EMISSION CONTROL SYSTEMS

CONTENTS

GENERAL INFORMATION

INDEX

Throughout this group, references are made to particular vehicle models by alphabetical designation (XJ or YJ) or by the particular vehicle nameplate. A chart showing a breakdown of alphabetical designations is included in the Introduction section at the beginning of this manual.

Information on the air cleaner housing and the air cleaner element can be found in Group 14, Fuel Systems.

CATALYTIC CONVERTOR

Refer to Group 11, Exhaust System and Intake Manifold for information.

EXHAUST GAS RECIRCULATION (EGR) SYSTEM

An EGR system is not used with the 2.5L 4 cylinder or the 4.0L 6 cylinder engine on any XJ or YJ model.

SERVICE REMINDER INDICATOR (SRI) LAMP

The instrument panel mounted SRI lamp was formerly referred to as the emission maintenance reminder (EMR) lamp. It is **not used** on any XJ or YJ model for the 1995 model year.

VEHICLE EMISSION CONTROL INFORMATION (VECI) LABEL

All vehicles are equipped with a combined VECI label. The label is located in the engine compartment (Figs. 1 or 2). 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

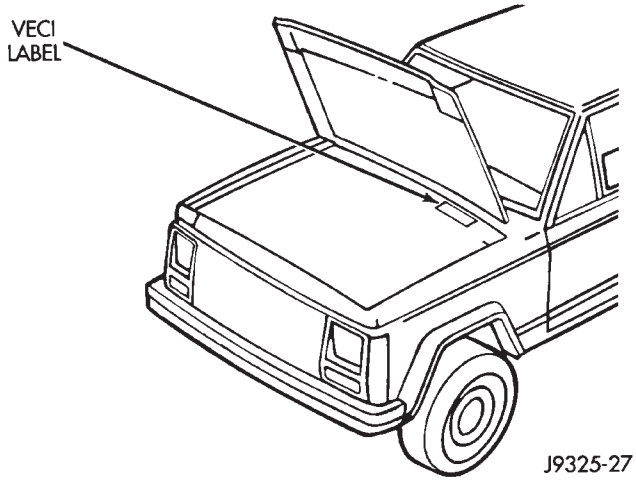


Fig. 1 VECI Label Location—XJ Models

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 label.

The VECI label illustration (Fig. 3) is used as an example only. Refer to the VECI label located in the engine compartment (Figs. 1 or 2) for actual emission information.

VACUUM HOSE ROUTING SCHEMATICS

The 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.

DRB SCAN TOOL

For operation of the DRB scan tool, refer to the appropriate Powertrain Diagnostic Procedures service manual.

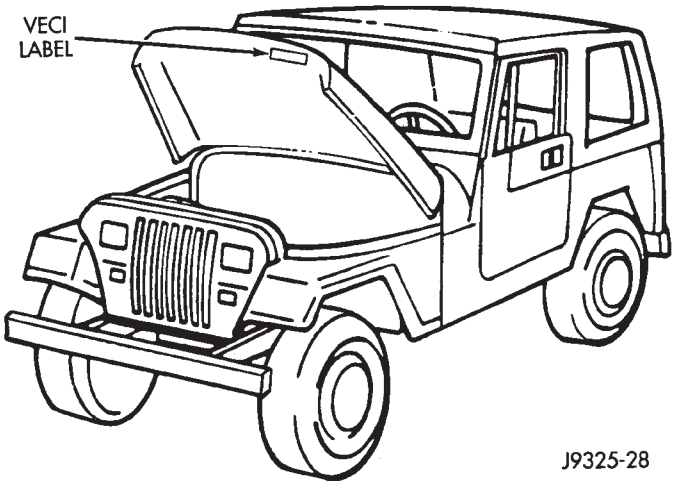
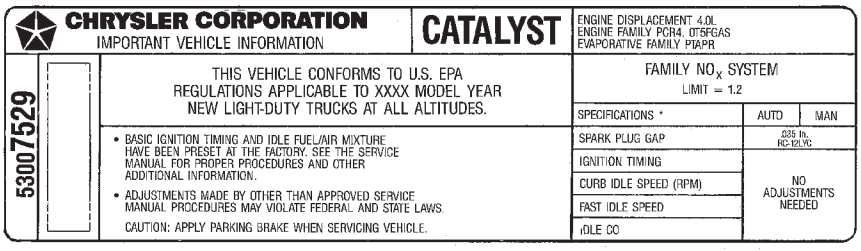
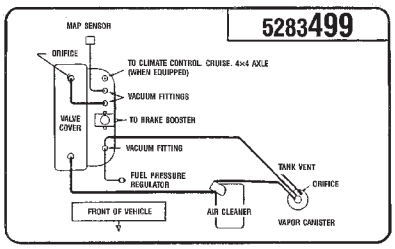


