

SECTION 9

**Positive Crankcase
Ventilation Systems**

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Positive Crankcase Ventilation System

DESCRIPTION

Typical Positive Crankcase Ventilation (PCV) System

The positive crankcase ventilation system (Figure 1) cycles crankcase gases back through the engine where they are burned. In a typical system, the PCV valve regulates the amount of ventilating air and blow-by gas to the intake manifold and prevents backfire from traveling into the crankcase. The PCV valve should be mounted in a vertical position (Figure 1). On some engine applications, the PCV system is connected with the evaporative emission system.

Unique 1.9L CFI Positive Crankcase Ventilation (PCV) System

The vent system for the 1.9L engine (Figure 2) does not depend on a flow of scavenging air, as do all other Ford engines, but evacuates crankcase vapors that are drawn into the intake manifold in metered amounts through a Dual Orifice Valve Assembly. A small orifice is connected to the intake manifold at all times. A larger orifice, controlled by a throttle body port signal, opens to the intake manifold during part throttle and WOT operation. If the availability of crankcase vapor is low (at idle for instance) air may be drawn along with crankcase vapor through the smaller orifice. If the availability of crankcase vapor is high (at high-speed operation) crankcase vapor is delivered to the intake manifold through both orifices. If the amount of crankcase vapor available exceeds that which can be handled by the two orifices, the excess flow is routed to the air cleaner. The Dual Orifice Valve is the critical point of this system.

Positive Crankcase Ventilation System

Diagnostic Test

PCV

DIAGNOSTICS — TYPICAL PCV SYSTEM (EXCEPT 1.9L CFI)

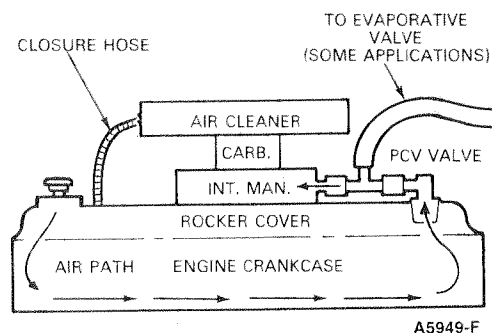


Figure 1 Typical PCV System (Except 1.9L with CFI)

Set parking brake and block wheels. Place transmission/transaxle in **NEUTRAL** or **PARK**. Place the A/C-Heat selector to the **OFF** position. Go to PCV Test Step 1.

