

POSITIVE CRANKCASE VENTILATION SYSTEMS – PCV

All Models

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.

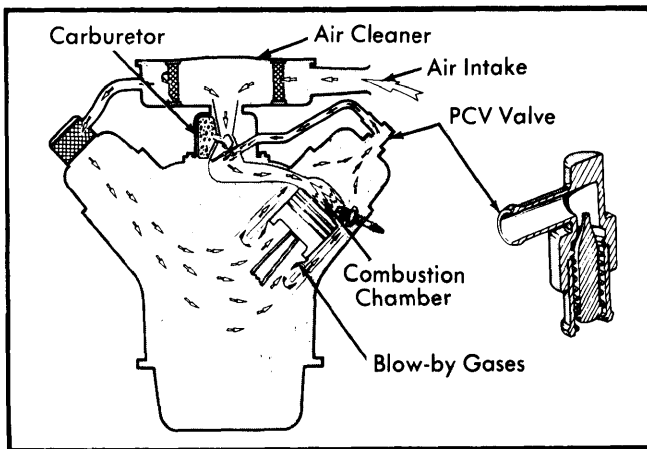


Fig. 1 Typical Crankcase Ventilation System

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

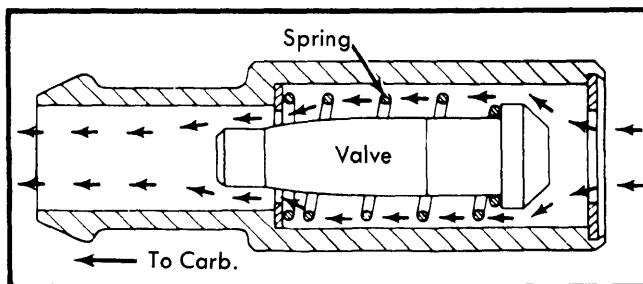


Fig. 2 Typical PCV Valve & Airflow

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 MODELS (EXCEPT JEEP)

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.

JEEP

1) Remove PCV valve from grommet in rocker arm cover on 4 and 6 cylinder models, or from hose behind carburetor on V8 models.

2) Connect valve to PCV valve tester (J-23111 or equivalent). Four cylinder valves require an adapter for the tester.

3) Connect a vacuum gauge to read intake manifold vacuum.

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

4) Start engine, allow to idle, compare vacuum and tester reading to flow chart. A valve that flows above or below chart specification must be cleaned or replaced.

1981 Crankcase Ventilation

POSITIVE CRANKCASE VENTILATION SYSTEMS – PCV (Cont.)

Jeep PCV Flow Rates[ⓐ]

Vacuum (In. Hg)	Flow Rate for 4-Cyl.	Flow Rate for 6-Cyl.	Flow Rate for V8
16	.....	.0-.20	1.34-1.63
15	.50-1.00	.....	.....
13	.....	1.30-1.90	.....
11	.....	.90-2.00	.....
7	.....	.....	2.70-3.79
6	1.05-1.85	.....	.....
5	.....	1.50-2.50	.....
3	1.50-2.50	.....	3.30-4.39
2	.....	1.28-2.56	.....

[ⓐ] – Flow rate given in cubic feet per minute (cfm).

MAINTENANCE

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.

If the 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).

CHRYSLER CORP.

PCV Valve – On Light Duty Emission models (up to 8,500 GVW), check every 15,000 miles and replace every 30,000 miles. On Heavy Duty Emission models (over 8,500 GVW), check every 12,000 miles and replace every 24,000 miles.

Filter Element – On Light Duty Emission models, clean crankcase inlet air cleaner every 30,000 miles. On Heavy Duty Emission models, clean every 12,000 miles.

FORD

PCV Valve – Valve is located on rocker covers. On all models replace every 30,000 miles. Under extreme conditions service will be more frequent.

Filter Element – Filter is located in air cleaner housing. Replace crankcase filter on 6 cylinder engines every 30,000 miles. On V8 engines, "E" & "F" 350 models replace every 30,000 miles. All other models not required.

GENERAL MOTORS

PCV Valve – Check every 15,000 miles and replace every 30,000 miles on Light Duty emission models (up to 8,500 lbs. GVW); check every 12,000 miles and replace every 24,000 miles on Heavy Duty emission models (over 8,500 lbs. GVW). Valve is located on rocker cover.

Filter Element – Replace every 30,000 miles on Light Duty emission models, every 24,000 miles on Heavy Duty emission models. Filter is located in carburetor.

JEEP

PCV Valve – Replace every 30,000 miles. Valve is located on rocker arm cover on 4 and 6 cylinder models, on intake manifold on V8 models.

Filter Element – Clean every 30,000 miles. Filter is located inside air cleaner on 4 and 6 cylinder models, in oil filler cap on V8 models.