Fig. 2 VECI Label Location—YJ Models

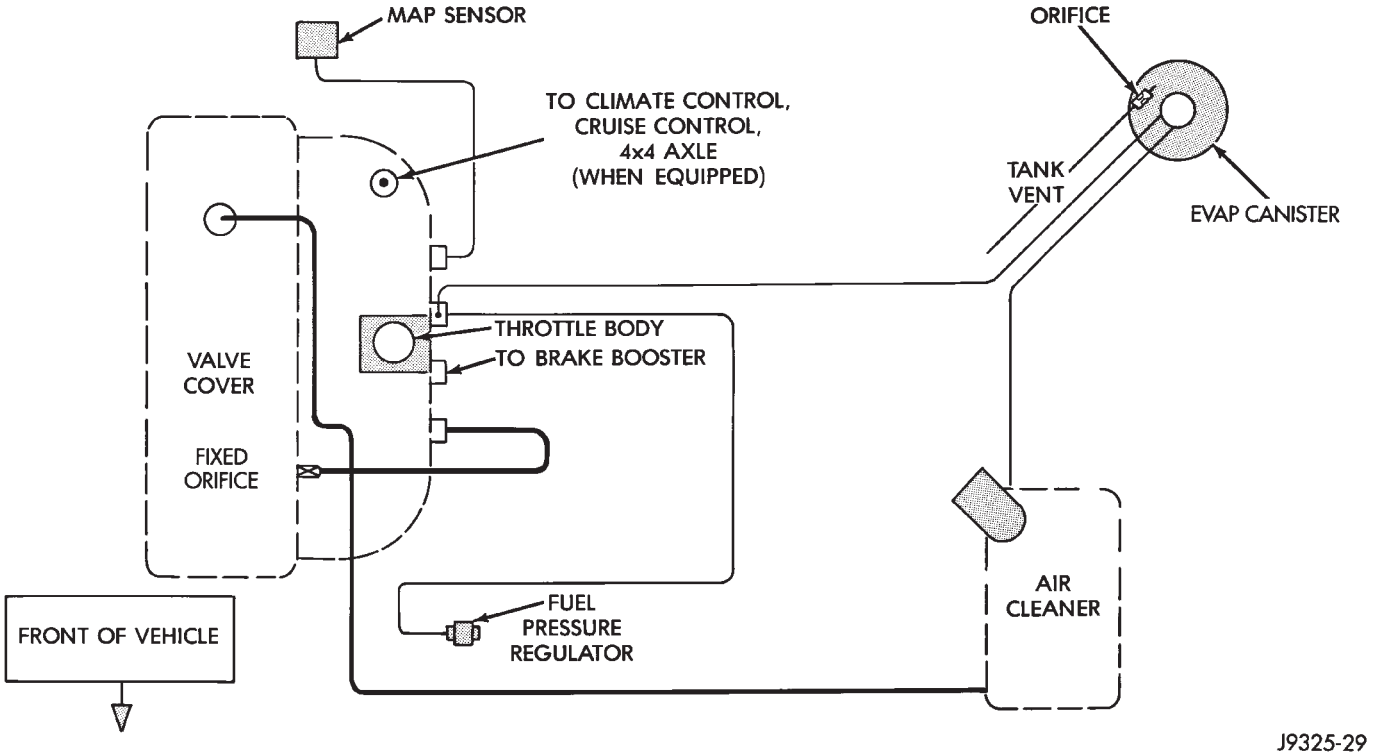




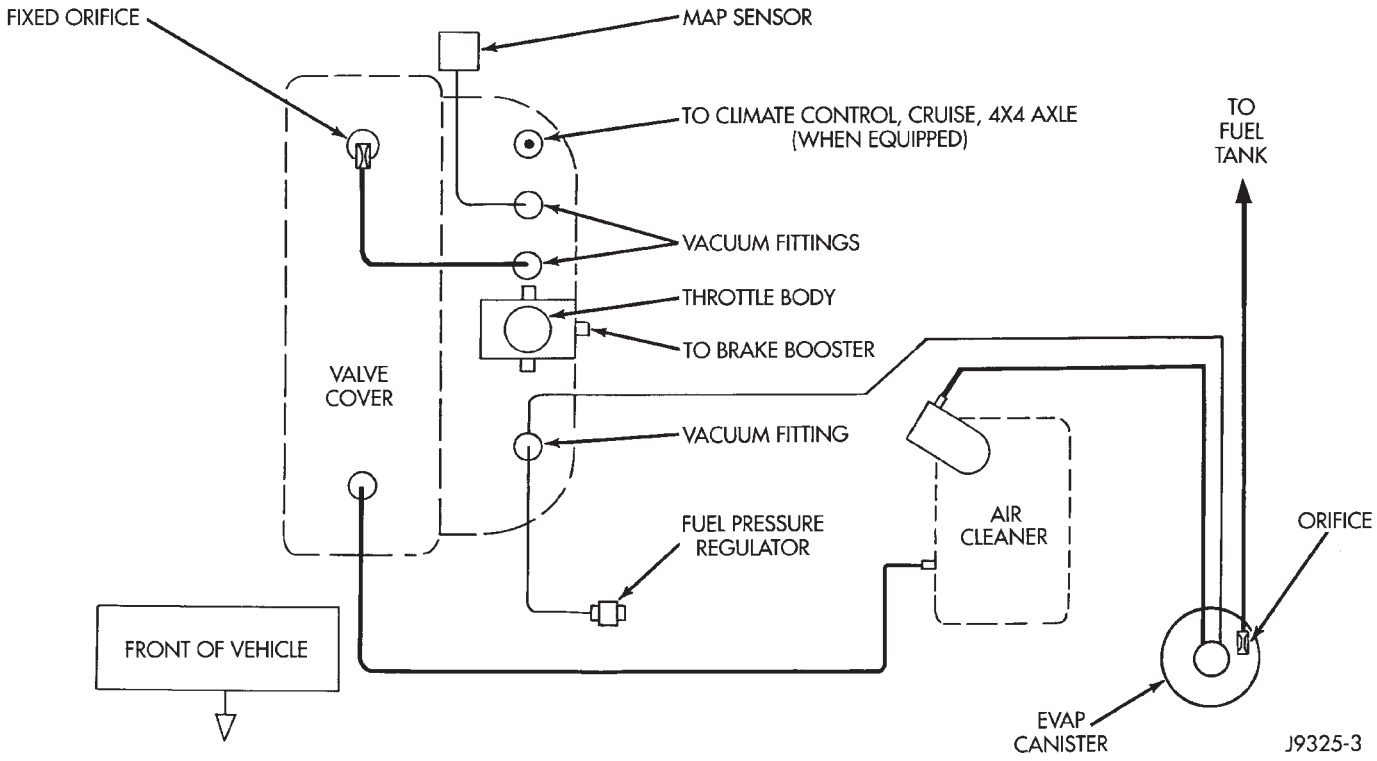
J9525-12

Fig. 3 VECI Label—Typical

VACUUM ROUTING SCHEMATIC—2.5L 4 CYLINDER ENGINE



VACUUM ROUTING SCHEMATIC—4.0L 6 CYLINDER ENGINE



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. On XJ models, the EVAP canister is located in the engine compartment on the passenger side frame rail (Fig. 4). On YJ models, the EVAP canister is located in the engine compartment on the dash panel and below the brake master cylinder (Fig. 5). The EVAP canister is filled with granules of an activated carbon mixture. Fuel vapors entering the EVAP canister are absorbed by the charcoal granules.

