

My new Oxygen sensor is faulty?

This is a true description of a technical case presented to AECS technical support team.

Vehicle

Mazda 6 2013 turbo common rail diesel 2.2L



Problem presented to the technical support team

We have a client who has booked in her car after an engine warning light had come on. Her partner has already diagnosed the car with his own scan tool he purchased online. He is apparently really enjoying being able to tell people what is wrong with their cars and has told her to replace her oxygen sensor in her exhaust. A local workshop was presented the car together with a brand new genuine sensor which was supplied by the owner. The workshop fitted the sensor and found the vehicle still has the same fault code plus some additional fault codes that were not apparently present when her partner originally scanned the vehicle.

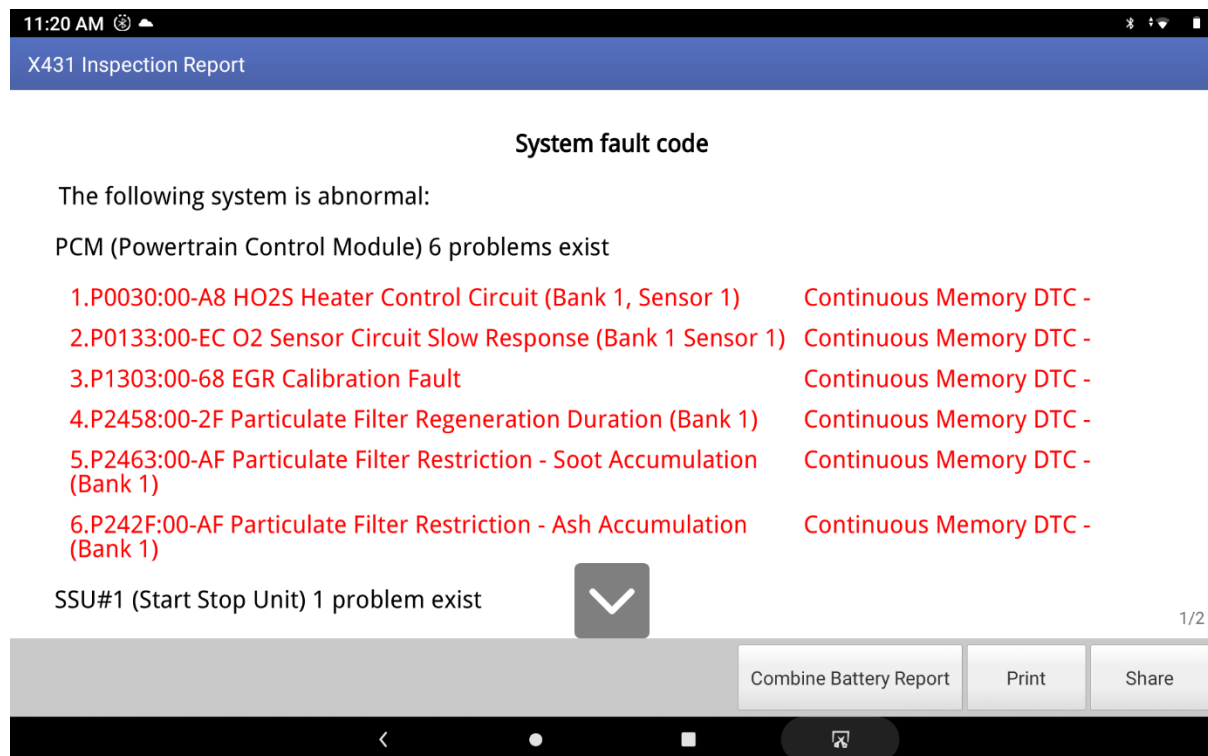
After some heated discussion with the workshop owner, the owner of the vehicle has decided to go to a second workshop for another opinion.

We prefer diagnosis which is what is about to be done, as it is way better then opinions, feelings, and Google which are not actually necessarily factual nor effective.

There had been a standoff between the garage who installed the sensor, the owners partner, the owner and the supplier of the sensor. It was time to bring the adults back into the room and find the problem.

The car owner wanted the problem fixed and to know who had let her down. She had already spent over \$1000 and had the same problem (plus more).

A health report was carried out by the diagnostic workshop using the AECS supplied Launch Auscan3 scan tool.



