EMISSION CONTROL SYSTEMS

CONTENTS

GENERAL INFORMATION

VEHICLE EMISSION CONTROL INFORMATION (VECI) LABEL

All vehicles are equipped with a combined VECI label. The label is located in the engine compartment (Fig. 1). The label contains the following:

- Engine family and displacement
- Evaporative family
- Emission control system schematic
- Certification application
- Engine timing specifications (if adjustable)
- Idle speeds (if adjustable)
- Spark plug and plug gap

The label also contains an engine vacuum schematic. There are unique labels for vehicles built for sale in the state of California and the country of Canada. Canadian labels are written in both the English and French languages. These labels are permanently attached and cannot be removed without defacing information and destroying it.

The following label illustrations are used as examples only. If there are any differences between these illustrations and the VECI label, those shown on the VECI label should be used.

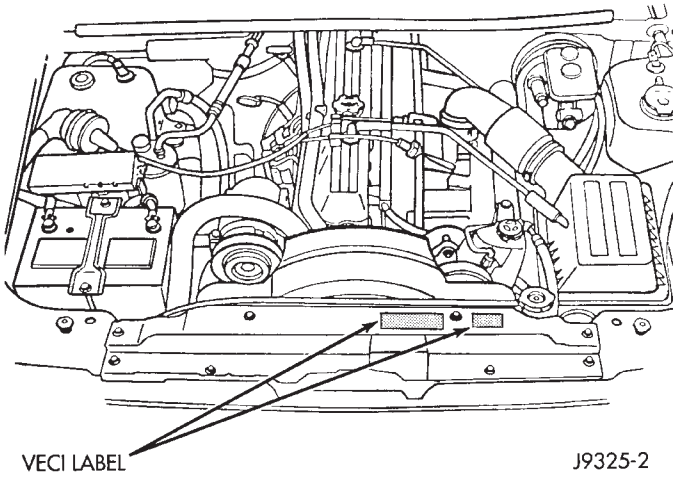
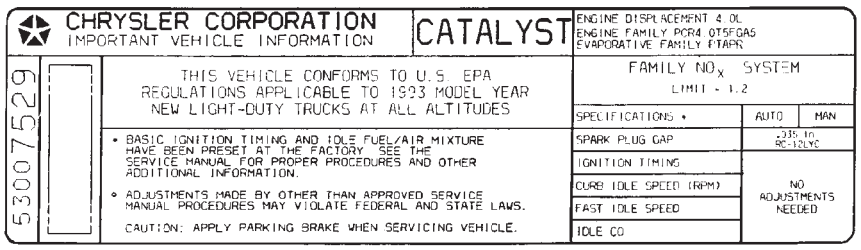
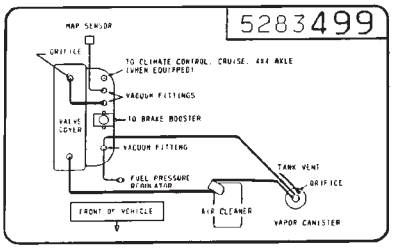


Fig. 1 VECI Label Location

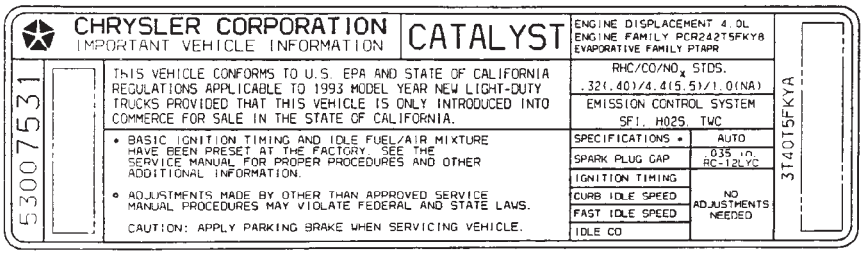
FEDERAL VECI LABEL—TYPICAL

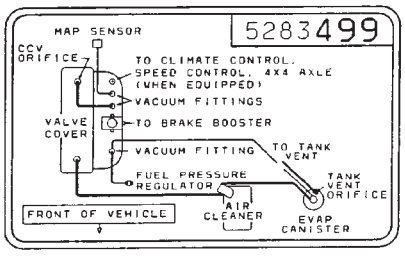




J9325-9

CALIFORNIA VECI LABEL—TYPICAL





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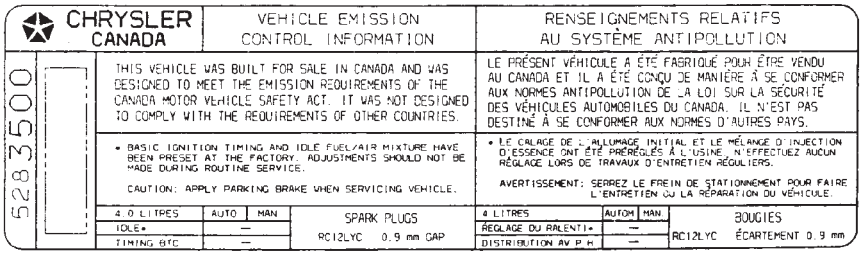
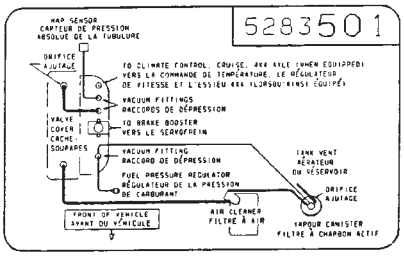
CANADIAN VECI LABEL—TYPICAL