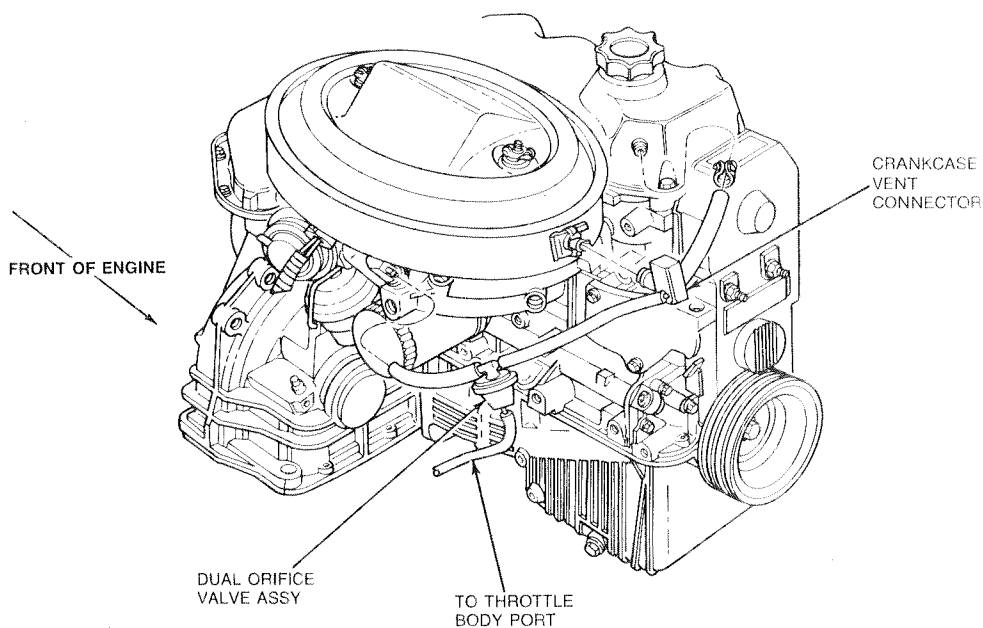
TEST STEP		RESULT	ACTION TO TAKE
PCV1	STUCK PCV VALVE CHECK		
<ul style="list-style-type: none"> Remove PCV valve from rocker cover grommet. Shake the PCV valve. Does the PCV valve rattle when shaken? 		Yes	GO to PCV2.
		No	PCV valve is sticking. REPLACE PCV valve.
PCV2	PCV SYSTEM CHECK		
<ul style="list-style-type: none"> Start engine and bring to normal operating temperature. Disconnect hose from air cleaner. Place a stiff piece of paper over the hose, wait one minute. Does the vacuum hold the paper in place? For 2.3L HSC, 2.9L and 4.9L engines remove the corrugated hose from the oil separator nipple and place a stiff piece of paper over the nipple, wait one minute. Does the vacuum hold the paper in place? 		Yes	System is OK. GO to Section 2 for vehicle symptoms.
		No	System is plugged or Evaporative Emission Valve is leaking, GO to PCV3.
PCV3	EVAPORATIVE EMISSION SYSTEM CHECK		
<ul style="list-style-type: none"> Disconnect evaporative hose, cap the tee, and retest. Place a stiff piece of paper over the hose, wait one minute. Does the vacuum hold the paper in place? 		Yes	GO to Evaporative Emission System, Section 7.
		No	CHECK for vacuum in the system (filter cap, PCV valve, hoses, oil separator on 2.3L) and rocker cover for bolt torque/gasket leak. SERVICE as necessary.

Positive Crankcase Ventilation System

Diagnostic Test

PCV

DIAGNOSTICS — UNIQUE 1.9L CFI PCV SYSTEM



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Figure 2 1.9L — CFI Engine PCV System

Set parking brake and block wheels. Place transmission/transaxle in **NEUTRAL** or **PARK**. Place the A/C-Heat selector to the **OFF** position. Bring engine to normal operating temperature and GO to PCV Test Step 1.

TEST STEP		RESULT	ACTION TO TAKE
PCV1	1.9L CFI HIGH-SPEED PCV CHECK		
<ul style="list-style-type: none"> Remove vacuum control hose at the dual orifice valve assembly (located at the throttle body port). Apply manifold vacuum to port. Is there significant change in engine rpm? 		Yes	High-speed PCV system is OK. GO to PCV2 .
		No	REPLACE the dual orifice valve assembly.

Positive Crankcase Ventilation System

Diagnostic Test

PCV

TEST STEP		RESULT	ACTION TO TAKE
PCV2	1.9L CFI LOW-SPEED CHECK		
<ul style="list-style-type: none"> Remove crankcase vent connector from side of air cleaner. Place a stiff piece of paper over the crankcase vent connector nipple, wait for one minute. Does vacuum hold the paper in place? 		Yes	Low-speed PCV system is OK. GO to Section 2 for vehicle symptoms.
		No	GO to PCV3 .
PCV3	CRANKCASE VENT CONNECTOR CHECK		
<ul style="list-style-type: none"> Remove vacuum hose (small port) at the crankcase vent connector. Place a stiff piece of paper over the vacuum hose. Does the vacuum hold the paper in place? 		Yes	REPLACE crankcase vent connector.
		No	GO to PCV4 .
PCV4	DUAL ORIFICE VALVE ASSEMBLY CHECK		
<ul style="list-style-type: none"> Remove dual orifice valve assembly from the system. Check for blockage through the valve. Is the valve clear of blockage? 		Yes	REFER to Section 2 for vehicle symptoms.
		No	REPLACE dual orifice valve assembly.