

【欧州】 【自動車】

Road/Railway - Automated driving vehicle: Regulation (EU) 2019/2144 with type-approval for fully automated vehicles and automated driving systems starts to apply

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【概要 : Summary】

In the next decade, the road transport could undergo massive changes, driven by electrification of the vehicle fleet and the introduction of connected and automated vehicle technologies. Automated vehicle technologies, the concepts of connected and automated transport (CAT), and especially automated driving is expected to contribute to increase the efficiency and safety of the road transport system.

Fully autonomous cars are already being tested in some confined areas and autonomous cars will be technologically feasible in the foreseeable future, but a huge array of issues including the safety and legal rules for their use must be resolved first. Automobile companies have been calling on governments to introduce laws that would allow autonomous cars to drive more freely in the EU, but safety and liability-related questions need to be answered before autonomous vehicles can enter the mass market. The answers will have to involve the vehicle manufacturers as well as insurers, to clarify who will have to take the responsibility and who is liable in case a fully autonomous car has an accident.

Regulation (EU) 2019/2144 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate

technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users aims at introducing state-of-the-art safety technologies as standard vehicle equipment. It started to be applied by 6 July 2022 and provides also the first ever EU legal framework for automated and fully automated vehicles.

【記事 : Article】

1. Introduction of autonomous vehicles in road transport

Road transport will undergo significant changes as automated vehicle technologies will be introduced at increasing pace and scope. Fully autonomous vehicles are capable of driving a vehicle without the human driver when the automatic driving features are engaged. Autonomous vehicles have been tested on public roads for some time, especially in the US, and in general, they are considered being safer than cars driven by a human driver. Fully autonomous or driverless cars do not need a driver's intervention to function while the automated driving features are engaged. The future transportation ecosystem could support the introduction of robotic taxis, automated shuttles, and delivery drones for urban environments. The

new market for automated and connected vehicles is expected to grow exponentially and large economic benefits are expected, with for instance revenues exceeding EUR 620 billion by 2025 for the EU automotive industry and EUR 180 billion for the EU electronic sector (COM (2018) 0283 final). Self-driving, autonomous vehicles are expected to have the potential to change the entire transport sector in the mid- and long-term. The Society of Automotive Engineers SAE determines the intelligence level and automation capabilities of vehicles, ranking from Level 0 to Level 5, from fully manual vehicles (level 0) to level 5 on which human driving is eliminated (SAE International 2021). SAE level 0 to 2 defines that the human driver is still “driving” also when support features and driving assistance systems are engaged. Level 3 to level 5 of automated vehicles define that the driver is not driving anymore, when the automatic driving features are engaged. Level 5 vehicles are the only class of automated vehicles that do not have manual driving control devices such as steering wheels, and gas and brake pedals anymore. The autonomous vehicles of level 5 of automation are expected to be commercially available and introduced by 2030 (SAE International 2021). Level 5 vehicles are the only class of automated vehicles that do not have manual driving control devices such as steering wheels, and gas and brake pedals anymore. The autonomous vehicles of level 5 of automation are expected to be commercially available and introduced by 2030. However, level 3 automated vehicles are already on the roads. The ultimate objective will be to reach the vehicle automation level 5 of fully autonomous driving. Since fully autonomous or driverless cars are connected to the Internet to function properly, alongside the development of these new technologies there will arise new vulnerabilities regarding cyber and physical threats for the highly automated vehicles.

Automated or autonomous driving is expected to increase road safety and to reduce the number of accidents considerably. However, legislation needs to be introduced to settle fundamental issues such as compliance with safety, ethical standards, and liability. Therefore, uniform procedures and technical specifications for the type-approval of the automated driving system (ADS) of fully automated motor vehicles needs to be introduced (European Commission n.d.).

2. Background of the EU’s legal framework for automated and fully automated vehicles

Considering the need to introduce legislation that covers automated vehicles and autonomous driving, it needs to settle fundamental issues such as compliance with safety, ethical standards, and liability in case of accidents involving driverless cars. The European Commission presented its third and final set of actions to modernise Europe’s transport system under the “Europe on the Move” Packages. The Commission proposes a comprehensive EU approach towards connected and automated mobility. Its strategy in the third mobility package Communication COM (2018) 0283 of 17 May 2018 also includes an integrated policy for the smooth transition towards a safe, clean as well as connected and automated mobility system in the EU. The Communication outlines a comprehensive set of EU actions towards the deployment of connected and automated mobility systems and proposes rules for self-driving cars under common EU legislation. The aim is to put in place the right EU internal market regulatory framework to ensuring the adequate legal framework for the full development and deployment of key technologies, services, and infrastructure of automated mobility (European Commission 2022b). It will ensure that EU legal and policy frameworks are ready to support the deployment of safe connected and automated mobility, while simultaneously addressing societal and environmental concerns which will be

decisive for public acceptance (COM (2018) 0283 final).

