

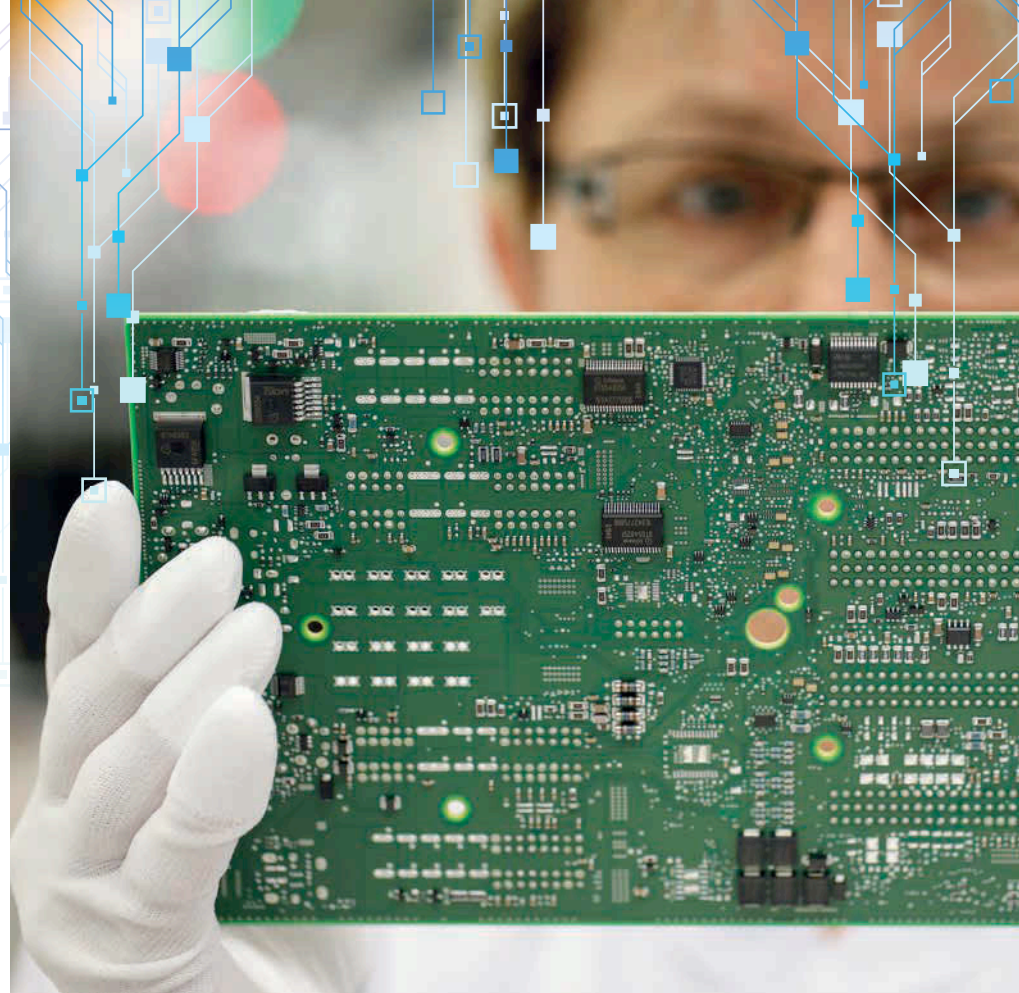
It's taken component shortages to make the industry come to terms with the positive and negative impacts of vehicle connectivity, argues Richard Simpson

Continuing shortages of, and long waiting lists for new trucks and other vehicles have been the dominant theme in the market since the COVID crisis. The reasons are well-known: with society locking down, vehicle manufacturers stopped ordering components, including the microchips and electronic control units that now operate the majority of vehicle systems from window opening to engine management.

The microchip manufacturers themselves were barely impacted. With the world staying at home, demand for personal computers and tablets for work, education and entertainment accelerated exponentially, and production was simply switched to provide components for these devices.

History shows that the commercial vehicle manufacturers made a spectacularly wrong call. Demand for home deliveries of life's essentials grew, and in the UK, with physical shopping for non-essentials banned, so too did demand for deliveries of luxury items, and consequentially registrations of new vans shot up by 21% in 2021. Demand for heavy commercial vehicles grew too, albeit not quite as spectacularly, and the registration figures recorded actually don't reflect the true levels of demand, as production was now curtailed by shortages of those essential components: microchips.

At the start of 2022, Mike Hawes, CEO of the UK's Society of Motor Manufacturers and Traders, said the crisis would continue with manufacturers "fighting for semi-conductors" and would only ease slowly through the year.



CHIPS WITH EVERYTHING

The easing of the first wave of restrictions in Europe and the resumption of vehicle production was badly timed, because, Hawes pointed out: "The COVID Delta lockdown in the Far East began almost simultaneously, and 80 microchip production plants shut."