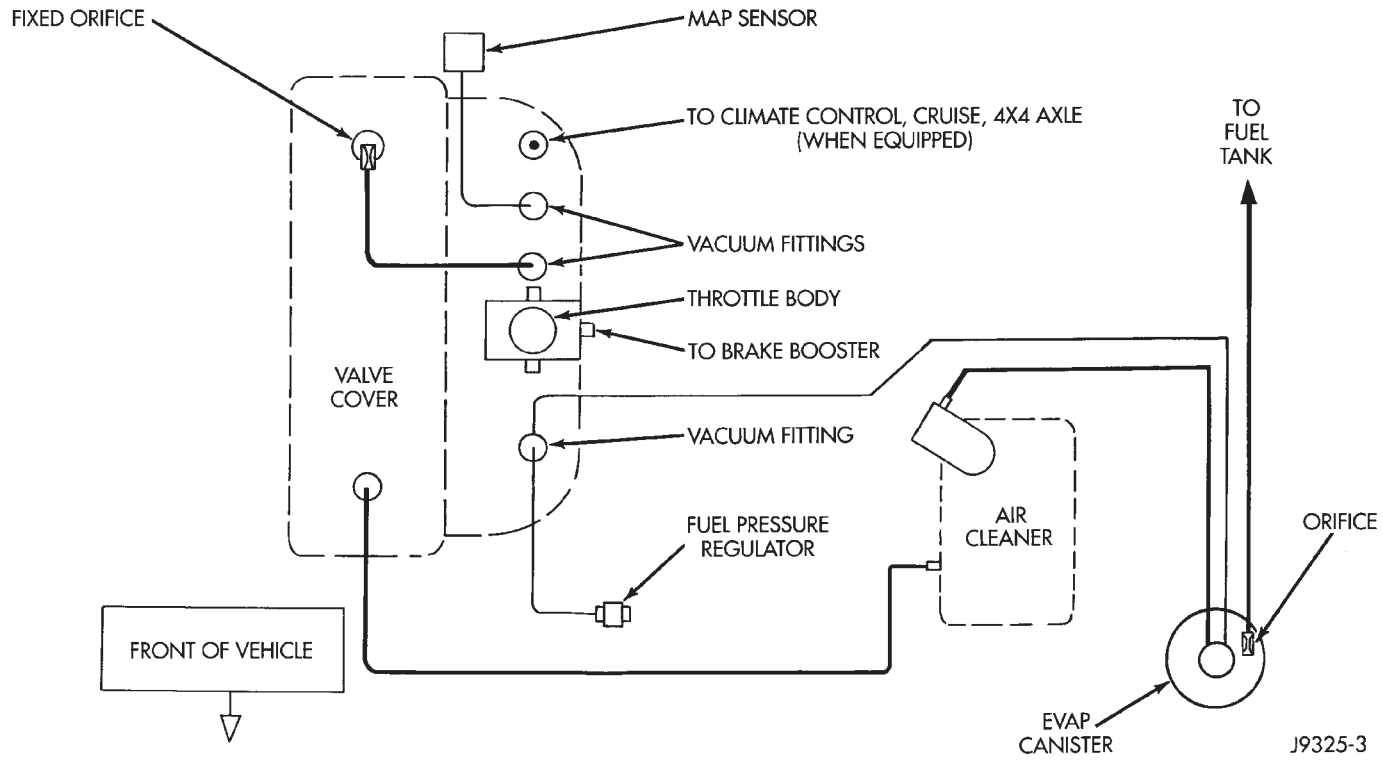


J9325-8

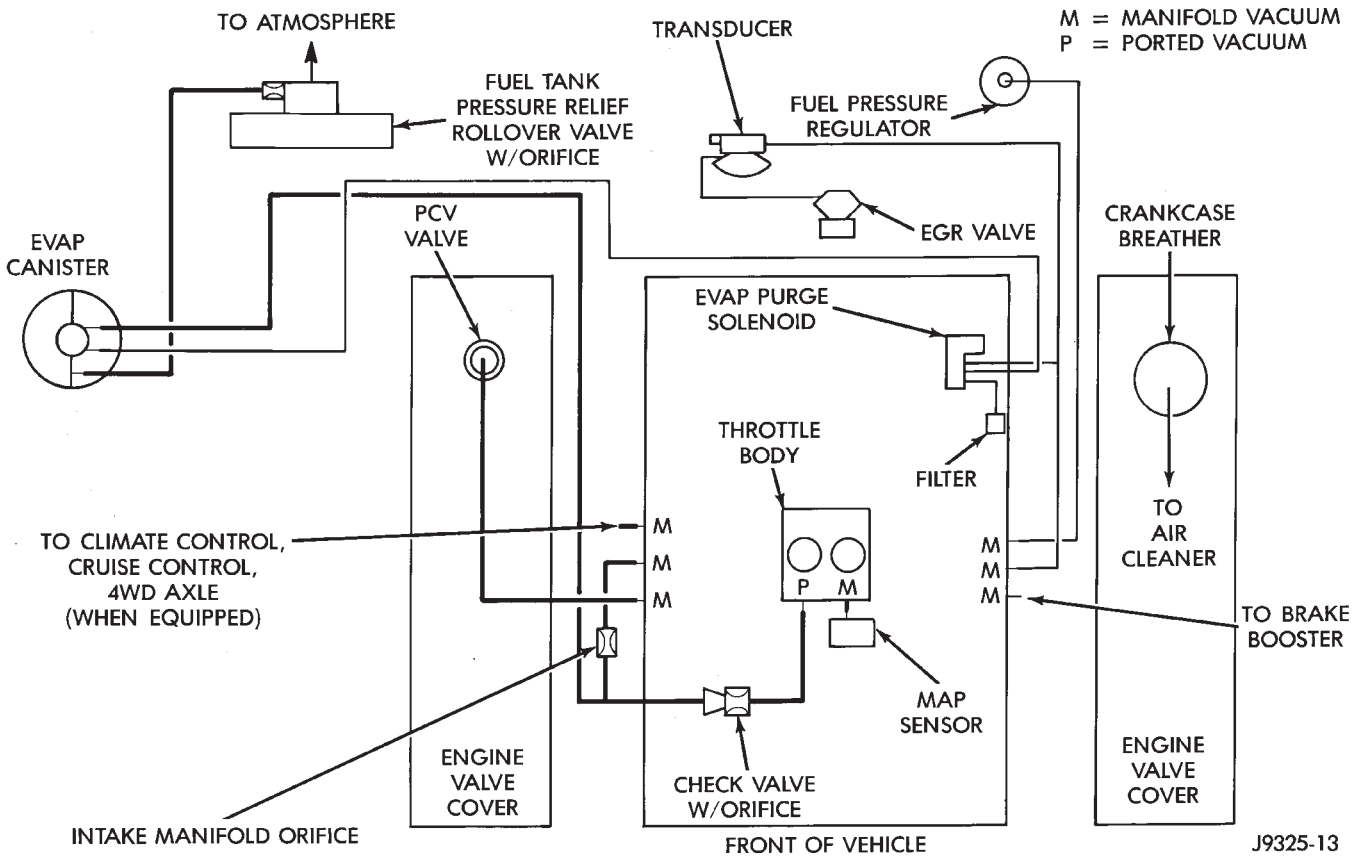
VACUUM HOSE ROUTING SCHEMATICS

The following vacuum hose routing schematics are used as examples only. If there are any differences between these schematics and the Vehicle Emission Control Information (VECI) label schematics, those shown on the VECI label should be used.

VACUUM ROUTING SCHEMATIC—4.0L ENGINE



VACUUM ROUTING SCHEMATIC—5.2L ENGINE—TYPICAL



EVAPORATIVE EMISSION CONTROLS

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EVAP (EVAPORATION) CONTROL SYSTEM

GENERAL INFORMATION

The function of the EVAP control system is to prevent the emissions of gasoline vapors from the fuel tank into the atmosphere. When fuel evaporates in the fuel tank, the vapors pass through vent hoses or tubes to a carbon filled EVAP canister. They are temporarily held in the canister until they can be drawn into the intake manifold when the engine is running.

The EVAP canister is a feature on all models for the storage of fuel vapors from the fuel tank.

The hoses used in this system are specially manufactured. If replacement becomes necessary, it is important to use only fuel resistant hose.

EVAP CANISTER

A sealed, maintenance free, EVAP canister is used on all vehicles. The EVAP canister is located in the left front corner of vehicle below the left front headlamp (Fig. 1). The EVAP canister is filled with granules of an activated carbon mixture. Fuel vapors entering the EVAP canister are absorbed by the charcoal granules.

Operation of the EVAP canister is different between the 4.0L six-cylinder engine and the 5.2L V-8 engine. Refer to the following Canister Operation.

CANISTER OPERATION—4.0L ENGINE

The EVAP canister is equipped with a vacuum controlled purge shutoff switch (orifice) (Fig. 2) that controls canister purge operation. The switch is open when manifold vacuum is applied to it. When the engine is operating, the EVAP canister purge function draws fresh air through the top of the canister. This causes the stored vapors to be drawn out of the canister and into the airstream in the air cleaner snorkel (Fig. 2).

The air cleaner contains a venturi in the air cleaner cover used as a purge line vacuum source (Fig. 3). The venturi effect increases the speed of the intake air flowing by the slots in the venturi wall. This creates a low pressure area around the slots. When the purge shutoff switch is open, vapors from the canister are drawn through slots and into the airstream flowing through the venturi (Fig. 3). The vapors pass through the intake manifold into the engine combustion chambers where they are consumed during engine combustion.

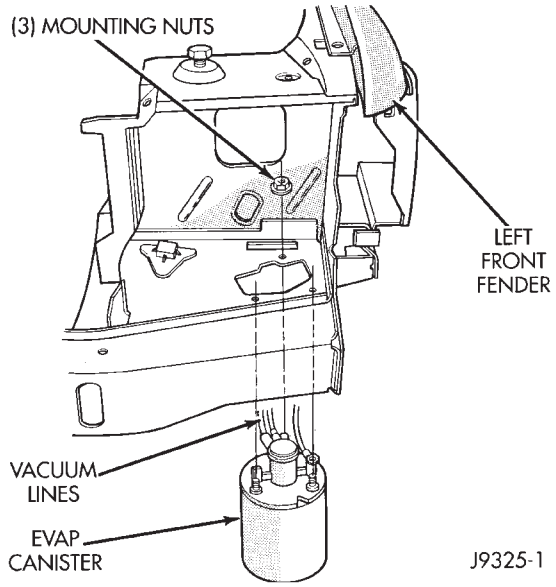

Fig. 1 EVAP Canister Location

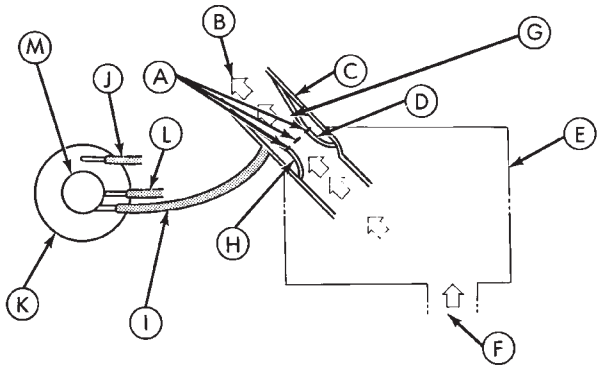

Fig. 2 EVAP System—4.0L Engine—Typical

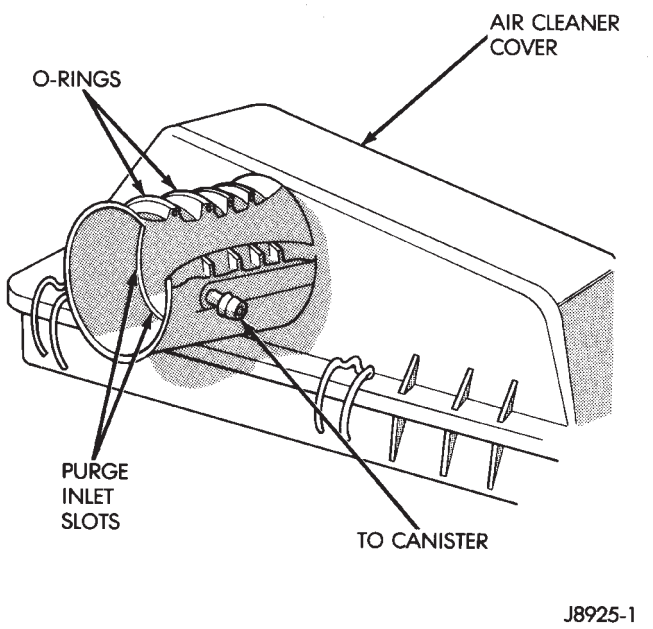

Fig. 3 Air Cleaner Venturi—4.0L Engine—Typical

CANISTER OPERATION—5.2L ENGINE

Fuel tank pressure vents into the EVAP canister. Fuel vapors are temporarily held in the canister until they can be drawn into the intake manifold. The EVAP canister purge solenoid allows the EVAP canister to be purged at predetermined times and at certain engine operating conditions. For more information, refer to the following EVAP Canister Purge Solenoid—5.2L Engine.

EVAP CANISTER PURGE SOLENOID—5.2L ENGINE

The EVAP canister purge solenoid is used with the 5.2L (V-8) engine only.

Vacuum for the EVAP canister is controlled by the EVAP Canister Purge Solenoid (Fig. 4). The solenoid is operated by the powertrain control module (PCM). The PCM regulates the solenoid by switching the ground circuit on and off based on engine operating conditions. When energized, the solenoid prevents vacuum from reaching the EVAP canister. When not energized, the solenoid allows vacuum to flow through to the EVAP canister.

During warm-up and for a specified time period after hot starts, the PCM grounds the EVAP canister purge solenoid causing it to energize. This will prevent vacuum from reaching the EVAP canister valve. When the engine reaches an operating temperature of approximately 27°C (80°F) and a time delay interval of about 100 seconds has occurred, the PCM removes the ground to solenoid. The de-energized solenoid allows vacuum to flow to the EVAP canister and purge fuel vapors through the intake manifold.

The EVAP canister purge solenoid will also be energized during certain idle conditions in order to update the fuel delivery calibration.

