TOYOTA

All Models

DESCRIPTION

The fuel evaporation control system used on Toyota models is designed to prevent the escape of raw fuel vapors to the atmosphere. This is accomplished through a combination of special fuel tank, filler cap, charcoal fuel vapor storage canister and various vacuum or fuel control valves (depending on vehicle application).

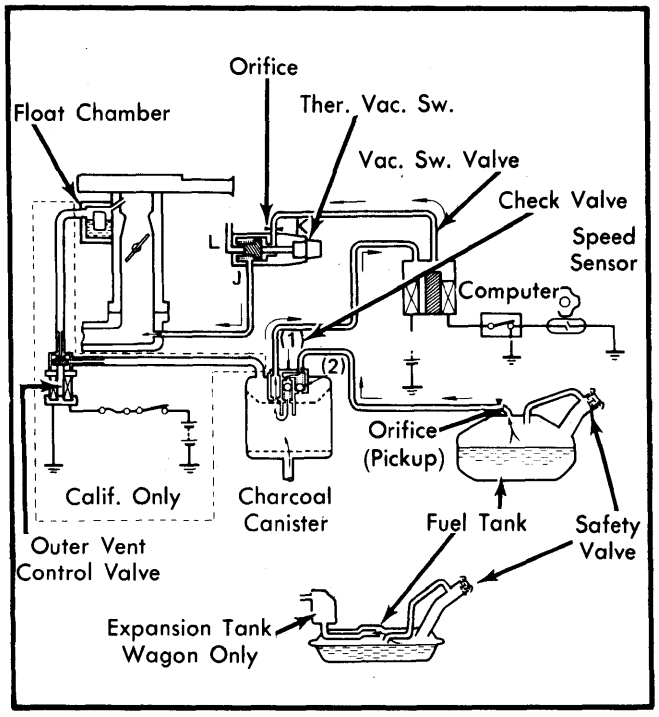

Fig. 1 Fuel Evaporation System (Celica, Corona & Pickup)

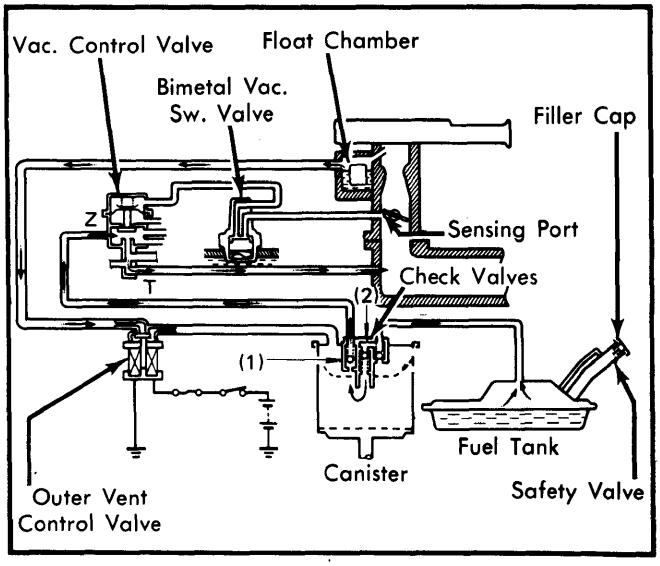

Fig. 2 Fuel Evaporation System (Tercel)

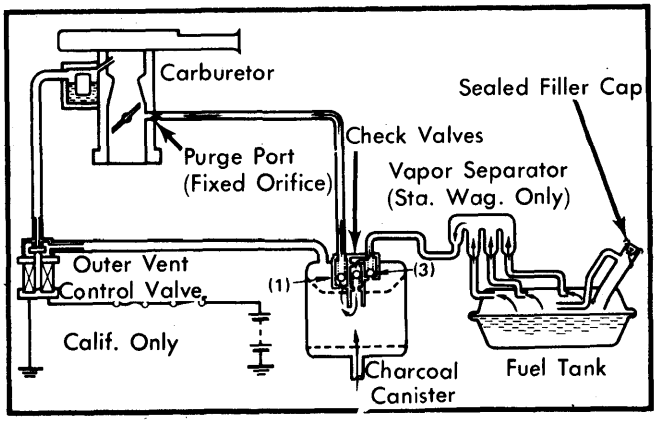

Fig. 3 Fuel Evaporation System (Corolla)

