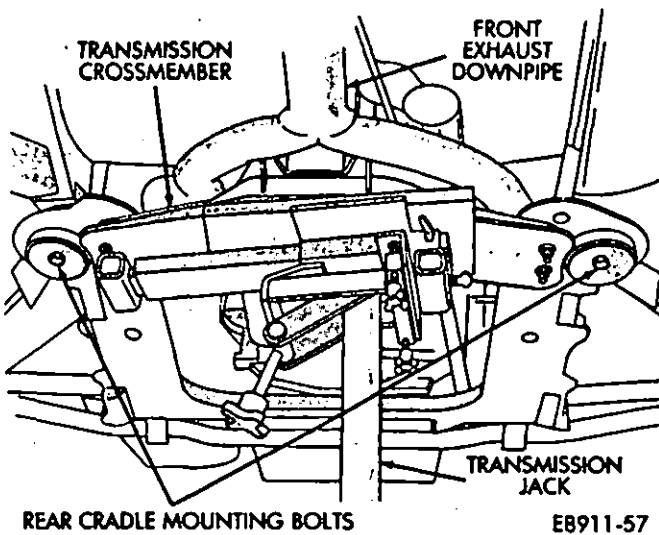


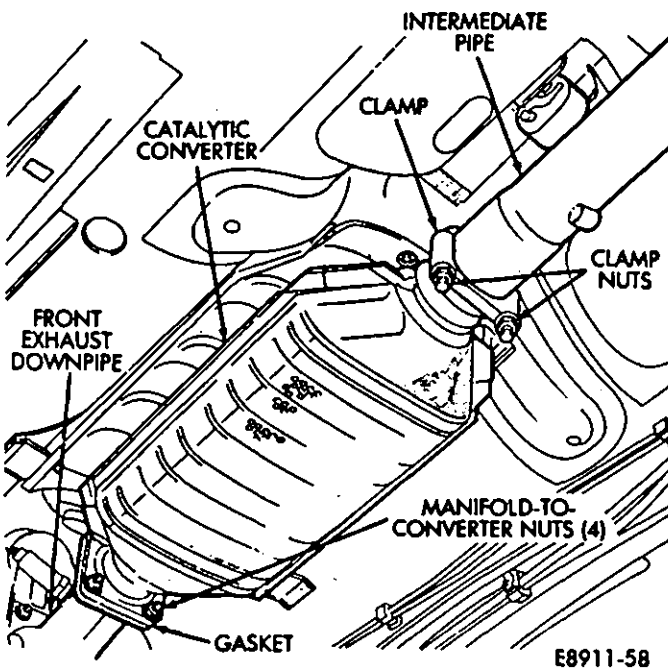
Fig. 8—Exhaust Downpipe Bracket



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Fig. 9—Support of Transmission Crossmember

- (5) Remove the transmission jack.
- (6) Replace the front exhaust downpipe to catalytic converter gasket.
- (7) Connect the catalytic converter to the front exhaust pipe (Fig. 7). Tighten the nuts to 34 N·m (25 ft-lbs) torque.
- (8) Install O₂ sensor (Fig. 7). Tighten the O₂ sensor to 30 N·m (22 ft-lbs) torque.
- (9) Connect the O₂ sensor connector.



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Fig. 10—Intermediate Pipe and Catalytic Converter**Removal**

- (1) Remove the clamp securing the intermediate pipe to the catalytic converter (Fig. 10).

- (2) Remove the intermediate pipe from the converter.

- (3) Disconnect the converter from the front exhaust downpipe (Fig. 7).

Installation

- (1) Replace the front exhaust downpipe to converter gasket.

- (2) Connect the converter to the front exhaust downpipe (Fig. 7). Tighten the nuts to 34 N·m (25 ft-lbs) torque.

- (3) Connect the intermediate pipe to the catalytic converter (Fig. 10). Tighten the clamp nuts to 61 N·m (40 ft-lbs) torque.

CATALYTIC CONVERTER HEAT SHIELD**Removal**

- (1) Disconnect the catalytic converter from the front exhaust downpipe (Fig. 7).

- (2) Remove the intermediate pipe from the exhaust hanger (Fig. 11).

- (3) Loosen the heat shield mounting screws and remove the shield (Fig. 12).

Installation

- (1) Install the heat shield (Fig. 12). Tighten the heat shield mounting screws.

