1973-74 GENERAL MOTORS EVAPORATION CONTROL SYSTEM

DESCRIPTION & OPERATION

The Evaporation Control System (ECS) is designed to prevent fuel vapors, from vehicles fuel system, from entering the atmosphere. Same basic design is used on all models with design differences detailed in this section. Included in system are a special fuel tank, either an integral or an external liquid vapor separator, non-vented filler cap, activated charcoal canister, connecting hoses and lines, and carburetor modifications. Fuel vapors are kept in sealed systems and are routed to engine, through vent lines, for burning.

Fuel Tank – Fuel tank is designed with an air chamber to allow for fuel expansion. Dome-shaped tank includes an integral metering design liquid-vapor separator. There is a two and three tube type metering design separator. Two tube type has canister feed in addition to fuel pickup. Three tube design has canister feed, fuel pickup and vapor return to prevent vapor lock. Tank venting (on all GM cars) is accomplished through three lines connected to separator. Lines are located front (two) and rear (one) so venting will occur regardless of any inclination of vehicle. Single vent line leads from liquid-vapor separator (all models) to charcoal canister where fuel vapors are stored until being drawn into engine for burning.

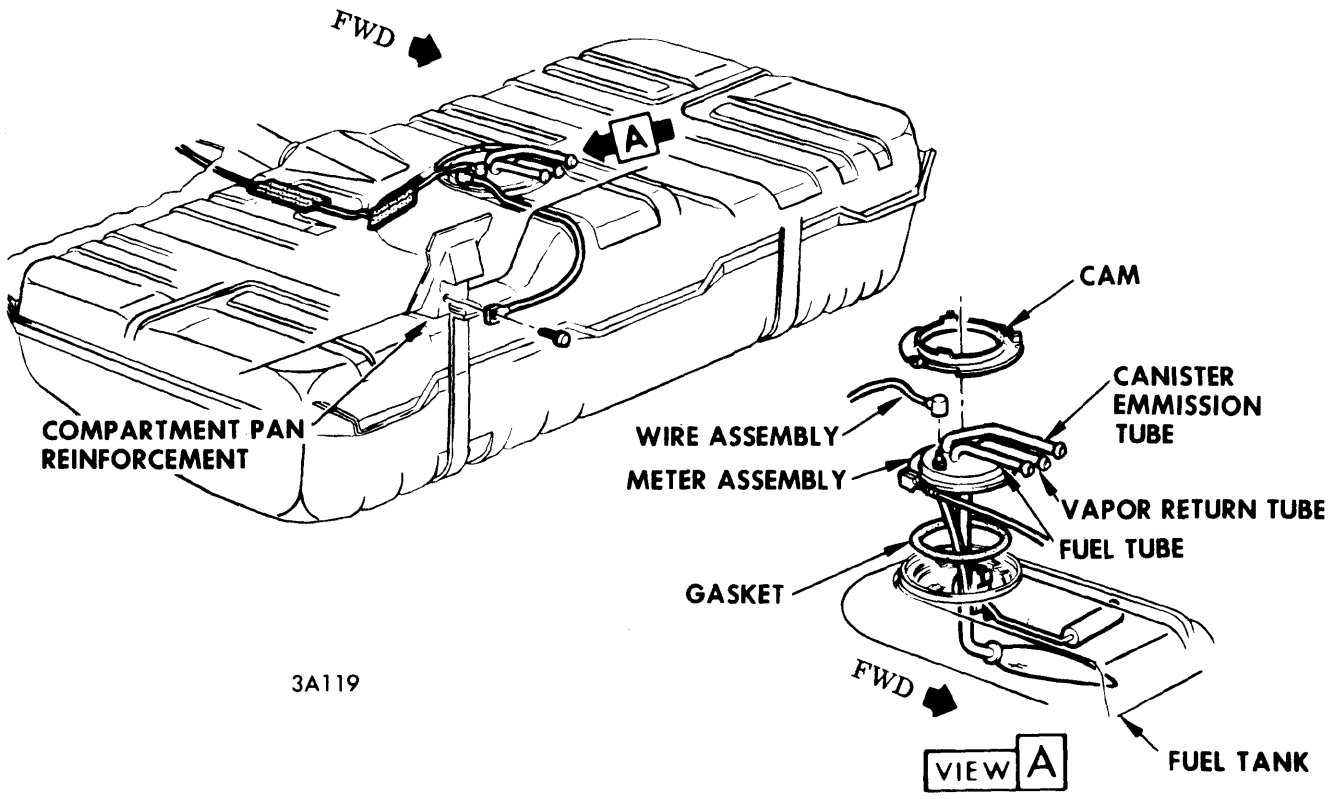
Fuel Tank Filler Cap – Filler cap is not vented and normally seals fuel tank. When fuel is drawn from tank, during engine operation, a vacuum valve in filler cap is opened, allowing air to come into tank. Cap also has pressure-relief valve which opens under excessive pressure to prevent tank damage.

