

Light wait

Improvements to van suspensions, powertrains, tyres etc are being led by technology often from other sectors of industry. Keith Read reports on current engineering advances for LCVs



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A combination of new legislation, developments by vehicle makers and changing operator demands has seen the humble van transformed into an efficient and sophisticated business tool. Compare today's newest Euro 6 Ford Transits with the original design that triggered the subsequent sea-change in LCVs when it was unveiled back in October 1965. Yet, despite the staggering changes, light commercials are nowhere near the end of the road when it comes to component development.

Roger Sanders, Continental Tyres' general manager of technical services in the UK and Ireland, forecasts evolution, rather than revolution, but believes the rate of development will accelerate, compared with that of the past few years – at least where tyres are concerned. "When the Transit first came out, it brought performance levels previously unheard of in the van market. Consequently, tyres had to take a quantum leap forward to cope with the new performance," he explains.

With the improvements have come lower running temperatures that also lower rolling resistance. Sanders sees the latter continuing to reduce, especially given the urgency of cutting fuel consumption and helping to meet the coming emissions legislation. "Tyres on a four-wheeled van can account for 20% of fuel consumption. So rolling resistance will become more important, leading to more energy-efficient rubber compounds, particularly in the tread area," he offers.

And the most recent impact of that has been the introduction of tyre labelling legislation. From November 2012, EU regulations will require all tyres to carry – or have at the point of sale – a label detailing their categorisation, in terms of rolling resistance, wet grip and noise levels.

"The seller will have to advise the purchaser of those label values before the purchasing decision is made," explains Sanders. In the van market today, the purchasing decision tends to be made on the basis of costs and perceived



longevity. “The label will educate consumers that there are other important criteria, both from safety and environmental points of view.”

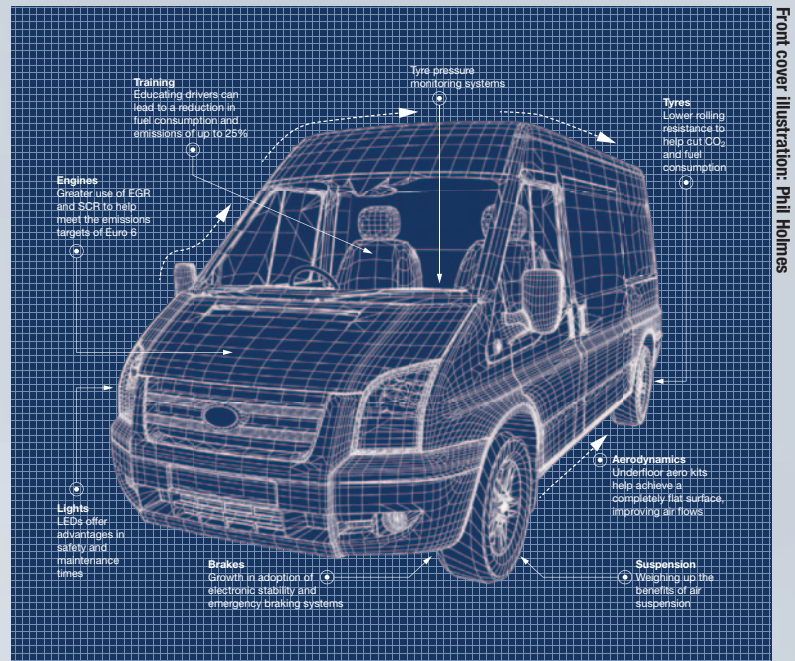
Sanders believes that premium tyre manufacturers will place their emphasis on wet grip for safety. “Not even the most arrogant of vehicle drivers says safety is not important and, in a vehicle fleet, the customers like to know that they are using a company that has safety uppermost in mind,” he says.

Tyre pressure monitoring systems (TPMSs) for vans will, he believes, follow their mandatory fitment on new cars from next year. “Arguments for enforcing TPMSs far exceed those against enforcing them. Fuel efficiency of the vehicle, longevity of the tyre, and its handling and safety are all designed to operate at a certain pressure for a given load. TPMSs are a very sensible and logical step forward.”

That said, like the car market, there is debate over which of the two main types of TPMSs to go for. “The indirect system uses electronics on the vehicle to monitor the rolling circumference of the four wheels to detect if one is operating at a lower circumference and therefore revolving faster, because pressure has dropped. But the best sensitivity is around 20% to 25%, meaning the pressure has got to drop that much before the system kicks in,” explains Sanders.

“The tyre industry says that’s not sensitive enough and we much prefer the direct system, which physically measures the pressure in the tyre and transmits that to the driver in the cab, with a colour-coded pressure reading,” he adds. “But either way, it’s going to be better than no system at all.”

Meanwhile, HGV manufacturers are also looking seriously at TPMSs, which suggests LCV owner/operators won’t have long to wait. Martin Flach, UK product director at Iveco – which offers a range of LCVs, as well as its heavies – points out



Front cover illustration: Phil Holmes

that LCV trends and developments often follow HGVs. Transmissions are a good example. “Trucks are almost 100% AMTs [automated manual transmissions],” he says. “LCV OEMs are not yet brave enough to change the standard gearbox specification, because the market’s not ready. But we’re finding that key fleets are buying AMTs.”