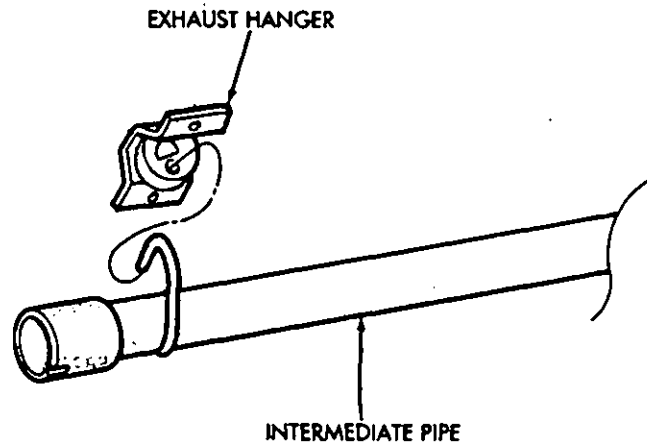
- (2) Hang the intermediate pipe into the exhaust hanger (Fig. 11).

- (3) Connect the catalytic converter to the front exhaust downpipe (Fig. 7).

INTERMEDIATE PIPE**Removal**

- (1) Remove the clamp securing the intermediate pipe to the catalytic converter (Fig. 13).

- (2) Remove the clamp nuts and clamp at the muffler end of the intermediate pipe (Fig. 14).



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Fig. 11—Intermediate Pipe Removal/Installation

(3) Separate the intermediate pipe from the muffler and from the converter.

(4) Remove the pipe from the hangers (Fig. 14).

Installation

(1) Position the intermediate pipe on the hangers and between the muffler and the catalytic converter.

(2) Connect the intermediate pipe to the converter and secure with the clamp (Fig. 13). Tighten the clamp nuts to 61 N·m (40 ft-lbs) torque.

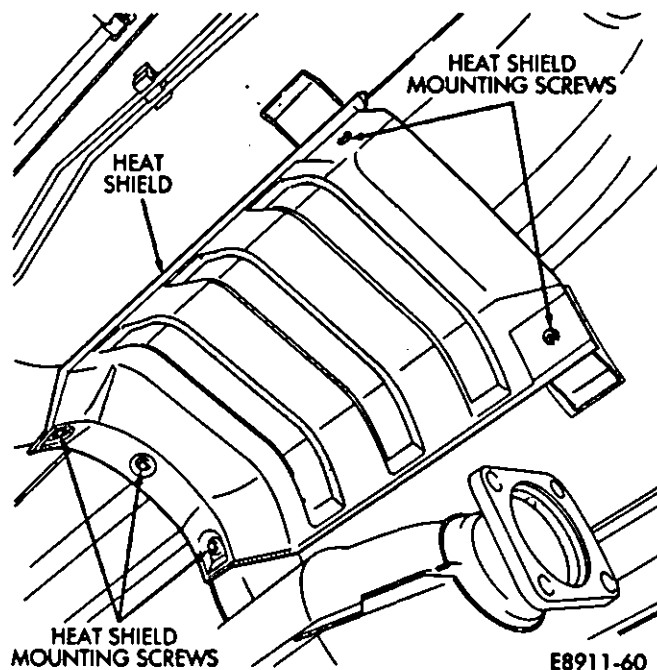


Fig. 12—Heat Shield Removal/Installation

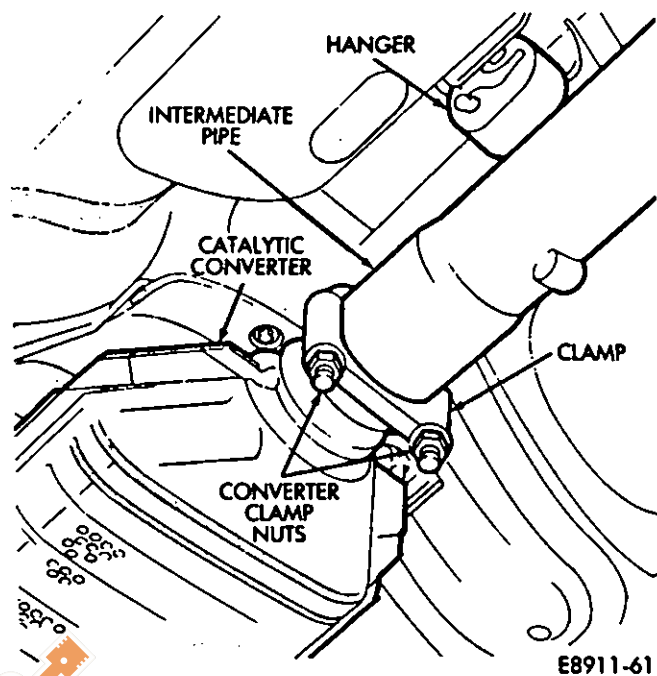


Fig. 13—Intermediate Pipe and Catalytic Converter

(3) Connect the intermediate pipe to the muffler (Fig. 14). Secure with clamp and nuts. Tighten the muffler clamp nuts to 45 N·m (33 ft-lbs) torque.

