

CV COMMERCIAL VEHICLE ENGINEER

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- > Maintaining ADAS technology

ZERO HOUR

IS VOLTA TRUCKS' NEW ZERO THE FUTURE OF COMMERCIAL VEHICLES?

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FUELLING THE DEBATE

September was a busy month for truck launches, with Daimler Trucks, Volta Trucks and Scania – twice – all unveiling new or updated models to the world and this glut of new trucks has highlighted how long-distance and urban transport is set to go in the coming years.

Volta Trucks led the way with its 16-tonne electric urban truck. Its makers claim it is the most sustainable truck ever made. It focuses on the whole truck and not just what comes out of the tailpipe – so panels are made from recyclable materials and the battery uses no precious metals, for instance.

Scania has also thrown its weight behind electric power by launching its first series production range of fully electric and plug-in hybrid P- and L-series rigid trucks. The trucks are aimed at operators working in urban areas and low-emission city centre zones.

This is just the start for Scania too, as the Swedish marque's president and CEO, Henrik Henriksson, added that Scania will now annually launch electric versions across the company's entire range.

But this doesn't mean Scania is moving entirely away from diesel. At the end of the month, the company announced a refresh of its iconic V8 range of trucks – including a whopping 770hp unit, the most powerful in Europe – which shows that the appetite is still there for diesel from operators and will be for some time to come. Although it should be noted these will be able to run on HVO – hydrotreated vegetable oil, which can reduce CO₂ emissions by up to 90% - and deliver 6% fuel savings on previous models.

Meanwhile Daimler Trucks suggested there is now a viable alternative to diesel for long-haul transport on the horizon. It unveiled its GenH2 Truck, which uses liquid instead of gaseous hydrogen, which has a higher energy density and can give the vehicle a performance equal to that of a comparable conventional diesel truck, the company says.

However, this truck won't be seen on the roads soon; customer trials are planned for 2023, with series production planned to start in the second half of the decade.

But sooner than that, Daimler Trucks plans to have a battery-powered long-haul truck in production. Its Mercedes-Benz eActros LongHaul is designed to cover regular journeys on plannable routes with a range of up to 500km on one battery charge. Daimler Trucks plans to have this ready for production in 2024.

It shows how quickly fuel technology is developing and that, at last, there may be a viable alternative to diesel on the horizon. The next few years in trucks will be fascinating to watch to see if this does happen – and if operators have the appetite for them.



THE TRUCK EXPERT



THE VAN EXPERT



THE CAR EXPERT

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HOW AI AND ML CAN DRIVE A SMART, SUSTAINABLE FUTURE FOR FLEETS

Artificial intelligence and machine learning are on the cusp of revolutionising the commercial vehicle sector and how fleet managers make decisions.

Today, fleet managers have a lot of purchase and management factors to consider. Vehicle selection, performance, cost and maintenance are the top factors that have historically shaped any fleet manager's decision. Now there is also a relentless drive to meet the sustainability requirements demanded by consumers and governments alike. Fleet managers are addressing these complex expectations by turning to data. It's no surprise that the telematics market is growing at 27% year-on-year, with fleets increasingly harnessing a wealth of data on vehicles, drivers and the environment around them.

What lies beyond? A new wave of fleet innovation: smart, sustainable fleets, fueled by intelligent, data-driven, semi-autonomous decision making. Artificial intelligence (AI) and machine learning (ML) are on the cusp of revolutionising the commercial vehicle sector.

For example, fleet managers can make highly informed purchasing decisions on internal combustion engines, electric (EV) and hybrid vehicles. Vehicle resellers often group customers together, making vehicle purchase recommendations simply by industry. But not every customer operates in the same way. Some are last mile, some are long haul, while others are multi-purpose. Other important factors include how the vehicle is driven, the geography, idle time and city/rural location.

This is where autonomy comes in. The best performing vehicles can be identified in each environment using a matrix created with an AI/ML model that considers almost infinite combinations. Once fleet managers have this foundational layer they can benchmark. Recommendations based on data gathered from operational fleets and AI-enabled insights help provide a breadth of purchasing and operational



options that would otherwise not have been apparent or available.

There are also benefits for 'local' operations, particularly in the public sector. For example, a fleet manager for a local government municipality may be able to tell how their entire fleet is performing, all the way to the level of individual vehicles. For local government operators getting to grips with emissions regulation, benchmarking and planning, intelligent analysis of traffic flow can help produce game-changing benefits. AI can identify vital points where infrastructure may need updating, for example at signal-controlled junctions. Rather than investing in costly physical hardware to monitor these areas and collect data, or even timely manual labour, data can be captured and automatically analysed. Intelligent telematics can process and automatically analyse the data.

The smart part of AI, in this context, is in its understanding of the 'topography' of a local area. Here it is vital to have an accurate vehicle location or its current situation in relation to each point of interest. This requires the ability to spot erroneous or misleading readings, for example, how another idle vehicle in an adjacent lane impacts the fleet vehicle.

Finally, another powerful application of AI is combining live telematics data and labelled data – data that has been tagged with one or more labels identifying certain properties or characteristics or classifications. This allows fleet operators to go beyond predictive maintenance to identify, for example, when a component, engine or battery is going to fail. A system can be trained with the historical data of past failure incidents in combination with rich, live data feeds from the fleet (e.g. the temperature of the vehicle, battery discharge rates etc). This gives fleet operators the power to build predictive models for each vehicle's lifespan. Further, despite surges in EV and hybrid adoption, planning when it is financially viable is key to smart decision making.

Fleet managers are already profiting from the speed and quality of decision-making provided by data, AI and ML and they have only just scratched the surface. Fleet data is becoming more connected, use cases for AI and ML techniques are becoming broader, and the technology is becoming more accessible. Their importance will only continue to grow.

David Savage is regional manager of Geotab for the UK & Ireland. ■

HOW VEHICLE CCTV SYSTEMS ARE CUTTING COSTS AND SAVING LIVES

Emily Hardy of Brigade Electronics discusses how vehicle CCTV is not only cutting insurance costs for fleet operators but also helping to prevent crime and save lives.

Vehicle CCTV has become increasingly popular in recent years, with the technology being utilised across many sectors including bus networks, delivery fleets and emergency vehicles.

As well as helping to support driver training, there are other benefits to installing vehicle CCTV, including:

- Proof against insurance claims such as 'crash-for-cash' scams
- Providing protection for drivers who may have been wrongly accused as the cause of an incident
- Providing irrefutable evidence in the case of accidents and legal proceedings
- Encouraging driver best practice, resulting in less vehicle damage and fewer accidents
- Deterring vandalism
- Providing peace of mind for passengers and drivers.

How does vehicle CCTV improve safety?

Bad driving poses a risk to drivers themselves as well as other road users. To qualify as a lorry, bus or coach driver, excellent driving skills and road safety knowledge are essential. Drivers must be able to concentrate for long periods and be prepared to work alone for lengthy stretches.

Vehicle CCTV can provide drivers with a bird's eye view of their vehicle, allowing them to see areas they cannot from the cab. Live images can be streamed directly to the driver covering the front, rear and each full side of the vehicle – including that all-important near-side. It can also incorporate warning alarms, which sound an alert

should a person or vehicle move into a blind spot, or if the driver is getting close to an object while manoeuvring at low speeds.

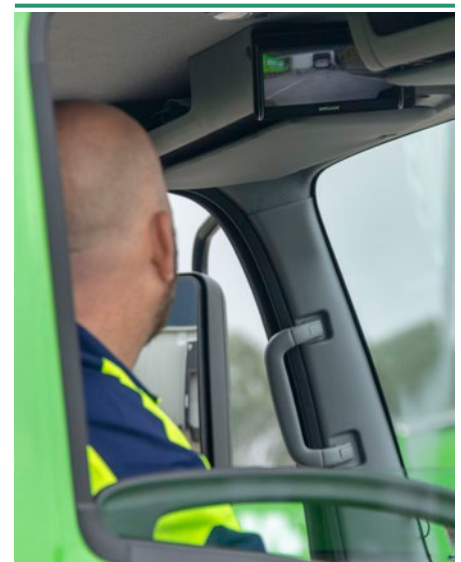
In the event of an incident, the footage can be used as evidence and helps to protect drivers if there are conflicting reports.

Vehicle CCTV can also help to reduce insurance premiums. HGV and other commercial vehicle operators suffer from high insurance premiums and when accidents involve trucks, buses or heavy machinery, the temptation is to blame the larger vehicle; often simply because it's bigger and can be viewed as more intimidating. Yet an American study showed that only 20% of accidents involving trucks were due to drivers' movements or loss of control, while 50% were due to car drivers' encroachments such as tailgating, suddenly slamming on brakes or veering into a truck's lane due to reckless or distracted driving.

Having recorded footage when there are conflicting reports of events or being able to prove a staged accident means companies can make major cost savings in the long-term. More importantly, they can also support their drivers, who are often the subject of increased scrutiny after an incident.

By giving the driver a clear view around their vehicle and recording activity, these types of camera safety systems enable HGV drivers and plant operators to move and drive safely and prevent accidents. As fewer accidents mean fewer claims, installing safety equipment can reduce insurance premiums.

They can also help to cut crime. Incidents involving vehicles are time-consuming issues to resolve. As mentioned, a lack of solid evidence can often mean companies automatically accept liability in the event of an incident. However, easy settlements have



led to an increase in cases against those operators, which quickly become known as a 'soft target' for further similar claims.

Having a vehicle CCTV system not only helps to refute these claims, but also deters the perpetrators of false claim crimes from targeting your vehicle in the first place. Clear and visible warning stickers on vehicles that have been fitted with vehicle CCTV have also proven to be an effective tool for tackling this issue and discouraging culprits.

While tough monetary decisions need to be made, it's clear this technology should be embraced as an opportunity to not only reduce risk and enhance road safety for drivers and road users, but also lower costs for the whole industry through reduced insurance premiums. It is estimated that fitting cameras to be five times worth the investment over a five-year lifecycle, so although the short-term outlay might be deemed to be costly, there are financial benefits to be gained in the long-term.

Emily Hardy is Brigade Electronics' marketing manager ■

CONTINENTAL LAUNCHES COMMERCIAL VEHICLE ON BOARD WEIGHTING SYSTEM

Technology company Continental has launched an on board weighting system (OBWS) that records and displays the weight of commercial vehicles, including trailers and semitrailers, before starting a trip.