Tesco, for example, took 800 units last year and will follow that order up with a further 800 this year, reveals our Iveco man. “AMTs alleviate costly clutch repairs. And the net effect on fuel savings is between 3% and 4%, as a fleet average. The best driver probably won’t improve, but the worst will come up much better. Routine maintenance [for ATMs] costs nothing extra and, in fact, repair costs will reduce.”

Engine developments

Turning to LCV engines, like their bigger brothers in the truck world developments over the next five years will be driven by emissions legislation, continues Flach. “Euro 5 light duty emissions legislation comes into play at the beginning of 2012, and everybody is about to introduce engine and model revision to meet that requirement. Most OEMs are on an EGR [exhaust gas recirculation] technology to achieve Euro 5 light duty emissions.”

Flach also warns of the possible knock-on effects of Euro 6 heavy-duty emissions legislation, set for the end of 2013. “They won’t affect smaller LCVs, but they will affect the higher end,” he predicts. “Anything above four tonnes can be affected and they will need an SCR [selective catalytic reduction] system as well – meaning AdBlue treatment.”

Precise details of what Euro 6 light duty will entail remain unclear, but Flach has an idea. “If it’s driving





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down NOx and particulates, then we’re probably looking at some sort of after-treatment system, because we’re pretty much at the end of the road with EGR,” he explains.

The next key driver for LCVs will be the recently passed European legislation on van CO₂, putting targets on van manufacturers, in terms of grams per km, which is another bone of contention for Flach. “This is completely the wrong unit of measure,” he fumes. “As an industry, we didn’t get our act together and explain the difference between a van and a car to the European Commission. They needed to recognise the difference between a half-ton Fiesta van and a 17m³ Sprinter. It’s not good legislation, because it doesn’t recognise the goods carried.”

And he continues: “The timescale for meeting emissions targets runs from 2016 to 2022. We’ll have to do what we can to achieve the best fuel economy and that will be through tuning and getting the best combustion possible.” Flach’s prediction on the technology? More automated transmissions, and “stop-start technology will be used extensively”.

Moving on, what about suspensions? Flach doesn’t see any reason to follow other vehicle classes and move to air suspension. “Base suspensions give an adequate ride, so why add the extra cost? [Air suspensions] have a very low take-up, but will remain an option for niche vehicles.”

That said, driver aids affecting van suspensions are an entirely different matter. “The functionality that ESP [electronic stability program] systems offer will improve year-on-year, with the likes of Bosch coming up with new ideas. There are some impressive breakthroughs with emergency braking systems, for example, where, if you’re about to have a crash and

don’t touch the brakes, it will slam them on for you.”

Legislators are, says Flach, pushing hard on emergency brake systems, leading to a classic dilemma. On one side, component manufacturers that have developed technology want to push for it to be a legal requirement (because it helps their business), while, on the other side, legislators fear the consequences of trying to run before walking.

Where it all began

Returning to Ford, and the Transit that kick-started the LCV evolution – what does the company’s ‘Mr Transit’ see around the corner? “Lots more evolution!” is the response from David Petts, the vehicle’s brand manager. “There will be automatic manual transmissions, going from five to six and seven speeds, which are more economical and cleaner, while smart re-gen charging will see a system of disconnecting the alternator when the battery is charged. This reduces demand on the engine and hence reduces CO₂.” Under braking, Petts sees the reverse happening, with the alternator being driven to recover energy as the vehicle slows and charge the battery.

“Aerodynamics will also play a part in the future,” he says. “Aero kits – such as one underneath the vehicle to make it virtually flat – will lead to much smoother air flows. That can reduce fuel consumption by between five and 10%, depending on the size of the vehicle. And, if you take a door mirror, for example, it’s big and blocks a fair amount of air. However, small, rear-facing cameras, appearing on concept cars, will give much better rear vision via a screen on the dashboard and, more importantly, cause hardly any drag. And – good news for the fleet manager – they’re less likely to get knocked off, so need replacing.”

Petts believes weight-saving will also continue to be important, with increased use of lighter materials, such as plastics, reducing vehicle weight, without compromising strength. “Reducing the weight increases payload and that’s key to any operator.” And, in much the same vein, we can expect greater use of LED lights on vans, offering enhanced efficiency and safety. “LEDs take a lot less load, so the alternator is placing a lot less load on the engine,” explains Petts.

All these small changes add up to a major benefit, insists Petts. But the biggest improvements in fuel consumption and emissions are likely to come from the driver. “With education of the driver, you can save up to 25%, depending on the person behind the wheel. To do this, we’ll be looking at fuel computers and telematics, where signals are sent back to the transport manager, showing which drivers are less economical and which are light-footed. I see telematics as a key feature for vans in the future.” **TE**

Tyre pressure monitoring systems will become a key aid to transport operators and their fleets

