POSITIVE CRANKCASE VENTILATION SYSTEM (PCV)

American Motors
Chrysler Corp.
Ford Motor Co.
General Motors
Buick
Cadillac
Chevrolet
Oldsmobile
Pontiac

DESCRIPTION

The crankcase ventilation system is designed to prevent contaminating hydrocarbons from escaping to the atmosphere. This is accomplished by routing the vapors from the crankcase through a vacuum controlled ventilating valve (PCV Valve) into the intake manifold, where they mix with the air-/fuel mixture and are burned in the combustion process.

OPERATION

Air is supplied to the crankcase ventilation system through a crankcase ventilating filter assembly located in the carburetor or on rocker arm cover.

When the engine is operating, fresh air enters the positive crankcase ventilation system through the air cleaner and filter.

The air then flows into the rocker arm cover and valve compartment. It combines with blow-by gas and unburned air/fuel mixture and burns in combustion chamber. *See Fig. 1.*

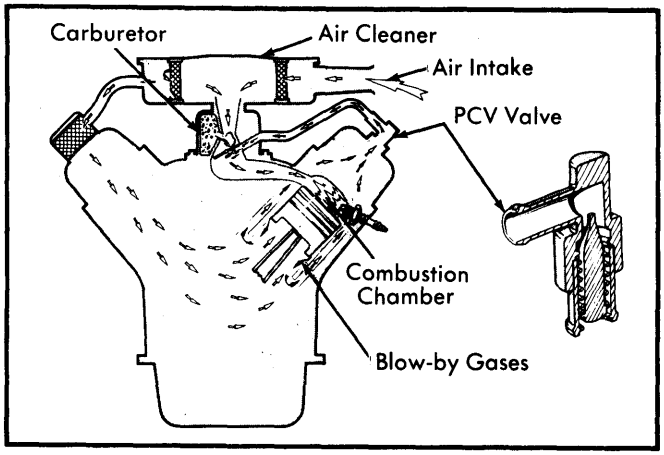

Fig. 1 Typical Crankcase Ventilation System

The ventilator valve *(See Fig. 2)* is constructed so it is held closed by spring pressure when engine is not running. This prevents an accumulation of hydrocarbon fumes from collecting in the intake manifold, which results in hard starting.

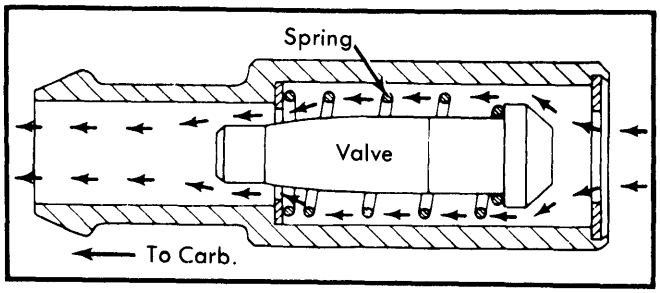

Fig. 2 Typical PCV Valve & Airflow

As the engine is started, manifold vacuum pulls the valve open against spring pressure. As long as there is engine vacuum, the valve floats, permitting crankcase fumes to enter the intake manifold.

A baffle in the rocker arm prevents oil from being drawn into the intake manifold through the ventilator valve.

In the event of an engine backfire through the intake manifold, the ventilator valve shuts, preventing any flow through it. This action prevents the ignition of fumes in the crankcase.

During certain engine operations more blow-by is created than the ventilator valve can handle. The excess amount is returned to air cleaner and carburetor through the rocker arm cover and breather assembly, then burned in the engine.

The breather assembly acts as a separator to keep oil from being drawn into the air cleaner during this operation.

TESTING

ALL (EXCEPT AMERICAN MOTORS)

To test crankcase ventilation system, start engine and allow it to reach normal operating temperature. Make sure engine is idling at normal curb idle and perform following checks:

1) Remove PCV valve from its mounting. If valve is functioning properly, a hissing noise will be heard as air passes through. A strong vacuum should be felt when finger is placed over valve inlet. While finger is over inlet, check for vacuum leaks in hose line and at all connections. Re-install PCV valve, then remove crankcase air inlet hose at air cleaner.

2) Loosely hold a piece of stiff paper over opening at end of inlet hose. Paper should be sucked against hose opening with a noticeable force after sufficient time has elapsed for crankcase pressure to lower (usually about a minute).

3) As a final check; stop engine, remove PCV valve and shake it, a metallic clicking noise should be heard, indicating valve is free.

