Diagnosing Electric Cooling Fans

Many times when diagnosing cooling fans, you are going after an overheating situation because the fan won't turn on when it is supposed to. Another thing to look for when checking fan operation is the condition of the clamping diodes used to protect the PCM from "spikes." Clamping diodes are used to protect delicate computer circuitry in the PCM from being damaged by excessive voltage induced when a coil collapses. These spikes can be as much as 85 volts or more. Check for the condition in the following manner.

1. Connect the red test lead to the control circuit and the black test lead to a good ground. Set the meter to read DC volts and enter the Min/Max function.
2. Activate the circuit and then deactivate the circuit. (Induced voltage is created when the field surrounding the coil collapses)
3. Enter Min/Max and read both the minimum and maximum voltages observed. The maximum voltage seen should not exceed battery voltage plus 10%.

If substantially higher voltages are found, suspect a defective suppression diode. If these conditions exist, they can significantly shorten the life of a PCM.