The European Commission 's proposed strategy and agenda for actions on the development and deployment of key aspects of autonomous driving on roads was also subject of the feedback period from 07 April 2022 - 05 May 2022 on the draft for a Commission Implementing Regulation laying down rules for the application of Regulation (EU) 2019/2144 regarding the uniform procedures and technical specifications for the type-approval of the automated driving system (ADS) of fully automated motor vehicles (European Commission n.d.). This draft for a Commission Implementing Regulation laying down rules for the application of Regulation (EU) 2019/2144 for the type-approval of the automated driving system (ADS) of fully automated motor vehicles aims at components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users.

It is necessary to adopt the implementing legislation for the type-approval of the automated driving system of fully automated vehicles (European Commission n.d.). According to the draft Implementing Regulation, the assessment of the automated driving system of fully automated vehicles relies heavily on the traffic scenarios that are relevant for the different uses cases of fully automated vehicles. It is therefore necessary to define those different use cases. The review of such use cases should be conducted on a regular basis. (EUR-Lex n.d.).

The EU ADS legislation draft has two main parts: ADS performance requirements and ADS compliance assessment. The ADS performance requirements specify what capabilities an autonomous vehicle must have to receive a type-approval in Europe. The ADS compliance assessment specifies how an autonomous vehicle will be evaluated, audited, and tested before it will get type-approval.

Given the complexity of automated driving systems, it is necessary to supplement the performance requirements and tests of this Regulation by manufacturer documentation demonstrating that the automated driving system is free of unreasonable safety risks to vehicle occupants and other road users (EUR-Lex n.d.). A safety management system needs to be put in place by the manufacturers, to set for manufacturers and authorities the parameters to be used for the traffic scenarios relevant for automated driving system, and to lay down criteria for accessing if the safety concept of the manufacturer addresses the relevant traffic scenarios, hazard, and risks. Finally, it is necessary to specify the relevant in-use data that shall be reported by the manufacturer to the type-approval authorities (EUR-Lex n.d.).

3. The General Safety Regulation 2018 (Regulation (EU) 2018/858) and the New Vehicles General Safety Regulation (EU) 2019/2144

In parallel to the presentation of the Communication on the automated mobility and the EU 's strategy for mobility of the future (COM/2018/283 final), the Commission presented the revised General Safety Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC (Regulation (EU) 2018/858).

Regulation (EU) 2018/858 rules addressed the need for improving vehicle and road safety, given that around 95% of accidents are related to human error (Regulation (EU) 2018/858). The Commission has since adopted a series of related implementing regulations covering several different driver assistant measures introduced by the Regulation (EU) 2018/858 (European Commission 2022b).

Most recently, the Regulation (EU) 2018/858 was amended by Regulation (EU) 2019/2144 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, as regards their general safety and the protection of vehicle occupants and vulnerable road users (Regulation (EU) 2019/2144), which entered into force on 5 January 2020 (Regulation (EU) 2019/2144).

The new Vehicles General Safety Regulation (EU) 2019/2144 on type-approval requirements for motor vehicles and their trailers, and systems, components and separate technical units intended for such vehicles, regards their general safety and the protection of vehicle occupants and vulnerable road users (Regulation (EU) 2019/2144). Regulation (EU) 2019/2144 aims at significantly reducing deaths and serious injuries on EU roads by introducing state-of-the-art safety technologies as standard vehicle equipment, and to enhance the competitiveness of EU's automobile manufacturers on the global market by providing the first ever EU legal framework for automated and fully automated vehicles (EUR-Lex 2022). This new legal framework of the general safety regulation (EU) 2019/2144 updates EU vehicle safety requirements including those for advanced vehicle systems and fully automated vehicles (EUR-Lex 2022). As of 6 July 2022, the new Vehicles General Safety Regulation (EU) 2019/2144 measures must be applied regarding safety features to assist the driver of all road vehicles including passenger cars, vans, trucks, and buses. It will apply for the intelligent speed assistance, reversing detection with camera or sensors, attention warning in case of driver drowsiness or distraction, event data recorders as well as an emergency stop signal (European Commission 2022b).

Regarding passenger cars and vans, additional features such as lane keeping systems and automated braking; and enlarged head-impact

protection zones capable of mitigating injuries in collisions with vulnerable road users; an interface to enable the fitting of an alcohol interlock (breathalyser); as well as driver drowsiness and attention warning systems among others will be applied (EUR-Lex 2022).

As for buses and trucks, technologies for better recognising possible blind spots, advanced systems capable of detecting pedestrians and cyclists close to the nearside of the vehicle and to give warnings to prevent collisions with pedestrians or cyclists (EUR-Lex 2022).

The rules will first apply to new vehicles' type approval from 6 July 2022 onwards and to all new vehicles from 7 July 2024. Some of the new measures will be expanded to cover different kinds of road vehicles until 2029 (European Commission 2022b).