Continental adds that its functionality makes it possible to increase efficiency far beyond the specifications of EU Directive 2015/719, which go into effect in May 2021.

The directive requires EU Member States to measure the gross vehicle weight of commercial vehicles more frequently. In order to plan accordingly and prevent sanctions, drivers and fleet operators must already know the load condition of a vehicle before starting a trip. So far, this has been almost impossible and poses challenges for vehicles for which the semitrailer is usually provided by the forwarder.

Most EU countries currently rely on a stationary solution to meet the new requirements, but the OBWS goes further than the regulations: "Even if the load is measured by sensors in the road in the future, the integrated solution will remain interesting for forwarding agents, fleet managers and drivers," said Marc Leinemann, a technical project manager at Continental involved in the development of the OBWS.

Before a truck drives off, fleet operators and drivers can check whether the weight of the vehicle is within a safe range, which means vehicles can be loaded more efficiently and safely. In addition, it can serve as a basis for new business models, for example with load-dependent transport tariffs, according to Continental.



Continental has developed OBW solutions that take into account the varying requirements of fleets, including chassis with air suspension and steel suspension.

For example, Continental has developed a sensor for vehicles with air suspension, which uses ultrasound to measure the height and pressure of air springs in order to determine the axle's load condition. On the same basis, a height sensor has been developed for shock absorbers for vehicles without air suspension. The suspension travel of the shock absorber provides information on the

load condition of the respective axle. The strain sensor from Continental is also suitable for steel and air-sprung axles. It measures the strain of the axle body and thus enables the load to be calculated. The sum of the axle loads results in the vehicle weight including the load.

In all four cases, the data gathered is collected, forwarded and evaluated, and the results are finally displayed via an app on the driver's smartphone or on a display in the driver's cab. Fleet managers can also retrieve the data and optimise the utilisation of their fleets. ■

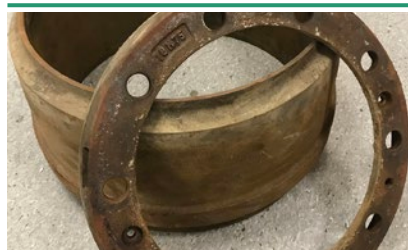
OPERATORS WARNED ABOUT DEFECTIVE AFTERMARKET BRAKE DRUMS

Operators are being warned about seriously defective aftermarket brake drums that may be fitted to Scania P400 lorries within their fleet.

The DVSA made the warning after two cases where aftermarket drums, which were not manufactured or supplied by Scania, have failed on P400 lorries. Both lorries were left without front braking and were fully laden.

The drums failed in the same way when the braking surface fractured and separated from the mounting ring. It is believed that this was not due to normal wear and tear.

The DVSA has been unable to identify the manufacturer. Mark Grant, Services



Director for Scania (Great Britain) Ltd, said: “As a safety-critical item, I would... strongly urge operators to always contact their local Scania dealer whenever the time comes to replace any component within their vehicles’ braking system.”

The DVSA has asked for operators to let them know if they have similar drums fitted to their lorries and their supplier by emailing vsb@dvsa.gov.uk.

RULES UPDATED ON WEARING FACE MASKS IN WORKSHOPS

People working in commercial vehicle workshops have been warned that they may have to wear face masks following the introduction of new rules by the government.

Jagjeet Virdee, managing director of health and safety in the commercial vehicle workshop specialists Inspire International, explained why it is applicable for the industry: “If you are a commercial vehicle dealership your business falls under the Standard Industry Classification code 4510 and 4530 and this means, following the new rules introduced today [September 24], that it is now compulsory for your customer facing employees to wear a mask or face shield within your workplace.

“The new rules will apply to customer facing employees only – if you are dealing with customers face to face or cannot socially distance. In addition, the rules apply for any employees crossing an environment within the dealership where customers are present.

“Commercial vehicle directors/managers will need to update their Covid-19 risk assessment with these new arrangements and educate employees, ensuring the new rules are correctly enforced to avoid government inspections which could result in fines. Although yet another challenge for the industry in what has been a difficult six months, I have no doubt commercial vehicle dealerships will continue to adapt and remain fully compliant.” ■

SQUARELL INTRODUCES TOOL TO GIVE INSIGHT INTO VEHICLE CONDITION

Dutch vehicle data provider Squarell has launched a new product that gives real-time insight into a vehicle’s condition to allow for timely intervention and maintenance of vehicles and lead to efficient operational management. Advanced Tell Tales offers fleet managers a direct insight into the technical condition of the vehicle and its operation by the driver, enabling them to act on issues faster. Monitoring warning signals could include recalling the vehicle for immediate maintenance or alerting the driver. This saves costs, such as repairing engine damage or towing the vehicle. Safety can be ensured via warnings



about low tyre pressure, critical fluid levels or a brake system in need of maintenance. The performance of the transport company increases through improved reliability, continuity of service and therefore reduced loss of revenue.

The Squarell Advanced Tell Tales solution consists of up to 64 warning signals and is available for Euro 6 trucks and buses.

Existing users of Squarell equipment can easily expand by performing an OTA update. ■

MICHELIN EXPANDS TRUCK TYRE RANGE

Michelin has extended its X Multi truck tyre range, with the addition of new multi-position and drive fitments and introduced two new high load carrying capacity tyres primarily for logging trucks and crane-mounted tractor units.

The new 315/80 R22.5 X Multi Z and D replace the equivalent size X MultiWay 3D tyres and have been launched to meet market demand, according to the company.

Michelin says these tyres, aimed at regional haulage company, can increase mileage potential by up to 15% new multi-position tyre, which is most commonly fitted to steer axles, and up to 10% for the drive tyre.

The X Multi Z features a self-regenerating tread called Regenion, which delivers grip in all conditions and throughout its working life. Other technologies include InfiniCoil, a continuous steel wire wrapped around the tyre to improve mileage potential and fuel efficiency, and Forcion, a new material that helps to increase mileage potential and also improve resistance to abrasions, cuts, chunking and chipping.

The X Multi D tyres also have Regenion technology within the tread, along with Powercoil – strong steel cables which ensure a lighter casing and contribute towards the drive tyre's longevity and lower rolling resistance.

Michelin have also launched the 385/65 R22.5 X Multi HLZ and X Multi HLT – high load carrying capacity tyres aimed at operators of crane-equipped tractor units and tandem-axle trailers.

The new X Multi HLZ stands has 10 tonnes per axle load carrying capacity while delivering a potential mileage increase of 30% compared to the equivalent size X MultiWay HD XZE it replaces, according to Michelin.

Designed for all types of road generally encountered in regional and nationwide haulage, they feature a special compound in the tread that enables the original grooves to be shallower, while also permitting superior mileage performance.

The X Multi HLT for load-bearing trailer axles provide additional load carrying capacity at a time when tri-axle trailers in specific applications are increasingly making way for tandems.

This trailer tyre can carry the equivalent of an extra tonne per axle, while its tread incorporates Regenion and Carblion technologies for a longer life. Michelin projects up to 25% additional mileage potential compared with its predecessor, along with a lower rolling resistance.

All new X Multi tyres feature 3PMSF (3 Peak Mountain Snowflake) markings on the sidewall, after passing tests in defined snowy conditions. Even when worn to just 2mm of remaining tread depth, the tyres continue to enjoy 3PMSF certification.

Like all Michelin truck tyres, they can also be regrooved and retreaded. ■



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FLEETS WARNED ABOUT EXTENDING REPLACEMENT CYCLES



Fleets extending replacement cycles in the wake of the coronavirus crisis have been warned to consider the impact from a service, maintenance and repair (SMR) angle.

epyx, which provides the Ilink Service Network SMR platform, says that the SMR profiles of many vehicles often involves considerable extra expense in years four and five.

Debbie Fox, commercial director (pictured), explained: "It seems like an obvious gain to defer replacing vehicles because it looks as though you are saving money when budgets are under pressure.

"However, the truth can be different. If you examine the cost of SMR over time, it tends to rise quite quickly as the vehicle ages."

According to industry SMR data, she said, this especially occurred around the point of the first MOT at three years, which was also where the warranty ended for most major manufacturers.

"There are several reasons for this and the picture does vary quite considerably when you look at different models and mileages, but you may find that you will have to buy a complete set of tyres or pass the point at which a major scheduled service is due. For some vehicles, there may even be relatively expensive one-off costs such as the replacement of a timing chain."

It was potentially prudent to consider looking at extending replacement cycles but, if the object was simply to save money, then a new vehicle or lease could be cheaper, Fox added. "Really, the important thing is to do the maths and work out which option results in the lower cost." ■

ADL BUS RECEIVES ULTRA LOW EMISSION CERTIFICATION

Alexander Dennis Ltd's (ADL) zero-emission capable Enviro400ER double decker has been fully certified as an Ultra Low Emission Bus by the Low Carbon Vehicle Partnership.

The ADL Enviro400ER is an electric range hybrid capable of running in zero-emission mode for up to three miles. Developed in partnership with BAE Systems, it uses an electric driveline for smooth acceleration and braking. Powered by a 32kWh battery and charged by an on-board generator, the Enviro400ER delivers zero emissions without any dependency on additional external charging infrastructure. Alternatively, it can be charged externally through an industry standard plug-in connection.

The Enviro400ER has now been fully accredited as an Ultra Low Emission Bus by the Low Carbon Vehicle Partnership, saving 31% well-to-wheel greenhouse gas emissions over the UK Bus Cycle compared to a Euro VI diesel bus of equivalent passenger capacity.

The test also confirmed a significant theoretical zero emission operating range for the Enviro400ER, although subject to operational factors this will be limited to up to three miles at a time to ensure the vehicle can self-charge for repeated zero-emission operation without causing spikes in NOX emissions.

Ken Scott, group engineering director at ADL, said: "Capable of zero-emission operation, the Enviro400ER delivers immediate carbon savings and air quality benefits that can be further enhanced by the stepwise introduction of charging infrastructure." ■



KUEHNE+NAGEL PUTS LNG TRUCKS ON THE ROAD

Global logistics provider Kuehne+Nagel has put eight new Volvo FH Globetrotter LNG (liquified natural gas) tractor units into 24/7 operation as part of a drive to reduce emissions and improve the sustainability of its transport operations.

The Volvos are the first from the Swedish marque to enter Kuehne+Nagel's UK fleet, following the firm's participation in the Innovate UK-funded 'Dedicated to Gas' project. They will work on two major contracts with Whitbread and Costa.

