

Stuart Still, Technical Support Co-ordinator at EEC, was recently called to a garage in Scotland to help overcome an issue associated with the cat efficiency light. This article highlights the problem and how it was resolved.

I was asked by a distributor in Dundee if I would visit one of their customers, Iain Hutcheon of Muirhead Garage. He was in a dilemma, as the car he was testing for its MoT, had passed the emissions section with flying colours: CO at .12, HC at 2PPM, CO₂ at 13.5, O₂ at .75 and Lambda at .99. Unfortunately though the cat efficiency light was on, but why?

Iain had assumed the catalytic converter must be faulty, but this is not necessarily the case. The reason the cat efficiency light came on is that the rear Lambda sensor was detecting a higher proportion of O₂ than was actually entering the catalytic converter. There should be less O₂ exiting a catalytic converter than enters it!

Here is the formula that explains the O₂ consumption within a catalytic converter:
 $2CO + O_2 = 2CO_2$
 $CH_4 + 2O_2 = CO_2 + 2H_2O$

This explains why there is a consumption of oxygen during the oxidation process, because when the exhaust gases reach a temperature of 350°C they react with the Platinum, Palladium and Rhodium Wash Coat within the monolith.

Identify the source

With this in mind we had to identify the Source of the extra O₂. I concluded that the location would be between the two Lambda



sensors, which I was able to deduce from the fact that if the source was before the first Lambda sensor, the HC's would be far higher, thus allowing the Lambda sensor to pick up the extra O₂. Therefore the sensor would think that the mixture was lean and the ECU would compensate for this by increasing the fuel. If the extra O₂ source is located after the second lambda sensor the cat efficiency light would not be on, as all of the emissions values are correct. The source of the unwelcome O₂ was due to a damaged pipe between the first and second Lambda sensors and once this was rectified, the warning light went out. I then explained to Iain how to evaluate the emissions values from his 4-gas analyser, and also how to diagnose, locate and remedy any faults.

4-gas analyser

Iain was extremely pleased with the outcome commenting: "I was totally unaware of what an effective tool my 4-gas analyser could be when it comes to assisting me in my day to day work of locating and eradicating problems. The 4G AGAR computer programme that Stuart

has installed for me is a fantastic aid in helping me to analyse emissions faults."

Heavy investment

EEC are committed to an education and training programme within the industry to help technicians understand, evaluate and diagnose emission problems. The introduction of Type Approval for catalytic converters has been a great leap forward and has created a more level playing field. EEC has invested heavily in its own wash coating facility in Denmead, thus ensuring the company produces a top quality product to allow garages to work quickly and efficiently when it comes to diagnosing faults.

