

EVAPORATIVE EMISSION (EVAP) SYSTEMS

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EVAPORATIVE EMISSION (EVAP) SYSTEMS

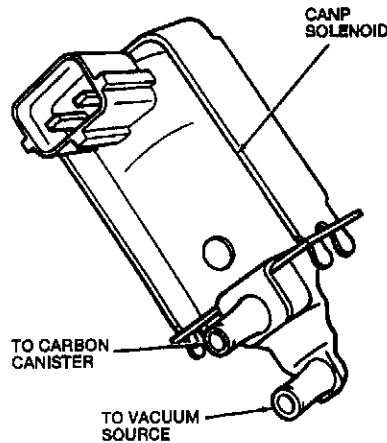
Description and Operation

Evaporative Emission (EVAP) Systems

The Evaporative Emissions (EVAP) system prevents the escape of fuel vapors to the atmosphere under hot soak and engine off conditions by storing these vapors in a carbon canister. The system also controls the purging of stored vapors from the carbon canister to the engine, where they are burned in the combustion chambers.

Canister Purge Solenoid

The Canister Purge (CANP) solenoid regulates the amount of evaporative fuel vapors transferred from the carbon canister into the intake manifold. The solenoid operates by an output signal from the Power-train Control Module (PCM) to open the vacuum passage between the carbon canister and intake manifold when purging conditions are met. If more evaporative fuel vapors can be consumed by the engine, the solenoid is held open for a longer period of time.



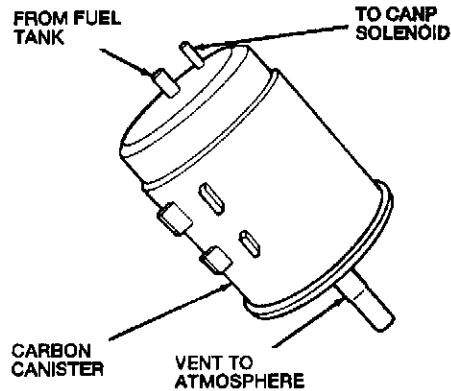
Engine Location	Mounted on intake manifold near fuel Pressure regulator
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EVAPORATIVE EMISSION (EVAP) SYSTEMS

Description and Operation

Carbon Canister

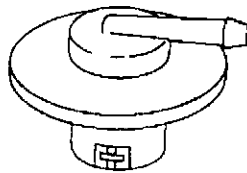
The fuel vapors from the fuel tank are stored in the carbon canister. When the vehicle is being operated, the carbon canister purges the fuel vapors into the engine for consumption by means of the Canister Purge (CANP) solenoid. During cool-down, air enters the carbon canister at the vent port.



Engine Location	Mounted left inner fender near battery
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Rollover/ Vent Valve

The valve serves a dual purpose: when fuel is in the tank, pressure increases, and the rollover/ vent valve releases the extra pressure into the atmosphere; if a rollover situation occurs, the rollover/ vent valve closes and will not permit fuel or fuel vapors to escape from the fuel tank.



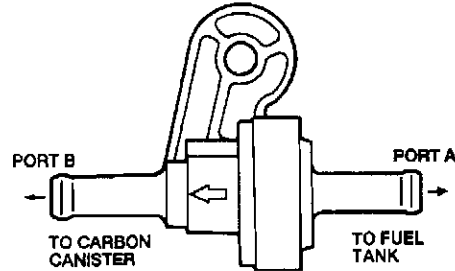
Engine Location	Located on top of the fuel tank
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EVAPORATIVE EMISSION (EVAP) SYSTEMS

Description and Operation

Two-way Check Valve

The two-way check valve controls pressure between the fuel tank and the carbon canister. The two-way check valve protects 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.



Engine Location	Mounted on battery bracket near the canister
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EVAPORATIVE EMISSION (EVAP) SYSTEMS

Diagnosis and Testing

System Inspection

NOTE: Excessive fuel tank pressure could be caused by the fuel cap and does not necessarily indicate a concern with the evaporative emission system components.

1. Visually inspect the components of the Evaporative Emission System.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none">• Fuel or odor or leakage• Damaged vacuum lines• Loose vapor line connections	<ul style="list-style-type: none">• Discharged battery• Damaged connectors• Damaged air flow meter• Damaged solenoid

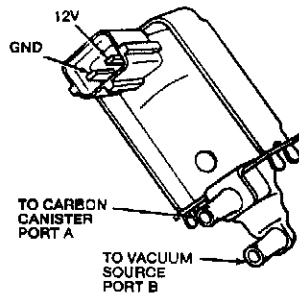
2. Exercise the wiring and connector for the Canister Purge (CANP) solenoid. Check the throttle body, air flow meter, and the Power-train Control Module (PCM) for looseness, corrosion, damage, or other problems.
3. Check the fuel tank, the fuel tank vapor lines, the vacuum lines, and the connections for looseness, pinching, leakage, damage or other obvious causes for malfunction.
4. If all checks are OK, proceed to the Pinpoint Tests

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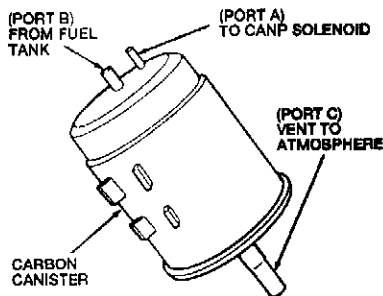
Diagnosis and Testing