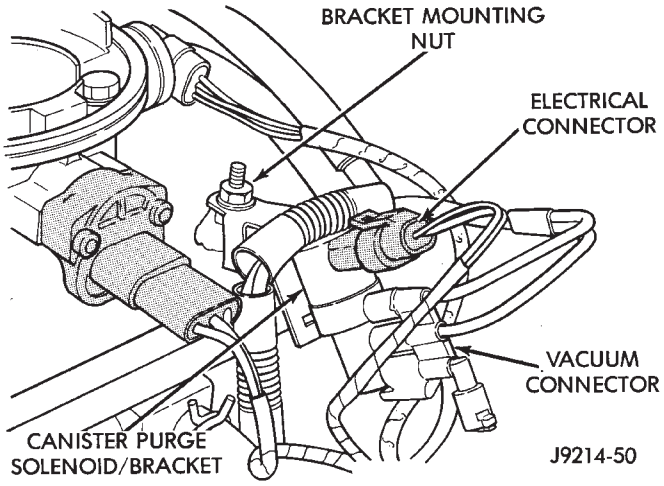

Fig. 4 Purge Solenoid—5.2L Engine—Typical

FUEL TANK FILLER TUBE CAP

The fuel tank filler tube cap incorporates a two-way relief valve that is closed to atmosphere during normal operating conditions. The relief valve used in fuel filler caps of all models is calibrated at a pressure of 10 kPa (1.5 psi) or a vacuum of 6 kPa (1.8 in. Hg). When the pressure or vacuum is relieved, the valve returns to the normally closed position.

CAUTION: The fuel filler cap must be removed prior to disconnecting any fuel system component.

CRANKCASE VENTILATION SYSTEM—4.0L ENGINE

The 4.0L engine is equipped with a Crankcase Ventilation (CCV) system (Fig. 5). The CCV system performs the same function as a conventional PCV system, but does not use a vacuum controlled valve.

A molded vacuum tube connects manifold vacuum to top of cylinder head cover at dash panel end. The vacuum tube contains a fixed orifice (Fig. 5) of a calibrated size. It meters the amount of crankcase vapors drawn out of the engine.

A fresh air supply hose from the air cleaner (Fig. 5) is connected to front of cylinder head (valve) cover. When the engine is operating, fresh air enters the engine and mixes with crankcase vapors. Manifold vacuum draws the vapor/air mixture through the fixed orifice and into the intake manifold. The vapors are then consumed during engine combustion.

POSITIVE CRANKCASE VENTILATION SYSTEM

DESCRIPTION/OPERATION

The 5.2L V-8 engine is equipped with a closed positive crankcase ventilation (PCV) system (Fig. 6).

This system consists of a crankcase PCV valve mounted on the cylinder head cover with a hose extending from the valve to the intake manifold.

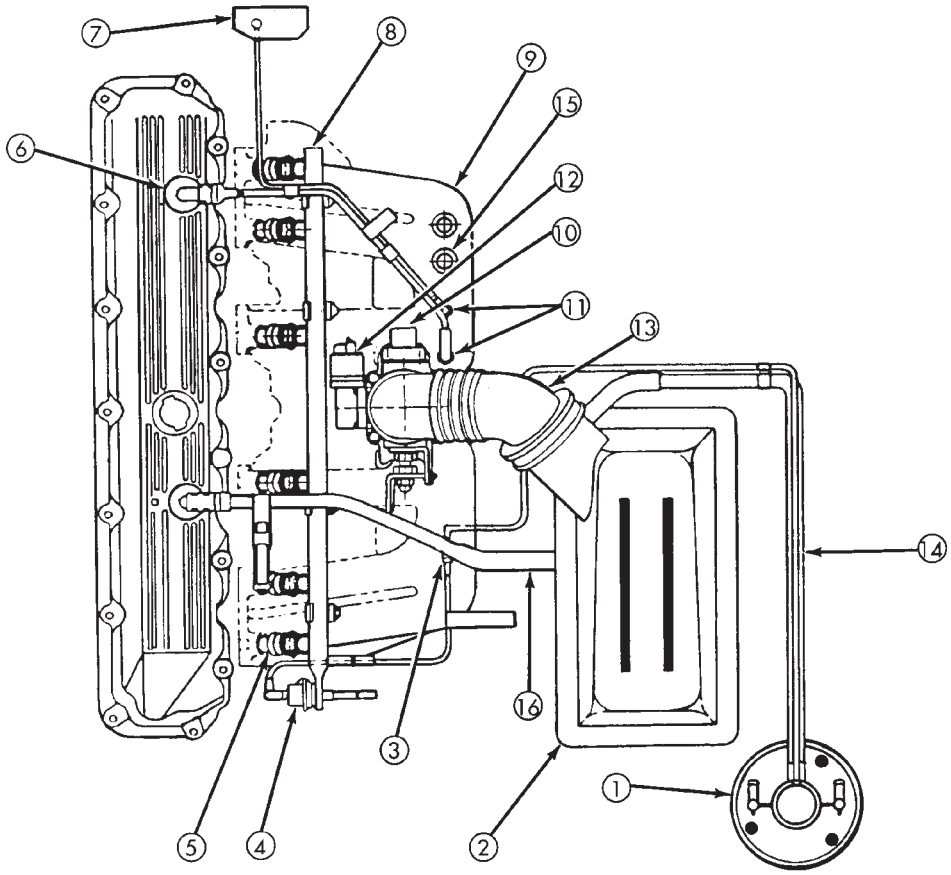

Fig. 5 CCV System—4.0L Engine—Typical

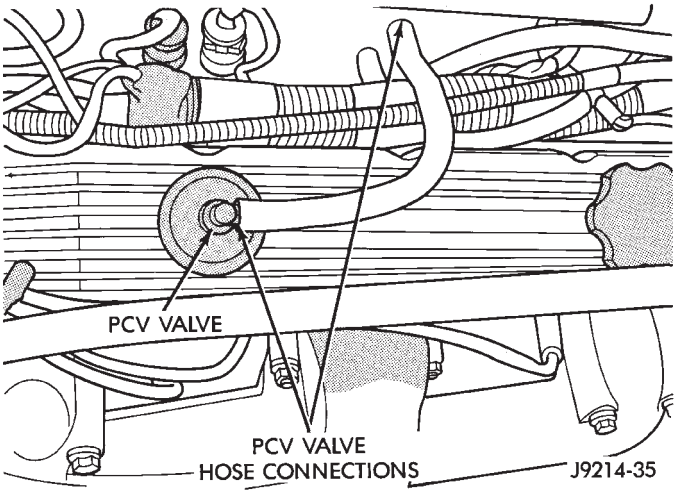

Fig. 6 PCV Valve/Hose—5.2L Engines

A closed engine crankcase breather/filter, with a hose connecting it to the air cleaner housing, provides the source of air for system.

The positive crankcase ventilation (PCV) system operates by engine intake manifold vacuum (Fig. 7). Filtered air is routed into the crankcase through the air cleaner hose and crankcase breather/filter. This forces crankcase vapors through the PCV valve. It is then drawn into the intake manifold. Here it becomes part of the calibrated air/fuel mixture to be consumed in the combustion chamber. The PCV system constantly ventilates the crankcase to help prevent sludge formation and vapors from entering the atmosphere.

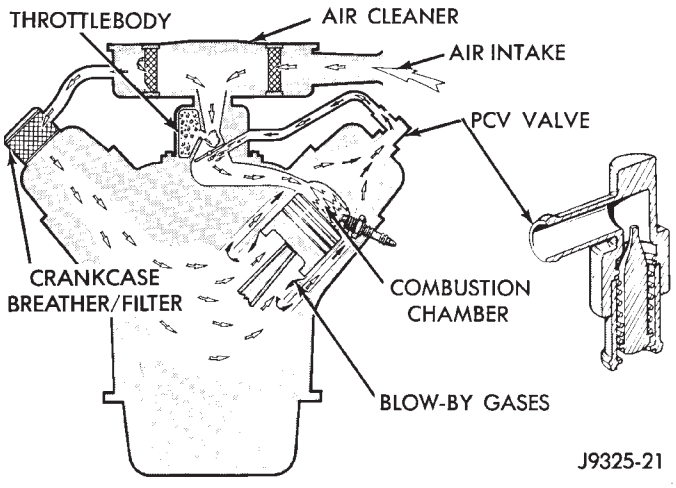

Fig. 7 Typical Closed Crankcase Ventilation System

POSITIVE CRANKCASE VENTILATION (PCV) VALVE

The PCV valve contains a spring loaded plunger. This plunger meters the amount of crankcase vapors routed into the combustion chamber based on intake manifold vacuum.

When the engine is not operating, or during an engine popback, the spring forces the plunger back against the seat. This will prevent vapors from flowing through the valve (Fig. 8).

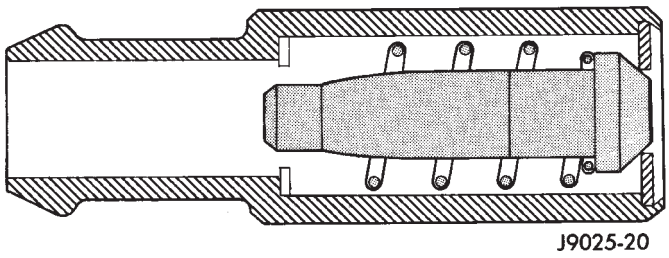

Fig. 8 Engine Off or Engine PopBack—No Vapor Flow

During periods of high manifold vacuum, such as idle or cruising speeds, vacuum is sufficient to completely compress spring. It will then pull the plunger to the top of the valve (Fig. 9). In this position there is minimal vapor flow through the valve.

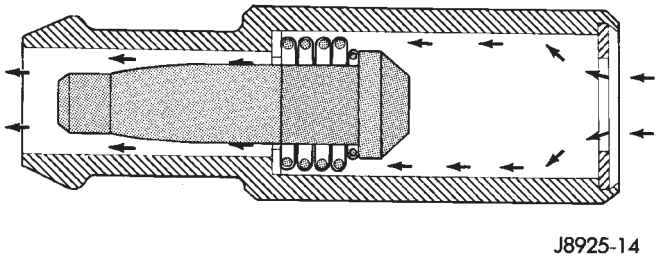

Fig. 9 High Intake Manifold Vacuum—Minimal Vapor Flow

During periods of moderate manifold vacuum, the plunger is only pulled part way back from inlet. This results in maximum vapor flow through the valve (Fig. 10).

