valves are either vacuum or electrically controlled. When electrically controlled, a purge valve is known as a purge solenoid. A vehicle may be equipped with a vacuum purge valve or purge solenoid or a combination of the two. Purging occurs when the engine is at operating temperature and off idle.

Fuel Tank Vapor Orifice and Roll over Valve Assembly

See Figure 4

Fuel vapor in the fuel tank is vented to the carbon canister through the vapor valve assembly. The valve is mounted in a rubber grommet at a central location in the upper surface of the fuel tank. A vapor space between the fuel level and the tank upper surface is combined with a small orifice and float shut-off valve in the vapor valve assembly to prevent liquid fuel from passing to the carbon canister. The vapor space also allows for thermal expansion of the fuel. The vapor valve incorporates the rollover valve. In the event of a vehicle rollover, the valve blocks the vapor line automatically to prevent fuel leakage.

The check valve is located in the fuel filler cap or on the underside of the vehicle. Its function is to protect the fuel tank from heat build-up rupture and cool-down collapse by allowing air to pass in or out of the tank to equalize pressure. On cool-down, air enters either at the carbon canister vent or at the check valve.

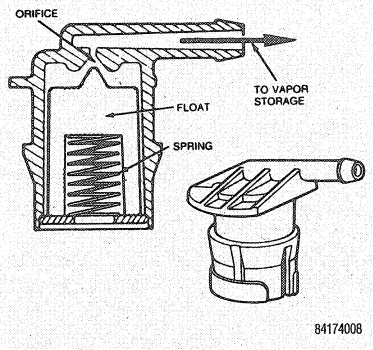

Fig. 4 Fuel tank vapor orifice and roll over valve assembly

Purge Solenoid Valve

See Figure 5

The purge solenoid valve is in-line with the carbon canister and controls the flow of fuel vapors out of the canister. It is normally closed. When the engine is shut off, the vapors from the fuel tank flow into the canister. After the engine is started, the solenoid is engaged and opens, purging the vapors into the engine. With the valve open, vapors from the fuel tank are routed directly into the engine.

Pressure/Vacuum Relief Fuel Cap

The fuel cap contains an integral pressure and vacuum relief valve. The vacuum valve acts to allow air into the fuel tank to replace the fuel as it is used, while preventing vapors from escaping the tank through the atmosphere. The vacuum relief valve opens after a vacuum of −0.5 psi. The pressure valve acts as a backup pressure relief valve in the event the normal venting system is overcome by excessive generation of internal pressure or restriction of the normal venting system. The pressure relief range is 1.6–2.1 psi. Fill cap damage or contamination that stops the pressure vacuum valve from working may result in deformation of the fuel tank.

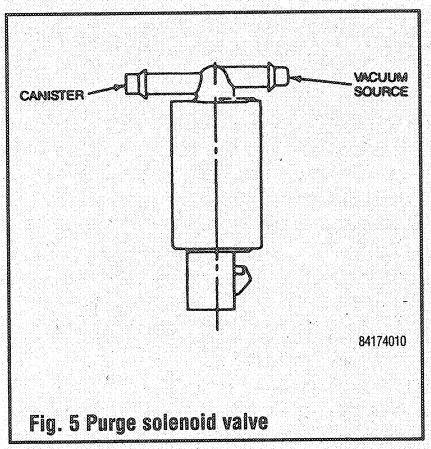

Fig. 5 Purge solenoid valve

REMOVAL & INSTALLATION

Carbon Canister

1. Disconnect the negative battery cable.
2. Label and disconnect the vapor hoses from the carbon canister.
3. Remove the canister attaching screws and remove the canister.
4. Installation is the reverse of the removal procedure.

Fuel Tank Vapor Orifice and Roll over Valve Assembly

1. Disconnect the negative battery cable.
2. Remove the fuel tank as described in Section 5.
3. Remove the vapor orifice and roll over valve assembly from the fuel tank.
4. Installation is the reverse of the removal procedure.

Purge Control Valve

1. Disconnect the negative battery cable.
2. Label and disconnect the hoses from the purge control valve.
3. Remove the purge control valve.
4. Installation is the reverse of the removal procedure.

Purge Solenoid Valve

1. Disconnect the negative battery cable.
2. Label and disconnect the hoses from the purge solenoid valve.
3. Disconnect the electrical connector from the valve.
4. Remove the purge solenoid valve.
5. Installation is the reverse of the removal procedure.

Exhaust Gas Recirculation System

OPERATION

See Figures 6, 7, 8 and 9

The Exhaust Gas Recirculation (EGR) system is designed to reintroduce exhaust gas into the combustion cycle, thereby lowering combustion temperatures and reducing the formation of nitrous oxide. This is accomplished by the use of an EGR valve that opens under specific engine operating conditions, to admit a small amount of exhaust gas into the intake manifold, below the throttle plate. The exhaust gas mixes with the incoming air charge and displaces a portion of the oxygen in the air/fuel mixture entering the combustion chamber. The exhaust gas does not support combustion, but it takes up volume, the net effect is to lower the temperature of the combustion chamber. There are a few different EGR systems used.

The most commonly used system is the Pressure Feedback Electronic (PFE) system. The PFE is a subsonic closed loop EGR system that controls EGR flow rate by monitoring the pressure drop across a remotely located sharp-edged orifice. The system uses a pressure transducer as the feedback device and controlled pressure is varied by valve modulation using vacuum output of the EGR Vacuum Regulator (EVR) solenoid. With the PFE system, the EGR valve only serves as a pressure regulator rather than a flow-metering device.

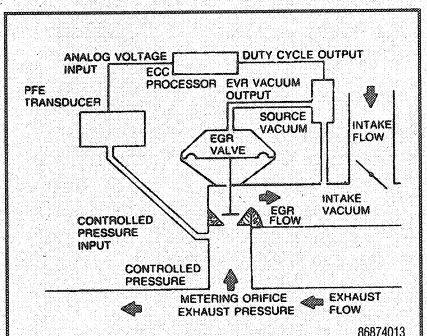

Fig. 6 Pressure Feedback Electronic (PFE) EGR system schematic

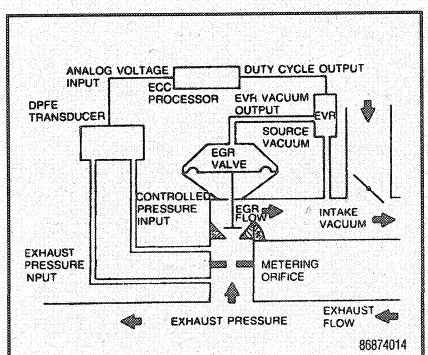

Fig. 7 Differential Pressure Feedback Electronic (DPFE) EGR system schematic