Electric Cooling Fan Assemblies

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TECH TIP

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An electric cooling fan is used to keep the engine at normal operating temperatures (which is usually between 195 to 215 degrees Fahrenheit) and is usually located in front of the condenser, or behind the radiator. It drops head pressure by removing the heat in the system.

Radiator Fan

The radiator cooling fan operates on engine cooling temperature. The engine coolant sensor, which operates on OHM resistance, sends a signal to the PCM (power control module), which then processes the signal, and returns the value as voltage to the cooling fan module. The cooling fan module then turns the fan on and selects the speed at which it operates. Cooling fans can be a single speed or variable speed.

Condenser Fan

The condenser pressure transducer is located on the high-side of the A/C system and it operates on A/C functions. The pressure transducer converts a signal from a pressure to a reference voltage. While the A/C is off, the transducer signal is roughly 1.5 volts, and when the A/C is turned on, the signal jumps to about 2.5 volts. The PCM (power control module) receives the signal from the pressure transducer and turns the condenser side of the cooling fan on if it is needed and to a certain speed to help in heat transfer and reduce head pressure. On cycling clutch systems, the fan cycles with the compressor. On an electronic control valve/clutchless compressor that doesn't cycle, the fan runs continuously.

If an electric cooling fan assembly fails to operate, the engine has the potential to overheat. Many things can lead to the failure of a fan's ability to function, such as a faulty fan relay, temperature sensor, fan control module, pressure transducer or PCM.