There is no slack in the system, Hawes explained: "Even in normal circumstances the plants work 24 hours a day, so there is no scope to increase production."

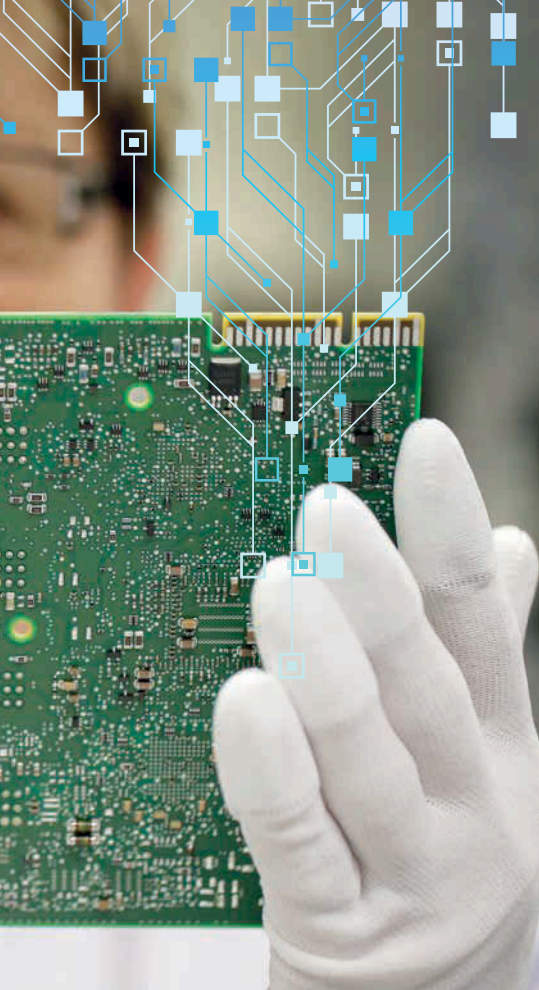
The Russian invasion of Ukraine has made things even worse. Fighting the world's first robot war with drones has obviously done nothing to dampen demand for microchips, and has caused additional problems with, for example, MAN having to pause truck production because its wiring harnesses were sourced from Ukraine. The shortages

have spread to the most prosaic of materials, and German trailer giant Schmitz Cargobull reports that its production is now constrained by a shortage of wood!

The lack of new vehicles is reflected in sharply rising demand for used Euro VI trucks, which sell fast for premium prices. Conversely, demand for earlier vehicles is being dampened by concerns about the prohibitive cost of operating them in clean air zones.

Used vehicle advertising platform Autotrader has reported healthy demand for used trucks and falling stock levels at dealers. In the last two years, the used truck stock held by Autotrader's regular advertisers has fallen by 37%. Autotrader says that tractor units are the most attractive truck type on its website, based on leads and interactions.

The chip shortage is also impacting



on pricing and supply of replacement parts. A coach operator recently reported that a replacement ECU which he was able to buy 'off the shelf' in 2018 for £916 was now on back-order with no determined date of delivery and a list price of £3,360.

TECHNICIAN TRAINING

In the light of this, are vehicle manufacturers prepared to move on from the traditional process where faulty ECUs are treated as impenetrable black boxes, and train technicians in their repair?

John Luxton lectures DAF Trucks technical apprentices at City of Bristol College (pictured, p26). "We don't teach technicians to physically go into ECUs," he says. "But ECUs obviously feature in diagnostics, and undertaking circuit testing in the correct way is of vital importance.

"There are ECUs all over modern trucks, in the instrument cluster for example, as well as on the engine, transmission and chassis. The ECU on the old AS-Tronic transmissions could be dismantled, but with more recent units the emphasis is on using fault codes to guide the diagnosis. The only times an ECU is disconnected is to

check component continuity or connection.

"The fault code will always guide the diagnosis, and this is accessed using the DAVIE (DAF Vehicle Investigation Equipment) tool, which can go into each electronic system on the vehicle and interrogate it.

"On engine diagnosis it can monitor various functions: for instance by actuating the backpressure regulator. It will run a sequence and see what causes a particular fault.

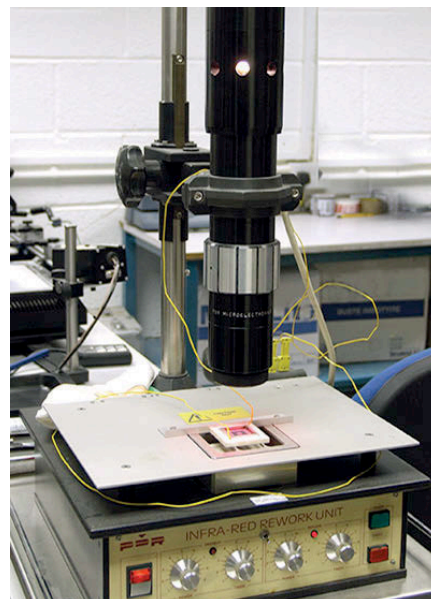
"This function has become increasingly important as engines have become more sophisticated with the introduction of the various iterations of Euro VI, and will become more important again with Euro VII, where the engines and transmissions will generate even more information for the ECUs to process. It's far more useful to be able to do this than it is to physically open an ECU.