Supplied by Volvo Truck and Bus Centre East Anglia, the 6x2 pusher-axle tractors feature 155 kg LNG tanks and have 12-speed I-Shift automated transmission. The specification also includes the latest generation I-See predictive cruise control system, which analyses the topography to optimise speed and gear changes.

To read the full story, [click here](#). ■



AMAZON MAKES HUGE ELECTRIC VAN INVESTMENT

Internet retail giant Amazon has announced that it is to add 1,800 electric Mercedes-Benz vans to its European deliver fleet this year.

Amazon's Delivery Service Partners will have access to the new fleet of zero-emission vehicles to make deliveries to customers in Europe this year.

The order is the largest Mercedes-Benz has received for electric vehicles to date. More than 1,200 EVs in the order will be the eSprinter, while the remaining 600 vehicles will be the manufacturer's midsize electric van, the eVito, to give Delivery Service Partners operating in geographies that require a smaller-format vehicle access to a zero-emissions delivery option.

For more information, [click here](#). ■



CLANCY GROUP INVEST IN 500 MERCEDES-BENZ VANS

Utilities contractor Clancy Group has taken delivery of more than 500 Mercedes-Benz vans, which are now supporting a range of well-known service providers.

The vehicles are operated by Clancy Plant and are now working on contracts held by other Group divisions, whose customers include many leading utility providers. They wear several different liveries, some of which bear the names and logos of businesses Clancy Group supports.

The 553 units delivered include 445 3.5-tonne Sprinter 316 CDI panel vans and chassis cabs, the latter being fitted with tipping or dropside bodies, or access platforms. Midlands Truck & Van



has also delivered 84 Vito vans, 20 Citans, and four X-Class pickups.

Most of the Sprinter panel vans were specified with 7G-TRONIC PLUS automatic transmissions, to make life easier for drivers working in urban environments. They are equipped with compressors and generators by On-Board Power of Liversedge, West Yorkshire.

To read the full story, [click here](#). ■

TEN NEW DOUBLE-DECK ELECTRIC BUSES HIT COVENTRY ROADS



Transport group National Express has put 10 new BYD ADL Enviro400EVs electric double-deck buses into operation in Coventry, linking the city centre and University Hospital.

The buses, produced by electric vehicle partnership Alexander Dennis Ltd (ADL) and BYD Europe, are part of a wider investment in 29 zero emission Enviro400EVs by National Express. Built to National Express's Platinum standard, the 10.9m long Enviro400EVs offer extra legroom for up to 65 seated passengers as well as USB chargers and free wi-fi. An advanced heat pump system ensures that saloon heating power is supplied efficiently from the main batteries without unduly impacting operational range.

The 382kWh BYD Iron-Phosphate batteries on each vehicle are maintained by Zenobe Energy, an owner-operator of mobile and stationary batteries, which provides them to National Express along with the charging system at the depot and a software platform that helps monitor and optimise energy use.

To read the full story, [click here](#). ■

IVECO RELAUNCHES DRIVEAWAY BODYBUILDER PROGRAMME

Truck manufacturer Iveco has relaunched its Driveaway bodybuilder programme, which means it has a diverse range of immediately available vehicles in its Daily range.

Iveco has forged partnerships with several specialist vehicle bodybuilders to supply its UK dealerships with ready-for-delivery solutions, catering for a wide range of missions. All models will be priced as complete vehicles to simplify the buying process and come with Iveco's unlimited mileage three-year warranty.

Examples of vehicles offered through the Driveaway scheme include 3.5t twin-wheeled drop-



sides and tippers, 3.5t single rear-wheeled Luton vans, and 7.2 tonne box and curtain-side vehicles.

Vehicles can be specified with other auxiliary equipment such as column or tuck-away tail-lifts and gross vehicle weight-dependent, are available on a range of wheelbases from 3,450 to 5,100mm.

To read the full story, [click here](#). ■

For all the latest news on truck and van launches, model updates, news for operators and drivers from around the sector and fleet news, visit [The Truck Expert](#) and [The Van Expert](#).



ELECTRIC AVENUE

Scania has launched its first production fully electric and hybrid trucks – and these are just the first in a long-term plan to bring electric trucks to the marketplace.

As the drive towards alternative fuels for commercial vehicles gathers pace, Swedish truck manufacturer Scania has revealed its commitment to electric and hybrid electric power with the launch of its first series production range of fully electric and plug-in hybrid P- and L-series rigid trucks.

The P- and L-series trucks are aimed at operators working in urban areas and low-emission city centre zones, and the addition of electric and hybrid power gives another benefit to operators, Scania says.

This launch is part of Scania's commitment to achieving a fossil fuel-free commercial transport system. Scania has already committed to cut CO₂ emissions from its own operations by 50% by 2025 and reduce emissions from its products while they are in use by 20% during the same period.

ELECTRIC TRUCK

Scania's fully electric truck comes with either a 165 or 300kWh battery pack to power its 230kW electric motor, equal to

about 310hp. In 300kWh format, a range of up to 250km can be achieved on a single charge.

Five batteries are used for 165kWh, with nine batteries employed for 300kWh. With the combustion engine removed, one battery is placed in the former engine tunnel with the remaining four or eight batteries placed along the chassis side.

The batteries can be charged by 130kW DC using a Combined Charging System connector. The charging time is less than 55 minutes for the five-battery option and less than 100 minutes for the nine-battery option.

“We are convinced that progressive customers will be eager to lead the way into electrification by taking the initial steps to future-proof their fleets”

In addition, the batteries are continuously charged in motion through regenerative braking energy.

Other components needed for fully electric propulsion, such as battery management units, battery cooling components, electrohydraulic steering system, electric air compressor and inverter are mounted along the chassis frame.

Scania add that the electric motor gives drivers better controllability compared to a traditional combustion engine, which is experienced this through faster acceleration and response from the powertrain.

The truck is equipped for a fully electric power take-off. Instead of connecting auxiliaries to the interface usually located on the gearbox or engine, they are instead connected to an electrical connection box, called a DC box, mounted on the chassis. This gives a DC link of up to 60kW power take-off for body auxiliaries such as refrigeration systems and hooklifts.

PLUG-IN HYBRID TRUCK

Scania’s plug-in hybrid truck can travel long distances in combustion engine mode and up to 60km in electric mode as required. Combined with renewable fuel, Scania’s plug-in hybrid enables operators to significantly reduce their environmental impact.

As the plug-in hybrid truck has a combustion engine, the space for batteries is less than the fully electric truck. It has three batteries for an installed capacity of 90kWh for its 115kW electric motor. The charging time from zero to 80% is about 35 minutes. In addition to charging via regenerative braking energy, battery power can also be topped up during loading and unloading. The electric powertrain is combined with combustion engine options ranging from 280–360hp.

Scania is aiming the plug-in hybrid at urban transport operations for applications such as goods delivery, refuse collection, tipper trucks, hooklift trucks, as well as secondary support vehicles for the emergency services.

Vincente Connolly, UK sales director for Scania (Great Britain) Ltd, says that the plug-in hybrid can enable operators to gradually expand their fleets to include a greater proportion of electric vehicles. “As clean air zones become more prevalent, they will also open up opportunities for operators based around cities looking to travel in for work.”

SUPPORT

To support early adopters in the UK Scania will initially be creating a series of regional servicing hubs strategically located throughout the UK. As uptake increases, additional servicing points will be added according to demand.



Scania's hybrid truck while charging



SCANIA ELECTRIC AND HYBRID TRUCKS

“We are convinced that progressive customers will be eager to lead the way into electrification by taking the initial steps to future-proof their fleets,” says Connolly. “In major transport companies with large fleets, implementation gives them an early opportunity to gain experience in this area. Meanwhile, we know that large transport buyers are interested in reducing their carbon footprint.”

Connolly added that the plug-in and fully electric trucks provide opportunities for increased vehicle utilisation. “With silent deliveries, transport services can be extended well into the night and early mornings, avoiding traffic congestion and parking difficulties. Studies show that off-peak deliveries can be more than 30% quicker than on equivalent daytime transport routes thanks to simpler parking at delivery points, less queuing, higher speeds and more frequent green lights at intersections.”

LONG-TERM COMMITMENT

This is the first announcement in a wider commitment to electric-powered vehicles. Scania’s President and CEO, Henrik Henriksson, added: “It is with a great deal of pride that we announce the start of Scania’s long-term electrification commitment.”

He added that Scania will now annually launch electric versions across the company’s entire range. “We are presently reorganising our production towards that end,” he said. “Of particular significance is that in a few years’ time we will also introduce long-distance electric trucks adapted for fast-charging during drivers’ compulsory 45-minute rest periods.”

Scania says that in the mid-term, it expects that the total cost of ownership of battery-powered heavy distribution trucks will be comparable with vehicles powered by fossil fuels, while batteries will become less expensive, and their service life will grow. The company says this paves the way not only for electrified distribution trucks but also, in few years’ time, for long-distance electrified operations.



Scania's electric truck on the road



The Combined Charging System connector on Scania's plug-in hybrid

“It is with a great deal of pride that we announce the start of Scania’s long-term electrification commitment”

However, the company notes that electrification will only take off if there is public investment in charging infrastructure and development of the energy grid.

Connolly added that the launch marks a significant step in Scania’s development. “Over the coming years, we will continue to develop our range of electrified vehicles for all applications, including long-haulage and construction.

Electrification of the heavy commercial truck fleet is decisive in reaching the Paris Agreement target of limiting global warming to well below 2°C. E-vehicles will therefore increasingly become an attractive option and we will, in the initial stages, develop and deploy hybrid and fully electric trucks in partnership with progressive operators who share our ambition and commitment to sustainability.” ■

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ZERO TO HERO

Volta Trucks launched what it claims is the world's most sustainable truck in September. The company's CEO, Rob Fowler, spoke to *CVE* ahead of the launch about the Volta Zero and how the company is breaking the mould in truck manufacturing. By Dan Parton

Volta Trucks is a company in a hurry. In just 18 months, the Swedish start-up has gone from conceptualising its zero-emission truck designed for urban work, the Zero, to launching a fully functioning prototype.

But, as Volta Trucks' CEO, Rob Fowler, explains, speed is necessarily of the essence. "We want to make sure we can get change and offer a zero emissions solution as quickly as we can," he says. "There is no point doing this to deliver [a truck] in 2030 as there will continue to be environmental damage until that point. So we can want make a contribution by moving quickly, that is one of the core principles of the business."

