1974-79 EXHAUST EMISSION SYSTEMS
Mazda Fuel Evaporation

Rotary Engine

DESCRIPTION

System prevents escape of fuel vapors into atmosphere. Components consist of a non-vented fuel tank, vapor separator, check valve (located between vapor separator and hose connecting ventilation valve to oil fill tube), a charcoal canister (located in air cleaner), and an air vent solenoid (if equipped).

OPERATION

When engine is not running, fuel vapors formed in the fuel tank pass through a vapor separator. Those vapors that do not condense to liquid fuel are routed through vent lines to the charcoal canister where they are absorbed. When engine is running, filtered air is drawn into the system through the air cleaner, mixed with gases and vapors that blow by the rotor and are drawn out through a ventilation valve and into the intake runner to be burned. The ventilation valve operates as the PCV and check valve in this system.

AIR VENT SYSTEM

An air vent solenoid is installed on the carburetor on all models, except the RX-3SP. The purpose of this system is to prevent carburetor bowl evaporated fuel from collecting in the intake manifold after a hot engine is shut off. *See Fig. 1.* When the ignition is turned off, the solenoid closes an air vent in the carbon canister, effectively trapping the evaporated fuel.

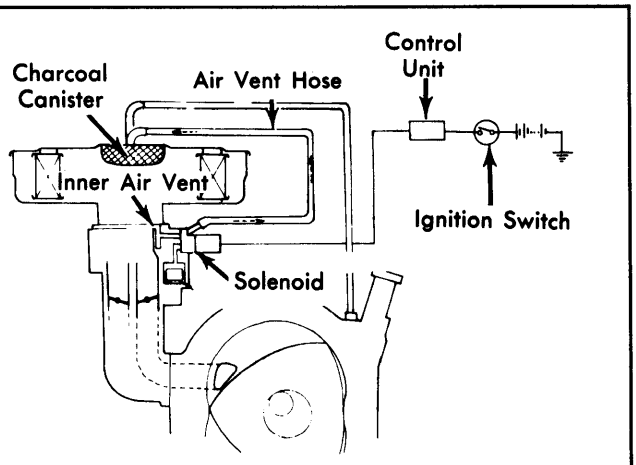

Fig. 1: Air Vent System

CHECK & CUT VALVE

If fuel system is normal, the vapors continue straight through the check valve from the condense tank to the ventilation valve. *See Fig. 2.* If condense tank to ventilation valve connecting pipe is clogged, check valve operates to provide ventilation to atmosphere. Valve also provides a safety release in case of pressure build-up in the fuel tank due to heat expansion.

VENTILATION & CHECK VALVE

If fuel system is normal, vapors are drawn through ventilation valve to air cleaner where they are stored in charcoal canister. *See Fig. 3.* When engine is running, these vapors, along with blow-by gases are drawn to ventilation valve and into the intake runner to be burned.

TESTING

EVAPORATIVE LINE CHECK

1) Disconnect vapor line from ventilation valve system and connect "U" tube pressure gauge to disconnected vapor line. Gradually apply low air pressure into "U" tube so that difference of water level should be 14" (356 mm). *See Fig. 5.*

2) Bind the inlet of the "U" tube and leave bound for 5 minutes. If water drops no more than 1" (25 mm) after 5 minutes, evaporative line is in good condition.