"The current generation of apprentices moves very fast when it comes to mastering the functions of computers and laptops; they go through it very quickly and are quick to embrace the idea of diagnosing faults electronically. It's just part of normal

working practice for them. The electronics and IT skills they come to us with outweigh the skills they have with hand tools now.

"It's interesting that we are seeing increasing numbers of apprentices now on DAF's 24-hour breakdown services, and I suspect that one of the reasons is the speed with which they can diagnose problems."

Luxton says the growing number of sensors on vehicles have impacted on teaching of what the college calls soft skills and behaviours. "We talk more now about preventative maintenance. For instance, a lot of electronic units need to sense exterior temperature or humidity, so to a certain extent they have to be open to the ambient environment. This means that anything on the vehicle chassis with a wire coming out of it should not be pressure-washed with a steam-cleaner. Paying attention to seemingly small details like that is now vitally important."



ELECTRONICS REPAIR?

In the wider automotive world, there is a longstanding tradition of repairing or modifying vehicle electronics, which dates right back to the 1990s and attempts to enhance engine performance by 'chipping' ECUs to deliver more fuel (see for example www.is.gd/fipilo). But there are also independent workshops that will repair or exchange ECUs and other components for more legitimate reasons. However, few of them handle heavy commercial vehicle components.

Independent workshops wishing to repair truck ECUs (pictured, left) are held back by a shortage of freely available information, says Neville Lewis, director of Devon-based Tamar Electronics.



“Truck ECUs are very different to car ECUs: for instance, there is reasonable support for independent repairers working on Bosch ECUs, but not many truck ECUs are made by Bosch.

“Temic [now part of the giant Continental concern], which is used by Mercedes-Benz, has a limited amount of information in the public domain, but the other makes are worse. Without the necessary information, we are just staring at a black box; we don't know what the internal components are, as they often lack any labelling; there are no drawings available, and we don't even know which pins do what on the external plug on the box. If you have this information, you can build a test rig and diagnose faults, but without it this is almost impossible.

“The older the vehicle is, generally the more information there is. Mercedes was the first to go down the electronic control route, so that makes Mercedes ECUs easier to access. Manufacturers will tell you that the information is on their technical websites – and it is, for a price. Similarly, there are subscription services available. But the volume of business is obviously far lower for trucks than it is for cars, and that makes buying

the information more difficult to justify economically.”

Globally, it's a hot issue. In the USA, president Joe Biden has won the perhaps unlikely support of mid-west farmers for supporting a 'right to repair' bill. In particular, farmers have been increasingly antagonised by farm machinery manufacturers tending to link the replacement of components with activation codes that will only be released to an authorised dealer. If a new part is fitted, the machine will only run again if a new code is issued by the factory to the technician, and the code will only be released to an authorised outlet.

Farmers argue that this has come about at the same time that the manufacturers have removed franchises from many long-established local 'mom and pop' repairers: the sort of enterprise that would come out to the farm in a pick-up truck and work on machines literally in the field. Never mind the economics, the farmers argue, when a harvest is interrupted by a breakdown, it is just not practical to load a crippled combine harvester on to a truck and take it into a city for repair. It has to be fixed where it failed, and quickly!

This situation is starting to ring bells with truck fleet operators in the UK. Scania alone has over half-a-million 'connected' trucks in operation, and the data they generate is being used to create 'predictive maintenance programmes' where the truck and its manufacturer, not its operator, decide what work needs to be done and when. All that data is generated by embedded ECUs; the vehicle is now part of the 'Internet of Things'.

DATA OWNERSHIP

There is also the question of who the data belongs to, and who shares it. In Europe, Schmitz Cargobull has responded to concerns about who has access to what in the wealth of data generated by its fridge trailers.

The mechanics of the trailer would be no concern of the consignor, but the consignor might well require full transparency when it came to load temperature and door openings. But key data about the vehicle's location would be of value to thieves, and could be released to them via an insider at the delivery destination.

“Therefore, the transporter might choose to let the destination know the ETA of the trailer, but not its real-time location,” says Marnix Lannoije, head of product line digital services, Cargobull Telematics.

The company has established a Data Management Centre which allows, for example, a freight forwarder to send forward route- and transport-order-related data separately to the individual destinations. Here, the forwarder decides which information is disclosed to a shipper, thereby protecting business secrets and networks.

Lannoije concludes that operators will “only share their fleet data if they have control over how their data is shared”.

And that's perhaps a lesson that needs to be taken on board across the industry. When we can get the chips! **TE**