Launch Auscan3 scantool reading

In the report you can see faults for the oxygen heater circuit. If this is not operating the sensor will not heat up in the required time which leads onto the next fault code of oxygen sensor slow response. And just like dominos in a row this would of likely lead the next fault codes for the Particulate filter regeneration (DPF). As soon as a sensor parameter in the after gas treatment system is out of specification a DPF regeneration will not be enabled. Soon this vehicle will be undrivable due to a blocked DPF.

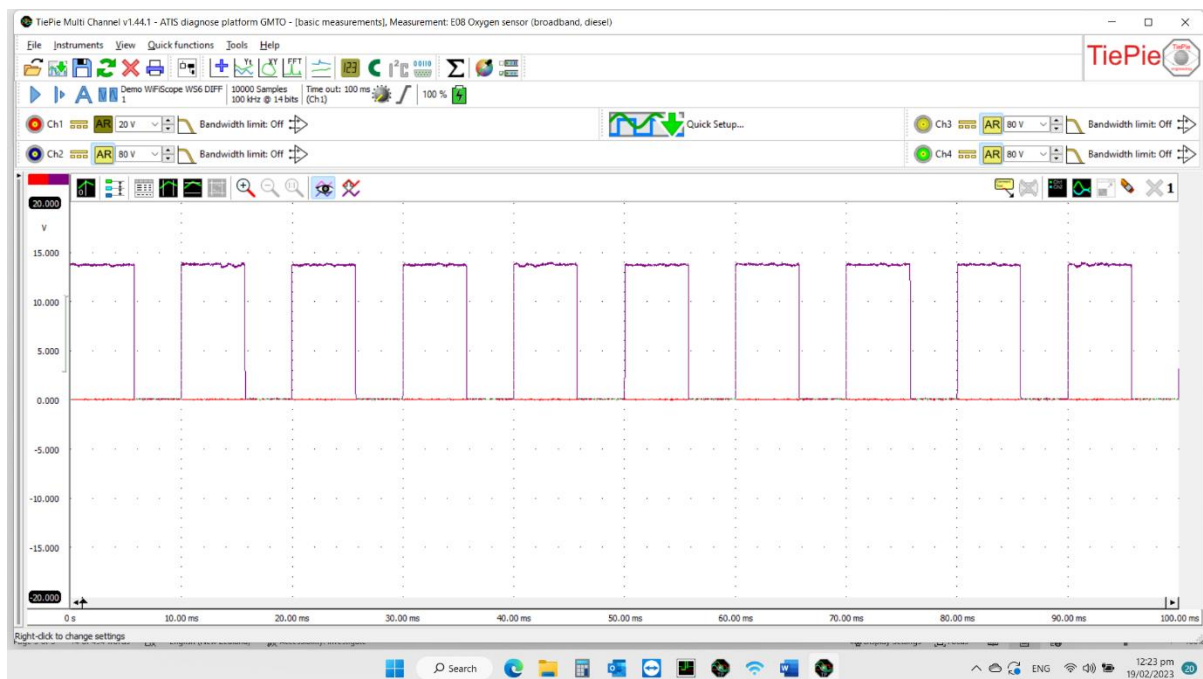
With the DMS1-4 AECS training it is fairly easy to see the relationship behind fault codes and the story being told. Some testing is now needed to confirm or otherwise.

Solution

There are 3 possibilities for this oxygen sensor fault code. The sensor itself. Unlikely as it has just been replaced with a new genuine sensor. Wiring between sensor and engine control unit. Highly likely in this case as new sensor fitted. The engine control unit. Not likely at all but possible.

The workshop involved did not have a wiring diagram for the vehicle and was now asking for assistance.

We recommended back probing the oxygen sensor heater wires. One wire should have system voltage. The other a duty cycle pulse. This will vary its on/off times as sensor heats up, and varies as a result of engine load.



