

EARLY DIAGNOSIS

Third party diagnostics systems, from Eclipse (right) and others, are ideal for mixed fleet workshops

As commercial vehicles have become more sophisticated, managing electrical and electronic systems has moved away from diagnosing and repairing discrete units, such as starter motors, lighting and cab equipment. Now, the technologies are integral to almost every component – not just engine management but cooling, braking, steering and suspension. CANbus also ties all these together, so it is almost impossible to make a mechanical change without a corresponding electronic one.

As a result, the emphasis has largely moved away from specialist vehicle electricians. Now, almost every technician needs some ability to diagnose and repair electrical and electronic subsystems. As Phil Whitehead, training manager at fleet maintenance specialist Pullman Fleet Services, puts it: “Eight out of 10 of our technicians have multimeters in their tool boxes.” And Jim McGuckin, dealer principal at Imperial Commercials in Bellshill and Cumbernauld, says many of his also use multimeters and PicoScopes (laptop-driven oscilloscopes).

But it's not just about the kit. McGuckin believes technicians need to start from first principles. “I say, check the basics first,” he advises, insisting that technicians shouldn't just jump on with the diagnostic kit. “For example, if a vehicle doesn't start, they should check that there is fuel in the tank. And if all the systems are dead, they should check that the batteries are still there. We've had them stolen.”

McGuckin also points out that, before a technician gets his or her hands on a vehicle, it is vitally important to establish the precise symptoms. “We need service advisors to ask pertinent questions,” he suggests. “A five-minute stint of test driving can be very useful, as can bringing in a master technician to discuss the problem directly with the driver.”

Pullman's Whitehead worries that, while most problems are communicated through written defect notes, “in a breakdown situation we tend to get them verbally from the driver”. That can be a problem, particularly if a driver doesn't want to admit he's

broken something, and just says ‘it's stopped working’.

McGuckin cites one case of a tachograph problem that could not be replicated in the workshop. Only when the driver was quizzed and said ‘it only does it going round a left-hand corner’ was it diagnosed as a wiring loom problem.

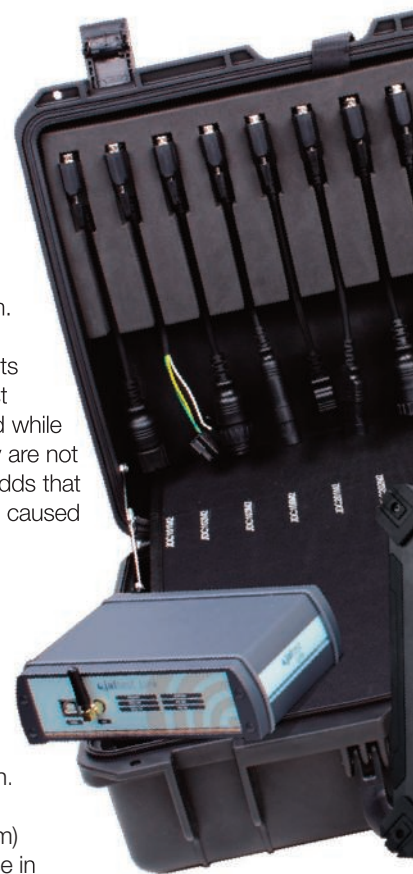
Says Whitehead: “Generally electrics – lights and wiring – are the most common problems.” And while agreeing that, often, they are not expensive to rectify, he adds that sometimes problems are caused by previous fixes.

Common problems

But while common causes of problems include overheating and wear, another that comes up is water ingress causing corrosion. McGuckin points to EBS (electronic braking system) sensors, particularly those in exposed positions on trailers. Similarly, sensors for SCR (selective catalytic reduction) and EGR (exhaust gas recirculation) can fail, though these tend to show on the dashboard.

Waterproof grease or Vaseline should be used whenever connectors or diagnostic sockets are exposed, advises McGuckin. “Your wiring looms now are so fine, and the CANbus relies on such tiny impulses, that any [corrosion] may show as a fault.”

With modern Euro 5 and Euro 6 engined vehicles, general sensor faults are also possible. Dashboard





Troubleshooting electrical and electronic problems on commercial vehicles requires a structured, but also a computer-assisted approach. Toby Clark looks at the role of diagnostics

Pullman technicians use the latest diagnostics, including PicoScopes



error lights and fault code readers might identify the faulty component, but not necessarily the nature of the fault. This, says Whitehead, is where diagnostic systems score. "Nine

times out of 10, the man with a garage down the road won't be able to do anything without this equipment."

But while diagnostics have been an essential for any workshop's armoury for years, they're even more important today. Third party diagnostics kit maker Eclipse

Automotive Technology points out that a Euro 6 engine can produce over 3,500 fault codes, with other truck and trailer systems adding many more. Plainly, technicians need help in interpreting and responding to this volume of data.

Systems such as Eclipse's Jaltest, Actia's Multi-Diag and Texa's Axone 4 can search multiple truck makers' systems and give explicit descriptions of errors. Most work with libraries of known faults to allow symptom-driven diagnosis and step-by-step rectification. Importantly, they're also intuitive,

meaning that technicians can work more efficiently, quickly getting to an analysis of the problem, and making repair faster, easier, cheaper – and better.

And with modern trucks, it's not just about problem resolution: sophisticated equipment is needed at the repair stage, too. As Whitehead says, "When you fit something, you can't just bolt it on. You have to recalibrate or program it." That said, although modern diagnostics offer a step-by-step approach, technicians still need training. All reputable suppliers offer it: Eclipse, for example, runs courses on-site or at its facility in Swadlincote, Derbyshire. But the trick is making it affordable. One way is to send super-users or master technicians on the courses, leaving them to train their colleagues.

Whitehead reckons that, as a result, Pullman can take a new technician and get him or her from zero to intermediate level in a day or two. "We've got some guys that have never picked up a computer in their life, but they use our system to diagnose and calibrate vehicles on a weekly basis." He also says that super-users can feed information back to diagnostics providers.

McGuckin runs a DAF and Fiat workshop, but makes the point that the dealership needs to look after customers' other vehicles, too. "We invested recently in all-makes diagnostics equipment," he says – coincidentally also Eclipse's Jaltest. His only observation: when you're looking at all-makes, it's generalised training and cannot be in-depth. That's why Imperial Commercials doesn't rely solely on its diagnostics systems for data. It also subscribes to the E3 Technical service, which gives detailed specification and repair information for specific vehicles, identified via a registration mark look-up.

Whatever you do, you must keep up to date. As McGuckin says: "Your technicians need to embrace technology, or it will run away from you." And remember the value of telephone support: two heads are better than one, and a three-way conversation between the driver, a technician and the diagnostics call centre can be even better. **TE**