Adding depth to Diagnostics

Technical training should never be viewed as a unproductive expense, it should always be seen as an investment. Getting trained on how to deal with and find faults in modern vehicle systems, keeps you and your business up to date with changing technology. It is chargable and will create extra revenue. MKW Motor's Keith Walsh explains.

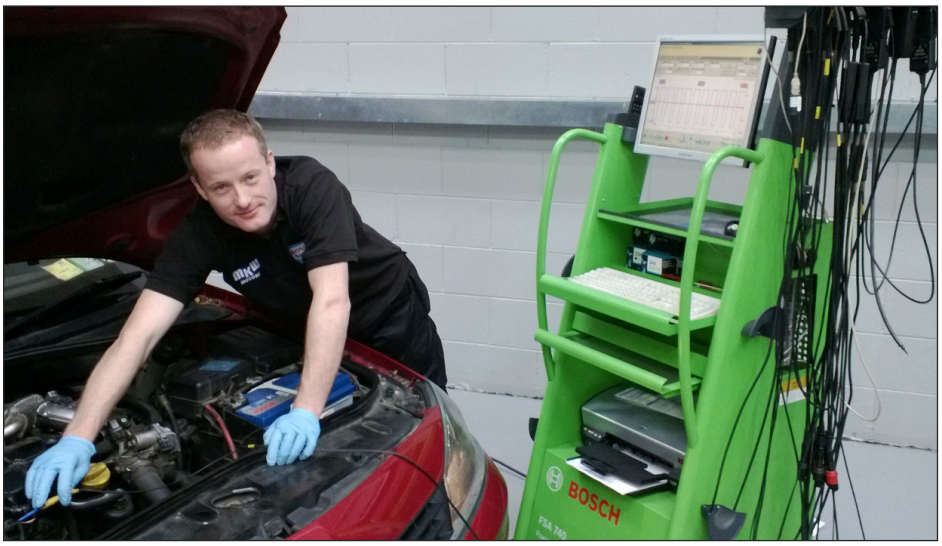
Technicians spend many years in college to become fully qualified technicians. However, after this initial training, a large number of technicians do not further their knowledge by keeping up to date with the massive changes that are taking place with technology.

There is a growing problem out there in the trade today and it is called "Internet Mechanics", where qualified technicians, find themselves falling into "the technical brick wall" trap. This is when technicians use cheap scan tools to get fault codes, that they do not understand or know how to approach. This is all down to a lack of proper training. It all gets too much for them trying to get their head around these problems, so they resort to the internet, where all the answers are. Late nights crawling through forums, blogs, pages and pages of long text until the early hours of the morning, with your eyes held open with match sticks in the hope of finding that golden nugget or silver bullet fix. This is known to some as Google diagnostics. But it really doesn't happen, instead there are lots of expensive parts replaced, which were advised to be the fault by a faceless person with what experience?

The problem begins from lack of training, no technician after finishing his or her time, has all the knowledge to fix all the problems they will ever encounter simply because technology is changing so fast. Technicians will go out and buy cheap scan tools for between €50 to €100, and will not see the reason to spend thousands like the rest of us mad people. But this cheap tool has no depth, it is only a code reader.

Diagnostic tools should be able to access sensor and actuator live data for the system being diagnosed. Live data is a huge benefit, as it is our eyes into the control unit and it lets us see what it sees. With proper training and the correct information, we can assess live data to see if the control unit is receiving bad information from a sensor. We can use that information to give us a test point or, in other words, test the sensor we see giving the bad information. We can also use actuators within the control unit, giving the means of actually moving the actuator to see if the component and all of it's associated wiring is in good order.

Modern cars are highly technical. Under that engine cover, behind all those interior body trims, is a maze of electronic control units, wiring and sensors. This technology is increasing continuously, as a result of European emission laws reducing the pollutants cars release from the exhaust , safety improvements and customer convenience and comfort. All the vehicles electrical systems work together and are linked by a complex networking system transferring information at speeds of 500,000 to 10 million bits per second and sharing this information between all the control units on the car.



To simply plug in and retrieve a diagnostic code for a component, and then replace that component in the hope that it will fix the problem, is not usually productive.

When a technician plugs in their scan tool and sees a fault code, this is by no means the fault. Far from it. Diagnostics has depth, and a fault code in the diagnostic world is only an idea, a clue, a tiny piece of information about the overall problem. So how do you actually find the problem? By experience, testing the relevant electrical system piece by piece, by using sophisticated test equipment, having the correct wiring diagrams and system working knowledge. To simply plug in and retrieve a diagnostic code for a component, and then replace that component in hope it will fix the problem, is not usually productive.

Diagnostic fault codes can be triggered as a result of a chain reaction. The fault displayed on the scan tool is only as a result of another sensor, actuator or component going faulty somewhere else in the system. Fault codes can be triggered even for components and sensors that are not actually faulty. This can be caused by a related, or unrelated, mechanical or electrical fault. When this happens it can be very confusing, even to a trained technician.

Fault codes come with explanations of why they have been triggered and each component, sensor or actuator can have 4 or more fault codes attached to it, all meaning completely different things. This means that it is crucial that you are trained and experienced to interpret this information. The codes will also have, in some cases, freeze frame data or environmental conditions. This means that some conditions of when the fault occurred have been stored in memory, such as engine and vehicle speed, temperatures ,gear position, airflow and so on. This information is very important when attempting to reproduce a fault that is intermittent.

Blogs and internet forums can be dangerous places for anyone visiting, in the hope of fixing a fault with their car, the people on these forums can't see, hear, or measure your car, so any advice is based on presumptions and can only be misleading. The end result is usually extra time and financial costs for both the technician and the car owner. Lots of technicians fall into hours wasted crawling through internet forums to finally think they have found a fix and spend lots of money on expensive parts that were not actually needed.

It would be cheaper and less time consuming if technicians got trained to keep up with technology and diagnostic procedures. Then there will be no need for looking for solutions on the internet.

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