Moreover, the European Commission must present an evaluation report on the effectiveness of the safety measures and systems by 7 July 2027. If appropriate, the report must make recommendations and include a proposal for legislation to further reduce or eliminate road transport accidents and injuries. A further report should be presented every 5 years subsequently (EUR-Lex 2022).

4. Regulation (EU) 2019/2144 as legal framework for new safety measures regarding automated vehicles

Regulation (EU) 2019/2144 introduces a range of mandatory advanced driver assistant systems to improve road safety and establishes the legal framework for the approval of automated and fully driverless vehicles in the EU. While this regulation entered into force on 5 January 2020 (Regulation (EU) 2019/2144), it started to be applied on 6 July 2022. The new safety measures are expected to help to better protect passengers, pedestrians, and cyclists across the EU, expectedly saving over 25,000 lives and avoid at least 140,000 serious injuries by 2038 (European Commission 2022b). Regulation (EU) 2019/2144 also

provides the first ever EU legal framework for automated and fully automated vehicles and empowers the Commission to complete the legal framework for automated and connected vehicles. Accordingly, the Commission will deliver technical rules for the approval of fully driverless vehicles, which is expected to increase public trust and boost innovation and competitiveness of the EU's automobile manufacturing industry (European Commission 2022b). The Commission is expected to adopt in the next months the technical rules for automated and connected vehicles, focusing on automated vehicles replacing the driver on motorways (level 3 automation) and fully driverless vehicles like urban shuttles or robotaxis (level 4 automation) (European Commission 2022b). The EU would thereby introduce the technical legislation that will allow EU Member States to approve the registration and sale of vehicles model installed with advanced automatic driving technology, starting with level 3 automation.

The delegated act is C/2022/3823 final (COMMISSION DELEGATED REGULATION (EU) /... amending Annexes I, II, IV and V to Regulation (EU) 2018/858 of the European Parliament and of the Council as regards the technical requirements for vehicles produced in unlimited series, vehicles produced in small series, fully automated vehicles produced in small series and special purpose vehicles, and as regards software update) (C/2022/3823). The implementing act is Ares(2022)2667391 on Type-approval of the automated driving system (ADS) of fully automated vehicles. COMMISSION IMPLEMENTING REGULATION (EU) .../... laying down rules for the application of Regulation (EU) 2019/2144 of the European Parliament and of the Council as regards uniform procedures and technical specifications is relevant for the type-approval of the automated driving system (ADS) of fully automated motor vehicles (Ares(2022)2667391, (Draft implementing regulation) (n. d.).

These technical rules for automated and connected vehicles will allow a comprehensive assessment of safety and maturity of the fully automated vehicles, covering testing procedures, cybersecurity requirements, data recording rules as well as monitoring of safety performance and incident reporting requirements by manufacturers of fully driverless vehicle before those automated vehicles can enter the EU's market (European Commission 2022b). Further measures will be progressively introduced between July 2024 to July 2029.

The new rules align the EU legislation with the new UN rules on level 3 automation, which extend automated driving in certain traffic environments from the current limit of 60 km/h to up to 130 km/h (UNECE 2022). The amendment to UN Regulation No.157 was adopted on 22 June 2022 by the World Forum for Harmonization of Vehicle Regulations and extends the maximum speed for Automated Driving System (ADS) for passenger cars and light duty vehicles up to 130 km/h on motorways (UNECE 2022). It also allows automated lane changes, among others and will enter into force in January 2023 also in the EU.

According to the Executive Vice-President for a Europe fit for the Digital Age, Margrethe Vestager, the new advanced and mandatory safety features will further help reduce the number of casualties and the rules will also enable a safe introduction of autonomous and driverless vehicles in the EU (European Commission 2022b). Commissioner Thierry Breton, responsible for the Internal Market, underlined that with the start of the application of the new vehicle safety legislation, the automotive industry has a predictable and safe framework to continue to develop and deploy innovative technology solutions while maintaining its global competitiveness.

5. Conclusion

Based on the EU General Safety Regulation, Regulation (EU) 2019/2144, which started to be applied on 6 July 2022, all vehicles in the EU will now have to be equipped with a series of new safety features. Furthermore, also the first legal framework to allow automated and fully driverless cars to become available on European roads, is now introduced. Regulation 2019/2144 sets specific requirements based on uniform procedures and technical specifications for the type-approval of the automated driving system (ADS) of fully automated motor vehicles. These rules will make sure that the automated systems are safe to use. In the next months, the European Commission is expected to adopt new rules in the form of delegated and implementing acts for the technical rules for automated and connected vehicles, including those automated vehicles replacing the driver on motorways (level 3 automation) and fully driverless vehicles like urban shuttles or robotaxis (level 4 automation). This will allow EU Member States to approve the registration and sale of these vehicles with next-generation automated driving systems. This introduction of the application of Regulation (EU) 2019/2144 and the planned adoption of the delegated and implementing acts for the technical rules for level 3 and level 4 automation vehicles clearly shows the EU's support for the deployment of fully automated vehicles in future.

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