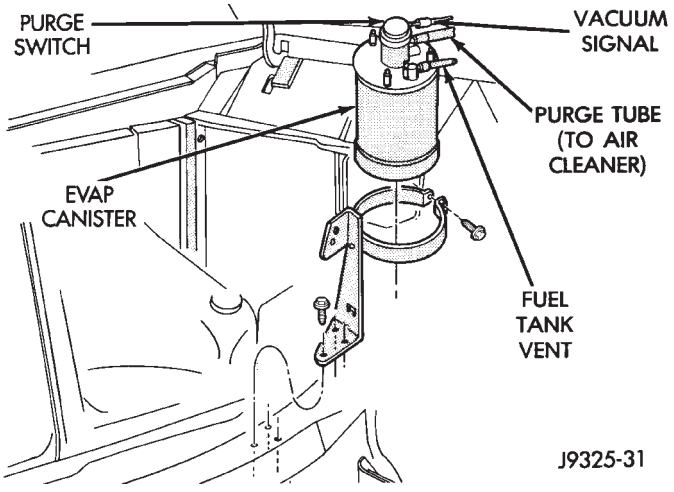

Fig. 4 EVAP Canister Location—XJ Models

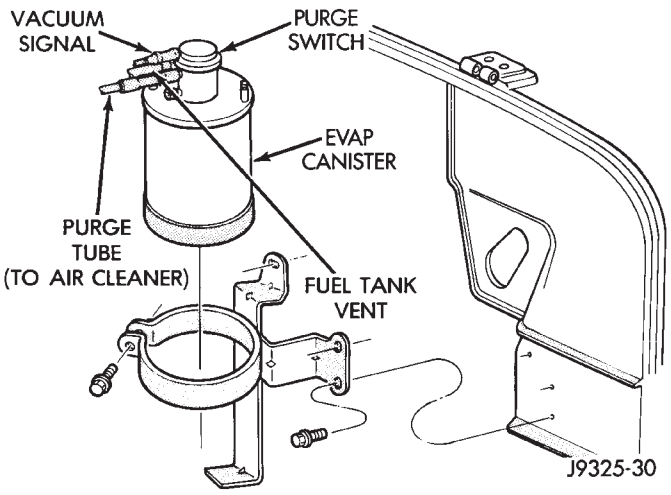

Fig. 5 EVAP Canister Location—YJ Models

CANISTER OPERATION

Vacuum is used to control and operate the EVAP canister. No electrical circuitry is used to control or operate the EVAP system.

The EVAP canister is equipped with a vacuum controlled purge shutoff switch (orifice) (Figs. 4 or 5) 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. 6).

The air cleaner contains a venturi in the air cleaner cover used as a purge line vacuum source (Fig. 6). 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. 7). The vapors pass through the intake manifold into the engine combustion chambers where they are consumed during engine combustion.

FUEL TANK FILLER TUBE CAP

The fuel tank filler tube cap (fuel tank cap) incorporates a two-way pressure/relief valve that is closed to atmosphere during normal operating conditions.

