



# ATTENTION SEEKING

DRIVER SAFETY: **DROWSINESS**

**The EU's new General Safety Regulation will require vehicle manufacturers to fit devices that warn of driver drowsiness and distraction and collect accident data. So how will they work — and how soon will they appear in a truck near you?**

WORDS: BRIAN WEATHERLEY

**Commercial Motor** It's the stuff of nightmares... literally. You've had an early start. You're feeling tired. The steady beat of the engine is comfortingly soporific. Your eyelids droop, your head nods... **FOR GOD'S SAKE WAKE UP!** We all know drowsy driving happens. But it could actually be more common than we are prepared to acknowledge.

Since 1969 Volvo Trucks' Accident Research Team has analysed more than 1,700 accidents involving trucks. Its latest annual report states: "It's often difficult to know for sure that an accident was caused by drowsiness – it's very unusual for a driver to admit to having fallen asleep." Well, who would?

The potential consequences of dropping off while driving any sort of vehicle, never mind a fully laden 44-tonner, are truly frightening. That's doubtless why the European Commission

is tackling the problem with its revised General Safety Regulation (GSR), which incorporates the requirement for all motor vehicles, including HGVs, to be fitted with a system to detect driver alertness and effectively warn those showing signs of fatigue, as well as event data recorders for post-crash analysis.

Under the new GSR, which came into effect in January this year, a driver drowsiness and attention warning system must be fitted to all new (type approval) models from July 2022 and to all new vehicles (registrations) from July 2024.

That's not all. There is a similar second-stage requirement to fit all types of vehicles with an advanced system for detecting driver distraction – defined as one that "helps a driver to continue to pay attention to the traffic situation" and warns them when they are distracted. It applies to all new models from July 2024 and all new vehicles from July 2026.



The latest GSR further extends the original GSR, which between 2012 and 2015 mandated a rolling programme of safety equipment for trucks, including daytime running lights (DRL), electronic stability control (ESC), lane-departure warning systems (LDWS) and automatic emergency braking systems (AEBS). And if you're thinking that we're no longer part of Europe and don't have to accept Brussels' rules any more, it's time for a reality check: no truck manufacturer is going to go to the trouble of deleting EU-mandated safety kit from a truck just for the UK market. A truck built in Europe is a truck made for all of Europe.

But what exactly constitutes a driver drowsiness detection and warning system, especially for a truck?

So far, the EC has yet to issue a final specification for one, although Brussels confirms: "The technical specifications and test protocols for approval of vehicles with regard to their driver drowsiness and attention warning are currently under development and are planned for adoption by the Commission by the end of this year. The technical specifications for the second-phase



A rude awakening: latest Volvo ART report suggests few drivers admit to having fallen asleep

### HOW IT WORKS: VOLVO DRIVER ALERT SUPPORT (DAS)

A support system that alerts the driver if he/she is inattentive or drowsy. The system uses a camera sensor that tracks the position of the truck in its lane and also monitors steering wheel movements. If any symptoms of tiredness are detected, the system activates an audiovisual alert.



It's common sense: take a break when you're feeling tired

advanced distraction warning will come two years later."

Interestingly, the EC adds: "The rules under development are set up to be completely technology-neutral and will be based on performance requirements. The Commission is currently in the process of consulting the various stakeholders on the future requirements."

Naturally, that leaves the truck manufacturers waiting to see what will make it into the final technical specification. Volvo's traffic and product

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safety director, Anna Wrige Berling, confirms: "At this moment the details of the regulations aren't ready—so we don't know exactly what will be required of such a system."

Coming up with a device that can effectively monitor drowsiness across the whole driver 'universe' isn't going to be easy, reckons Wrige Berling. "But we do expect the regulation to specify to some extent how the system should work and how the information/warning should be communicated to the driver," she adds.

### ADVANCED VEHICLE SYSTEMS

Although the revised GSR regulations were published in the Official Journal of the European Union last December, within the 'definitions' section it simply confirms: "Driver drowsiness and attention warning means a system that assesses the driver's alertness through vehicle systems analysis and warns the driver, if needed." So, at the very least, some kind of audible and visible dashboard alert seems inevitable.

Significantly, under the section headed 'advanced vehicle systems' the latest regulations then go on to verify that: "Driver drowsiness and attention



Ready and waiting: Volvo's Anna Wrige Berling says the current DAS system will probably fulfil most parts of the new regulation

“Those data shall not be accessible or made available to third parties at any time”

warning and advanced driver distraction warning systems shall be designed in such a way that those systems do not continuously record nor retain any data other than what is necessary in relation to the purposes for which they were collected or otherwise processed within the closed-loop system. Furthermore, those data shall not be accessible or made available to third parties at any time and shall be immediately deleted after processing."

### DATA CAPTURE

As for what data an accident event recorder might actually capture, the regulations state it should be "anonymised and protected against manipulation and abuse" and that "the data they are capable of recording can be made available to national authorities [presumably the police and DVSA in the UK] on the basis of Union or national law, only for the purpose of accident research and analysis". Most important of all, an event data recorder "cannot be deactivated".