MUFFLER

Removal

(1) Remove the muffler to intermediate pipe clamp and nuts (Fig. 14).

(2) Remove the muffler from the hanger.

(3) Separate the muffler from the intermediate pipe.

Installation

(1) Install the muffler on the intermediate pipe.

(2) Install the muffler to the hanger.

(3) Install the intermediate pipe clamp at the muffler (Fig. 14). Tighten the nuts to 45 N·m (33 ft-lbs) torque.

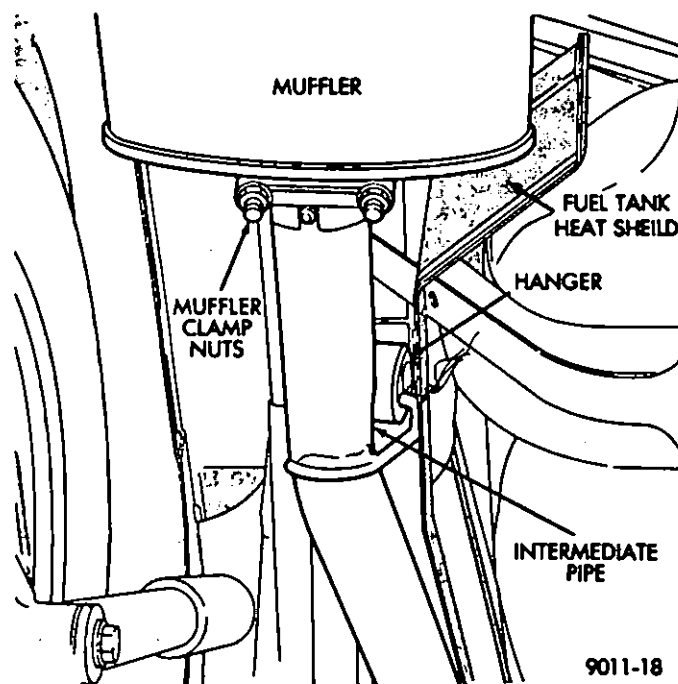


Fig. 14—Intermediate Pipe and Muffler

INTAKE MANIFOLD 3.0L

Removal—3.0L

(1) Remove the battery negative cable.

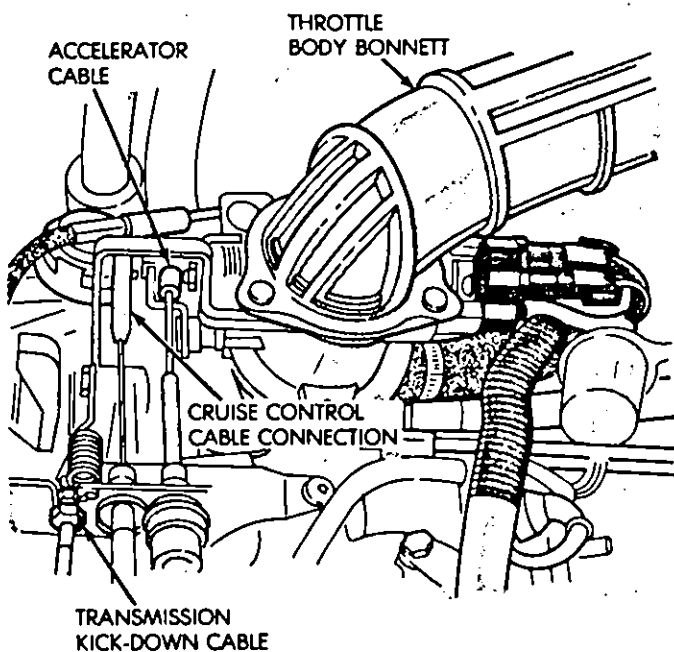
(2) Remove the throttle body bonnet (Fig. 1).