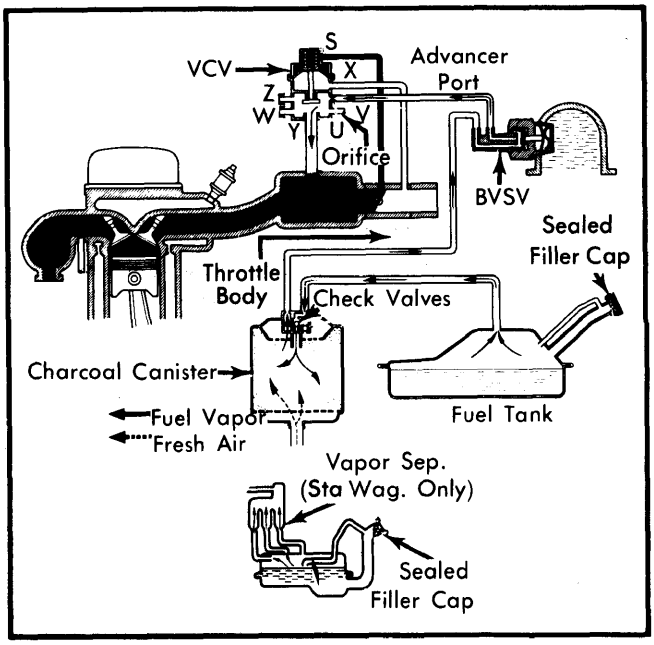

Fig. 4 Fuel Evaporation System (Celica Supra and Cressida)

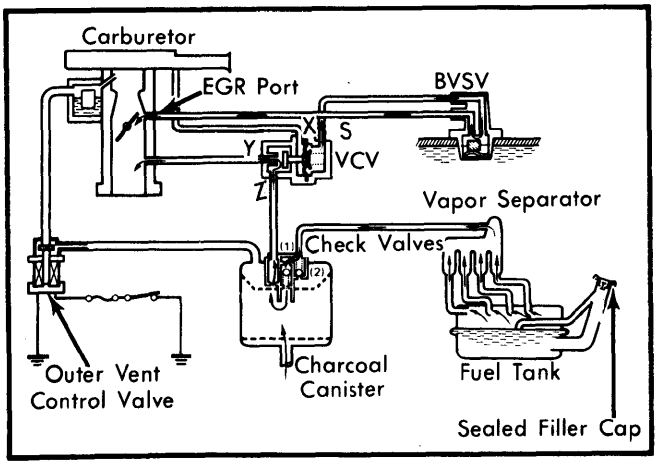

Fig. 5 Fuel Evaporation System (Land Cruiser)

1980 Fuel Evaporation Systems

TOYOTA (Cont.)

OPERATION

CELICA SUPRA, CRESSIDA, LAND CRUISER & TERCEL

Recycling of fuel vapors from the fuel tank and charcoal canister occurs through the action of the bimetal vacuum switch and vacuum control valve (VCV). At low temperature, all vacuum to the VCV is cut off and no fuel vapors are taken to the intake manifold. Once engine coolant warms up, the BVS opens, vacuum reaches the vacuum control valve, and fuel vapors are drawn from the charcoal canister to the intake manifold.

When the throttle plate is closed, (engine stopped or at idle), a "no vacuum" condition allows a spring loaded ball in the check valve to close, routing fuel vapors from the fuel tank to the canister where they are absorbed.

When engine speed increases the spring loaded ball opens and allows intake manifold vacuum to draw accumulated vapors from the charcoal canister and the fuel tank into the carburetor.

The check valve also functions (along with the fuel tank safety cap), to balance fuel tank pressure and prevent fuel tank collapse.

The outer vent control valve is a solenoid which opens a passage from the carburetor float bowl to the carbon canister when the ignition is "OFF". It closes when the engine is running.

