2012 Mercedes ML350 DPF fault repair hampered by bad information

A 2012 Mercedes ML350 BlueTEC W166 was in an Autobiz Helpline Subscriber's workshop, for a fault in the engine management system. The initial fault scan revealed an issue with the diesel particulate pressure differential sensor. Live data from the differential pressure sensor showed unstable data, so a physical test of the pressure was performed using a manometer.

Manometers are a relatively inexpensive test tool, and they are indispensable when working with such small differential pressures present in a healthy running exhaust after treatment system. The pressure reading was well within specifications, at idle we were recording only 11 millibars and the pressure was stable.

The differential sensor was then suspected to be faulty. A wiring diagram was sourced, and the 3 wires were checked. A 5 Volt reference was present, and the ground was at 0 Volts. But the signal line was unstable when back probing the sensor, and the voltage was moving even though the engine was not running.

A DPF Differential Pressure sensor can be a pull-down or a push-up design

The sensor was deemed to be faulty, and a replacement sensor was ordered from the local factors. When the replacement sensor was fitted, a scan tool was used to reset the adaptation. But the adaptation failed, and the sensor data was still incorrect.

The signal line in a usual system is 5 volts from the ECM, and the sensor modifies the voltage. With the key on, and the engine off, there will be no differential pressure across the sensor, and the sensor would normally pull the signal down to 0.5 volts. And as the pressure increases, the voltage would rise.

The signal line on this vehicle was not 5 volts from the ECM, so after testing the circuit back to prove that no open or high resistance was present, the ECM was called faulty.

It was decided to clone the ECM, to keep the cost of repair within a budget limit. But on fitting the clone, the issue persisted. The issue was that the aftermarket sensor was the pull-down version, and we suspected it was wrongly supplied. We suspected that the workshop data was also incorrect.

Using a sensor simulator, we applied a voltage of 0.5 volts to the signal line and checked the serial data for a response. As expected, the data showed a reading of 0 millibars at the sensor, and no fault codes were present. Slowly increasing the voltage to 1 volt, the pressure data also tracked correctly.

A digital manometer is an inexpensive tool

We then knew the sensor was a push-up version, and a second replacement sensor was ordered from Mercedes. The new sensor did output a push-up signal.

In this case, the information provider had it wrong, and the part supplier had supplied the incorrect part for this system.

As this type of push-up sensor is not very common, it can easily be misdiagnosed.

Tim Stock, Autobiz Helpline