(3) Disconnect the transmission kick-down cable at the throttle body (Fig. 1).

(4) Disconnect the accelerator cable and cruise control cable connector (Fig. 1).

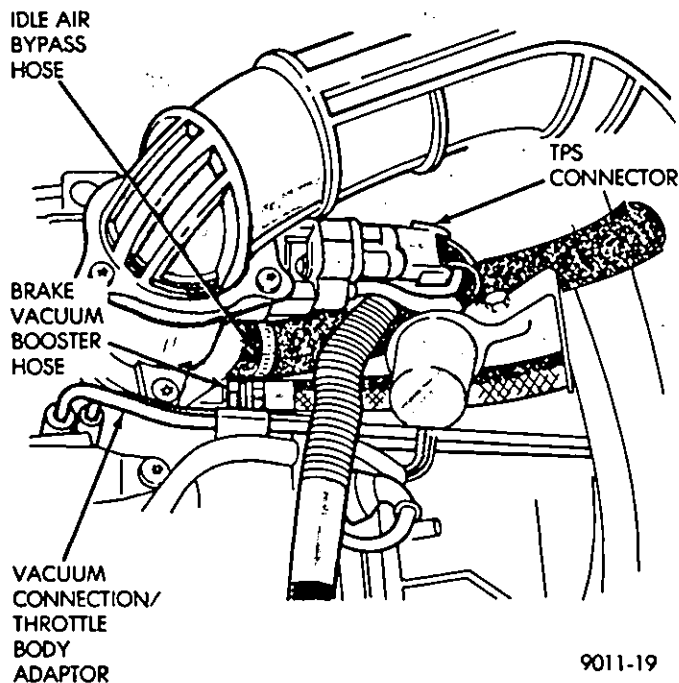
CAUTION: Use finger pressure only to remove the cruise control connector. If the connector is broken, the whole cable must be replaced.

(5) Disconnect the brake vacuum booster hose (Fig. 2).



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Fig. 1—Removing/Installing Bonnet and Throttle Controls



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Fig. 2—Vacuum Hoses/TPS Connector/Idle Air Bypass Hose

(6) Disconnect the vacuum connection from the throttle body adapter (Fig. 2).

(7) Disconnect the Throttle Position Sensor (TPS) connector (Fig. 2).

(8) Disconnect the idle air bypass hose from the throttle body adapter (Fig. 2).

(9) Disconnect the Hevac reservoir vacuum hose from the fitting on the throttle body adapter.

(10) Disconnect the EGR tube.

(11) Disconnect the EGR valve transducer vacuum hose (Fig. 3).

(12) Disconnect the air temperature sensor wire connector (located behind the idle air bypass hose).

(13) Before disconnecting the fuel injector wire harness, tag each connector with the number of its corresponding injector.

(14) Disconnect the fuel injector wire harness from the injectors and lay to the side (Fig. 4).

(15) Disconnect the CCV vacuum hose from the fitting between Nos. 2 and 3 runners (Fig. 4).

(16) Remove the fuel tank filler cap to relieve the fuel tank pressure.

(17) Install the fuel tank filler cap.

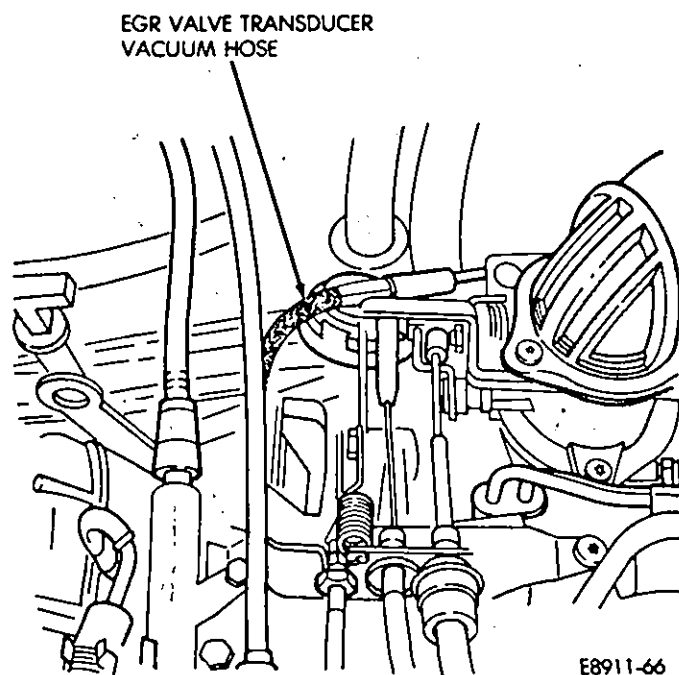
(18) Place shop towels under the fuel tubes. Disconnect the fuel supply tube from the fuel rail and the fuel return tube from the fuel pressure regulator using disconnect tool 6182 (Fig. 5). Slide the tool onto the nipple and push it forward into the quick-connector until the handle stops on the connector casing. Pull the fuel tubes off.