As far as we can tell from looking at the new GSR, there's nothing in it about operators having access to data generated by a driver drowsiness device – surprising, given that companies would



# KEEPING A SAFE EYE ON YOU



Eyes straight ahead: Seeing Machines' Guardian camera tracks head movements

**Australian company** Seeing Machines is a world leader in driver monitoring and uses human factors science and AI technology to unobtrusively monitor a driver's attention in real time, warning them if they become drowsy or distracted. It currently has more than 20,000 connected vehicles, including trucks, PSVs and even trams. Its Guardian system, launched in 2016, features a driver-facing sensor, forward-facing camera, processor and seat vibration motor.

## VIBRATING ALERT

The small, dash-mounted infrared camera tracks a driver's head position and eyes day or night – regardless of whether they are wearing safety glasses, prescription

glasses or sunglasses. If the driver is deemed to be distracted or drowsy, audible and seat vibration alerts are triggered. Event data is then fed back to the Guardian 24/7 monitoring centre for analysis, where staff confirm whether it is a distraction event, mobile phone use or drowsiness related. If the latter, the fleet operator is notified so that they can enable their fatigue intervention plan, which may involve them telling the driver to take a break or, in extreme circumstances, pulling them off the road.

In Australia, Seeing Machines has more than 8,000 individual connections across more than 250

transport companies, including blue-chip fleets Toll Logistics and Ron Finemore Transport.

Australia's largest truck insurer, National Transport Insurance (NTI), has teamed up with Seeing Machines (see right) and is rewarding NTI-insured companies that use the Guardian technology with policy benefits and financial incentives.

The Guardian system appears to have been accepted by drivers, too. Seeing Machines told us: "Once the driver has experienced the technology, they appreciate that the system only records any data if a safety-related event is detected; it doesn't continually record the driver and is only activated if the alerts are triggered. Most companies deploying Guardian already have a culture of safety that drivers appreciate and respect. In Australia, the majority of drivers are very accepting."

In the UK, temperature-controlled distribution specialist FreshLinc has over 300 Guardian units fitted to its fleet of mainly Volvos, DAFs, and Scania's. It told *CM*: "The system works really well and all have embraced it."

- To see Guardian in action, go to [youtube.com/watch?v=dAykREddhC4](https://www.youtube.com/watch?v=dAykREddhC4)



IT'S NO ACCIDENT. NTI AND SEEING MACHINES HAVE JOINED FORCES.

probably want to know if a driver had triggered a drowsiness warning. If few drivers already admit to falling asleep as things are, how many would willingly tell a manager they had triggered a drowsiness warning? Again, however, we won't know for sure about this until the EC publishes the final spec later this year.

Since 2004 Volvo's engineers and safety researchers have been heavily involved in the development of workable driver drowsiness monitoring systems, having pursued a number of possible avenues (including highly sophisticated camera-based technology) before finally settling on its current Driver Alert Support (DAS) system.

Originally launched in 2008 as an option on FH and FM chassis, DAS is based on Volvo's Lane-keeping Support – a lane departure warning system which has been required on all newly registered trucks since November 2015 under the old GSR.

## ADAPTING TODAY'S SYSTEMS

DAS could certainly help Volvo tackle the forthcoming drowsiness monitoring requirement, Wrigle Berling confirms. "From what we know as yet, we believe our current DAS system is likely to fulfil most parts of the regulation. Some adaptations will probably be needed to comply fully in terms of human/machine interfaces (HMI), maybe, or other things, as current systems on the market are 'OEM-individual'. With the [new] regulation they will become harmonised, and it's likely that everybody will have to make some adaptations."

As for driver drowsiness devices, there appears to be no provision in the new regs (or at least none that we can see) for any direct intervention to prevent a drowsy driver from driving further, once a warning has been triggered. The obvious analogy here is with the latest-generation of Euro-6 engines, which initiate progressive warnings or torque/speed reduction interventions when

**Staying alert:** driver drowsiness and attention warning system must be fitted to all new (type approval) models from July 2022 and all new vehicles (registrations) from July 2024



the emissions control system detects there is no AdBlue in the reservoir. However, Wrigle Berling says that, with Volvo's current DAS, "we do take some action and deactivate adaptive cruise control and cruise control after the second warning, forcing the driver to be more 'active' in the driving".

## WELL-TRAINED DRIVERS

Ultimately, while Wrigle Berling acknowledges that future drowsiness warning devices will certainly help improve road safety, she says much will still depend on the driver.

"We believe the most important safety system is still the driver," she confirms. "Active safety systems that support the driver and reduce the consequences of human error are essential, but that doesn't take away the importance of having a well-trained driver. A well-trained driver is still the best way to avoid ending up in critical situations."

Educating drivers to be more aware of the possible consequences of tiredness is clearly a key tool in preventing fatigue-related accidents. However, thanks to the new GSR, within two years it will no longer be left to drivers to judge whether they are drowsy or not.

And in the meantime, when it comes to reporting back on that EC final specification for a drowsiness monitoring and alert system, rest assured that *CM* won't be caught napping. □

## THE NEW GSR SHOPPING LIST

Along with drowsiness and attention warning devices, the new General Safety Regulation includes the following items for trucks:

- alcohol interlock installation facilitation
- distraction recognition/prevention
- event (accident) data recorder
- emergency stop signal
- intelligent speed assistance
- reversing camera or detection system
- tyre pressure monitoring
- vulnerable road user detection and warning on front and side of vehicle
- vulnerable road user improved direct vision from driver's position.

The above features will become mandatory starting from 2022, with the exception of direct vision rules for trucks and buses, which will follow later (because of the necessary structural design changes).

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