4.4 Evaporative Emission System Monitoring – 0.040” (1.0mm) Diameter

4.4.1 Description

The evaporative emission system monitoring permits the detection of leaks in the fuel evaporative emission control system with a diameter of 0.040” or larger.

For this purpose, a system pressure check is performed at idle with the vehicle stationary. Since vapour generation in the fuel tank could cause the false detection of a system leak, the first step is to close the EVAP canister purge valve and EVAP canister vent solenoid valve. Any pressure build-up is then measured, so that later results can be compensated for this fuel evaporation effect.

The EVAP canister purge valve is opened and the EVAP canister vent solenoid valve is closed. With this procedure a vacuum in the tank is created, which is measured by the fuel tank pressure sensor.

If no vacuum is detected, a large leak is assumed and the diagnosis is halted. If a large lean correction of the oxygen sensor controller is detected during the vacuum build-up, then the check is also halted, since fuel vapour is present in the system due to a high EVAP canister loading and idle instability will occur if the test is continued.

At a pre-determined vacuum the EVAP canister purge valve is closed, and the system is now considered "closed". From the gradient of the vacuum decay and the previously measured fuel vapour generation pressure rise, the presence of a leak can be inferred. The decay of the vacuum gradient also depends on the fuel level in the tank. The fuel level is roughly derived from the gradients of the vacuum build-up and vacuum decay and this information is also used when determining if a leak is present.