

Proposal for supplement 01 to the 00 series of amendments to UN Regulation No. 131

Submitted by the experts from the International Organization of Motor Vehicle Manufacturers

(The modifications to the current text of the Regulation are marked in **bold** or ~~strikethrough~~ characters)

I. Proposal

Introduction, amend to read:

"Introduction (for information)

The intention of this Regulation is to establish uniform provisions for advanced emergency braking systems (AEBS) fitted to motor vehicles of the categories M₂, M₃, N₂ and N₃¹ primarily used under highway conditions.

While, in general, those vehicle categories will benefit from the fitment of an advanced emergency braking system, there are sub-groups where the benefit is rather uncertain because they are primarily used in other conditions than highway conditions:

- **Category M₃ vehicles of Class A, Class I and Class II;
Category M₃ articulated buses of Class A, Class I and Class II**
AEBS is most efficient for “long distance trucks and coaches” travelling on highways. AEBS has been primarily designed to support the driver during monotone driving conditions on highways.

Class A, Class I and Class II buses are mostly used in urban or sub-urban areas and rather seldom on highways. Thus AEBS is likely not to be as efficient as on a long distance truck or coach. This is even more the case for articulated buses.

Moreover, such City buses are also designed for conveying standing passengers and are usually not equipped with seatbelts. In cases of unintended interventions of AEBS the standing passengers are more endangered than the belted and seated ones. Despite such unintended interventions will be very seldom, the consequences of such a situation are more critical than for long distance trucks and coaches.

- **Off-road vehicles of categories M₃, N₂ and N₃**

Off road-vehicles are very seldom used on highways but mainly used in off-road areas and/or on graveled tracks. They are normally driven at lower speeds than on highway, in such conditions that monotone driving is not expected. In addition, Environment conditions for these vehicles (dust, mud, humidity etc.) can negatively affect the sensor. Bad driving surfaces (gravel etc.) are expected to quickly damage the sensor and may affect the whole system robustness. Off-road vehicles are designed for off-road conditions, and therefore have a high chassis height which might cause problems to install the sensor in accordance with the supplier’s recommendations.

¹ As defined in the Consolidated Resolution on the Construction of Vehicles (R.E.3.), document ECE/TRANS/WP.29/78/Rev.3, para. 2.

- **Vehicles of categories M₃, N₂ and N₃ with more than three axles and a maximum wheel diameter code exceeding 19.5 or with a maximum mass exceeding 25 t**

Vehicles with more than 3 axles in the EU are often construction vehicles, which are seldom used on highways and rarely in conditions where AEBS would be the most efficient.

~~(e.g. buses with standing passengers i.e. Classes I, II and A⁺).~~ Regardless from the benefit, there are other sub-groups where the installation of AEBS would be technically difficult:

- **Vehicles not equipped with a pneumatic rear-axle suspension**

Vehicles not equipped with a pneumatic rear-axle suspension have high pitch angle variations which are limiting and affecting the field of view of the sensors.

- **Category N2 tractor for semi-trailer with a maximum mass between 3,5 tonnes and 8 tonnes;**

These vehicles are typical vehicles not much distributed because they have particular utilizations. Due to this rarity it is currently difficult to equip them with AEBS in an economically efficient way.

- **Special purpose vehicles of categories M₃ , N₂ and N₃**

On special purpose vehicles, installation of the sensor is often not possible (snow plows, front pumps, external devices at or on the bumper etc.) and cannot fulfill the supplier's specifications for the installation of the sensor. Typically, these vehicles have a low mileage for a high number of operating hours.

- **Vehicles of categories M₃, N₂ and N₃ with more than three axles and a maximum wheel diameter code exceeding 19.5 or with a maximum mass exceeding 25 t**

The environment conditions for these construction vehicles can negatively affect the sensor, in a similar way as for off road vehicles. 4 axle vehicles in Japan are mostly used for long haulage transport, thus are not excluded from the scope."

In addition, systems intended for vehicles not equipped with a pneumatic rear-axle suspension require the integration of advanced sensor technology to take into account the variation of the pitch angle of the vehicle. **Vehicles not equipped with a pneumatic rear-axle suspension indeed have high pitch angle variations which are limiting and affecting the field of view of the sensors.** Contracting Parties wishing to apply this Regulation to these vehicles should provide adequate time for this.

The system shall automatically detect a potential forward collision, provide the driver with a warning and activate the vehicle braking system to decelerate the vehicle with the purpose of avoiding or mitigating the severity of a collision in the event that the driver does not respond to the warning.

The system shall only operate in driving situations where braking will avoid or mitigate the severity of an accident, and shall take no action in normal driving situations.

In the case of a failure in the system, the safe operation of the vehicle shall not be endangered.

The system shall provide as a minimum an acoustic or haptic warning, which may also be a sharp deceleration, so that an inattentive driver is made aware of a critical situation.

During any action taken by the system (the warning and emergency braking phases), the driver can, at any time through a conscious action, e.g. by a steering action or an accelerator kick-down, take control and override the system.

The Regulation cannot include all the traffic conditions and infrastructure features in the type-approval process. Actual conditions and features in the real world should not result in false warnings or false braking to the extent that they encourage the driver to switch the system off.

II. Justification

1. Vehicle manufacturers are currently implementing AEBS on a large variety of models, e.g. to fulfil mandatory requirements in some Contracting Parties. This implementation work confirms the concerns which have been brought up for discussion during the AEBS/LDWS informal group activities and sheds light on a number of technical issues that pop up when installing obstacle detection devices on some specific vehicles, in particular in case of huge technical diversity and where the vehicle environment can have negative impact on system reliability and on its ability to operate.

For example:

- Due to the technical environment specific to off-road vehicles (steel bumpers, electric truck winches, windshield thickness, split windshields, asymmetrical cabs, front hood vehicles etc.) robust and reliable sensor integration is not always possible.
- Robust sensor installation on special purpose vehicles is often not possible (snow plows, external devices, front mounted equipment etc.).
- The environment conditions for construction vehicles may also negatively affect the sensors, in a similar way as for off road vehicles (dust, mud, humidity in off-road areas or on gravelled tracks...).
- (See more technical background further down in this justification.)

2. The proposal here is to draw the attention of the Contracting Parties on the vehicle categories where the technical and external environment generates conditions affecting correct operation of the system, and technical issues to properly install the system.