NOTE – When replacing filler cap, use same type as original to prevent system malfunction or damage.

Liquid-Vapor Separator – Most GM models have integral separator in dome section of fuel tank. Integral separator acts as standpipe, allowing fuel vapors to escape to canister without filling the system with liquid fuel. Other models use a standpipe designed using three vent lines of varied heights (so venting is accomplished under any inclination) to separate liquid fuel and return it to tank while vapors are vented to canister.

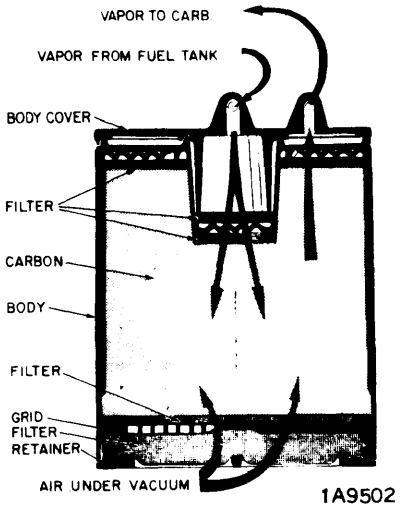
Charcoal Canister – Canister is filled with activated charcoal which adsorbs and stores fuel vapors when engine is not running. Three different versions of charcoal canisters are used.

Two Tube Type – 1) Used on all GM V8 engines (except 1973 Chevrolet). Canister has two hose connections on top. Inner connection is vent line from fuel tank. Outer connection goes to carburetor. When engine is running, air (entering from filler cap vacuum valve) is drawn by carburetor purge ports through bottom of charcoal canister. This air picks up fuel vapors being held by charcoal and carries them through the carburetor into the engine to be burned. This action purges and renews absorption quality of charcoal.



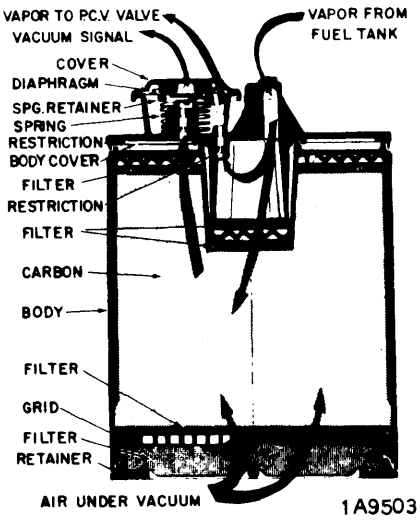
GENERAL MOTORS EVAPORATION CONTROL SYSTEM (TYPICAL)

1973-74 GENERAL MOTORS EVAPORATION CONTROL SYSTEM (Cont.)