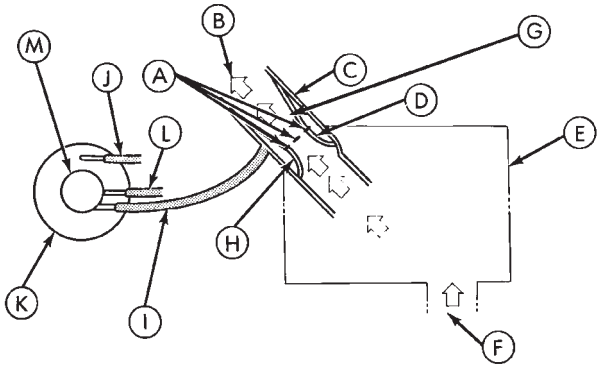

Fig. 6 EVAP System—Typical

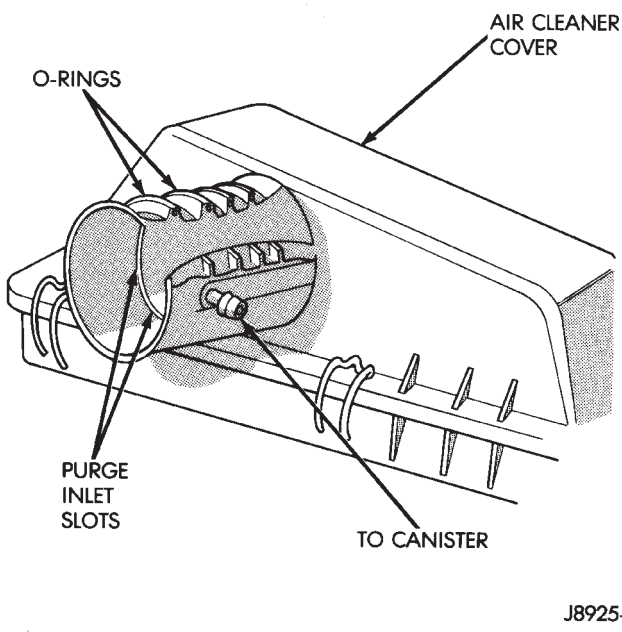

Fig. 7 Air Cleaner Venturi—Typical

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

All 2.5L 4 cylinder and 4.0L 6 cylinder engines are equipped with a Crankcase Ventilation (CCV) system (Figs. 8 or 9). The CCV system performs the same function as a conventional PCV system, but does not use a vacuum controlled valve.