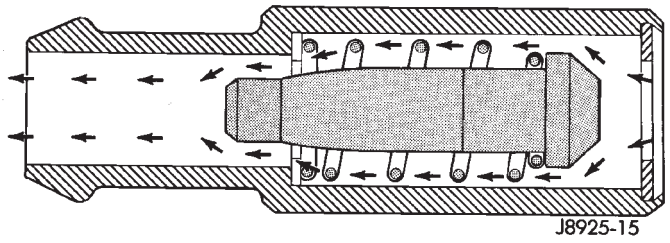

Fig. 10 Moderate Intake Manifold Vacuum—Maximum Vapor Flow

INSPECTION AND SERVICE PROCEDURE

(1) With engine idling, remove the PCV valve from cylinder head cover. If the valve is not plugged, a hissing noise will be heard as air passes through the valve. Also, a strong vacuum should be felt at the valve inlet (Fig. 11).

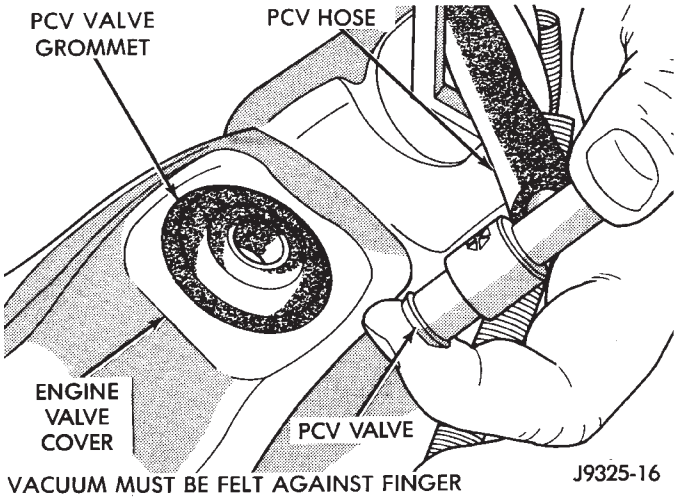

Fig. 11 Check Vacuum at PCV Valve—Typical

(2) Install the PCV valve. Remove the crankcase breather/filter. Hold a piece of stiff paper, such as a parts tag, loosely over the opening of crankcase breather/filter at the cylinder head (valve) cover (Fig. 12).

(3) The paper should be drawn against the opening in the cylinder head (valve) cover with noticeable force. This will be after allowing approximately one minute for crankcase pressure to reduce.

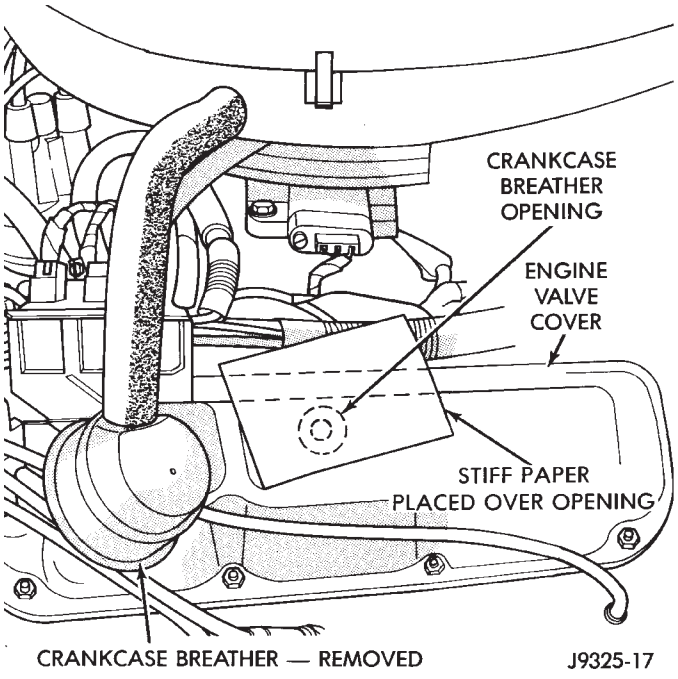

Fig. 12 Check Vacuum at Crankcase Breather Opening—Typical

cylinder head (valve) cover. The valve should rattle when shaken (Fig. 13).

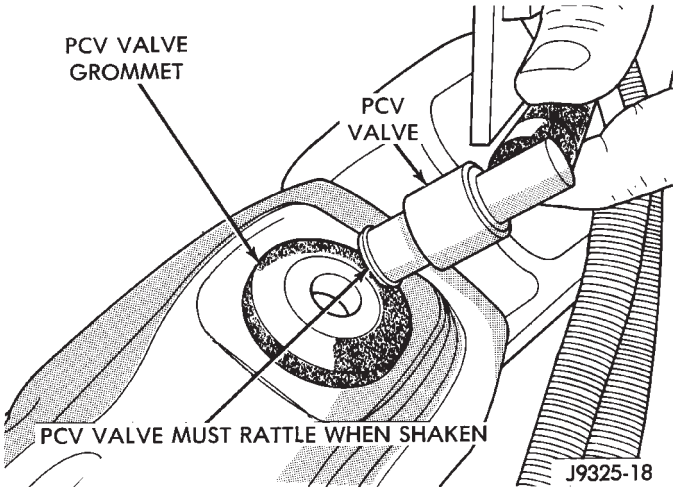

Fig. 13 Shake PCV Valve—Typical

Replace the PCV valve and retest the system if it does not operate as described in the preceding tests. **Do not attempt to clean the old PCV valve.**

(5) If the paper is not held against the opening in cylinder head (valve) cover after new valve is installed, the PCV valve hose may be restricted and must be replaced. The passage in the intake manifold must also be checked and cleaned.

(6) To clean the intake manifold fitting, turn a 1/4 inch drill (by hand) through the fitting to dislodge any solid particles. Blow out the fitting with shop air. If necessary, use a smaller drill to avoid removing any metal from the fitting.

CRANKCASE BREATHER/FILTER—5.2L ENGINES

The crankcase breather/filter is used with the 5.2L V-8 engine only.

The crankcase breather/filter (Fig. 14) is located on the engine valve cover. It must be kept clean and lubricated. At the recommended interval, remove the filter and wash it thoroughly in kerosene, or similar solvent. Lubricate or wet the filter by inverting it and filling with SAE 30 engine oil. Filter must then be thoroughly drained. More frequent service may be necessary for vehicles operated extensively on short run, stop and go, or extended engine idle service.

The filter must be replaced at correct intervals. Refer to Lubrication and Maintenance, Group 0.

PRESSURE RELIEF/ROLLOVER VALVE

These vehicles are equipped with a combination fuel tank pressure relief and rollover valve (Fig. 15). This dual function valve will relieve fuel tank pressure and also prevent fuel flow through the fuel tank vent hoses in the event of an accidental vehicle rollover.

The valve incorporates a pressure relief mechanism (Fig. 16) that releases fuel tank pressure when the pressure increases above the calibrated sealing value. Refer

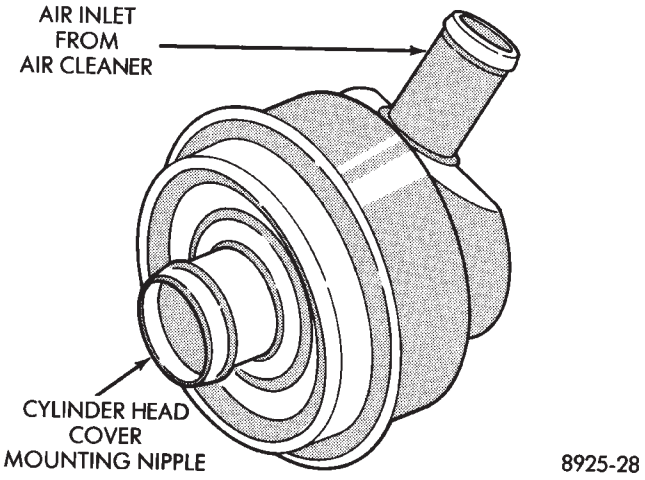

Fig. 14 Crankcase Breather/Filter—5.2L Engine

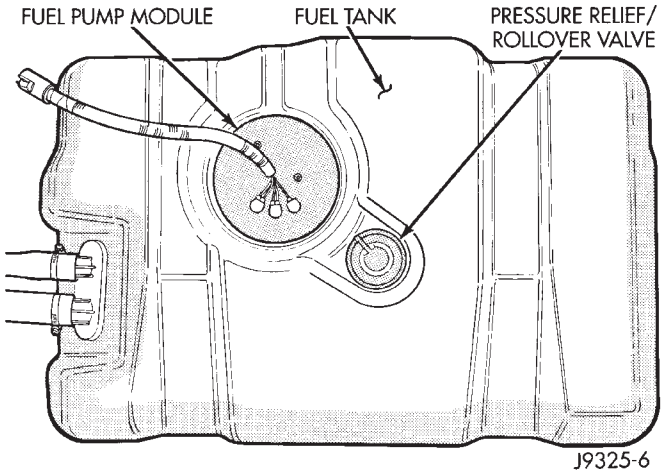

Fig. 15 Pressure Relief/Rollover Valve Location

to the Fuel Tank section of Group 14, Fuel Systems for removal and installation procedures.

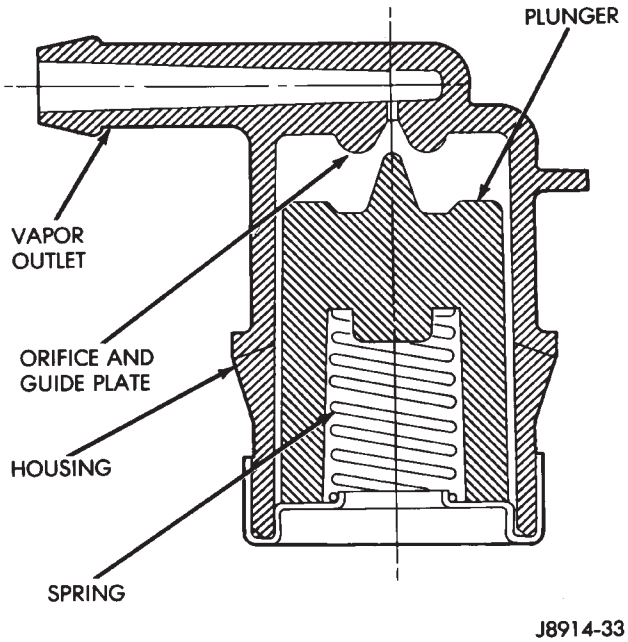

Fig. 16 Pressure Relief/Rollover Valve Operation

EXHAUST EMISSION CONTROLS

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AIR CLEANER

The air cleaner used on all models (Figs. 1 or 2) is open to ambient air. The blend air door and vacuum motor that was used on 4.0L engines of previous model years to supply heated air, is no longer used. The air cleaner housing assembly contains the engine air filter.