The Zero is marketed as the world's first purpose-built full-electric 16-tonne commercial vehicle. It has been designed specifically for inner-city parcel and freight distribution.

"In the long-term, regulation is going to come forwards that restricts operators in city centres," says Fowler. "Operators need to be able to continue to service city centres because they need freight; whether it is a bar, restaurant, retail or offices nearly everything you interact with has been delivered by a larger commercial vehicle.

They are part of the lifeblood of cities and logistics companies."

This is where zero-emission trucks such as the Zero will come into their own. The Zero will offer a pure-electric range of 150-200kms (95-125 miles). Fowler is quick to point out that this figure is a real-world range – it has been validated using simulations with a full payload. "We don't want to go out and declare we can do 250km and only deliver 150km," he says. "We are very confident on the real-world data we are putting out. I understand from an operator's perspective, getting what you are told you are getting is crucial."



Rob Fowler, Volta Trucks CEO



Rip it up

As a start-up Volta Trucks' team took a fresh look at not just how trucks are powered but how they are built – unencumbered by past designs and ideas of how things should be done.

“We get to do things as we see it, which is exciting for us,” says Fowler. “But we have some experienced heads from around the automotive industry around us to make sure we are deliverable in what we are doing.

“If you look at the design of commercial vehicles, particularly large trucks, they haven't fundamentally changed since they were created; you put a big diesel engine in the front, you put the driver up in the air. So we used this [Volta Zero] as an opportunity to not just think about electrification but the design as well in general with a focus on making sure we have hopefully the safest commercial vehicle on the road but also giving the driver a great experience. We want to make the driving experience to be different; easy to get into and out of, good visibility around the cab, comfortable environment, not just effectively building the same truck everyone else has built for the last 30 years.”

One of the most obvious differences to other trucks is where the driver sits – in the centre of the cab. “It is all about visibility around the vehicle,” explains Fowler. “We provide a 220-degree field of vision around the vehicle. That is part of the objective of building an incredibly safe commercial vehicle. By having 220 degrees, [and] a lower seating position at 1.8 metres the driver is at comparable height to pedestrians and cyclists, it helps form that relationship between driver and pedestrian, it also reduces blind spots around the vehicle considerably, which is very important. It also allows access and egress on both sides of the vehicle so stops drivers having to step into rows of traffic. We can still provide three seats, but it allows the driver to move from side to side in the vehicle. The feedback from drivers driving it has been very positive.”



The Volta Zero has a central seating position and internal mirrors





Sustainability

A key point of difference for Volta Trucks is sustainability – and not just in terms of zero emissions. The truck is billed as the most sustainable on the market, and this has meant innovating in the design of the truck and the materials used to build it. For example, some body parts are made from a flax composite material, which is used in 16 of the world's most competitive motor racing series. The Zero is the first truck to include it.

“The flax composite panels are great. They are grown in a field and therefore it makes them much easier to recycle at the end of the lifecycle,” says Fowler. “It is about trying to reduce impact where you



Close-up of the flax composite used in the panels of the Volta Zero

“The flax composite panels are great. They are grown in a field and therefore it makes them much easier to recycle at the end of the lifecycle”

can across your footprint. The panelling is great in the way it has been put together, sourced and disposed of. We can use this panelling in non-structural areas without creating problems for ourselves.”

Likewise, the battery has been designed with sustainability in mind – it contains no precious metals, being made from lithium iron phosphate, eliminating the associated sourcing issues that come with those.

“The battery has long life cycles, plenty of discharges without a problem, robust cell design, stability and safety,” says Fowler. “We are comfortable we have created a battery that is suited for the use case we are working to combined with good quality processes in the supply chain too. we can get the performance we need but also meet the sustainability objective we have as a business.”

The supply chain is also an important part of Volta Trucks' sustainability journey. “We are spending a lot of time talking to suppliers about how they source materials and put their products together,” says Fowler.

“There is no reason we can't clean up our supply chain, and long-term a key piece for our business is ensuring that our supply chain has quality credentials coming into it.

“It is very much in the mindset of the technical team in particular – as well as the rest of the business – that sustainability is a key piece.”

Complete package

As well as sustainability, delivering customers a complete package is crucial. As is becoming common with truck manufacturers, it isn't just about selling customers a truck, it is about delivering a range of products and services, including the charging infrastructure, data package, driver training, maintenance and services. “Basically, you get a truck, but we can do everything to make that truck work for you; it is an enabler for people,” says Fowler. “Volta Trucks can turn up with everything you need to go electric.

“We engage with customers and understand their challenges around electrification and how our solution fixes those problems for them. My point is, as an operator you want to concentrate on operating and leave the rest to us.”

Trials

Following the launch, Volta Trucks will conduct trials of the Zero with selected customers such as DPD in the first half of 2021. “That is about making sure the product we are offering is fully refined – where can we learn from them? How can we understand what they are doing and want to use the vehicle? It is all about making sure we have a product that is right for them,” says Fowler.

The trials will be conducted with a view to moving to production in 2022 and Volta has a target of making 500 trucks in 2022. “We are already taking orders on 2022 vehicles, which shows the strength of demand,” says Fowler. “We were taking orders even before we unveiled the prototype.”

DESIGN FOR URBAN LIFE

The Volta Zero has been designed for the urban delivery market – for operators working in congested and polluted towns and cities.

Its zero-emission engine has been geared towards compliance with the ever-more stringent emission rules that cities around the UK are planning to introduce in the coming years.

It has also been built with an eye on other legislation, such as the Direct Vision Standard. For instance, drivers have 220-degrees of direct vision around the vehicle. This view through a glasshouse-style cab is designed to deliver a Transport for London five-star Direct Vision Standard rating for optimum visibility and the reduction of blind spots.

In addition, the Volta Zero has rear-view cameras rather than traditional mirrors – something currently only seen on certain Mercedes-Benz trucks – a 360-degree birds-eye camera showing the driver their complete surroundings, and blind-spot warning systems that detect objects down the sides of the vehicle.

The driver also sits far lower than in a conventional truck, with their eye-line at 1.8 metres, about the height of pedestrians and other road users nearby for easy visual communication.

Volta Trucks add that the cabin has been designed to minimise cognitive overload for the driver. For instance, the central display conveys critical information while touch screens on each side are used for lights, climate control, navigation and trip planning, communication and in-cab media. Volta say the aim is for the driver's workspace environment to be more akin to a premium car than today's perception of a traditional commercial vehicle.

Drivers will also benefit from advanced driver aids such as active steering, road



“By 2025, we aim to have saved around 180,000 tonnes of CO₂ from the atmosphere”

sign assist, reversing assistant with reversing camera, lane change assist and lane departure warning systems. The driver also benefits from a technical status monitoring system, based on artificial intelligence, that avoids breakdowns and maximises the uptime of the vehicle.

Optimised payload

But the Volta Zero is also practical and has been designed to optimise its load-carrying capacity. The principle is that thanks to its overall design, the Volta Zero can operate in narrow city streets and undertake the role that three or four 3.5-tonne vehicles would ordinarily do.

It offers a payload of 8,600kgs, with an overall volume of 37.7m³ and is designed to accommodate 16 Euro pallets.

A refrigerated cargo box will also be available, without reducing overall volume as a result of the vehicle design. Volta Trucks will integrate the use of the vehicle's battery for the cooling and refrigeration unit of the cargo box that's normally diesel-powered, thus further reducing CO₂ or particulate emissions from commercial vehicle operations.

As with other commercial vehicles, the Volta Zero is limited to a top speed of 56mph.

Due to its electric powertrain, the Volta Zero has 90% less mechanical parts than an equivalent internal combustion engine vehicle. As a result, Volta Trucks is targeting the same total cost of ownership as equivalent diesel-powered vehicles, providing a further incentive towards the migration to electric vehicles.

Innovation

At launch, Volta Trucks will be the first full-electric large commercial vehicle manufacturer in Europe to use an e-Axle to drive the rear wheels, rather than the conventional electric motor and driveshaft set up used by the small number of other electric truck manufacturers. The single electric motor, transmission, and axle of the Volta Zero are contained in a lightweight and compact e-Axle unit that is lighter and more efficient, delivering an increased range as a result. It also provides packaging benefits by freeing up space between the chassis rails. This is where Volta Trucks fits the battery of the vehicle – the safest possible location, according to the company.

Volta Trucks has also been innovative in its construction; the Zero will be the first road vehicle to use a sustainably sourced natural Flax material and biodegradable resin in the construction of exterior body panels, with the cab's dark body panels and many interior trims constructed from the natural material. The high-tech Flax weave was developed by Bcomp of Switzerland, in collaboration with the European Space Agency, and is currently used in 16 of the world's most competitive motor racing series.

The Flax fibre's quality, yarn thickness and twist are all highly engineered, and the weave is reinforced by Bcomp's patented powerRibs grid technology. The result is an extremely lightweight, high-performance fibre reinforcement that is almost CO₂ neutral over its lifecycle.

The Flax matting is then combined with a biodegradable resin produced by UK-based composites manufacturer Bamd to produce the body panels for the Volta Zero. The fully bio-based resin, derived from rape seed oil, creates a naturally brown coloured matting. A black natural pigment dye is added to complete its darker, technical appearance.



Battery power

Meanwhile the Volta Zero will use 160-200kWh of battery power from lithium iron phosphate batteries, which are well suited to large commercial vehicle use, the company says. It delivers a long cycle life, robust cell design and good thermal stability, enhancing safety. Located between the chassis rails, the battery is as far away from an accident as possible. Should the vehicle be involved in a significant accident that punctures a battery cell, the lithium iron phosphate battery is very stable and does not ignite.

In addition, lithium iron phosphate batteries contain no precious metals, eliminating the associated sourcing issues of those materials. And at the end of its life a lithium iron phosphate battery can be recycled and reused as an energy storage device.

Another advantage of the lithium iron phosphate battery is that it will be highly modular, enabling Volta Trucks to adapt the vehicle to an operator's specific requirements.



“By 2025, we aim to have saved around 180,000 tonnes of CO₂ from the atmosphere – the equivalent annual CO₂ usage of 24,000 houses – and improved inner-city air quality by emitting no pollutants. But for Volta Trucks, sustainability is much more than just tailpipe emissions,” says Fowler. “We take an environmental-first approach to all material sourcing and will continue to strain every sinew to ensure we deliver on our mission of becoming the world's most sustainable commercial vehicle manufacturer.” ■



BRINGING THE NOISE

Scania has launched a new V8 range – including the most powerful production truck in Europe – with a host of innovations to make the trucks more fuel efficient than their predecessors. By Dan Parton

When Scania first launched its V8 engine back in 1969, it was the most powerful on the market at 350hp. Now, some 50 years later, Scania's V8 is back at the top of the power league, with the launch of its new 770 S V8.