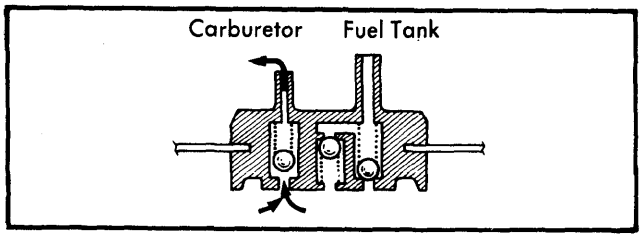

Fig. 6 Check Valves in Charcoal Canister

CELICA, CORONA & PICKUP

The fuel evaporation system is controlled by a thermal valve, vacuum switching valve, and a speed-controlled computer. When coolant temperatures are low, no vacuum is present at vacuum switching valve. When the engine warms up, the thermal valve opens and vacuum is present at switching valve.

When the vehicle is stopped or running at low speed, a computer interprets signals from a speed sensor and acts on the VSV, closing the passage to the intake manifold. This routes fuel vapors into the charcoal canister to be stored.

When the vehicle reaches the road speed specified, the computer signals the VSV to open. This allows accumulated fuel vapors from the charcoal canister and fuel tank to be drawn into the intake manifold and burned in the combustion chamber.

A check valve in the charcoal canister is used to balance fuel tank pressure and prevent tank collapse. The outer vent control valve allows float bowl vapors to the canister when the ignition is "OFF".

COROLLA

The fuel evaporation system is controlled by intake manifold vacuum. During deceleration, and when the engine is off, fuel vapors from the tank (and float bowl on Calif. models) are led to the charcoal canister. When the engine is at cruising speed, the number 1 check valve opens to allow fuel vapors from the canister to be pulled into the intake manifold for burning.

TROUBLE SHOOTING

Fuel Odor or Gas Leaks – Disconnected or cracked fuel vapor line or defective components in system. Check all lines and fittings and check operation of system.

Fuel Tank or Expansion Tank Deformed –Canister clogged, fuel filler cap defective (valve in cap inoperative), hoses clogged or kinked.

Rough Engine Operation – Check vacuum hose between vacuum solenoid valve and intake manifold for damage and proper connections. Check for malfunctions in other valves and be sure all vacuum hoses are tight and in good condition.

TESTING

VACUUM SWITCHING VALVE (VSV)

1) Connect battery voltage and ground to VSV terminals as shown. Air should pass through valve with power applied; no air should pass without power.

2) Use an ohmmeter to check resistance between terminals where power was applied. Resistance should measure 38-43 ohms on Federal Pickup with automatic, and 18-23 ohms on all other models. There should be no continuity between case of valve and positive terminal.

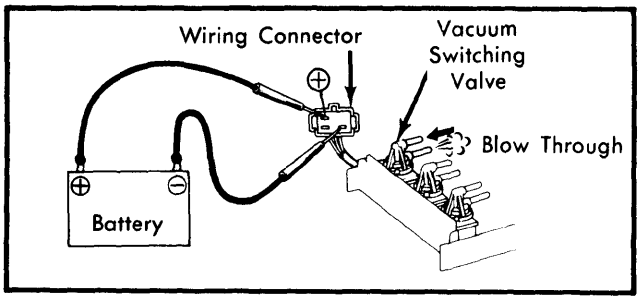

Fig. 7 Testing Vacuum Switching Valve

BIMETAL VACUUM SWITCHING VALVE (BVSV)

1) Remove valve from engine. Dip sensing portion into cold water. Check to see that valve is closed below specified temperature.

BVSV Switching Temperature

Application	Closing Temp. (°F)	Opening Temp. (°F)
Celica Supra, Cressida	95	129
Land Cruiser	104	129
Tercel	122	147

TOYOTA (Cont.)

2) Heat water and cbeck valve by blowing through to be sure valve opens above specified temperature. Replace valve if necessary.

THERMOSTATIC VACUUM SWITCHING VALVE (TVSV)

1) Remove valve from engine. Dip sensing portion of valve in cold water. Blow in port "J"; air should come out port "L" when valve is below 122°F.

2) Heat water and check valve by blowing through port "J". Air should come out port "K" above 150°F.