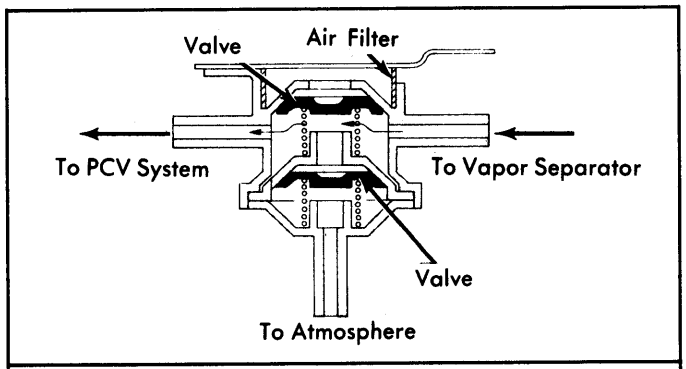

Fig. 2: Check & Cut Valve

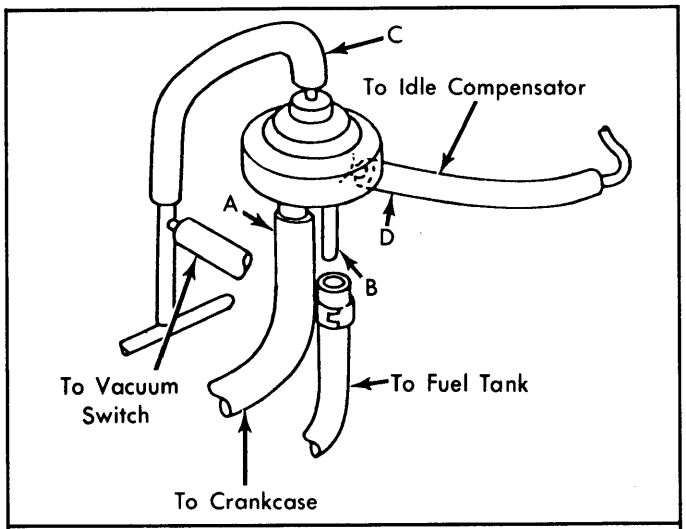

Fig. 3: RX-7 Ventilation & Check Valve

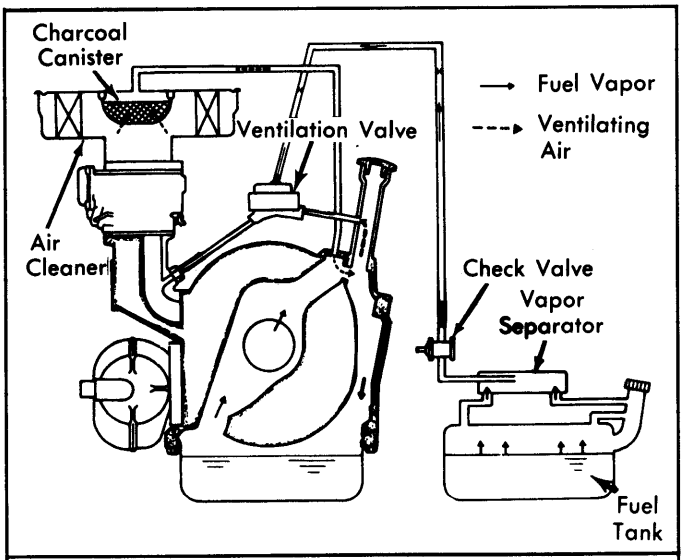

Fig. 4: Fuel Evaporation System (Typical)

1974-79 EXHAUST EMISSION SYSTEMS
Mazda Fuel Evaporation (Cont.)

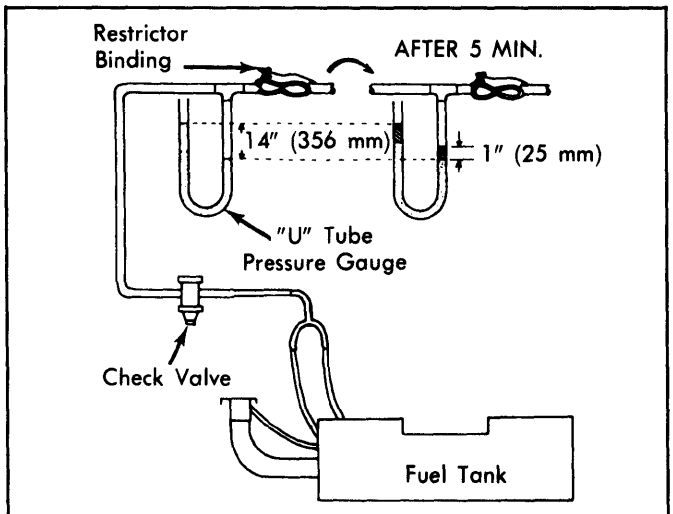

Fig. 5: Testing Evaporative Lines Using "U" Tube Pressure Gauge

CHECK & CUT VALVE

1) Remove check valve from lines. Connect a pressure gauge with tee fitting on the nipple leading to the fuel tank and hold finger over opposite nipple.
2) Blow through open end of tee fitting. When pressure gauge reads .78-1.0 psi (.06-.07 kg/cm²), the valve should be open.
3) Remove pressure gauge and connect it to atmospheric vent nipple, using same tee fitting. Again, blow through open end of fitting. With valve held horizontally, valve should open at .14-.71 psi (.01-.05 kg/cm²).

VENTILATION & CHECK VALVE

1) Disconnect hoses "A" and "B" from valve. Start engine and allow it to idle. Check vacuum at port "A". *See Fig. 3.*
2) If vacuum is present, place finger over port "A" and check vacuum at port "B". If vacuum is present, continue holding finger over port "A" and disconnect port "C", making sure there is no vacuum at port "B".
3) Stop engine. Disconnect hose "D" and attach suitable length of hose. Blow through valve and make sure air does not pass through. If valve fails any test, it must be replaced.

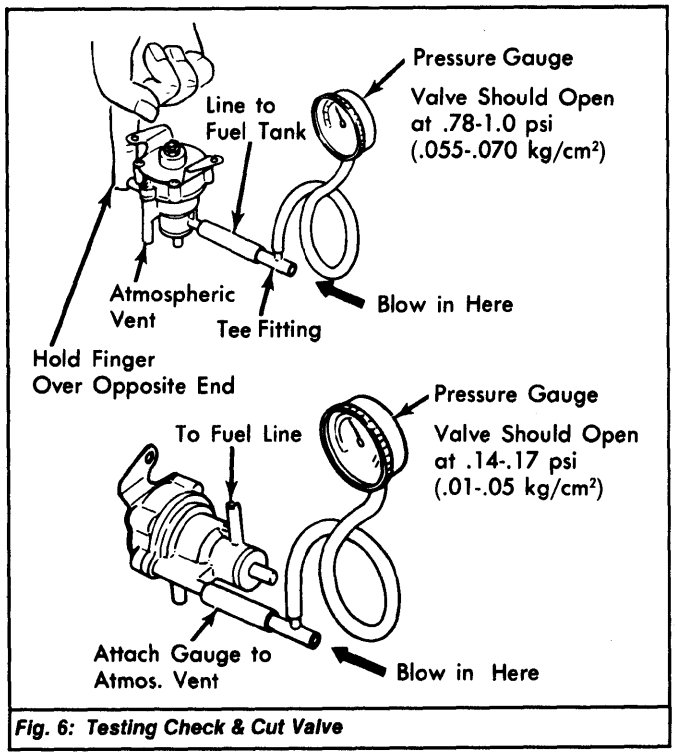

Fig. 6: Testing Check & Cut Valve

MAINTENANCE

Check entire system for proper functioning every 12,500 miles. Check valve should be tested every 25,000 miles. Replace parts as necessary.