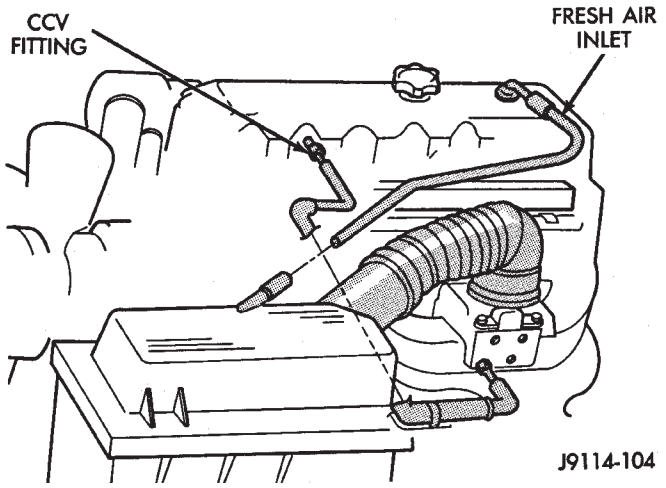

Fig. 8 CCV System—2.5L Engine—Typical

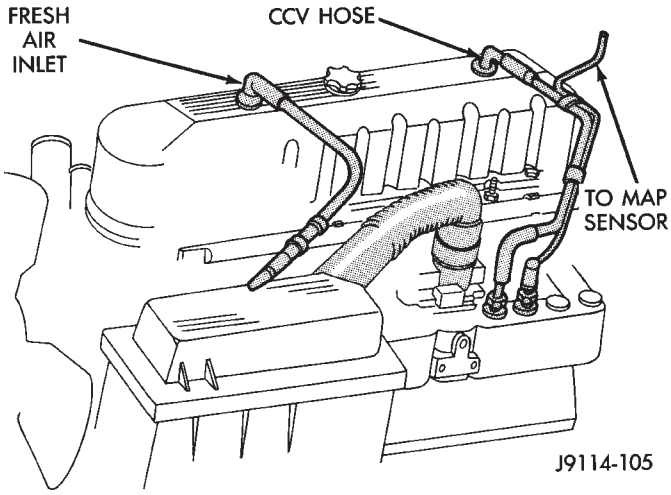

Fig. 9 CCV System—4.0L Engine—Typical

On 4.0L 6 cylinder engines, a molded vacuum tube connects manifold vacuum to top of cylinder head (valve) cover at dash panel end. The vacuum tube contains a fixed orifice of a calibrated size. It meters the amount of crankcase vapors drawn out of the engine.

On 2.5L 4 cylinder engines, a fitting on drivers side of cylinder head (valve) cover contains the metered orifice. It is connected to manifold vacuum.

A fresh air supply hose from the air cleaner is connected to front of cylinder head cover on 4.0L engines. It is connected to rear of cover on 2.5L engines.

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 combustion.

PRESSURE RELIEF/ROLLOVER VALVE

All vehicles are equipped with a combination fuel tank pressure relief and rollover valve (Fig. 10). 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.

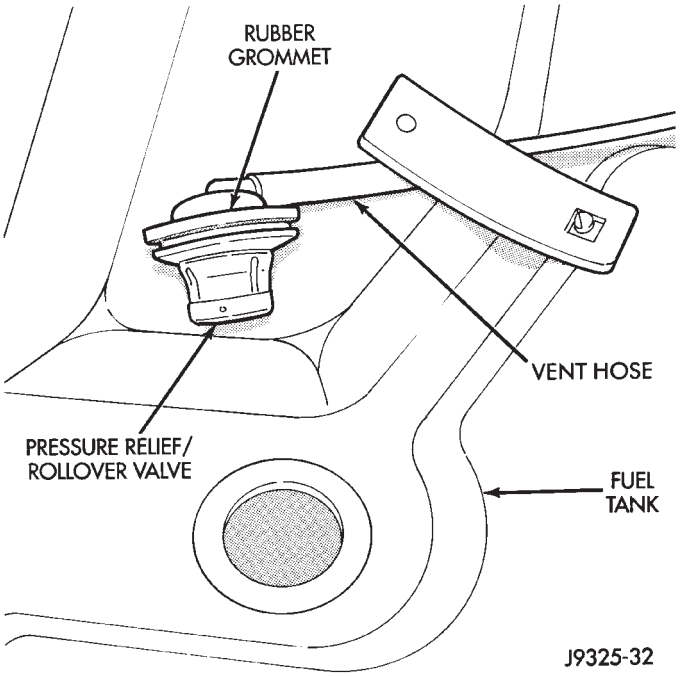

Fig. 10 Pressure Relief/Rollover Valve Location—Typical

The valve incorporates a pressure relief mechanism (Fig. 11) that releases fuel tank pressure when the pressure increases above the calibrated sealing value. Refer to the Fuel Tank section of Group 14, Fuel Systems for removal and installation procedures.

