



Dave Gordon, TEXA

Diagnosing intermittent faults

An intermittent fault can be the hardest to track down and fix. If you can't observe the fault, you are only guessing what might be going wrong. TEXA's Dave Gordon recounts two recent situations where he encountered a sporadic fault and the steps that were needed to come to a successful diagnosis and repair.

The first example was a 2013 Peugeot 308 with a 1.6 petrol engine. Previously, the owner had brought the car to a garage because the emission warning light was coming on and a DTC for a lambda sensor fault was recorded. The garage examined the sensor, cleared the fault code, and sent the car on its way running smoothly.

The owner came to realise that the fault would return intermittently, with no discernible pattern. The matter came to a head when the warning light came on during an MOT inspection, making the problem a more urgent matter.

The garage replaced the lambda sensor, and the catalytic converter, at a total cost of almost £700. The light was off and all seemed to be correct with the car.

When the light came back on again, the car was brought to a garage that not only had more diagnostic experience, but more importantly, had the proper equipment to deal with this intermittent problem. A review of the live data from the car showed that everything was as it should be, so a TEXA TXTs diagnostic unit was installed on the car and it was sent off on the road with instructions to return when the fault had occurred again. The TXTs provides up to 8 hours of data recording, from 32 values that the mechanic selects to adjust it to the suspected fault, while the vehicle is being driven. The data collected can be analysed after the intermittent problem has occurred.

When the fault occurred this time, the values from various sensors had been monitored and recorded, allowing the garage to look at the readings from the sensors to see what was really going on at the sporadic times the fault was present. It was very quick and easy to see the problem in this case: The Inlet Air Temperature sensor would occasionally report a temperature of -25. With this input, the ECU would provide extra fuel for the cold, dense air it thought was coming in, but it was too much fuel for the air that was actually coming in. The lambda sensor would then



The TEXA TXTs records up to 32 channels of data for up to 8 hours, making finding an intermittent fault easier to diagnose

show a rich mixture that couldn't be made lean triggering the fault. Resistance measurements were made along the wiring from the sensor to the ECU, but no problems were found. The Air Inlet Temperature sensor was replaced and the problem was fixed.

As a matter of curiosity, the sensor was left sitting on a bench connected to a multimeter. While the sensor was sitting still, without any external input, the resistance would change radically, and then change back. The sensor must have had an internal intermittent fault.

The next example was on a Mercedes-Benz lorry. The lorry was having issues with the

AdBlue system and also had sporadic periods of extremely low power and high emissions. Although there was definitely an existing problem during these low power episodes, no DTCs were set. In the garage, the live data was all within specifications, and the engine ran smoothly. The TEXA TXTs was installed to record data while the lorry was on the road.

The fault occurred after 5 hours in use, and the lorry was returned to the garage. A review of the data very quickly showed the problem: the catalytic converter inlet air temperature dropped to a negative value. This caused a series of problems, including halting the AdBlue from being injected into the exhaust. When freezing temperatures are detected, the AdBlue system will stop working, to prevent the formation of ice crystals in the system.

The fault this time in the temperature sensor was easier to see. A crack in the housing had allowed oxidation to start within the sensor, intermittently causing a false reading.

