Overcoming component issues

A technician rang the Autobiz Technical Helpline about a 2017 Opel Vivaro. The Vivaro was reporting an AdBlue mileage countdown, and the initial scan of the vehicle reported code P2033. This code often refers to any issue that would affect the efficiency of the Selective Catalytic Reduction (SCR) system.

The first process would be to interrogate the system data, beginning with the quantity of AdBlue stored in the tank. Overfilling the system can actually register as no AdBlue stored, so often this can be an error on the driver's part, if they over fill the system. This was not the case, 16 litres of AdBlue were showing on the live data.

The next test was to check the pressure within the system. A typical pressure reading, Key On Engine Off, will be 4 bar (400 Kpa). With the engine up to operating temperature and running, the system pressure needs to be a minimum of 5 bar, with a maximum pressure of 8 bar. All of these pressures were found to be fine, so we had the two basic requirements for the system to work.

The next step was to monitor the NOx concentration at both sensors, or the single sensor if only one is fitted. This can be done



A NOx CAN diagnostic too can directly read the data from a NOx sensor serially on the live data, with the engine at operating temperature on fast idle. NOx is measured in parts per million (PPM).

With only one sensor fitted on this vehicle, mounted behind the SCR catalyst, we expected to see around 35-40 PPM, if the system is operating correctly. The single NOx sensor was displaying 65,535 PPM, a default value for a nonoperational sensor.

The NOx sensor was scoped directly, a simple test. This NOx sensor has only 4 wires: power supply (Normal battery voltage), ground, CAN high and CAN low.

All signals proved good, so

a replacement sensor was ordered and fitted. The adaptions for the SCR system were reset, and the data rechecked. On a test drive of the new sensor, there was still no usable data.

A scope was used again, to check the power, ground and CAN signals. The signals on the CAN were deemed to be OK, but with the NOx sensor disconnected, the CAN from the sensor was not as expected. It was just a continuous pulse without any CAN data.

We have found a Nitrogen and Oxygen Sensor CAN diagnostic tool to be very useful



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in a situation like this. If the NOx sensor is communicating any signal at all, the tool will display the actual NOx concentration, directly from the sensor.

In this instance, the scan tool showed that the replacement NOx sensor was not sending any signal, so another replacement sensor, from an OE supplier, was fitted. After a final reset and road test, the live stream data from the NOx sensor was a healthy 32 PPM. The mileage counter for the AdBlue system was reset, and the repair was now complete.

So, if you suspect a new sensor is the issue, retest, and then use a substitute known good component, or scan tool, to prove your readings.