The Powertrain Control Module (PCM) monitors air temperature in the intake manifold through the Intake Manifold Air Temperature sensor. The PCM adjusts injector pulse width and ignition timing to compensate for intake air temperature. Refer to Powertrain Control Module (PCM) in Group 14, Fuel System for more information.

Refer to the Component Removal/Installation section of this group for removal and installation procedures.

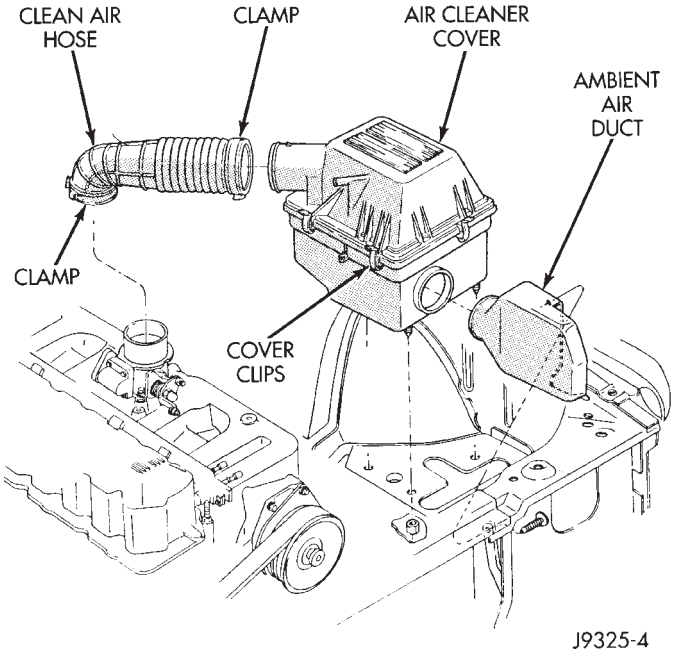

Fig. 1 Air Cleaner—4.0L Engine

EXHAUST GAS RECIRCULATION SYSTEM—5.2L ENGINE

GENERAL INFORMATION

The Exhaust Gas Recirculation (EGR) System is used with the 5.2L engine only.

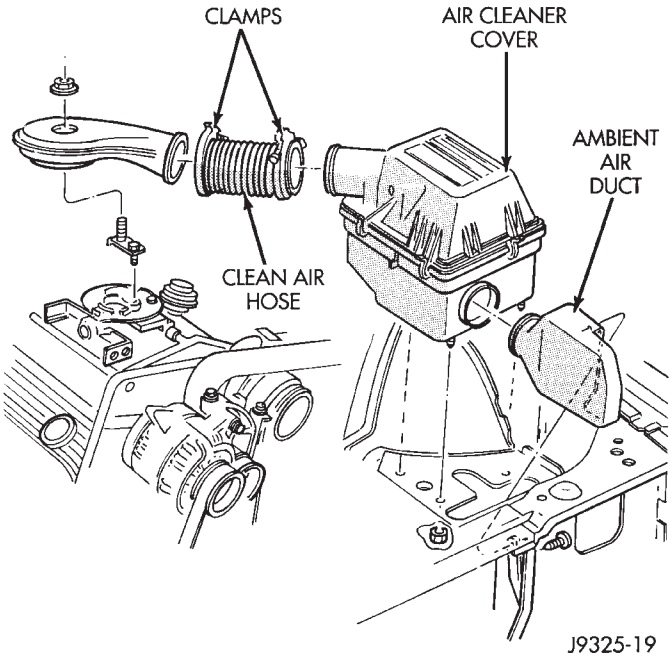

Fig. 2 Air Cleaner—5.2L Engine

The EGR system reduces oxides of nitrogen (NOx) in the engine exhaust and helps prevent spark knock. This is accomplished by allowing a predetermined amount of hot exhaust gas to recirculate and dilute the incoming fuel/air mixture. This dilution reduces peak flame temperature during combustion.

The system consists of an intake manifold mounted EGR valve (Fig. 3) and connecting hoses. The vacuum to the EGR is controlled by the Electric EGR Transducer (EET) (Figs. 3 and 4). The EET is a dual electric/vacuum function switch. It is controlled by the powertrain control module (PCM).

EGR OPERATION—5.2L ENGINE

The Electric Exhaust Gas Recirculation Transducer (EET) is a back pressure transducer and an electric vacuum solenoid combined into a single unit (Figs. 3 and 4). The vacuum solenoid portion of the EET receives its electrical signal from the powertrain control module (PCM). Using this signal, the solenoid regulates the vacuum flowing through to the transducer portion of the EET. The back pressure transducer measures the amount of exhaust gas back pressure on the exhaust side of the EGR valve. It then varies the strength of the vacuum signal ap-

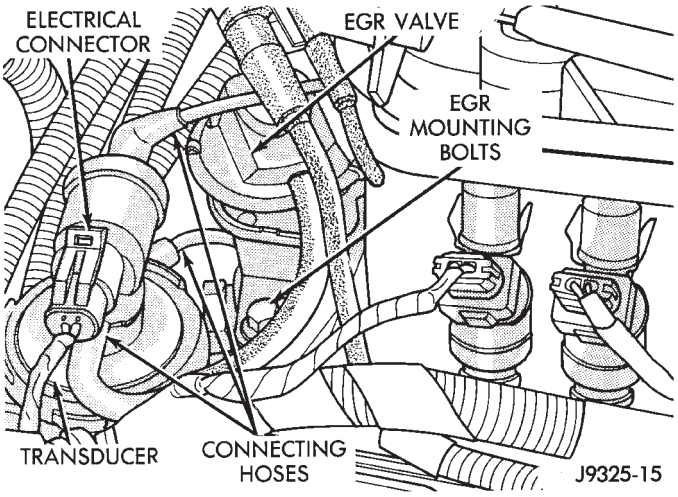

Fig. 3 EGR System—5.2L Engine

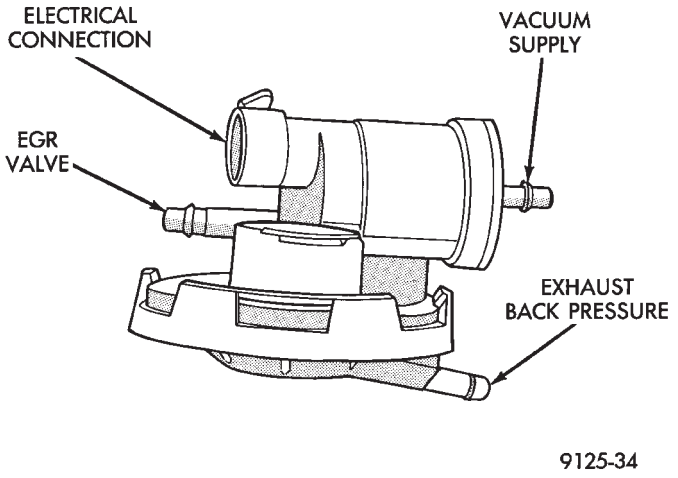

Fig. 4 Electric EGR Transducer (EET)—5.2L Engine

plied to the EGR valve. The transducer uses this back pressure signal to provide the correct amount of exhaust gas recirculation under all conditions.

The vacuum supply for the EGR valve is controlled by the EET. The electrical solenoid portion of the EET is controlled by the powertrain control module (PCM). The PCM monitors engine coolant temperature and other operating conditions to determine when EGR operation is desired. Refer to Open Loop/Closed Loop Modes of Operation in Group 14, Fuel Systems for a description of EGR solenoid operation based on engine operating conditions.

If the electrical connector to the EET is disconnected, or the electrical signal is lost, the EGR valve will operate at all times. This results in poor engine performance and reduced driveability during certain operating conditions.

Vacuum flows between the solenoid portion of the EET and the transducer portion of the EET. This happens only when the solenoid is not electrically energized. The transducer is connected to the EGR valve by a vacuum hose and a back pressure hose. The transducer is controlled by exhaust back pressure and is ported to the exhaust manifold through a hose connecting it to the bottom of the EGR valve.

Vacuum will be supplied to the EGR valve and EGR operation will begin when:

- The electrical solenoid portion of the EET is not energized.
- The engine back pressure entering the EGR valve inlet is strong enough to close the transducer bleed valve.

If back pressure is not strong enough to close the transducer bleed valve, the transducer will bleed off the vacuum preventing EGR operation.

When the electrical solenoid portion of the EET is de-energized by the powertrain control module (PCM), vacuum flows to the transducer. The transducer is connected to the engine exhaust system by a small hose that connects to the base of the EGR valve.

The vacuum section of the transducer is controlled by exhaust system back pressure. When back pressure is high enough it will close a bleed valve in the transducer allowing vacuum to actuate the EGR valve. If back pressure does not close the bleed valve, vacuum will be bled off.

For more information, refer to the Multi-Port Fuel Injection section of Group 14, Fuel Systems for 5.2L engines.

EGR SYSTEM ON-BOARD DIAGNOSTICS (CALIFORNIA VEHICLES ONLY)

The powertrain control module (PCM) performs an On-Board Diagnostic (OBD) check of the EGR system on all California vehicles. The diagnostic system uses the Electric EGR Transducer (EET) for the system tests.

The OBD check activates only during selected engine/driving conditions. When the conditions are met, the PCM energizes the EET solenoid to disable the EGR. The PCM checks for a change in the oxygen sensor signal. If the air-fuel mixture goes lean, the PCM will attempt to enrichen the mixture. The PCM registers a Diagnostic Trouble Code (DTC) if the EGR system has failed or degraded. After registering a DTC, the PCM turns the **Malfunction Indicator Lamp (MIL)** on. (The Malfunction Indicator Lamp was formerly referred to as the Check Engine Lamp). The Malfunction Indicator Lamp indicates the need for immediate service.