The 770hp tractor is the highlight of the relaunch of Scania's V8 range, which will be also available in variants of 530, 590 and 660hp, and deliver fuel savings of up to 6% when combined with Scania's new G33CM Opticruise gearbox, according to the company.

Possibly the most eye-catching element of the relaunched V8 range is Scania's

new 770 S, which has 40hp more than its predecessor and 20hp more than the previous most powerful truck on European roads, Volvo's FH750.

But the increased power doesn't come at the expense of efficiency, and it has "significant" fuel savings compared to its predecessor thanks to new technologies, according to Göran Lindh, chief engineer for Scania's V8 engines. "It has a Selective Catalytic Reduction only after-treatment system, a robust, fixed geometry turbocharger and the same kind of single-bank exhaust manifolds as the other three V8s".

The shedding of some components and simplifying others has lowered the

weight by 75kg compared to the 730 S. Another new feature is that for increased responsiveness, the 770hp power unit has a unique, fixed geometry turbocharger with ball bearings rather than traditional journal bearings, the company says.

"The new single-bank manifolds actually come with a perk," explains Lindh. "Not only are they lighter and more efficient, but they also contribute to the distinctive V8 sound that so many Scania customers and V8 fans appreciate. It does not generate more noise, rather it is the result of how the exhaust gases are allowed to collide due to the firing order, and inside the manifold on their way out."

INCREASED EFFICIENCY

Another headline claim at the launch was that the new V8 range can deliver fuel savings of up to 6%, compared to their predecessors. Three percent of this comes from refinements to the engine, such as with the new Engine Management System (EMS), which enables a smarter and more advanced engine control software with higher accuracy. “We can, for instance, calculate more precisely how much fuel is needed, and when,” says Lindh.

The EMS interacts with the Aftertreatment Management System. Both are critical for meeting the current and coming Euro 6 regulations regarding nitrogen oxides (NO_x) and particulate matter – not only when the truck is new, but also over time as the legal demand is for at least seven years or 700,000km.

Scania has added a new solution where AdBlue fluid is injected twice; once directly after the exhaust brake, with a second dose at the regular position within the silencer itself. With the extra dosing, the evaporation of the AdBlue is improved during low load cycles as the temperature is higher near the outlet manifold. With the extra dosing, the aftertreatment strategy is improved and contributes to better fuel efficiency.

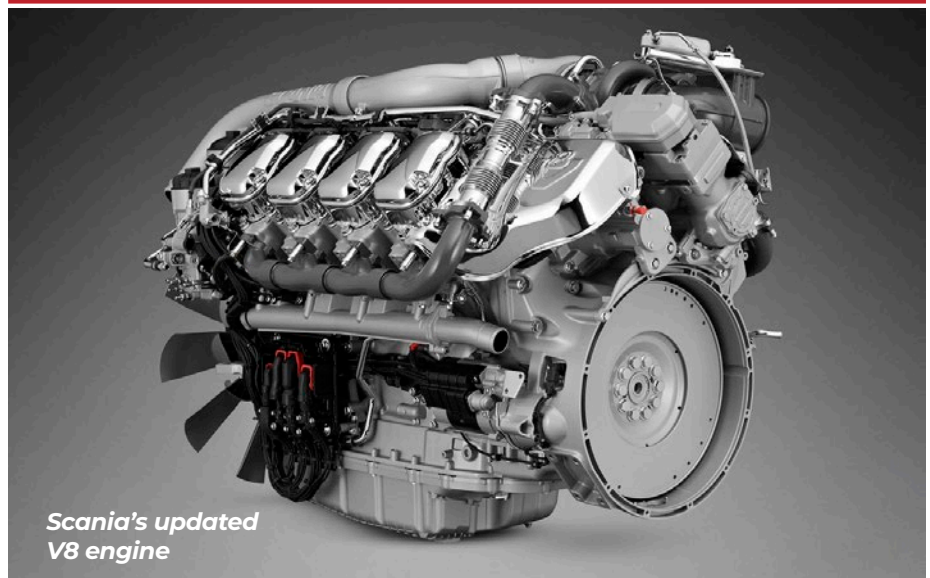
“We build upon Scania’s vast V8 experience and continue to improve what generations of skilled engineers have learnt, created and achieved before us,” says Lindh. “There are no quantum leaps, it is all about refining things and adding the latest technology.”

PRESSURE

The updated V8 range also features a new high-pressure fuel pump where the pumping elements are individually controlled via Active Inlet Metering. The overall pressure and inlet control are enhanced with improved diagnostics for increased uptime and performance. The new pump is also optimised for minimising engine oil consumption, and the compression ratio and maximum



Scania's 770 S V8 is the most powerful truck in Europe



Scania's updated V8 engine

“We build upon Scania’s vast V8 experience and continue to improve what generations of skilled engineers have learnt, created and achieved before us”

cylinder pressure have been raised to further improve combustion and fuel efficiency.

There have also been moves to reduce internal friction. While Scania say that the use of thinner, more effective modern oils is a factor they are not sufficient on their own; the engine itself must also be developed to capitalise on the possibilities:

“Raising the pressure and the power output requires that several components

inside the engine, including gears, pistons, rings, cylinder heads and valves, are refined and reinforced,” says Lindh. “This necessitates advanced fine-tuning and improvements to reduce internal losses, especially since we also wanted to extend maintenance intervals and strengthening durability. I am proud to say that we have managed to reconcile these somewhat conflicting objectives”.

“The Scania V8 has long been the preference of many here – it’s an engine which definitely stirs the emotions!”



NEW GEARBOX RANGE

Along with the new V8 range, Scania has launched a new range of automated manual transmission (AMT) gearboxes. The new range – the result of C400 million investment by the Swedish marque – will run under the well-established Opticruise brand and will ultimately replace all current automated Scania Opticruise gearboxes.

The gearboxes have a wider spread, which means they have 1% less fuel consumption and less noise compared to their predecessors. They also have lighter and improved gear-shifting, which handles up to 3,700Nm of torque.

The first member of the new range – G33CM Opticruise – will be found on Scania’s 500 and 540hp 13-litre engines.

“This introduction adds yet another vital Scania component to remaining highly competitive in ICE-based powertrains all the way up to 2030,” says Alexander Vlaskamp, executive vice president, head of sales and marketing, Scania. “The new gearbox range is a prime example of Scania’s technological excellence, bringing increased fuel and transport efficiency to our customers in a sustainable way.

“The development of a new range has been absolutely necessary,” adds Vlaskamp. “Our new gearboxes offer the improvements that are needed for more efficient and sustainable road transport in the coming decade. A core feature is the wider spread of ratios, making them better suited to meet our low-rev engines with extended economy-gearing and reduced fuel consumption.”

With sales commencing in October, the first version of the new gearboxes can be coupled with three of Scania’s four new Euro VI V8s and two inline six engines. The first vehicles with a G33CM-based Scania Opticruise solution will be produced in February 2021.

HEAVY LOAD

“Our V8 engine has a tremendous following and these new models are sure to attract interest from operators across a variety of sectors,” said Vincente Connolly, UK sales director for Scania (Great Britain) Ltd. “The range is ideally suited for heavy haulage customers and those working in the most arduous conditions, such as forestry and other on-off road applications.



Our V8 is also extremely popular among long-haul operations who run at high gross train weights for extended periods of time. Then, of course, there are operators looking to make a statement with a flagship model for their fleets.

“The Scania V8 has long been the preference of many here – it’s an engine which definitely stirs the emotions! – and the new range-topping 770hp variant is sure to raise the aspirational bar even higher.”

The 770hp unit will be available for production in late December with the 530, 590 and 660hp variants units following in February 2021. The first examples of the new engines are set to enter service in the UK during the first quarter of the year. ■



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FUTURE VISION

Daimler Trucks has revealed its strategy for the electrification of its vehicles and unveiled its hydrogen-based fuel-cell concept truck, the Mercedes-Benz GenH2 Truck, which, it is claimed, has a range of up to 1,000km.

By Dan Parton.



Laptops were focused on Stuttgart on September 16 when Daimler Trucks took the wraps off its striking new hydrogen-based fuel-cell concept truck in – as is normal these days – a slickly produced online launch presentation.

The launch of the concept truck, the Mercedes-Benz GenH2 Truck, was the highlight of a wide-ranging presentation, which included outlining Daimler Trucks' plans to electrify its commercial vehicle fleet in the coming years.

GenH2 Truck

Daimler Trucks plans to begin customer trials of the GenH2 Truck in 2023, with series production planned to start in the second half of the decade. By using liquid instead of gaseous hydrogen with its higher energy density, the vehicle's performance is planned to equal that of a comparable conventional diesel truck, according to Daimler Trucks.

Development engineers at Daimler Trucks have based the GenH2 Truck on the capabilities of the conventional Mercedes-Benz Actros with regard to tractive power, range and performance.

For example, the series-production version of the GenH2 Truck is to have a gross vehicle weight of 40 tons and a payload of 25 tons. Two special liquid-hydrogen tanks and a powerful fuel-cell system will make this high payload and long range possible, the company say.

Daimler Trucks says it prefers to use liquid hydrogen (LH2), because in this state, the energy carrier has a far higher energy density in relation to volume than gaseous hydrogen. As a result, the tanks of a fuel-cell truck using liquid hydrogen are much smaller and, due to the lower pressure, significantly lighter. This gives the trucks a larger cargo



Mercedes-Benz's hydrogen truck can run up to 1,000km

space and higher payload weight. At the same time, more hydrogen can be carried, which increases the trucks' range.

This means that the GenH2 Truck would be suitable for multi-day, difficult to plan long-haul transport and where the daily energy throughput is high. Previously, alternative fuels were not considered a rival to diesel for this given that none had anything approaching the range – or refuelling infrastructure – to compete.

Daimler Trucks is developing the tank-system technologies to make liquid hydrogen usable also in mobile applications as an energy source for series-produced fuel-cell trucks. The storage of cryogenic liquid hydrogen at -253 degrees Celsius is already common in stationary applications, for example in industry or at hydrogen filling stations. This also applies to the transport of liquid hydrogen as cargo.

