Positive Crankcase Ventilation: Description and Operation

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

Overview

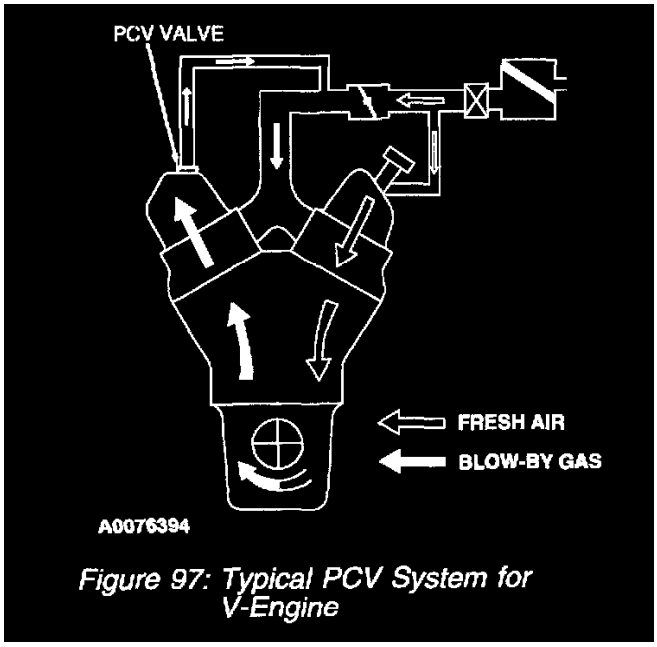

Figure 97: Typical PCV System for V-Engine

Typical PCV System For V-Engine

The PCV system cycles crankcase gases back through the induction system into the engine where they are burned. The PCV valve regulates the amount of ventilated air and blow-by gases to the intake manifold.

Currently, Ford uses both heated and non-heated PCV systems. The heated systems use either a water heated valve, an electrically heated valve, or an electrically heated tube. Engine coolant flows around the water heated valve to prevent it from freezing. Electrically heated systems use a heating element enclosed in the PCV valve, or the PCV tube to prevent the valve or tube from freezing. The valve or the tube heater can be controlled by either the PCM or the thermal harness.

- Thermal harness controlled heater - On vehicle applications that are equipped with a thermal harness to the PCV valve or tube. The thermal harness only provides electrical continuity to the heating element when temperatures are less than **5°C ± 4°C (40°F ± 7°F)**. Typically this harness is located close to the PCV valve or tube.
- PCM controlled heater - On these applications the PCV heater is turned on by the PCM. When the intake air temperature is less than **0°C (32°F)** the PCM grounds the positive crankcase ventilation valve heater control (PCVHC) circuit and turns the heater ON. When the intake air temperature exceeds **9°C (48°F)** the heater is turned OFF. The PCV heater is also OFF when the engine is not running to prevent unnecessary battery drain. The heater is also OFF if the vehicle charging system is greater than **16 volts**. This minimizes heater element overload.

PCV Types

Heated Tubes

- PCM controlled (no thermistor in harness)
- Non-PCM controlled (thermistor in harness)

PCV Valves

- Non-heated
- Water heated
- Non-PCM controlled electrically heated thermistor in harness
- PCM controlled

Refer to the give figures for examples of these types of PCV valves.

NOTE: PCV systems that comply with OBD PCV monitoring requirements will use a quarter-turn cam-lock thread design at one end to prevent accidental disconnection from the valve cover. For more information about the PCV monitor refer to PCV System Monitor.

CAUTION: Do not remove the PCV system from the engine. Removal of the PCV system will adversely affect the fuel economy and engine ventilation and result In shorter engine life.