If a malfunction is indicated by the Malfunction Indicator Lamp and a DTC for the EGR system was set, check for proper operation of EGR system. Use the following: System Test, EGR Gas Flow Test and EGR Diagnosis Chart.

If the EGR system tests properly, check the system using the DRB II scan tool. For use of the DRB II, refer to the appropriate Powertrain Diagnostics Procedure service manual.

EGR SYSTEM SERVICE—5.2L ENGINE

A malfunctioning EGR system can cause engine spark knock, sags or hesitation, rough idle, engine stalling and poor driveability. To be sure of proper operation of the EGR system, inspect all passages for blockage. Check moving parts for binding. Inspect the complete system for leaks. Replace system components or hoses that are leaking.

Inspect all hose connections between throttle body, intake manifold, EGR valve and EGR purge solenoid. Replace any vacuum harness components that are leaking or damaged.

Refer to EGR Control System Test and EGR Gas Flow Test to check EGR System operation.

EGR GAS FLOW TEST—5.2L ENGINE

(1) Disconnect hose from EGR valve and connect a hand vacuum pump to EGR valve nipple. Apply a minimum of 12 inches vacuum the valve.

(2) The engine should now idle roughly or stall. If this occurs, the valve is performing correctly. Proceed to Electric EGR Transducer Test.

(3) If the engine idle speed did not change, remove the EGR valve and inspect the valve and the exhaust passage in the manifold for blockage. Repair as necessary. If blockage is not present, replace the EGR valve.

ELECTRIC EGR TRANSDUCER (EET)—5.2L ENGINE

TESTING ELECTRIC SOLENOID PORTION OF TRANSDUCER

(1) Bring the engine to normal operating temperature. Operate at idle speed. Test the EET as follows:

(2) Check vacuum at EET vacuum source. Disconnect the hose and attach a vacuum gauge to it.

(3) Vacuum should be a minimum of 15 inches:

- If vacuum is low, check the line for kinks, twists, or a loose connection at vacuum connector or intake manifold.
- If vacuum is correct, remove gauge. Connect the vacuum line and proceed to next step.

(4) Check EET operation using the appropriate Powertrain Diagnostic Procedures service manual. Refer to this manual for use of the DRB II scan tool and repair EET as necessary.

TESTING VACUUM PORTION OF TRANSDUCER

(1) Disconnect the EET vacuum lines, back pressure line and electrical connector. Remove transducer.

(2) Plug the EET EGR valve port.

(3) Apply 1-2 pounds air pressure to exhaust back pressure port. Air pressure can be supplied with a hand operated air pump or compressed air (regulated to correct psi).

(4) Apply a minimum of 12 inches of vacuum to vacuum supply port.

Replace the EET if it will not hold vacuum.

For electrical tests of the EET and its circuitry, refer to the appropriate Powertrain Diagnostic Procedures service manual and use the DRB II scan tool.

OXYGEN (O_2) SENSOR

For description, operation, diagnosis and removal/installation procedures of the O_2 sensor, refer to Group 14, Fuel Systems.

EGR DIAGNOSIS CHART—5.2L ENGINE

NOTE: ALL TESTS MUST BE MADE WITH FULLY WARM ENGINE RUNNING CONTINUOUSLY FOR AT LEAST TWO MINUTES

WARNING: BE SURE TO APPLY PARKING BRAKE AND/OR BLOCK WHEELS BEFORE PERFORMING IDLE CHECK OR ADJUSTMENT, OR ANY ENGINE RUNNING TESTS OR ADJUSTMENTS.

Condition	Possible Cause	Correction
EGR VALVE STEM DOES NOT MOVE ON SYSTEM TEST.	(a) Cracked, leaking, disconnected or plugged hoses.	(a) Verify correct hose connections and leak check and confirm that all hoses are open. If defective hoses are found, replace hose harness. (b) Disconnect hose harness from EGR vacuum transducer and connect auxiliary vacuum supply. Raise engine rpm to 2000 rpm and hold. Apply 10" Hg vacuum while checking valve movement. If no valve movement occurs, replace valve/transducer assy. If valve opens (approx. 3mm or 1/8" travel), hold supply vacuum to check for diaphragm leakage. Valve should remain open 30 seconds or longer. If leakage occurs, replace valve/transducer assy. If valve is satisfactory, check control system.
EGR VALVE STEM DOES NOT MOVE ON SYSTEM TEST. OPERATES NORMALLY ON EXTERNAL VACUUM SOURCE.	(a) Defective control system—Plugged passages.	(a) Remove throttle body and inspect port (slot type) in throttle bore and associated passage in throttle body. Use suitable solvent to remove deposits and check for flow with light air pressure. Normal operation should be restored to EGR system.
	(b) Defective control system—solenoid or solenoid control circuit.	(b) Refer to Group 14. General Diagnosis "On Board Diagnostics" to check solenoid.
ENGINE WILL NOT IDLE. DIES OUT ON RETURN TO IDLE OR IDLE IS VERY ROUGH OR SLOW.	(a) High EGR valve leakage in closed position.	(a) If removal of vacuum hose from EGR valve does not correct rough idle, (a1) Turn engine off. Remove the air cleaner exposing the inlet to the throttle body. (a2) Disconnect the backpressure hose from the EGR valve. (a3) Using a nozzle with a rubber grommet connection, direct compressed air (50 to 60 psi) down through the steel backpressure tube on the EGR valve while opening and closing the throttle blade. (a4) If the sound from the compressed air changes distinctly in step a3, the poppet is leaking and air is entering the intake manifold. Replace the EGR valve.
	(b) EGR tube to intake manifold leak.	(b) Remove tube and visually inspect tube seal on gasket. Tube end should be uniformally indented on gasket with no signs of leak. If signs of exhaust gas leakage are present, replace gaskets and tighten flange nuts to 23 N·m (200 in. lbs.). If an intake plenum leak persists, replace EGR tube and gaskets, following installation instructions.
	(c) Solenoid or control signal to solenoid failure.	(c) Verify correct hose connections and leak check and confirm that all hoses are open. If defective hoses are found, replace hose harness. (c1) Refer to Group 14, General Diagnosis "On Board Diagnostics" to check solenoid.

NOTE: DO NOT ATTEMPT TO CLEAN BACK-PRESSURE EGR VALVE, REPLACE ENTIRE VALVE/TRANSDUCER ASSEMBLY IF NECESSARY.

9225-26

COMPONENT REMOVAL/INSTALLATION

INDEX

AIR CLEANER HOUSING

REMOVAL

(1) Unlock clean air hose clamp (Figs. 1 or 2) at air cleaner cover. To unlock the clamp, attach adjustable pliers to clamp and rotate pliers as shown in figure 3.

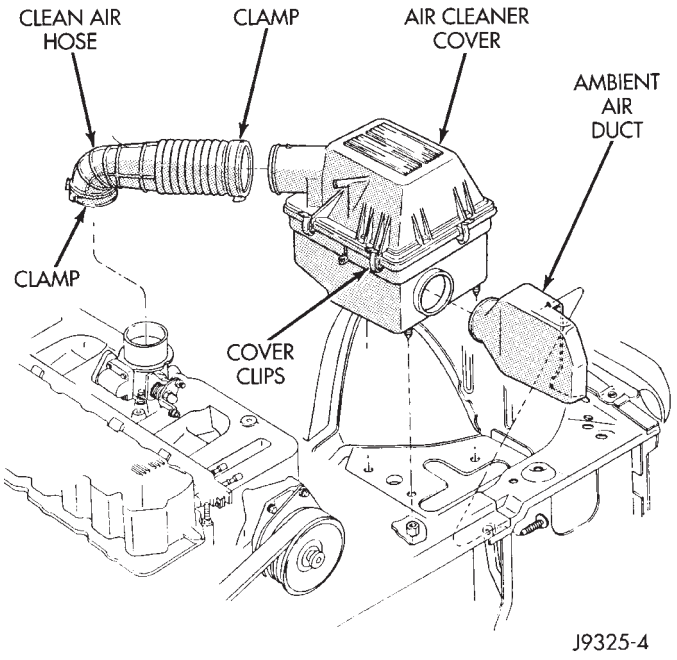

Fig. 1 Air Cleaner—4.0L Engine

Remove clean air hose at cover.

(2) Remove crankcase breather/filter hose at air cleaner cover.

(3) From under vehicle, remove three housing nuts (Figs. 1 or 2).

(4) Release the air cleaner housing from the ambient air duct and remove housing from vehicle.

INSTALLATION

(1) Position air cleaner housing to body and ambient air duct (Figs. 1 or 2).

(2) Install three nuts and tighten to 10 N•m (93 in. lbs.) torque.

