



EUROPEAN COMMISSION

Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs

Industrial Transformation and Advanced Value Chains
Automotive and Mobility Industries

Public Consultation on the revision of the Vehicle General Safety Regulation and the Pedestrian Safety Regulation

Background document

Introduction

Road safety in the EU has improved significantly over the past decades, thanks to strong and effective action taken at EU, national and local level to address vehicle safety, road user behaviour and infrastructure.

Passenger cars, vans, trucks, buses and their trailers are all covered by EU legislation that requires type-approval of vehicles. Each vehicle type has to meet a range of rules, roughly divided in three main areas: 1) general construction, 2) environmental protection and 3) vehicle safety. As part of the vehicle type-approval framework, vehicle safety in turn is covered by two main regulations, namely the General Safety Regulation (EC) No 661/2009 (GSR) as well as the Pedestrian Safety Regulation (EC) No 78/2009 (PSR).

The GSR covers practically all vehicle safety aspects such as crash testing, safety belt restraint systems, lighting, glazing, brakes, stability control systems, child seat anchorages ISOFIX and tyre safety.

The PSR manages the requirements for cars in terms of the protection of pedestrians and other vulnerable road users that are struck by a car on the road. It contains requirements for bonnets to absorb energy when impacted by a person's head as well as requirements for bumpers to absorb energy when it hits a person's leg.

Need for new legislation

In general, the number of road fatalities in the EU has come down considerably during the last decades, although recently this progress seems to have stagnated. The Commission is therefore now considering whether the safety elements of the General Safety and Pedestrian Safety Regulations should be updated to lower the number of road fatalities and severe injuries. The Commission is specifically considering the following packages of safety measures:

ACCIDENT AVOIDANCE SAFETY MEASURES:

Autonomous emergency braking - Combine sensing of the environment ahead of cars and vans with the automatic activation of the brakes (without driver input) in order to mitigate or avoid an accident.

Intelligent speed assistance - To aid drivers in observing the appropriate speed for the road environment by providing haptic feedback (e.g. increase accelerator pedal pushback force).

Lane-keeping assistance - Monitoring the position of the vehicle with respect to the lane boundary and applying a torque to the steering wheel, or pressure to the brakes, when a lane departure is about to occur.

Driver drowsiness or distraction monitoring - Assessment of driver alertness in relation to distraction or fatigue.

GENERAL SAFETY MEASURES:

Emergency braking display – Rapid flashing stop lamps to indicate a high retardation

Safety belt reminders – safety belt status on all seats in motor vehicles (except bus passengers).

Frontal crash testing updates – introduction of full width crash test for better restraint systems protecting older and smaller occupants, removal of crash test exemption for heavier passenger cars (SUVs) and introduction of crash testing for light commercial vehicles (delivery vans).

Side crash testing updates – introduction of pole side impact for better side collision head protection and removal of crash test exemption for vehicles with elevated seating positions (SUVs).

Rear crash testing introduction – Assessment of fuel tank fire risk and propulsion battery electrical safety in case of a rear impact

Alcohol interlock device interface standardisation – Introduction of requirements that facilitate a much easier fitment of aftermarket Alcohol Interlocks Devices in motor vehicles, when needed.

Crash event data recorder - Stores critical crash-related information such as vehicle speed, state of restraints and braking systems as well as other relevant vehicle data, just before, during and after the collision

Tyre pressure monitoring - Reporting tyre-pressure information to the driver of the vehicle via gauge or warning lamp, expansion from passenger cars (currently mandatory) to all motor vehicles and heavy trailers.

MEASURES FOR TRUCKS, TRAILERS AND BUSES

Front-end design and direct vision - To protect pedestrians and cyclists involved in collisions, via blind spot camera/monitoring systems paired with detection capability of pedestrians and cyclists around the cab, to the introduction of requirements covering the direct vision of the driver.

Truck and trailer rear underrun protection (rear bumper) – Upgrading of the required bumper strength to prevent passenger cars from sliding under the rear end of trucks and trailers

Truck lateral protection (side guards) - significant reduction of exemptions that are currently permitted, notably for off-road vehicles

Fire safety for buses – CNG (Compressed Natural Gas) powered vehicles blow-off valve location/orientation and automatic fire extinguishers

PEDESTRIAN AND CYCLIST SAFETY

Pedestrian and cyclist forward detection – Specific focus on the detection of these Vulnerable Road Users in combination with autonomous emergency braking action

Head impact on a-pillars and front windscreen – Extension of the impact zone as realistically struck by an adult’s head when involved in a collision with a passenger car or van, as this is currently limited to the rear edge of the bonnet.