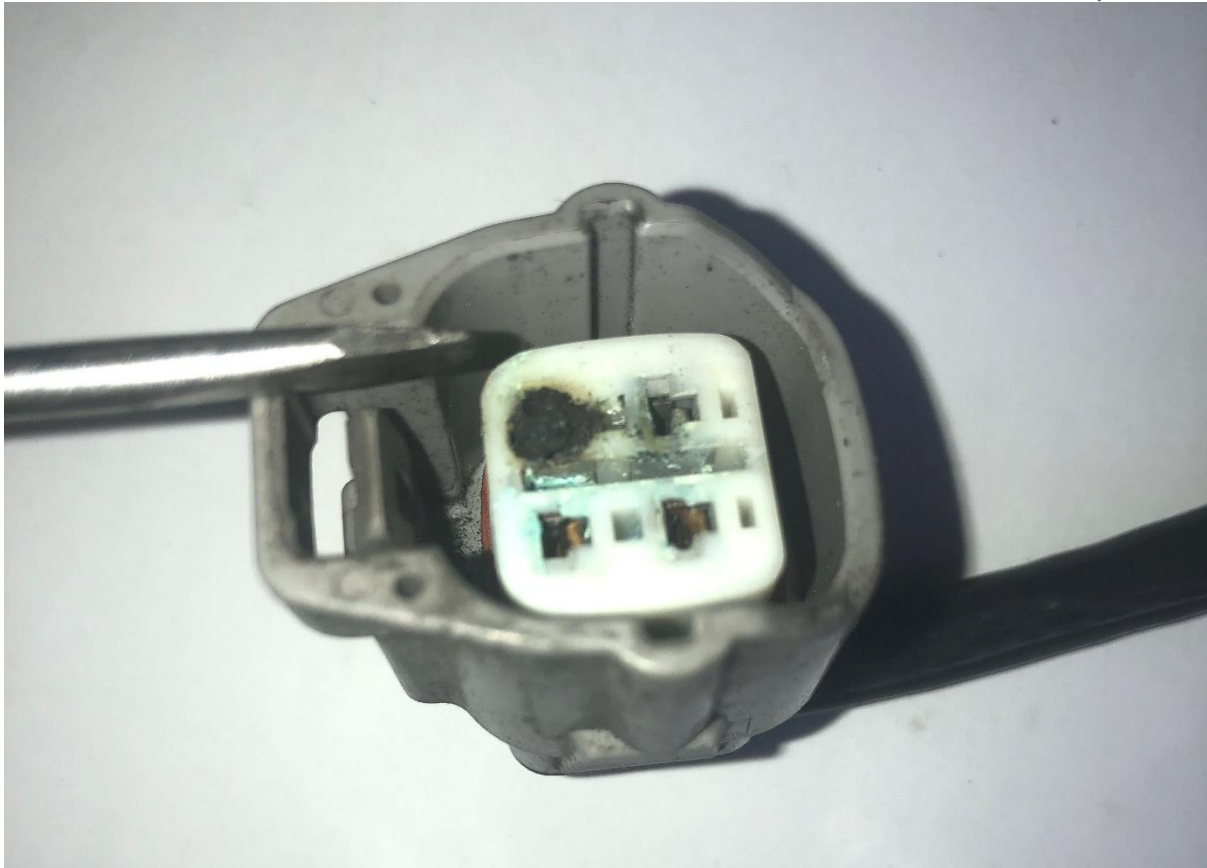
ATS scope recording of the Oxygen heater circuit operating correctly

The diagnostician reported back 14.4 volts flat line on supply wire and 0 volts flat line on the signal wire, where we should see the Duty cycle control.

We from the AECS helpdesk suggested to test the same wire, but on the sensor side of the multi connector.

Bingo

A full steady 14.4 volts was measured. The multi plug to sensor was removed and inspected. Please see the following picture what was found.



Multi plug connector pin with corrosion damage

Conclusion

The simplicity of this case is astounding, even someone who has completed the staple diet AECS AED training would have found this fault with their hands tied behind their back. Why would anyone struggle with a case like this and create expenses and stress for the customer. All it does is create a bad name for any technician, exacerbating the problem that customers are trying to diagnose the faults them selves.

It is never a good policy to cut corners when carrying out diagnosis. Maybe there are times when you can get lucky but this will never be a professional way to run your business.

Scan tools seldom tell you everything about a problem and is it necessary to test wiring, signals to have a high degree of accuracy about electronic failures. Time is a big part of what we sell in our workshops, so use it to test properly.

Activated by the Launch scanner, the DPF was able to be statically regenerated with the oxygen sensor circuit repaired.

The original workshop has simply done what was asked of them by the owner and likely got a rough ride when the problem was not solved. I think we can all relate to dealing with Google graduates with \$25 OBD scanners. Just be professional when dealing with situations as they arise. Explain what could be done with YOUR skill if the customer lets you.

The owners partner now hopefully realises not to believe everything you read.



Thank you for reading.

For AECS Ltd

Hamish van Lier

Technical trainer / workshop advisor.

06 8749077