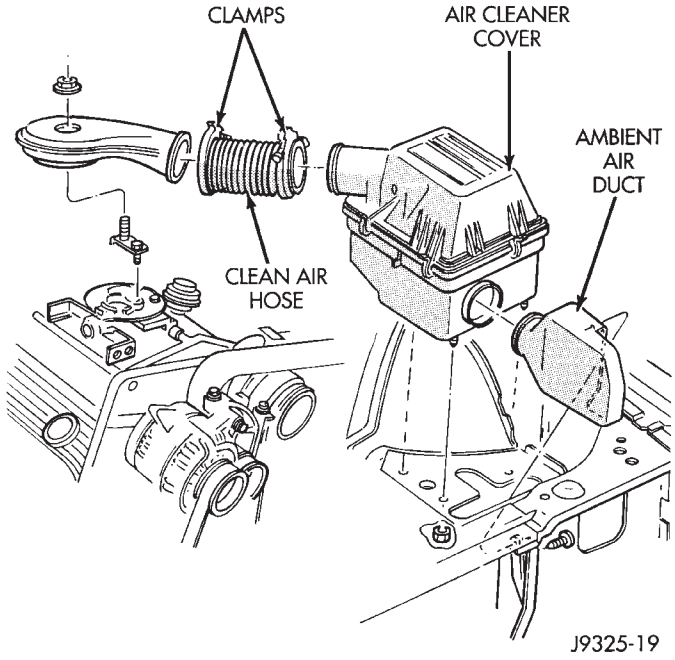

Fig. 2 Air Cleaner—5.2L Engine

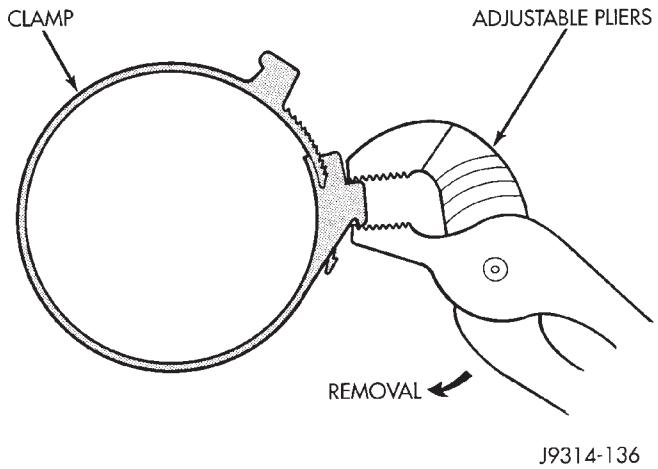

Fig. 3 Clamp Removal

(3) Install crankcase breather/filter hose to cover.

(4) Install clamp to cover. Compress the clamp snugly with adjustable pliers as shown in figure 4.

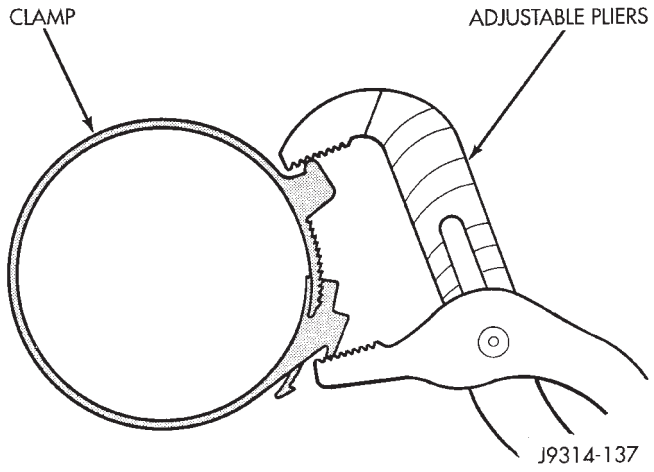

Fig. 4 Clamp Installation

AIR FILTER

REMOVAL/INSTALLATION

(1) Pry back the six clips retaining the air cleaner cover to the air cleaner housing (Fig. 5).

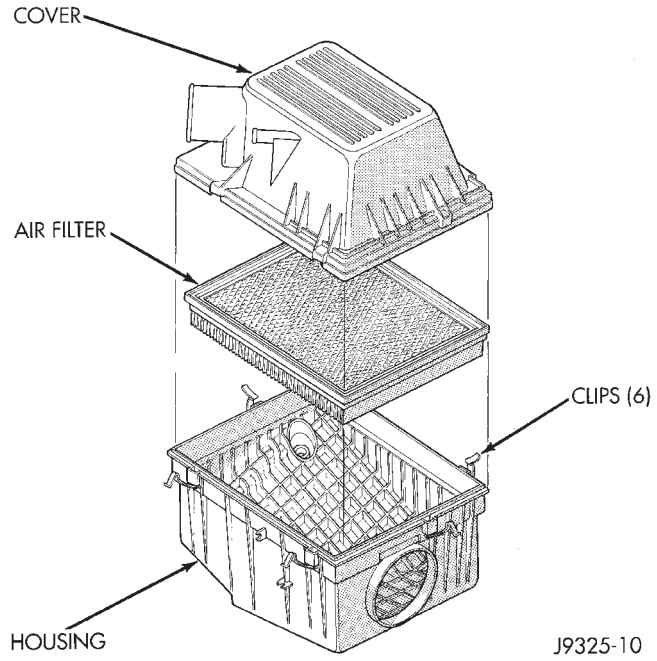

Fig. 5 Air Filter Removal/Installation

(2) Lift the cover up and position to the side.

(3) Remove air filter.

(4) Clean the inside of air cleaner housing before installing new filter.

(5) Reverse the preceding operation for installation. Be sure the air cleaner cover is properly seated to air cleaner housing.

COOLANT TEMPERATURE SENSOR

For description, operation, diagnosis and removal/installation procedures of the engine coolant temperature sensor, refer to Group 14, Fuel Systems.

EGR VALVE—5.2L ENGINE

REMOVAL

The EGR valve and the Electric EGR Transducer (EET) are serviced as one unit on the 5.2L engine.

(1) Disconnect vacuum hose to EGR valve/transducer assembly. Note position of hoses (Fig. 6) on the EGR valve and transducer for easier installation.

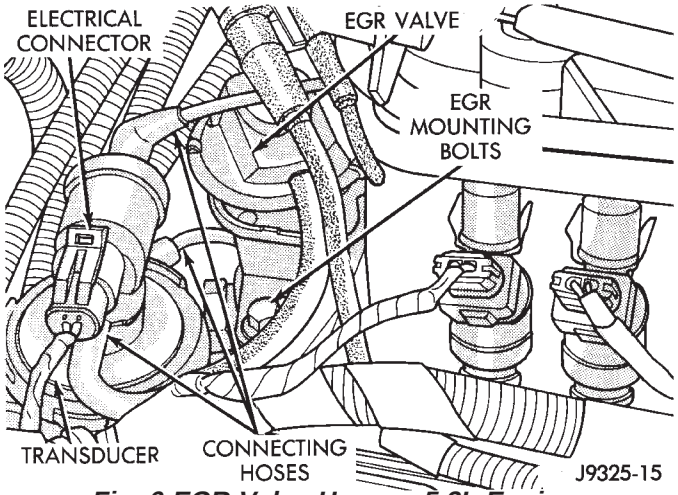

Fig. 6 EGR Valve Hoses—5.2L Engines

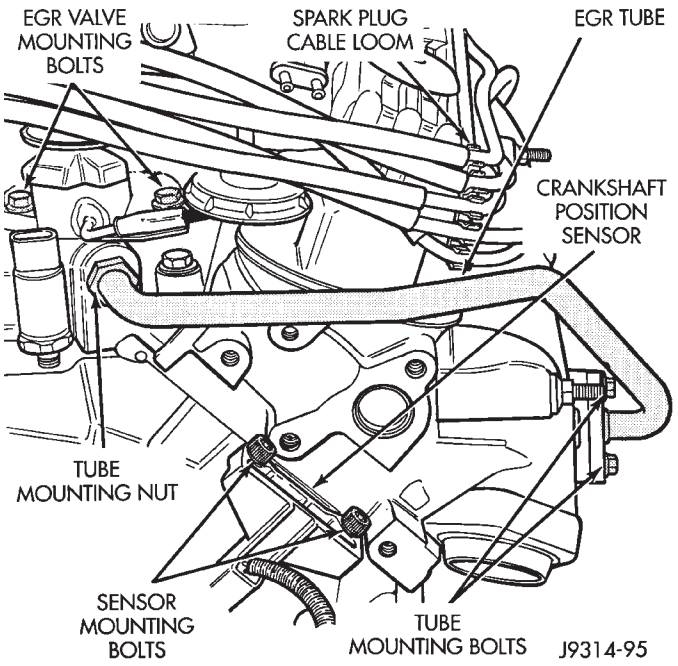

Fig. 7 EGR Valve Mounting Bolts—5.2L Engines

(2) Remove EGR mounting bolts (Figs. 6 or 7).

(3) Remove EGR valve and gasket. Discard old gasket. Clean intake manifold mating surface and check for cracks.

INSTALLATION

(1) Place new EGR gasket on intake manifold.

(2) Install EGR valve. Tighten mounting bolts to 23 N●m (200 in. lbs.) torque.

(3) Connect vacuum hose to valve/transducer assembly.

EGR TUBE—5.2L ENGINE

REMOVAL

(1) Remove the spark plug cable loom and spark plug cables from valve cover mounting stud at rear of right valve cover (Fig. 8). Position spark plug cables to top of valve cover.

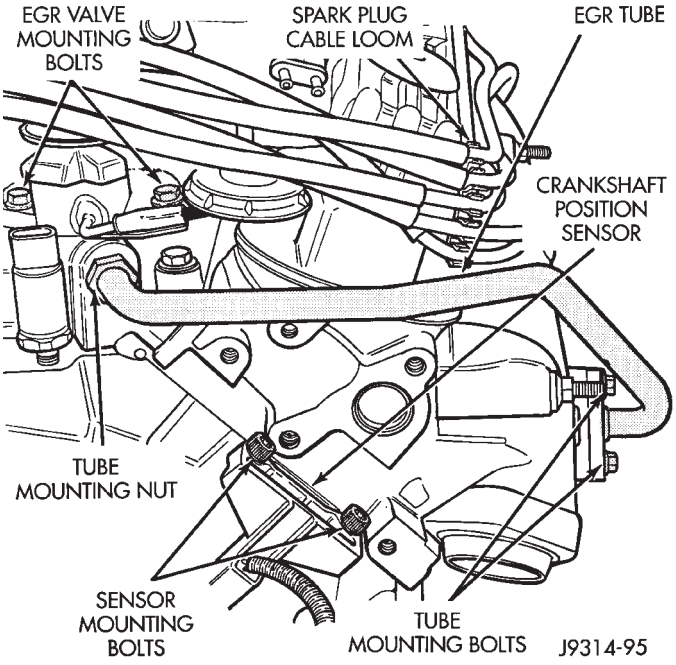

Fig. 8 EGR Tube—5.2L Engine

(2) Remove the right exhaust manifold heat shield nuts/bolts and remove heat shield (Fig. 9).