The two stainless-steel liquid-hydrogen tanks intended for the series version of the GenH2 Truck will have a storage capacity of 80kg (40kg each) for covering long distances. The stainless-steel tank system consists of two tubes, one within the other, that are connected to each other and vacuum-insulated.

In the series version of the GenH2 Truck, Daimler says the fuel-cell system will supply 2 x 150kws and the battery will provide an additional 400kW temporarily. At 70kWh, the storage capacity of the battery is relatively low, as it is not intended to meet energy needs, but mainly to be switched on to provide situational power support for the fuel cell, for example during peak loads while accelerating or while driving uphill fully loaded. At the same time, the relatively light battery allows a higher payload. It will be recharged in series-production vehicles with braking energy and excess fuel-cell energy.

A core element of the operating strategy of the fuel-cell and battery system is a cooling and heating system that keeps all components at the ideal operating temperature, thus ensuring maximum durability. In a pre-series version, the two electric motors are designed for a total of 2 x 230kW continuous power and 2 x 330kW maximum power. Torque is 2 x 1577Nm and 2 x 2071Nm respectively.



How the Mercedes-Benz GenH2 Truck will look

eActros LongHaul

Daimler Trucks' ambitious plans for a future of long-haul trucks being powered by alternative fuels also includes a purely battery-powered long-haul truck, the Mercedes-Benz eActros LongHaul, which was also debuted in the presentation.

The eActros LongHaul is designed to cover regular journeys on plannable routes in an energy-efficient manner, with a range of up to 500km on one battery charge. Daimler Trucks plans to have the eActros LongHaul ready for series production in 2024.

Daimler Trucks says that it intends for the truck to be largely charged within 45 minutes – so drivers will be able to charge it when they take their legally-mandated 45-minute break after every 4.5 hours of driving. It will also be available in two- and three-axle form.

Daimler Trucks added that the charging infrastructure needed for the eActros LongHaul can be set up by the transport companies themselves at their depots. Another key component will be the opportunity to charge for range extension, for example, while unloading or loading when the electric truck is stationary. The company envisages that public charging stations along main transport routes will also become increasingly important – a nationwide charging infrastructure will maximise the operating range of battery-electric trucks. New, more durable batteries will also contribute to the competitiveness of battery-electric trucks, reducing total cost of ownership over a vehicle's lifecycle.

Additionally, it was announced that the Mercedes-Benz eActros for distribution transport, which was presented in 2018 and has been tested intensively since then by customers in everyday transport operations, will start series production next year.. The range of the series-produced eActros on one battery charge will significantly exceed that of the prototype's about 200km, the company added.



Mercedes-Benz eActros LongHaul, scheduled for production in 2024

ePowertrain

Daimler also announced a new worldwide modular platform architecture, the ePowertrain, which will be the technological basis of all medium- and heavy-duty CO₂-neutral, all-electric series-produced trucks from Daimler Trucks – whether powered by batteries or by hydrogen-based fuel cells. With the ePowertrain, Daimler Trucks plans to achieve synergies and economies of scale for all relevant vehicles and markets.

Martin Daum, chairman of the board management of Daimler Truck AG and member of the board of management of Daimler AG, said: “We are consistently pursuing our vision of CO₂-neutral transport with a focus on the genuinely locally CO₂-neutral technologies battery power and hydrogen-based fuel cells, which have the potential to succeed in the market in the long-term. This combination enables us to offer our customers the best vehicle options, depending on the application. Battery power will be rather used for lower cargo weights and for shorter distances. Fuel-cell power will tend to be the preferred option for heavier loads and longer distances.



Refuelling the eActros

“We are consistently pursuing our vision of CO₂-neutral transport with a focus on the genuinely locally CO₂-neutral technologies”

“With our alternative drive concepts from Mercedes-Benz – the GenH2 Truck, the eActros LongHaul and the eActros – and our electric trucks of the Freightliner and FUSO brands, we have a clear focus on customer requirements and are creating genuine locally CO₂-neutral alternatives for them.” ■



SAFETY FIRST

Volvo's latest truck generation, launched earlier this year, have a wealth of ADAS as standard.

Trucks are safer than ever thanks to a range of advanced driver assistance systems technologies that have added in recent years – but how do operators ensure that they are properly maintained? By Dan Parton

Truck safety has been a major concern for manufacturers and operators alike for many years and vehicles are safer than ever before thanks to a plethora of devices and driver aids that have been developed in recent years. Advanced driver assistance systems (ADAS) such as lane assist are now commonplace, and indeed will be required on new trucks by law in 2022.

The European Commission has stipulated that by 2022 new mandatory safety features will include:

- For cars, vans, trucks and buses: warning of driver drowsiness and distraction (e.g. smartphone use while driving), intelligent speed assistance, reversing safety with camera or sensors, and data recorder in case of an accident ('black box')
- For cars and vans: lane-keeping assistance, advanced emergency braking, and crash-test improved safety belts
- For trucks and buses: specific requirements to improve the direct vision of bus and truck drivers and to remove blind spots, and systems at the front and side of the vehicle to detect and warn of vulnerable road users, especially when making turns.

The Commission has said it expect that the measures will help save more than 25,000 lives and avoid at least 140,000 serious injuries by 2038. This also forms part of the EU's 'Vision Zero' long-term goal of moving close to zero fatalities and serious injuries by 2050.

The drive towards ADAS is a no-brainer: about 90% of incidents are down to driver error – such as inattention, distraction or tiredness – so any piece of technology or equipment that can help drivers avoid incidents is welcome. But, as John Comer, head of product management at Volvo Trucks, notes, it doesn't take away the driver's responsibility.

“With ADAS the approach is simple: the systems are there to support the driver, they do not remove the driver’s responsibility for his and other road users’ safety,” he says. “They can step in to prevent or reduce the effect of an incident.”

Comer adds that as ADAS become standard, it is easy to take their value for granted. “It is vital to train drivers on them so they understand their functionality what they do and importantly what they cannot do. [For example,] forward collision warning is where we want a driver to be – with the reassurance that advanced emergency brake is there to reduce or prevent the effect of any impact. Electronic stability control has entered the market which has seen a growth in double deck trailers – both systems work but cannot fully overcome the laws of physics, with telematics we can monitor system activations and driving styles, and support with data should an incident occur.”

Maintenance

ADAS also need to be kept clean and unobstructed to work – again something that can be overlooked. “Painting of and aftermarket deep sunvisors affect camera performance – which needs recalibrating when the windscreen is replaced,” Comer adds. “Radar sensors also need to be free of paint and obstructions such as bull bars and bling.”

But there is also a lack of available guidance on ADAS, which is leaving workshop staff and engineers unclear on effective maintenance practices and functionality checks, according to Logistics UK’s Engineering Forum. To provide standardised information for use on all commercial vehicles, the forum launched a generic ADAS guidance document at the beginning of September.

Phil Lloyd from Logistics UK explains the rationale for publishing the guidance: “When it comes down to maintaining vehicles, which is the operator’s obligation, we have been asking questions about what the rules are on ADAS: what is supposed to be checked? When is it supposed to be checked? What is the regulator’s perspective?”



Liam Prince, operations manager at Carlisle City Council, in a Mercedes-Benz RCV fitted with ISS safety equipment

Our concern is that the first time a vehicle is involved in an accident and then someone identifies that an ADAS wasn’t working the coroner could be quite interested in what an operator does to ensure a vehicle’s ADAS are working.”

It can be difficult to find out if an ADAS isn’t working too, as while some may flash up a warning light on the dashboard, others may require investigation of the on-board diagnostics and searching for error codes, Lloyd adds. If it is an intermittent fault, it can be even harder to diagnose.

This is why the guidance was needed, Lloyd adds. He says that the guidance was split into three areas: safety inspections, maintenance and what you would check after an accident.

“For safety inspections it was very light touch,” he says. “For maintenance, it was more about having some integration with the vehicle’s on-board diagnostic equipment and looking for error codes that might not be seen in warning lights. Then with accidents, a lot of ADAS work on sensors – you would never be able to check those so how do you get assurance if your vehicle has been in repair that all sensors are working?”

“We started to work out a benchmark of what we would expect. We were doing it from a perspective of if I have a maintenance contract with a third party what assurances do I want from them? To say that this is what the industry expects and what you will do with the vehicle to make sure all the ADAS are working correctly.

“We were trying to simplify it and that’s a problem with ADAS – while an OEM is building to a generic EU specification, the tolerances of that are fairly wide, so checking the calibration on a DAF compared to a Mercedes compared to a Scania, they are all slightly different.” For operators with a mixed fleet of vehicle marques, it is easy to see how matters can become complicated.

Lloyd says that the guidance has been well received thus far – although it is early days – and is creating conversations about what is expected of operators and what may need to be changed in inspection and maintenance regimes.

Cameras

But there also needs to be work to ensure that operators get the best out of ADAS – sometimes operators aren’t aware of the value of them, especially if they are fitted as standard, according to Gavin Thoday, a director of vehicle safety company Innovative Safety Systems (ISS).

“There isn’t a big focus on what it does and how it helps because there isn’t the raised profile of someone going out talking and selling a solution as it is a standard fit,” he says.

For similar reasons, ISS hasn’t seen a lot of requests for retrofitting ADAS to trucks, Thoday adds.

But other safety features are also increasingly popular – including retrofitting – such as cameras. For instance, Carlisle

City Council recently invested in camera recording technology, reverse radar and safety equipment from ISS for its fleet of more than 30 waste and cleansing vehicles. The decision to install the equipment was made primarily to address the rise in potential insurance claims and monitor best practice among drivers and crews.

Laura Monkhouse, fleet and depot manager at Carlisle City Council, said: “There were a number of incidents where we had been accused of causing damage to cars or property, and there was no way of knowing if these claims were true or not.

“With the new camera systems, it’s easy to check what actually happened and if any of our vehicles were involved. Often, we find the damage has happened before our vehicles were on the scene. The footage is very clear and you can see from every angle of the vehicle, so there are no hidden areas. We can also use the footage for crew training and to check that everyone is following the correct procedures.”

ISS also take the problem of checking the equipment is working out of the hands of the operator. “ISS offer health checking as part of our package,” explains Thoday. “We have a team at HQ and every day a report comes through and tells us how our equipment is performing. Historically, the customer would need to visit with the vehicle or have a defect report to say there is a problem and by then it would be too late. They would have gone to the vehicle, removed the hard drive or remotely logged in to it to download footage of an incident but the information wasn’t there because the camera had broken, been damaged or there was a fault with a hard drive or software. That could have been a significant incident with information they needed on the camera and they only find out when it isn’t there.