Reversing detection – Camera and/or detection to avoid collisions with persons behind reversing vehicles.

ANNEX

ACTIVE SAFETY MEASURES

AUTONOMOUS EMERGENCY BRAKING: Combines sensing of the environment ahead of the vehicle with the automatic activation of the brakes, without driver input, in order to mitigate or avoid an accident. The systems shall detect the possibility of a collision, warn the driver by a combination of optical, acoustic or haptic signals and, if the driver takes no action, automatically apply the vehicle's brakes.

Introduction date: 1 September 2020 for slowing car in front, 1 September 2022 for standing car in front

INTELLIGENT SPEED ASSISTANCE: Describes a range of technologies which are designed to aid drivers in observing the appropriate speed for the road environment. These systems which warn the driver when the speed limit is exceeded, or actively assist the driver by reducing speed, provide a very effective strategy for reducing accidents and injury severity. However, the system should at all times be easily overridden by the driver when necessary, e.g. when overtaking. The suggested method for such a system would be providing effective haptic feedback, for instance by gently pushing the pedal upwards to signal the vehicle is driving too fast and to slow it down.

Introduction date: 1 September 2020

LANE KEEPING ASSISTANCE: This system can help avoid accidents in which a vehicle leaves the lane unintentionally, usually because of driver distraction or fatigue, that can result in head-on collisions with oncoming vehicles, involve impacts with roadside obstacles or side-swipe of the vehicle that is travelling in the same direction in an adjacent lane.

Introduction date: 1 September 2020

DRIVER DROWINESS OR DISTRACTION MONITORING: Distraction and drowsiness are both considered types of driver inattention for which the key shared feature is the absence of visual attention on the driving task, either due to fatigue or due to some activity that competes for a driver's visual attention. In order to recognize distraction and drowsiness, the type of system considered is the one that may employ physiological monitoring, physical monitoring or behavioural indices and patterns.

Introduction date: 1 September 2020

PASSIVE SAFETY MEASURES

EMERGENCY BRAKING DISPLAY: The emergency braking display, or emergency stop signal, consists of a rapid flashing of the brake signal lamps when full brakes are applied. Drivers following the hard-braking vehicle are instantly aware that the vehicle in front is slowing down very quickly so that they can take appropriate action. The rapid flashing brake lamp may be observed by onboard camera detection systems to provide other types of warning to the driver.

Introduction date: 1 September 2020

SAFETY BELT REMINDERS: Safety belt reminder systems detect the presence of occupants on front and rear seating positions and monitor their safety belt status. In order to encourage safety belt use, an audible and visual warning is emitted if occupants are not wearing a seat belt.

Introduction date: 1 September 2020

FRONTAL CRASH TESTING UPDATES: This type of crash testing has been established and introduced on a mandatory basis for the majority of passenger cars available on the market. The test replicates a 40% overlap frontal collision with an oncoming vehicle. There are however several exemptions for heavy passenger cars, notably SUVs, linked to their maximum mass and these do not have to be crash tested for EU compliance as a result. Furthermore, common light commercial vehicles such as vans and pick-up trucks are currently entirely exempted from frontal crash testing. It is suggested that these exemptions are eliminated and to add a further integrated set of tests procedures containing both a full width and a small overlap test to cover common crash scenarios. A full width crash leads to high decelerations which require advanced load limiting safety belts to protect occupants on front and rear seats. A small overlap crash can lead to very strong deformation of the A-pillar and side door onto which the occupant's head can strike, leading to severe head trauma.

Introduction date: 1 September 2020

SIDE CRASH TESTING UPDATES: This type of crash testing has been established and introduced on a mandatory basis for the majority of passenger cars and light commercial vehicles available on the market. It covers side collisions by another passenger car. Vehicle models with high seating positions, notably SUVs and vans, are exempted from the side impact test as the occupants are generally safe from harm. However, the test should also assess integrity of the fuel tanks against rupture or leakage as well as protection of occupant or rescue worker exposure to high-voltage electrical system parts after a crash. Furthermore, rear occupant and far side occupant safety is not assessed in this crash test scenario at the moment. .

Introduction date: 1 September 2020

REAR CRASH TESTING INTRODUCTION: A rear-end collision is defined as a crash in which the front of one vehicle collides with the rear of another vehicle. Rear impact testing is not mandatory in the EU, but it has been regulated in the USA and Japan for many years, notably linked to fire-related deaths. Modifying the EU legislation to include a compulsory rear impact test would contribute to the process of harmonising vehicle regulations and would address the fact that, in general, vehicles with electric propulsion also need to offer adequate protection of occupant and rescue worker exposure to high voltage electrical system parts after a crash.