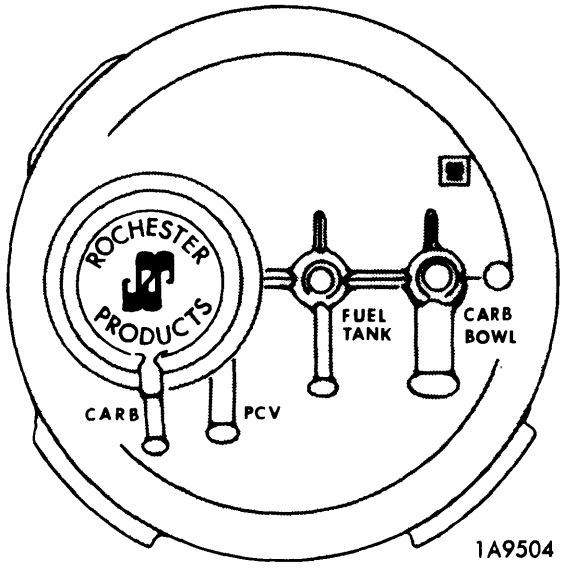
TWO TUBE CANISTER

Three Tube Purge Valve Type – (2) Used on all GM 6 cylinder engines and 1973 Chevrolet V8 engines. Three tube type canister provides a two-stage purge system. It operates basically the same as two tube design, however a purge valve is added which is an integral part of the canister. Purge valve controls flow of vapor from canister to carburetor intake manifold. Purge valve consists of body, spring loaded diaphragm, diaphragm cover and metered purge restrictions. Purge valve limits flow of vapor to carburetor or manifold at idle, allowing maximum vapor purge during higher carburetor air flows. This is accomplished through use of a vacuum signal from carburetor spark port which unseats purge valve diaphragm. A minimum amount of canister purge can be maintained at idle because of smaller constant bleed restrictions. At higher air flows where more fuel vapors can be tolerated, spark port in carburetor is uncovered and vacuum is applied to purge valve diaphragm. This lifts diaphragm off its seat and allows additional vapors to be pulled through larger restriction, thereby completely purging charcoal canister.



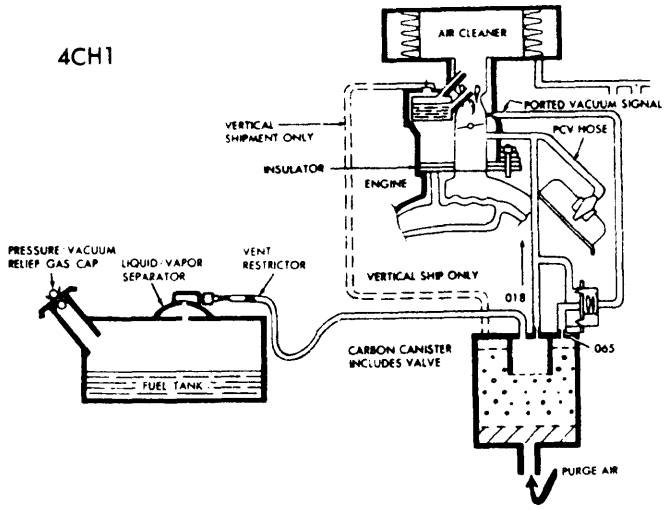
THREE TUBE PURGE VALVE CANISTER

Four Tube Purge Valve Type – (3) Used on Chevrolet Vega models only. Operation of four tube type canister is identical to three tube type except that an extra vent tube connects to carburetor float bowl vent valve, located on air horn.



FOUR TUBE PURGE VALVE CANISTER (VEGA)

Carburetor Modifications – Carburetors used with ECS are sealed to outside venting. Vapor and idle vents have been removed (except Vega). Purge port is added to draw vapors from canister when engine is running.



EVAPORATION CONTROL SYSTEM (VEGA)

MAINTENANCE

Replace charcoal canister hoses as necessary. Replace canister filter, on all models every 24 months or 24,000 miles (more often under dusty conditions).

CAUTION – Hoses on this system are special type and must be replaced only by hose marked "EVAP" or "GM 6107M".