Pinpoint Tests – EV

TEST STEP	RESULT	ACTION TO TAKE
EV 1 Check Canister Purge Solenoid Valve Function <ul style="list-style-type: none"> Disconnect the vacuum hoses from Ports A and B, and the electrical connector from the solenoid valve. Blow air through Port A and verify that no air exits from Port B. Apply 12 volts and ground as shown below. Blow air through Port A and verify that air flows from Port B. Does the valve function properly?	Yes NO	Go to EV 2. REPLACE the Canister Purge (CANP) solenoid



TEST STEP	RESULT	ACTION TO TAKE
EV 2 Check For Liquid Fuel In Carbon Canister <ul style="list-style-type: none"> Run engine until warm to purge any fuel from the carbon canister. Turn off the engine and remove the carbon canister. Inspect the carbon canister for liquid fuel (strong odor or excessive weight). Blow into the air vent (Port C) and verify that air flows from the fuel vapor inlet (Port B). Is the carbon canister free of liquid fuel, and does it function properly?	Yes NO	Go to EV 3. REPLACE the Carbon Canister.

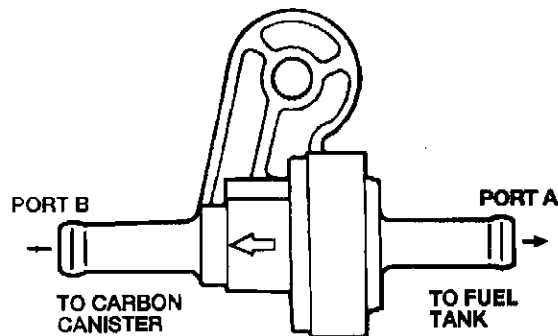


EVAPORATIVE EMISSION (EVAP) SYSTEMS

Diagnosis and Testing

Pinpoint Tests – EV

TEST STEP	RESULT	ACTION TO TAKE
EV 3 Check Purge Lines For Blockage <ul style="list-style-type: none"> Remove the purge lines leading from the carbon canister to the engine air intake. Check the lines for blockage by blowing through them. Does air flow freely through the lines?	Yes NO	Go to EV 4. REPLACE the purge line(s) any check valves, or restrictors that may be partially plugged.
EV 4 Check Two-way Check Valve <ul style="list-style-type: none"> Visually inspect the two-way check valve and its connection for pinching, blockage, looseness, or other damage and/ or leakage. Remove the two-way check valve. Refer to Service Manual Section 10 – 01. Connect Rotunda Vacuum Tester 021-00037 or equivalent, to Port A of the valve. Apply 26 mm-Hg (1.01 in-Hg) of Vacuum to Port A. Verify that the valve opens (does not hold vacuum). Connect the vacuum tester to Port B of the valve. Apply 44 mm-Hg (1.73 in-Hg) vacuum to Port B verify that the valve opens. Is the valve free of leakage, and does it function properly?	Yes NO	Go to EV 5. REPLACE/ SERVICE the Two-way check valve.



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Diagnosis and Testing

Pinpoint Tests – EV

TEST STEP	RESULT	ACTION TO TAKE
EV 6 Check Rollover/ Vent Valve Function <ul style="list-style-type: none">• Check the rollover/ vent valve for evidence of leakage.• Remove the rollover/ vent valve. Refer to Section 10 – 1.• Hold the Valve as shown in figure A.• Blow into Port A and verify that air flows through the rollover/ vent valve.• Invert the rollover/ vent valve.• Blow into Port A and verify that air does not flow through the rollover/ vent valve Does the valve function properly?	Yes NO	RETURN to the Diagnostic Routines Section 2. REPLACE the Rollover/ Vent Valve.

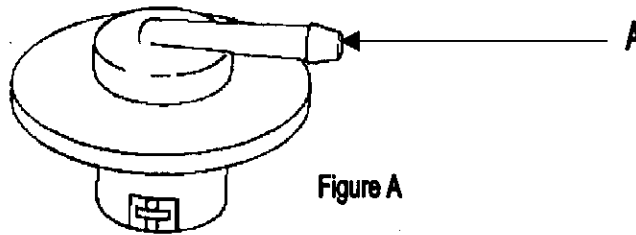


Figure A

EVAPORATIVE EMISSION (EVAP) SYSTEMS

Specifications/ Special Service Tools

Specifications

General Specifications	
Description	Specifications
Rollover/ Vent Valve Operation	
Fuel Tank Pressure to open (max.)	7.0 kPa (1.0 psi.)
Air pressure to vent tank (max.)	4.9 kPa (0.7 psi.)
Valve in upright position	Open
Valve in Inverted position	Closed
Two-Way Check Valve Operation (Air must flow easily under low pressure in either direction)	
Vacuum to open valve. Port A (fuel tank pressure)	26 mm-Hg (1.01 in-Hg)
Vacuum to open valve. Port B (barometric pressure)	44 mm-Hg (1.73 in-Hg)

Special Service Tools/ Equipment

Rotunda Equipment

Model	Description
021-00037	Vacuum Tester
059-00008	Vacuum/ Pressure Tester