“But with a live connection over 3 or 4G we are checking this daily so we can see if a camera is obscured let alone faulty.

“It is pretty easy to look after the equipment, there is very little maintenance required. In many cases we are keeping an eye on it for the operator. If there was a fault, we would have an engineer on route to the customer within three hours.”



Lighting up

But truck safety innovations aren’t just about in-cab high-tech driver aids – improvements in safety are still being made to long-established devices such as warning chevrons.

There are a growing number of roadside incidents in the UK and Department of Transport figures claim there are 24 collisions involving parked vehicles every week on motorways or main roads, with a fifth resulting in death or serious injury.

To combat this, newly launched company Inspace Media has developed illuminated chevrons and safety signage that improve visibility, so vehicle operators can mitigate fleet risk and overcome duty of care concerns regarding their remote teams.

“IM Red is our chapter 8 chevron kit with integrated rear position red lamp technology that enables vehicle operators to mitigate fleet risk,” says Alex Knowden, director of sales and business development at Inspace Media. “This illuminated solution can be seen at night at a range of one mile, so based on the full beam range of headlight, it has at least 14 times greater visibility at night than a traditional premium-grade chevron solution.”

Knowden adds that this means a driver travelling at 70mph on a dual carriageway or motorway has almost 45 seconds longer to react, giving substantially more time to safely reduce speed and move into an adjacent lane. “The illuminated technology

“The illuminated technology also maintains the highest levels of performance in lowlight and poor weather conditions”

also maintains the highest levels of performance in lowlight and poor weather conditions – such as rain and fog – without the same limitations experienced by traditional chevron technology,” he adds.

Developed over two years and independently tested, the illuminated solutions use patented components and are less than 1mm in thickness. This makes the chevrons and safety signage suitable for all types of fleets because it can be shaped and moulded to fit anywhere on the rear or side of a vehicle. The technology also possesses IP69 waterproof rating and a minimum illumination life of 20,000 hours before any light depreciation.

It has already had a positive response from the sector, Knowden adds. “We are in advanced discussions with a number of automotive manufacturers, as well as leading vehicle leasing and fleet management businesses, because they recognise the importance of protecting personnel operating at the side of the road or in high-risk situations.” ■

BREATHE EASY

Saving fuel and reducing CO₂ emissions in diesel engines is a goal for all truck manufacturers and a new technology in development that digitises the engine could help to bring significant savings.

By Dan Parton

Reducing emissions has been a focus for truck manufacturers for many years and continues to be as ever more stringent laws are passed to improve air quality in towns and cities. While alternative powertrains are coming onto the market, nothing has yet come close to replacing heavy duty diesel (HDD) engines in the HGV sector, so finding ways to make those less polluting is the goal – and a new technology could save millions in fuel while significantly reducing harmful emissions.

Cambridge-based automotive engineering company Camcon Automotive has developed Intelligent Valve Technology (iVT), which replaces the camshaft with electric actuators for full, precise control over the engine's breathing. This, combined with specialist software, has the potential to make a step change in powertrain development programmes, dramatically reducing fuel consumption and improving control over harmful emissions, without any need for OEMs to invest in electrification, according to the company.

Neil Butler, technical consultant at Camcon Automotive, explains: "All key combustion process parameters have been under digital control for some time now. But breathing has been stuck under the control of increasingly complex but essentially mechanical variable valve train systems. iVT is as big a leap forward as the change from carburetors to electronically controlled fuel injection."

iVT gives infinite control over the valves, bringing benefits for HDD commercial trucks, from cold start emissions performance to exhaust gas recirculation to on-demand cylinder deactivation and management of harmful pollutants like NOx.

Butler explains that Camcon Automotive has been innovating in the fields of vehicle braking and transmission for the past decade, using a patented actuator design. "It is this sophisticated actuator that is at the heart of our engine valvetrain concept, iVT. iVT has been under development for the

last nine years, initially for the passenger car market, with several thousand hours of lab testing and the development of an iVT-equipped engine with a leading OEM which has been used for R&D purposes in a prototype vehicle. In recent years, we have had increased interest from the HDD industry and have focused on iVT diesel engine development, as we believe the system can come to market even quicker in the trucking and haulage market."

ARTIFICIAL INTELLIGENCE

To this system, Camcon Automotive's plans to incorporate a suite of software that allows iVT to be calibrated through machine learning, combining hardware and software in one package, resulting in the most optimised internal combustion engine yet: the digital engine.



“iVT is as big a leap forward as the change from carburettors to electronically controlled fuel injection”

Artificial intelligence and neural networks are used in this. “These sit alongside the calibration work of the engine to help optimise operation,” explains Butler. “Because we have digital control of the fuel injection and the spark as well as digital control of the air, we believe that we can use machine learning in the test cell to try to optimise for what we want in an intelligent way. We may even be able to integrate this into the vehicle at a later stage.

“Engineers in engine consultancies have been trying to do this for a while now, but they haven’t had the closed-loop tools. That’s where, with software too, the whole concept really starts to come together. In future, we may even consider doing an open license for the hardware, letting anyone manufacture and supply it while Camcon Automotive focuses on the calibration work, acting as a consultancy.”

REDUCING AFTER-TREATMENT TECH

With truck makers under regulatory pressure to reduce CO₂, NO_x and other harmful emissions, such as particulate matter, real driving emissions (RDE) compliance is a huge challenge and many trucks now feature so much after-treatment technology that the equipment can cost more than the actual engine itself, Butler notes.

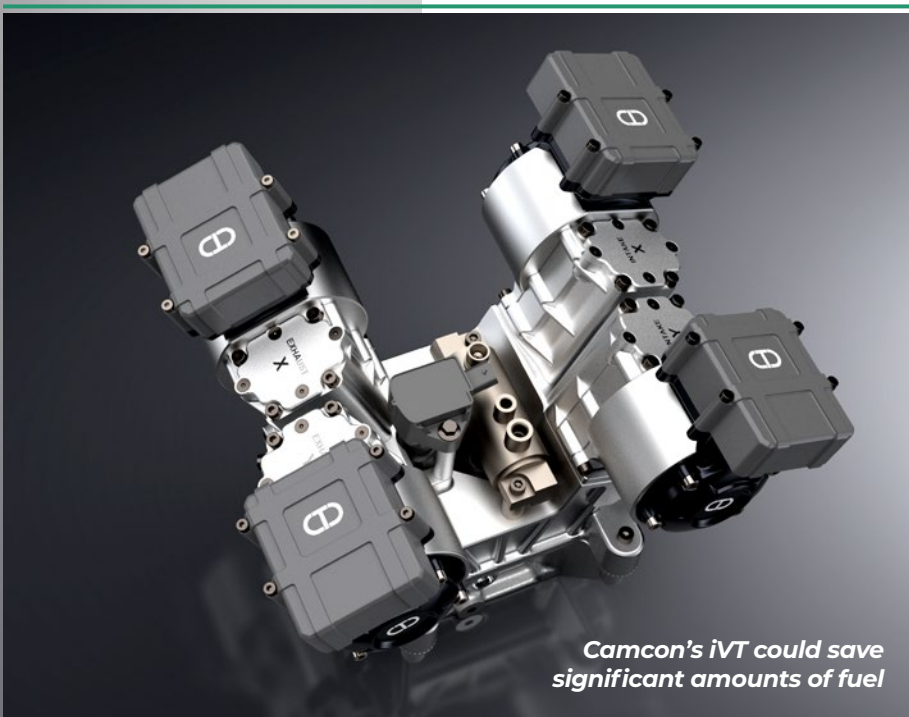
IVT can significantly reduce the size, weight and cost of the after-treatment equipment fitted to a HDD engine and better control the exhaust after-treatment temperature as catalysts can be maintained at their optimum operating temperature over a greater proportion of the drive cycle. In addition, thanks to the system’s greater optimisation of emissions control, a truck would not need to use as much AdBlue.

While Butler concedes it is too early in the product’s design process to estimate how much weight and cost can be saved, he does expect it will result in a net reduction in powertrain cost.

It could also help to improve the lifespan of the engine as it reduces load and all the valves don’t have to be operated all of the time, which reduces wear. “IVT completely removes the need for timing chains and ancillaries, so there will be fewer parts,” says Butler. “Due to its increased control over the combustion process, iVT can potentially even lengthen service intervals while there really is nothing about the system that will present any more complexity for technicians.”

POTENTIAL IMPACT

IVT also significantly reduces fuel consumption. Camcon Automotive believes it can improve the efficiency of the average diesel truck by 5%. The company calculates that for just one truck that would save almost £2,500 a year in diesel; so for a fleet of six HGVs, an operator could save £15,000 and a fleet of 1,000 vehicles, could have its annual fuel costs slashed by £2.5 million.



Camcon's iVT could save significant amounts of fuel

“Extrapolated across the entire UK haulage fleet, iVT could save the industry close to half a billion pounds in diesel every year,” says Butler. “With more than three million heavy duty diesel trucks sold worldwide and each vehicle having a lifetime of over 10 years it is very easy to see just how much of a massive effect our system could have.”