NOTE – *If system passes both the engine running and stopped tests, it is functioning properly and no further tests are required. If it has failed either test, replace appropriate components and retest. If it does not pass on second try, clean system.*

AMERICAN MOTORS

1) Check crankcase ventilation system with engine at idle. Remove PCV valve from grommet in rocker arm cover. Connect valve to PCV valve tester (J-23111 or equivalvent). Use adaptor for 4-cylinder engine.

2) Connect a vacuum gauge to central location of intake manifold to read vacuum. Start engine. With engine at idle, compare vacuum tester reading to flow chart. Replace valve with air flow rate above or below chart specifications.

NOTE – *PCV valve must be in a horizontal position and lightly tapped during tests (holding tester in a vertical position).*

POSITIVE CRANKCASE VENTILATION SYSTEM (PCV) (Cont.)

American Motors
PCV Valve Flow Rate Chart

Vacuum (In. Hg)	Airflow (CFM) 4 Cyl.	6 Cyl.
15	.69-1.13	.50-1.00
6	.77-1.66	1.05-1.85
3	1.22-2.21	1.50-2.50

SERVICE PROCEDURES

NOTE – *An engine may idle slow or rough due to clogged ventilator valve or system; therefore, never adjust carburetor idle without first checking valve and system (see testing in this article).*

CAUTION – *If ventilator valve or system becomes clogged, all crankcase ventilation will stop and serious engine damage could result.*

Although the following manufacturers' service procedures give specific intervals, it is recommended the crankcase ventilation system be checked more frequently if vehicles are operated under severe conditions (extreme dust, prolonged idling, trailer hauling or short trips in cold weather).

AMERICAN MOTORS

PCV Valve – Replace every 30,000 miles. Cleaning may be required between valve replacement intervals under adverse operating conditions.

NOTE – *PCV valves are color coded: Black for 4-cylinder and Green for 6-cylinder engines.*

Air Inlet Filter – Filter element is located in a retainer in air cleaner. Rotate retainer and remove. Clean with kerosene (4-cylinder) and/or replace (6-cylinder) at 30,000 miles.

BUICK

PCV Valve – Remove from intake manifold or rocker arm cover and replace every 30,000 miles.

Filter Element – Replace every 30,000 miles. On Diesel engines, service breather cap and ventilation filters at 5,000 and 15,000 miles and then at 15,000 mile intervals.

CADILLAC

PCV Valve – Remove from intake manifold or rocker arm cover and replace every 30,000 miles.

Filter Element – Replace every 30,000 miles. On Diesel engines, service breather cap and ventilation filters at 5,000 and 15,000 miles and then at 15,000 mile intervals.

CHEVROLET

PCV Valve – Remove from intake manifold or rocker arm cover and replace every 30,000 miles.

Filter Element – Replace every 50,000 miles (Chevette only) or 30,000 miles (all other vehicles). On Diesel engines, service breather cap and ventilation filters at 5,000 and 15,000 miles and then at 15,000 mile intervals.

CHRYSLER CORP

PCV Valve – There are no scheduled intervals for replacement of PCV valve. Replace valve when plugged or sticking. Do not attempt to clean old valve.

Filter Element – Every 52,500 miles remove and clean crankcase inlet filter. On vehicles with Mitsubishi 2.6L engines, replace carburetor air cleaner at 30,000 mile intervals; on all other engines, replace at 52,500 mile intervals.

FORD MOTOR CO.

NOTE – *Refer to engine compartment decal for maintenance code.*

PCV Valve – Check at same interval as filter element. Replace if defective. Two types are available and not interchangeable.

Filter Element – Replace at 50,000 miles on 4-cylinder models, 30,000 miles on 6-cylinder models and 52,500 on 8-cylinder models.

OLDSMOBILE

PCV Valve – Remove from intake manifold or rocker arm cover and replace every 30,000 miles.

Filter Element – Replace every 30,000 miles. On Diesel engines, service breather cap and ventilation filters at 5,000 and 15,000 miles and then at 15,000 mile intervals.

PONTIAC

PCV Valve – Remove from intake manifold or rocker arm cover and replace every 30,000 miles.

Filter Element – Replace every 30,000 miles. On Diesel engines, service breather cap and ventilation filters at 5,000 and 15,000 miles and then at 15,000 mile intervals.

NOTE – *Pontiac recommends replacement of worn or plugged PCV hoses. DO NOT blow out clogged lines.*