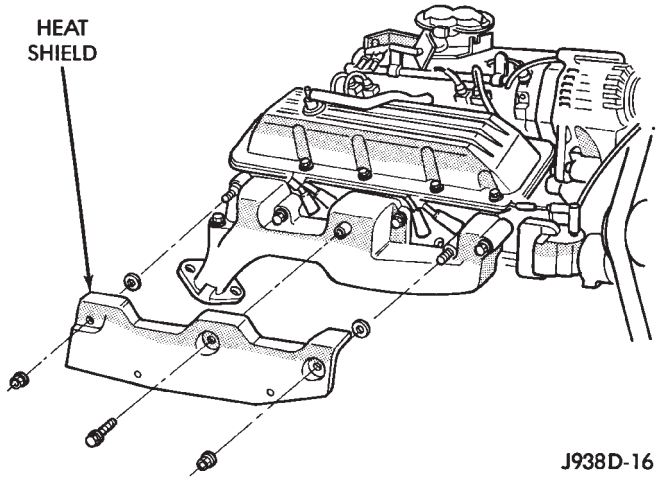

Fig. 9 Exhaust Manifold Heat Shield—5.2L Engine

(3) Disconnect 2 hoses at Exhaust Gas Recirculation (EGR) valve. Note position of hoses at EGR valve before removal.

(4) Disconnect electrical connector and hoses at electric EGR transducer (EET). Note position of hoses at EET before removal.

(5) Remove 2 EGR valve mounting bolts (Fig. 8) and remove EGR valve. Discard old EGR gasket.

(6) Disconnect electrical connector at engine oil pressure sending unit.

(7) To prevent damage to oil pressure sending unit, a special tool, such as number C-4597 must be used (Fig. 10). Remove sending unit from engine.

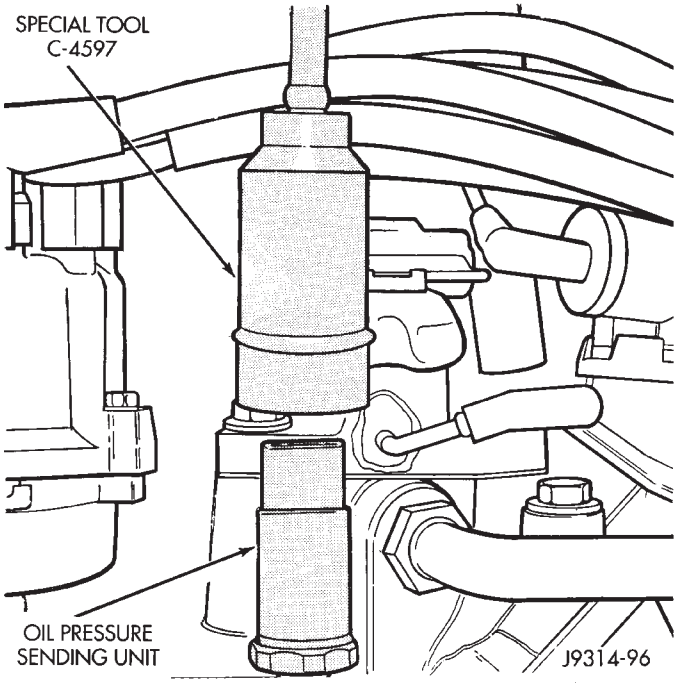

Fig. 10 Oil Pressure Sending Unit—Removal/ Installation

(8) Loosen EGR tube mounting nut at intake manifold (Fig. 8).

(9) Remove 2 EGR tube mounting bolts at exhaust manifold (Fig. 8) and remove EGR tube. Discard old gasket at exhaust manifold.

(10) Remove EGR tube from vehicle.

INSTALLATION

(1) Clean the EGR tube and exhaust manifold (at EGR tube mounting point) of any old gasket material.

(2) Install a new gasket to exhaust manifold end of EGR tube and install EGR tube to both manifolds. Tighten tube mounting nut at intake manifold. Tighten 2 mounting bolts at exhaust manifold to 23 N●m (204 in. lbs.) torque.

(3) Coat the threads of the oil pressure sending unit with thread sealant. Do not allow any of the thread sealant to get into the sending unit opening, or the opening at the engine. Install sending unit to engine and tighten to 14 N●m (130 in. lbs.) torque. Install electrical connector to sending unit.

(4) Clean the intake manifold and EGR valve of any old gasket material.

(5) Install a new EGR valve gasket at intake manifold.

(6) Install EGR valve to intake manifold. Tighten 2 EGR bolts to 23 N●m (200 in. lbs.) torque.

(7) Position EET and install its electrical connector. Connect hoses between EGR valve and EET. Connect hose between main vacuum harness and EET.

(8) Install spark plug cable loom and spark plug cables to valve cover mounting stud.

(9) Install heat shield at right exhaust manifold.

ELECTRIC EGR TRANSDUCER (EET)—5.2L ENGINE

The EGR valve and the EET are serviced as one unit on the 5.2L engine. Also refer to EGR valve removal/installation.

REMOVAL

(1) Disconnect wiring connector at EET (Fig. 11).

(2) Disconnect hoses at EET. Note position of hoses for easier installation.

(3) Remove EET from engine.

INSTALLATION

(1) Position EET to engine and connect hoses.

(2) Connect wiring connector.

EVAP CANISTER

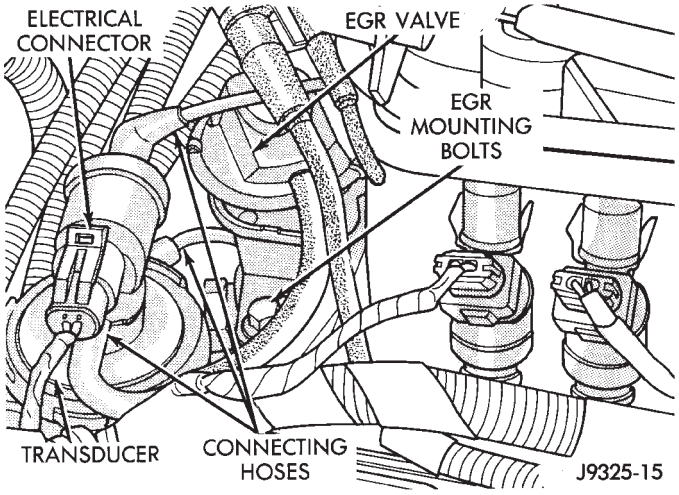

Fig. 11 Electric EGR Transducer—5.2L Engine

REMOVAL

(1) Remove the grill. Refer to group 23, Body.

(2) Remove the front bumper/fascia assembly. Refer to group 23, Body.

(3) Disconnect vacuum lines at canister.

(4) Remove the three canister mounting nuts (Fig. 12).

(5) Lower the canister through bottom of vehicle.

INSTALLATION

(1) Position canister to body.

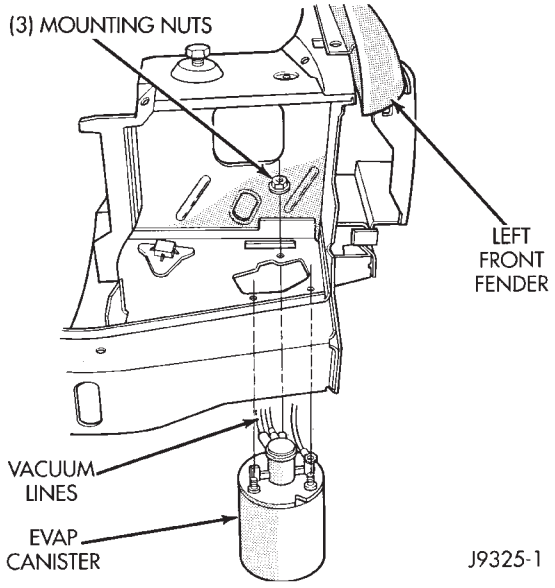

Fig. 12 EVAP Canister Location

(2) Install canister mounting nuts. Tighten nuts to 6 N●m (55 in. lbs.) torque.

(3) Connect vacuum lines.

(4) Install the front bumper/fascia assembly and grill. Refer to Group 23, Body.

EVAP CANISTER PURGE SOLENOID

REMOVAL—5.2L ENGINE

(1) Remove air duct at throttle body.

(2) Disconnect wiring connector at solenoid (Fig. 13).

(3) Disconnect vacuum harness at solenoid (Fig. 13).

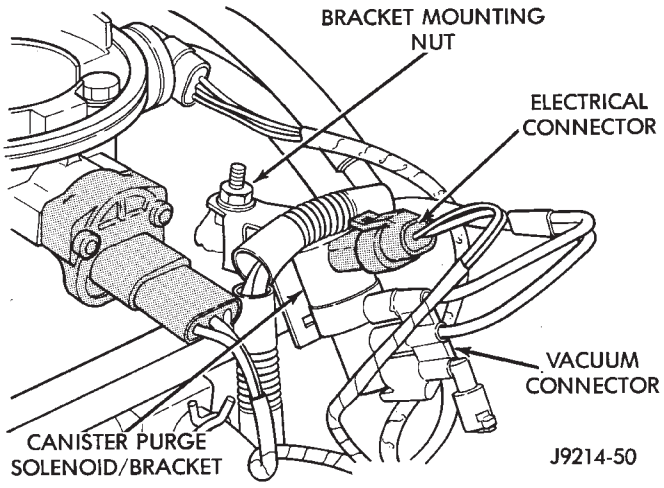

Fig. 13 EVAP Canister Purge Solenoid—5.2L Engine

(4) Remove solenoid and its support bracket from intake manifold.

(5) Remove EVAP canister purge solenoid from engine.

INSTALLATION

(1) Install EVAP canister purge solenoid and its mounting bracket to intake manifold.
(2) Connect vacuum harness and wiring connector.
(3) Install air duct to throttle body.

FUEL TANK FILLER TUBE CAP

If replacement of the fuel filler tube cap is necessary, it must be replaced with an identical cap to be sure of correct system operation.

OXYGEN (O_2) SENSOR

For description, operation, diagnosis and removal/installation procedures of the O_2 sensor, refer to Group 14, Fuel Systems.

POWERTRAIN CONTROL MODULE (PCM)

For removal and installation procedures, refer to Group 14, Fuel Systems.

PRESSURE RELIEF/ROLLOVER VALVE

For removal and installation procedures, refer to the Fuel Tank section of Group 14, Fuel Systems.