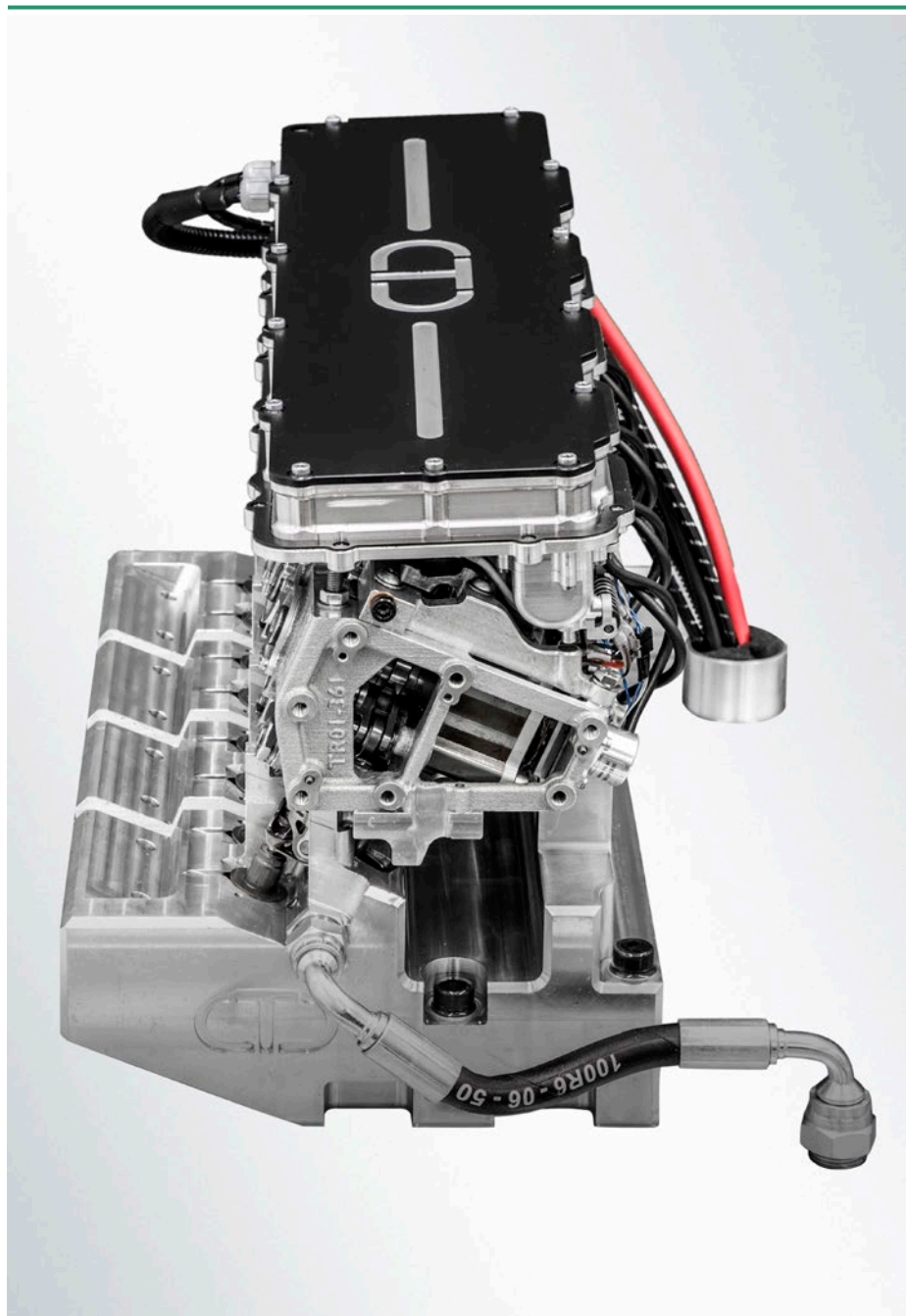
Butler believes that diesel power has a long life ahead, particularly in heavy applications. “Our responsibility is to make these powertrains as low-impact to the environment as possible. iVT can make a huge and almost immediate reduction in fuel consumption and emissions. It requires no changes to existing infrastructure, saves operators money and lessens environmental impact. It also allows operators to keep their long driving ranges, without any compromise in rapid unloading and loading.”

David Cebon, director of the Centre for Sustainable Road Freight and professor of Mechanical Engineering at University of Cambridge, agrees. “Changing the powertrain of cars and trucks is inevitable,” he says. “What technologies will win in the new era is yet unknown. While the future emerges, it has to be acknowledged that conventional engines will be with us for at least the next decade, and probably a lot longer as part of hybrid drivetrains.

“So, our responsibility is to make them as low-impact to the environment as possible. Technology such as digital control of valve timing – replacing camshafts with electric motors to increase engine efficiency – can make a significant and almost immediate reduction in fuel consumption and emissions, particularly when applied to heavy duty diesel trucks. What’s more, innovation such as this requires no changes to existing infrastructure, saves operators money and lessens environmental impact.”

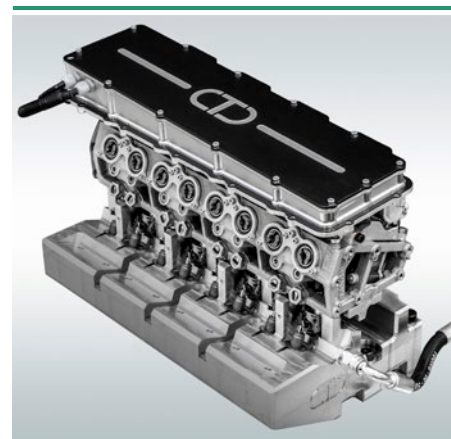
POSITIVE RESPONSE

However, while the concept is in the advanced development stage, we are some way off from iVT-equipped trucks entering the marketplace, Butler notes.



That said, the response from the marketplace has been positive. “We are in advanced discussions with a number of OEMs, universities and Tier 1s on the supply of iVT-equipped single cylinder development engines for combustion research,” Butler says.

“OEMs and Tier 1 companies are our targets with the strategy being that we work with them to take an iVT-equipped HDD engine through an entire development programme and onto the market for fleet use.” ■





SAFE FROM HARM

Stray sparks from industrial processes can increase risk of accidental fires starting

Vehicles working in high-risk industries can be subject to fire risks, so operators should take precautions to mitigate those. By James Mountain, sales and marketing director, Fire Shield Systems

In high-risk industries, such as agriculture, mining or manufacturing, businesses often rely on the everyday use of industrial vehicles, such as forklifts, tractors or self-propelled vehicles. These are often in constant use to fulfil tight work schedules, which brings about several fire risks. Each of these risks should be addressed and controlled to ensure maximum site safety.

There are numerous fire risks associated with industrial vehicles, which this article explores.

Electrical failures

The UK's ongoing transition towards a more sustainable way of living has propelled demand for electric vehicles (EVs) and hybrid electric vehicles (HEVs). This means more commercial fleets go through the 'electrification' process. Many businesses are seeking to increase the sustainability of their operations and EVs and HEVs provide an ideal opportunity for this.

However, new technology brings new risks, and, for EVs and HEVs, the primary risk is thermal runaway. Thermal runaway is caused by a failure within

a vehicle's battery cells. This failure causes a chemical reaction, resulting in a rapid temperature increase, which if uncontrolled will escalate to thermal runaway. If a battery reaches thermal runaway, its propagation process can escalate quickly, as it will begin to produce its own oxygen as a fuel source to further propel the flames. Common electrical faults, such as overcharging, overheating or short-circuiting, all have the potential to lead to thermal runaway.

Internal combustion engine industrial vehicles often also have a variety of electrical components, which are subject to similar fire safety risks.

High-risk working environments

Vehicles operating within high-risk working environments, such as hot works, close to flammable materials or other material vehicle storage, are all exposed to numerous safety risks. When working among hot works, for example, vehicles can be subjected to multiple ignition sources. Works such as soldering, welding, cutting or grinding can all give off stray sparks, which can cause significant damage to any surrounding assets and vehicles and can also lead to the ignition of any combustible materials.

Infrequent cleaning and maintenance

Industrial vehicles can become clogged over time as a result of dust build up. This is particularly common in large warehouses or mines and can bring about increased fire safety risks.

A lack of regular maintenance can also cause the performance of industrial vehicles to deteriorate, as electrical faults, mechanical faults or other warning signs may go unnoticed for long periods of time.

Unattended fuel spills – either from the transport of flammable liquids around the site or from the vehicles themselves – also present key fire risks. If fuel spills are left for long periods of time, they can interfere with vehicle performance, bringing about increased fire risks to the vehicles, while endangering assets and teams in the process.

Arson

Although less common, arson is still a key cause of vehicle fires across the UK. Any vehicles left unattended or unsecured when not in use are at increased risk of arson.

Reducing risk and maximising safety

For owners or managers of industrial vehicles, there are several steps that can be taken to safeguard teams and assets, while ensuring minimal operations downtime:



Vehicles in industrial use can become clogged with dust, increasing fire safety risks

1. Choose the right fire protection and suppression solution for you

Your vehicle's fire safety solution should consider its individual risks and uses. There are several factors to consider:

- EVs or HEVs: for EVs and HEVs, your suppression solution should act to avert thermal runaway, or delay this where complete prevention is not possible. When failing, a battery will vent its over-pressure, indicating its progression towards thermal runaway. At this point, the suppression system should begin to initiate battery cooling, mitigating or delaying the risk of thermal runaway. Where prevention is not possible, delaying thermal runaway is crucial to enable the safe evacuation of the operator and passengers

- Regularly monitor risks: conduct a regular risk assessment on each of your vehicles and their uses to identify any new or evolving risks they may be faced with. This will help you to ensure you select the most effective fire suppression solution for that vehicle's individual requirements.

2. Check the vehicle's surroundings

Your vehicle's environment plays a crucial role in the effectiveness of your fire suppression system. Here are some key considerations:

- High-risk environments: ensure vehicles are not operating within close proximity to active high-risk works, such as hot works



Fire safety should always be a priority in sites such as this



Dry conditions can also increase fire risks

- Materials storage: monitor all storage surrounding vehicle operations carefully and ensure flammable liquids are stored elsewhere to reduce the risks of any stray sparks causing a fire
- Risk assessments: fire risk assessments will highlight any new risks that may be compromising your site's safety. Conducting these on a regular basis will help you to stay on top of the risks.

3. Ensure regular site and vehicle cleaning and maintenance

Regular cleaning and maintenance is important to prevent dust build up and allow you to identify any mechanical or electrical malfunctions quickly:

- Temperature monitoring: ongoing temperature monitoring can prevent

the risk of overheating for vehicles in constant use

- Vehicle charging: vehicles should be charged away from other operations, preventing the risk of ignition from stray sparks, which can be caused when connecting and disconnecting from power supplies
- Site cleanliness: ensure prompt cleaning of any fuel or flammable liquid to prevent ongoing risks to vehicles and teams.

4. Tighten up your security measures

Reducing your business' risk of arson lies with your site's security and storage safety measures:

- Secure your site: whenever it's left unattended, ensure your site is fully secured, with any valuables locked inside.

Any externally stored materials should also be kept away from the perimeter of the site

- Store flammable materials securely: keep any flammable materials, or other possible accelerants, locked within your site. This will prevent ease of access for intruders.

Minimal downtime, maximum safety

For high-risk industries, industrial vehicles are an incredibly valuable asset but should be managed carefully.

For more information on how you can best safeguard your assets and people with your vehicle's fire suppression solution, visit www.fireshieldsystemsLtd.co.uk or call 0800 975 5767. ■

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