Hardware

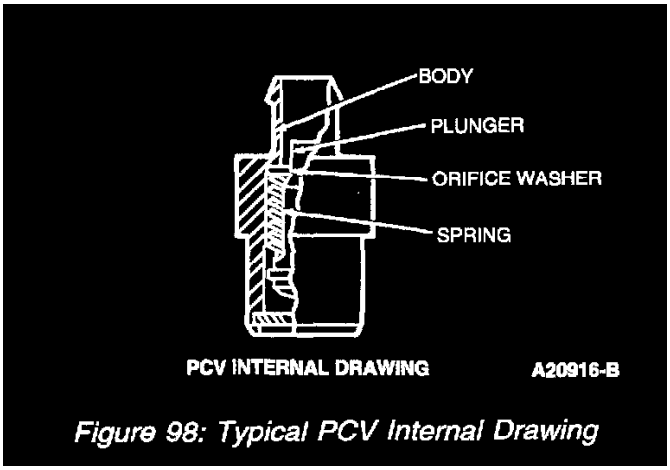

Figure 98: Typical PCV Internal Drawing

Typical PCV Internal Drawing

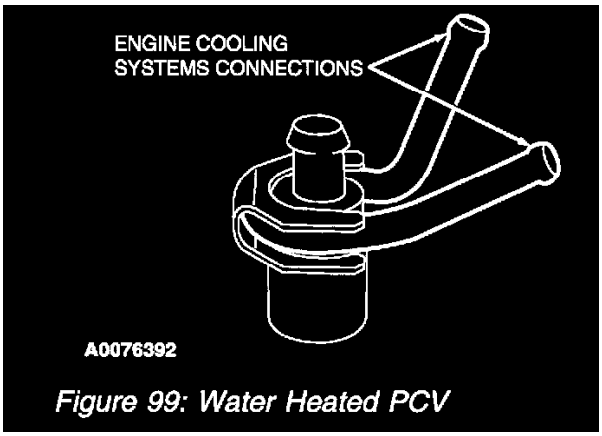

Figure 99: Water Heated PCV

Water Heated PCV

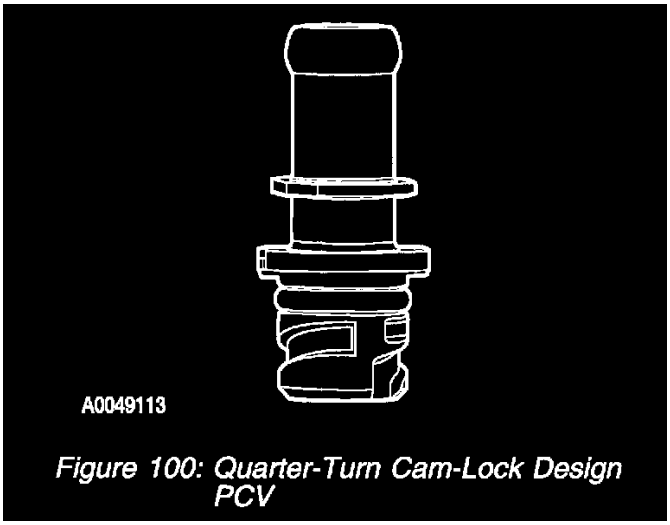

Figure 100: Quarter-Turn Cam-Lock Design PCV

Quarter-Turn Cam-Lock Design PCV

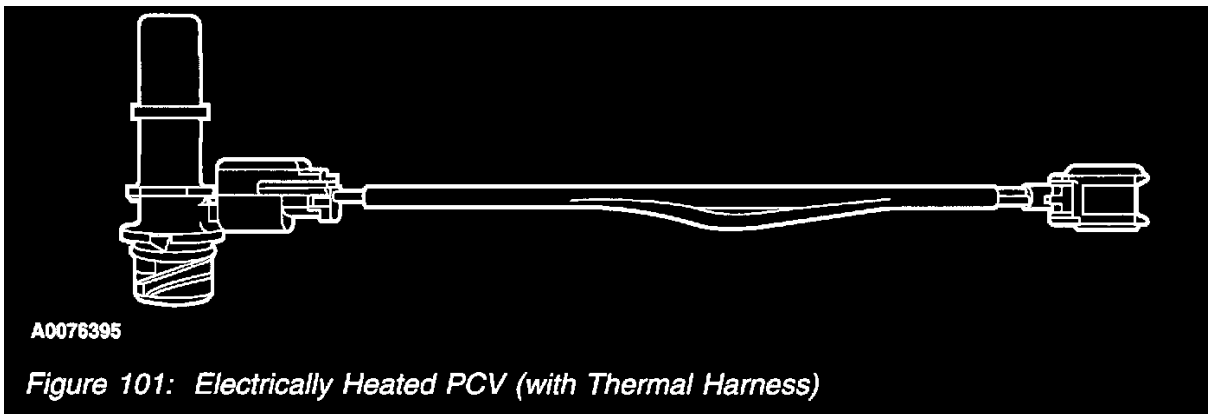

Figure 101: Electrically Heated PCV (with Thermal Harness)

Electrically Heated PCV (with Thermal Harness)

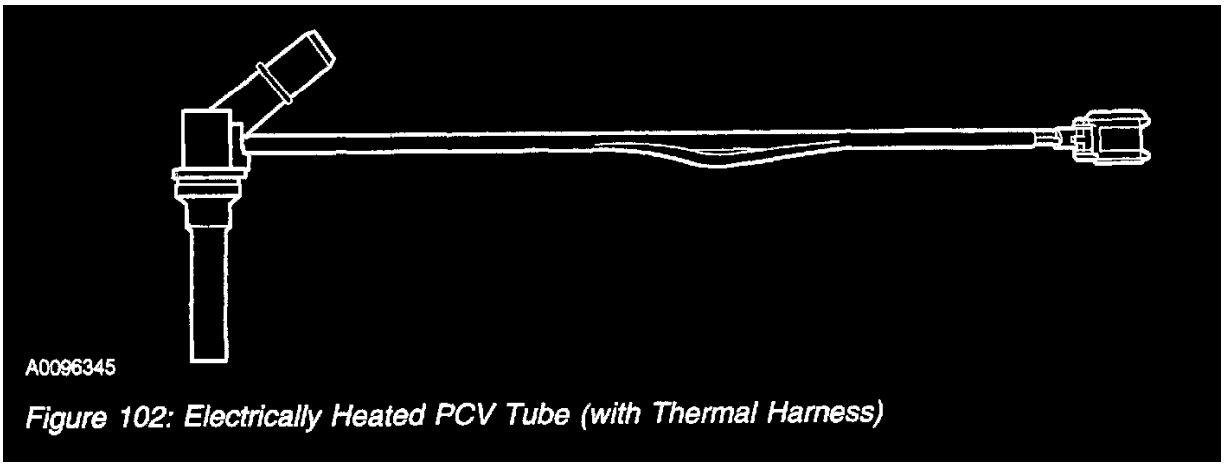

Figure 102: Electrically Heated PCV Tube (with Thermal Harness)

Electrically Heated PCV Tube (with Thermal Harness)