VACUUM CONTROL VALVE (VCV)

1) Remove VCV. Connect a hand vacuum pump to port "S", and block ports "R" and "Y" on Tercel valve. With specified vacuum applied, blow into port "T" on Tercel valve and port "Y" on all others.

2) Air should come out specified ports. Stop vacuum application and blow into valve. No air should come out.

Vacuum Control Valve Testing

Application	Vacuum (In. Hg)	Open Ports
Celica Supra Cressida	3.5	U, V
Land Cruiser	2.75	Z
Tercel	3.5	U, W, Z

OUTER VENT CONTROL VALVE

1) With valve installed, remove hoses. Turn ignition switch off. Blow air through one side of valve. Air should pass through.

2) Turn ignition switch to "ON". Repeat air application. Air should not pass through valve.

3) Visually check wiring and fuse condition.

SPEED SENSOR

1) Jack up one rear wheel and support off ground.

2) Release parking brake. Place shift lever in "N" position. Unplug wiring connector from computer. Computer location; Celica & Corona, right cowl side. Pickup, left cowl side.

3) Test "ON-OFF" cycles of speed sensor by connecting positive terminal of ohmmeter to wiring connector terminal and connecting negative terminal to ground.

4) Turn wheel slowly, checking to see that ohmmeter needle deflects consistently. Plug in wiring connector back into computer.

CAUTION — *Insert ohmmeter probe from back side of connector.*

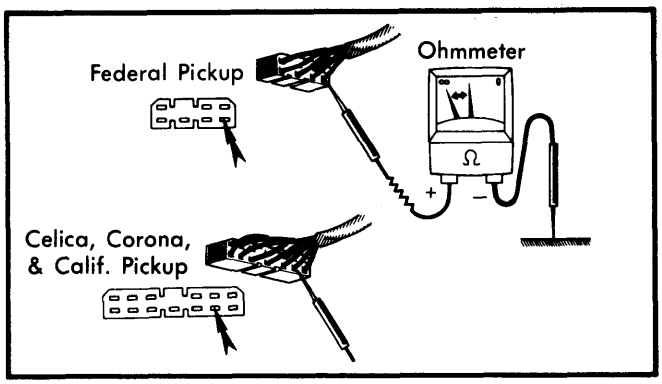

Fig. 9 Speed Sensor Test

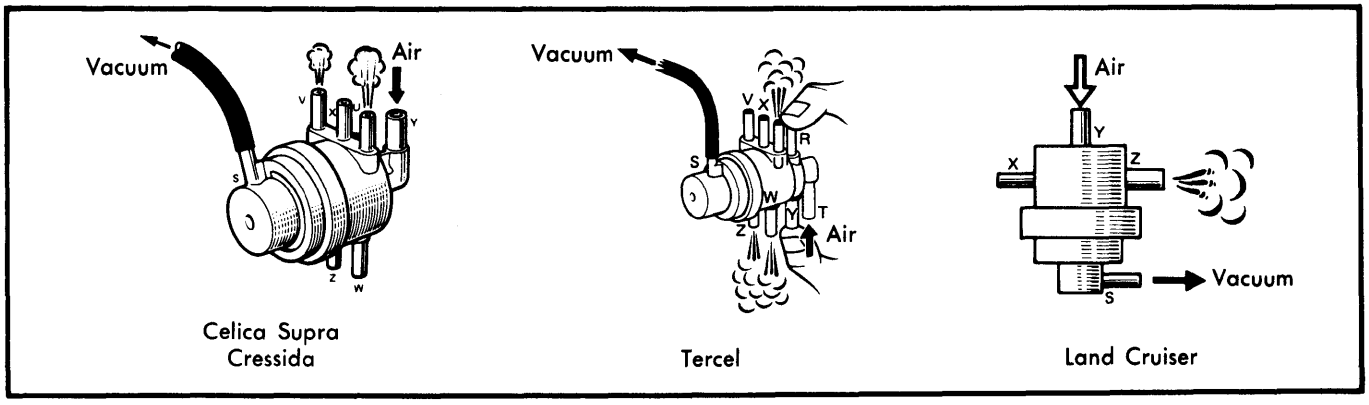

Fig. 8 Testing Vacuum Control Valve