(19) Move the tubes to the side being careful not to kink the fuel tubes.

(20) Loosen the intake manifold mounting bolts (Fig. 6).

(21) Remove the intake manifold.

(22) Remove and replace the O-rings in the cylinder heads.



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Fig. 3—EGR Valve Transducer Vacuum Hose

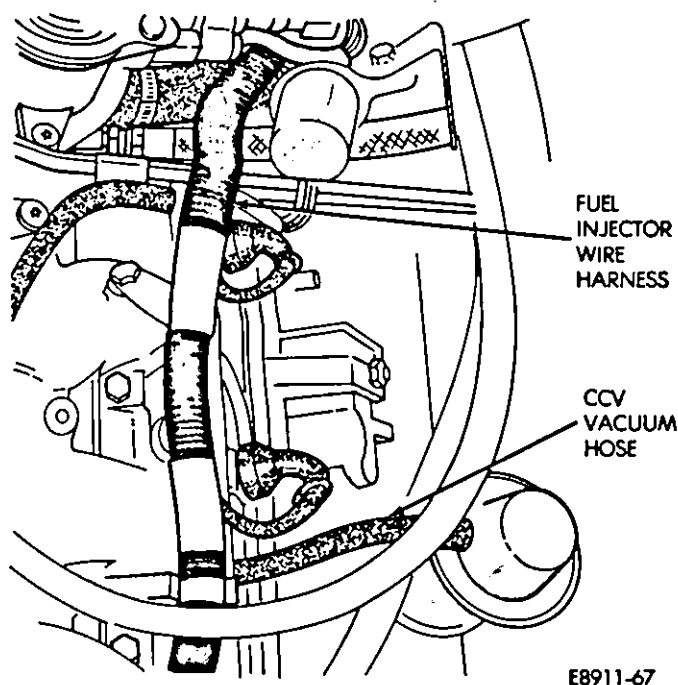


Fig. 4—Injector Harness and CCV Vacuum Hose

Installation—3.0L

- (1) Install new O-rings in the cylinder head (Fig. 7). The original O-rings must not be reused.
- (2) Install the intake manifold. Tighten the intake manifold bolts to 15 N·m (11 ft-lbs) torque.

