

Mercedes E-Class Engine cooling fan constantly on

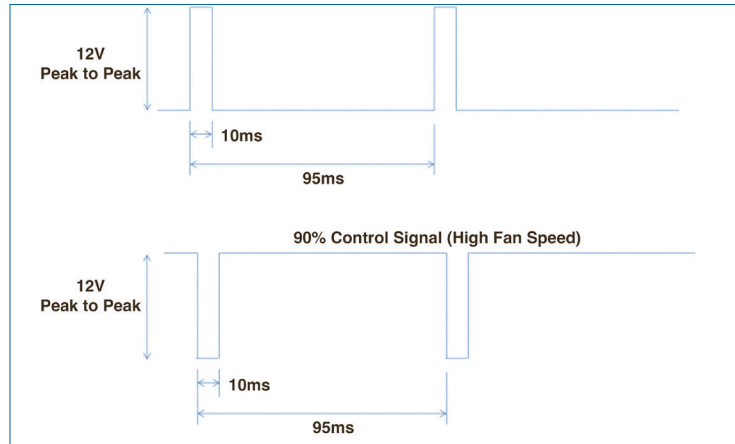
The engine cooling fan on this 2009 Mercedes E-Class Blue-Tec W212 was constantly on, and at full speed, the moment the engine was started. The initial fault scan revealed no issues with any system.

The Engine data was checked and confirmed the correct engine temperature from key on, and climbed at the correct rate as the engine warmed up.

The diagram for the cooling fan was checked. It confirmed that the fan speed control module was part of the fan motor assembly.

A relatively simple system, the fan module has a large power and ground supply, with battery voltage supplied when the ignition was on. Finally, a control signal comes from the fan control module and is ground-controlled by the ECM. Usually a Pulse Width Modulated (PWM) signal, the variable pulse width, is interpreted by the module and increases the speed of the fan as the pulse widens.

The signal is usually 12 volts. If it remains constantly at this level, the ECM is not



A typical control signal (PWM) showing the fan speed percentage changes

controlling the fan speed.

We asked the technician to scope the signal line before any parts were replaced. The scope signal was present, indicating that the ECM was controlling the fan module to run the fan.

We asked the technician to check the serial data for engine temperature and refrigerant pressure. These are the two parameters that the ECU uses for fan speed control. The Coolant temperature was normal for a cold engine, as it had not been run yet, but the refrigerant pressure was abnormal at 24 Bar, even though the engine was not running.



**Tim Stock,
Autobiz Helpline**

We checked the diagram for the AC pressure sensor, and the 3 wires were checked for 5 volt power, ground, and signal. The pressure sensor was located at the lower nearside of the condenser. The connector was removed to inspect the terminals, and it was easy to see that they were corroded.

A new sensor was fitted, and the connector was cleaned. The data was now showing the correct refrigerant pressure, and the fan remained off when starting the vehicle.

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