EVAPORATIVE EMISSION CONTROL SYSTEM (EVAP)

DESCRIPTION

The maximum fuel level in the tank is limited by fuel covering the vapour vent pipe. This is necessary to accommodate up to 7% fuel expansion, due to fuel volume increasing as the fuel temperature increases. The vent pipe is located at the maximum fuel level. It is linked to the filler neck via a tube on the top of the tank (4 Fig.1). During filling, fuel rises in the filler tube. When the vent pipe is covered by fuel, it causes the fuel delivery nozzle to shut off.

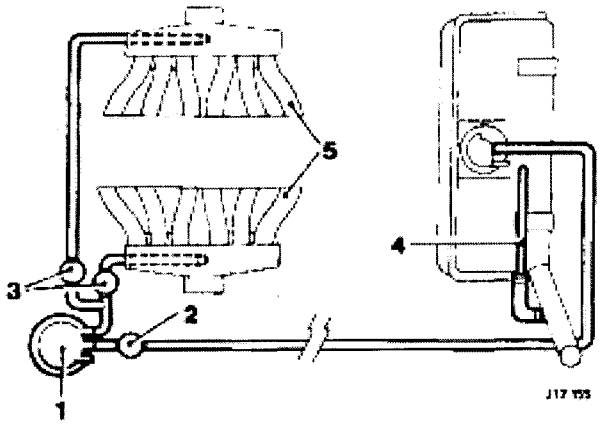
In vehicle use the fuel tank is vented through a liquid / vapour separator and vapour pipe, to an activated charcoal canister (1 Fig.1). The charcoal canister is located under the left-hand front wheel arch. The flow of vapour to the canister is controlled by a Tank Pressure Control Valve (2 Fig.1).

The tank pressure control valve is a three-function valve, as follows:

(1) When the engine is not running, but due to increasing ambient or vehicle temperature the fuel temperature is rising, vapour is generated and the valve functions as a pressure relief valve. It limits the tank pressure to about 1.0 lbf / in^2.
(2) If the fuel in the tank is cooling down no vapour will be formed. The fuel tank will draw air / vapour back from the charcoal canister through a non-return valve in the tank pressure control valve (negative tank pressure could collapse the fuel tank).
(3) With the engine running a manifold vacuum signal is connected to the valve diaphragm, opening the valve and reducing the fuel tank pressure to near zero.
A further fuel tank over pressure safeguard is provided by the fuel cap.

The vapour that leaves the fuel tank enters the charcoal canister and is adsorbed by the activated charcoal. The canister is air purged by engine vacuum via two electrically (mark / space ratio) operated Purge Control Valves (EVAPP) (3 Fig.1) controlled by the Powertrain Control Module Fuel (PCMF).
The EVAPP valves are connected one to each inlet manifold (5 Fig.1). This method ensures that vapour is delivered proportional to manifold vacuum to each bank of the engine.
The rate of purge flow is dependent upon engine speed, engine load and charcoal canister loading. The maximum flow is limited by a $^3/_{32}$ in. dia. restrictor fitted in the hose between the EVAPP valve and the inlet manifold.
With normal canister loading the full mapped purge rate will be used. If the vapour load becomes excessive it will be detected by the HO2S feedback signal. The PCMF will reduce the purge rate at lower engine speeds until the vapour load reduces and the full purge rate can be reinstated.
This method allows aggressive purge rates to be used without causing driveability problems.
Charcoal canister purging commences a short time after HO2S closed loop operation is initiated.

There are no OBD codes associated with the charcoal canister purge system.



1. Charcoal Canister
2. Tank Pressure Control Valve
3. Electrical Purge Control Valve (EVAPP)
4. Fuel Tank Limited Fill Vapour Pipe
5. Inlet Manifold

Fig. 1 Evaporative Emission Control System (EVAP).