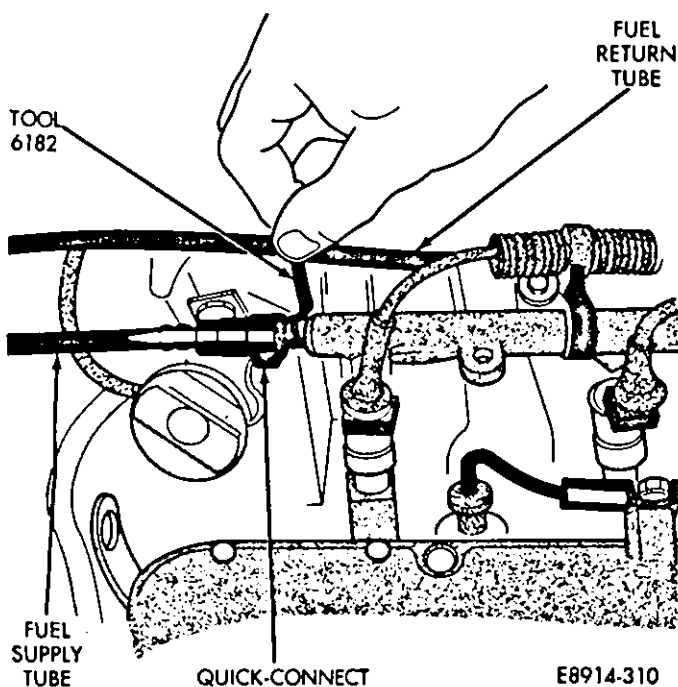


Fig. 5—Disconnect Fuel Lines Using Disconnect Tool 6182

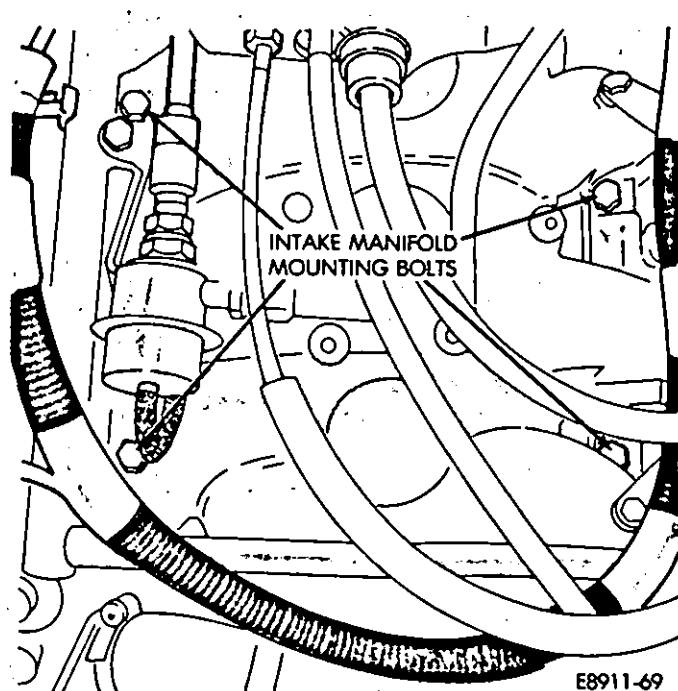


Fig. 6—Intake Manifold Mounting Bolts

- (3) Push the fuel supply tube over the fuel rail nipples until a click is heard. Pull back to ensure the connector is locked in place.
- (4) Push the fuel return tube over the fuel pressure regulator nipples until a click is heard. Pull back to ensure the connector is locked in place.
- (5) Connect the CCV vacuum hose (Fig. 4).
- (6) Connect the fuel injector wire harness to the injectors (Fig. 4).
- (7) Connect the air temperature sensor wire connector.
- (8) Connect the Hevac vacuum reservoir hose to the fitting on the throttle body adapter.
- (9) Connect the air idle bypass hose (Fig. 2) to the throttle body adapter.
- (10) Connect the TPS electrical connector (Fig. 2).
- (11) Connect the vacuum hose to the EGR valve transducer (Fig. 3).
- (12) Connect the vacuum connector to the throttle body adapter (Fig. 2).
- (13) Connect the EGR tube.
- (14) Connect the brake vacuum booster hose (Fig. 2).
- (15) Connect the accelerator cable (Fig. 1).
- (16) Connect the cruise control cable (Fig. 1), if equipped.
- (17) Connect the transmission down-kick cable (Fig. 1). Refer to Group 21, "Transaxle" for the adjustment.

- (18) Connect the battery negative cable.
- (19) Connect the throttle body bonnet (Fig. 1).
- (20) Start the engine and check for vacuum leaks.

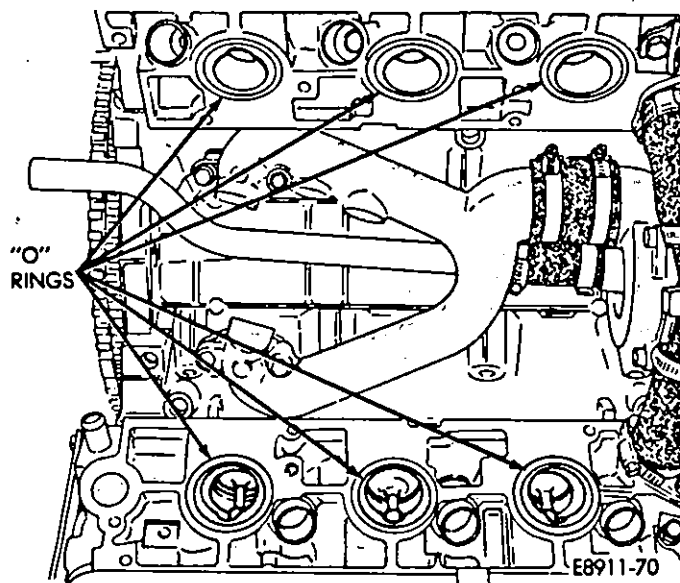


Fig. 7—O-Rings In Cylinder Head