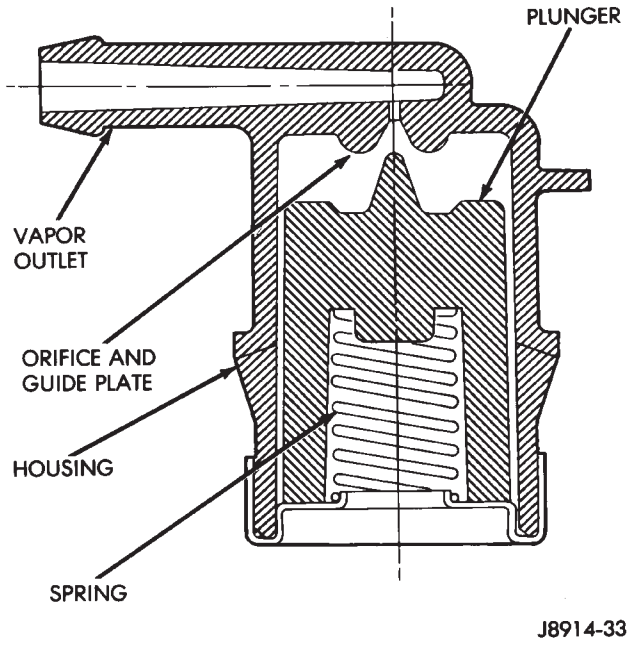

Fig. 11 Typical Pressure Relief/Rollover Valve Operation

OXYGEN (O2S) SENSOR

For description, operation, diagnosis and removal/installation procedures of the O2S sensor, refer to Group 14, Fuel Systems.

COMPONENT REMOVAL/INSTALLATION

INDEX

AIR CLEANER ELEMENT

For removal and installation procedures of both the air cleaner housing and the air cleaner element, refer to the Group 14, Fuel System.

COOLANT TEMPERATURE SENSOR

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

EVAP CANISTER

On XJ models, the EVAP canister is located in the engine compartment on the passenger side frame rail (Fig. 1). On YJ models, the EVAP canister is located in the engine compartment on the dash panel and below the brake master cylinder (Fig. 2).

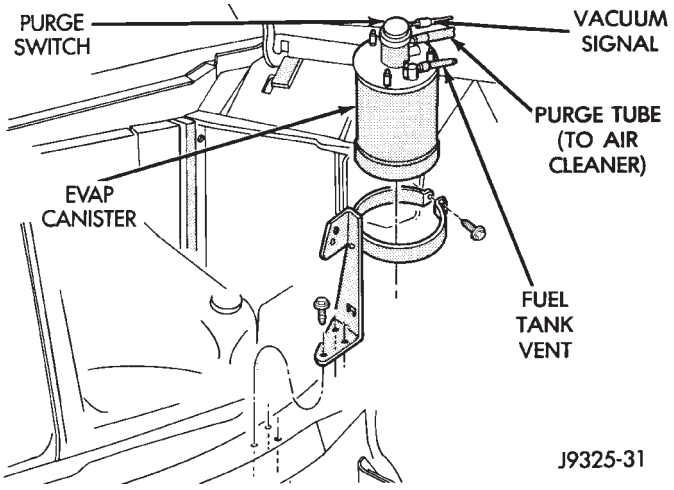

Fig. 1 EVAP Canister—XJ Models

REMOVAL/INSTALLATION

(1) Disconnect the vacuum lines at the EVAP canister. Note location of lines before removal.

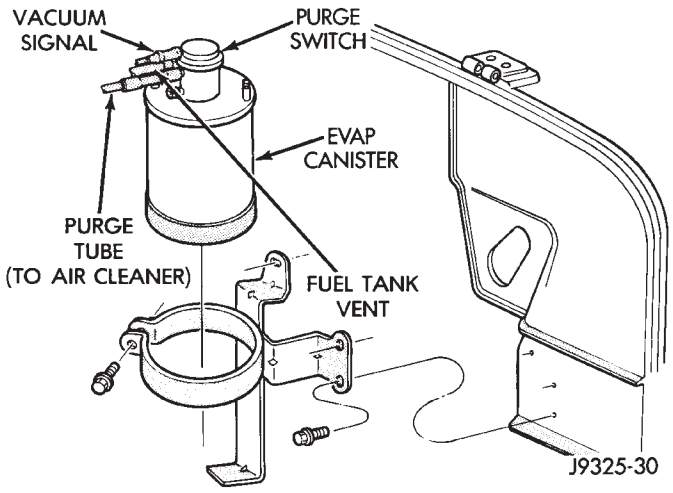

Fig. 2 EVAP Canister—YJ Models

(2) Remove canister retaining strap bolt.
(3) Remove canister from vehicle.

Reverse the procedure for installation.

FUEL TANK FILLER TUBE CAP

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

OXYGEN (O2S) SENSOR

For description, operation, diagnosis and removal/installation procedures of the O2S 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.