Introduction date: 1 September 2020

ALCOHOL INTERLOCK DEVICE INTERFACE STANDARDISATION: Alcohol interlock devices require a vehicle operator to for instance provide a breath sample so as to prevent the vehicle from being operated if alcohol above a pre-defined threshold is detected. Application of alcohol interlock devices is intended to reduce collision risk by preventing drivers under the influence of alcohol from operating vehicles. This measure, as suggested in the report, does not involve the mandatory installation of alcohol interlock devices, but facilitating their installation, as this task has become increasingly difficult for installers due to more complicated and advanced vehicle powertrains in modern vehicles.

Introduction date: 1 September 2020

CRASH EVENT DATA RECORDER: Event data recorders keep track of a range of vehicle data over a short timeframe before, during and after they are triggered, usually by the deployment of an airbag, caused by a vehicle crash. It contains critical crash related information such as vehicle speed, state of restraints and braking system as well as other relevant vehicle data at the time of the accident. With even more autonomous features taking over certain driver tasks, it will become increasingly important to check their state and their level of autonomy at the time the accident occurred. In addition, event data recorders have the potential to provide a wealth of accurate information that will help in dept accident analysis to check the effectiveness of systems that are mandated or fitted on a voluntary basis, to help review future safety legislation.

Introduction date: 1 September 2020

TYRE PRESSURE MONITORING: Severe tyre under-inflation may lead to accidents. A pressure deviation of more than 15% generally results in noticeable change of tyre properties which affects the wear rate of the tyre, as well as the braking and handling performance of the vehicle. The increased heat generation due to tyre under-inflation reduces the maximum lateral tyre force, creating a further safety risk. Proper tyre pressure also reduces rolling resistance and thus saves fuel and reduces CO₂ emissions. Improvements are suggested for light and heavy commercial vehicles as well as buses which haven't been subject to tyre pressure monitoring requirements until now.

Introduction date: 1 September 2020

TRUCKS AND BUSES

FRONT-END DESIGN AND DIRECT VISION: The main goal is to introduce pedestrian and cyclist detection and warning systems as well as to improve the direct vision of truck drivers by changing the windows in the cab. Improved front end design could also lead to better protection in case of frontal collision of cars with trucks, by upgrading front underrun protection systems to absorb impact energy, and promote the use of easy access streamlined cabs.

Introduction date: 1 September 2020 for detection and warning systems, 1 September 2028 for driver's direct vision

TRUCK AND TRAILER REAR UNDERRUN PROTECTION (rear bumper): Improvements in the strength of rear underrun devices and better vertical geometric alignment with the main structures of modern passenger cars are needed to prevent that the rear underrun is performing sub-optimal when a car crashes into the rear of the truck or trailer.

Introduction date: 1 September 2020

TRUCK LATERAL PROTECTION (side guards): Heavy goods vehicles and their trailers are presently required to be fitted with structures to reduce the open space ahead of the rear axle(s) to provide protection to pedestrians and cyclists in collision with the side of such vehicles, reducing the likelihood of them being run over. However , the current legislative text allows for broad exemptions to fitting these structures, and therefore action needs to be taken to improve this situation.

Introduction date: 1 September 2020

FIRE SAFETY FOR BUSES: This measure considers specific enhanced requirements for CNG (compressed natural gas) buses in case of fire, as well as the introduction of automatic fire extinguishers in the engine bay.

Introduction date: 1 September 2020

PEDESTRIAN AND CYCLIST SAFETY

PEDESTRIAN AND CYCLIST DETECTION: This measure is closely connected to the automatic emergency braking system. In this case, the system is expanded with the ability to specifically detect pedestrians and cyclists that are about to cross the street and that may collide with the vehicle.

Introduction date: 1 September 2024 for pedestrians, 1 September 2026 for cyclists

HEAD IMPACT ON A-PILLARS AND FRONT WINDSCREEN: In case a pedestrian or cyclist is struck by a car, impacts of the person's head to the windscreen and the frame around the edge of the windscreen are not considered in current legislation and can be considered to represent significant gaps in the protection of vulnerable road users. Accident data suggests that accidents where the head strikes these elements are indeed significant. Therefore additional tests should be introduced.

Introduction date: 1 September 2024

REVERSING (BACKING UP) DETECTION: Reversing detection systems are those that increase the view and/or awareness of drivers in respect of persons, in particular small children, or other obstacles behind reversing vehicles.

Introduction date: 1 September 2020