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A civil law review of liability in accidents involving electric vehicles with autonomous control systems

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Abstract

The development of electric cars is accelerating, supported by environmentally friendly technology regulations aimed at reducing carbon emissions and dependence on fossil fuels. Electric cars also integrate Artificial Intelligence (AI) technology, giving rise to autonomous driving systems. The implementation of autonomous driving systems is expected to reduce the rate of accidents caused by human error. However, the adoption of electric cars with autonomous systems presents new challenges, particularly related to the risk of accidents. These accidents raise questions about who is responsible for such incidents whether it is the manufacturer, the AI developer, or the vehicle owner. The purpose of this study is to analyze the existing legal regulations regarding liability for autonomous driving systems in electric cars. The research method used is normative juridical. The findings indicate that Indonesia currently lacks specific regulations governing the feasibility testing and use of electric cars with autonomous driving systems. This regulatory gap makes it difficult to determine who should be held accountable in the event of an accident. This research has significant implications for legal reform, policy development, and automotive technology innovation. These findings can serve as a foundation for creating better and more adaptive regulations in the future.

Keywords

Electric vehicles, Liability, Legal regulations, Autonomous control

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Introduction

The development of electric vehicle (EV) technology and automatic control systems (autonomous driving) has experienced significant progress in the last few decades [1]. This innovation not only offers an environmentally friendly solution by reducing carbon emissions, but also improves energy efficiency and driving safety. Electric vehicles with automatic control systems are a symbol of the automotive industry's transformation towards sustainable and intelligent mobility.

In recent years, the development of electric vehicle technology and automatic control systems has become a major focus in the global automotive industry [2]. Electric vehicles, which were previously considered a less attractive alternative to fossil fuel vehicles, have now undergone a significant transformation thanks to technological advances.

Electric cars equipped with automatic technology such as automatic control systems, offer the potential to increase driving safety and comfort. This technology utilizes artificial intelligence (AI) and various sensors to help drivers make decisions and reduce the risk of accidents [3]. If an electric car accident occurs, this responsibility involves not only the driver, but also the vehicle manufacturers, who must ensure that the systems they develop are safe and function properly. Electric car drivers still have responsibility for controlling the vehicle, although most control functions have been transferred to automated systems. But on the other hand, if an accident occurs due to system failure, liability may shift to the manufacturer. This is a legal challenge regarding the limits of responsibility between drivers and corporations and how existing laws can regulate this situation.

The use of electric cars with automatic systems abroad, especially those involving autopilot technology, has become a global spotlight along with the increasing adoption of these environmentally friendly vehicles [4]. Case studies of accidents involving electric cars, one of which is Tesla, show that incidents often occur due to system failure or user error in operating this sophisticated technology [5]. For example, accidents in China and the United States that claimed the lives of drivers and passengers, as well as fire incidents involving new vehicles within a short time of purchase. The United States National Highway Traffic Safety Administration (NHTSA) has recorded hundreds of crashes involving Tesla's driver assistance features, highlighting the need for further evaluation of the safety of this technology [6].

Method

The method used in this research is normative juridical with a case study approach to statutory regulations. The problem formulation that is the focus of this research is what is the concept of civil legal responsibility in accidents involving electric cars with automatic control systems? The aim of this research is to analyze the principles of civil legal responsibility in accidents involving electric cars with automatic control systems and to find out the legal rules that apply in Indonesia. It is hoped that this research can contribute both theoretically and practically to answering the legal challenges that arise due to the development of electric car technology with automatic control.

Results and Discussion

Electric cars with automatic systems are vehicles that use electric power as the main energy source and are equipped with technology that allows the vehicle to control itself

in various driving conditions [7]. This automated system presents the potential to increase driving comfort and safety. Apart from that, this feature also combines various advanced technologies such as sensors, radar, cameras and artificial intelligence (AI) systems to collect and analyze data from the surrounding environment [8].

Electric cars with automatic systems have several main characteristics that differentiate them from fossil fuel cars [9]. First, in terms of energy sources, electric cars use batteries to store electrical energy, replacing fossil fuels. This makes it more environmentally friendly because it produces lower emissions. Second, this vehicle is equipped with automation and artificial intelligence (AI) technology such as an automatic control system or autopilot, which allows the car to drive itself without driver intervention under certain conditions. For example, technology like Tesla Autopilot can take over control when faced with certain traffic situations. Third, from a security and safety perspective, electric cars with automatic systems are equipped with advanced features such as collision detection, automatic emergency braking and obstacle avoidance. In addition, international regulations set strict safety standards to ensure this technology is not only efficient but also safe for users and the surrounding environment.

Based on the description above, it can be seen that electric cars with automatic control systems offer various advantages, comfort and safety. However, in several cases of accidents involving electric vehicles with automatic control systems, this creates new challenges in determining legal responsibility, especially responsibility in civil law if an accident caused by an electric car with an automatic control system result in losses for both the car owner and the victim. Civil legal responsibility is a person's obligation to bear the consequences of his or her actions that cause harm to another party [10]. In the context of an electric car accident with an automatic control system, this responsibility may involve various parties, including the driver, the vehicle manufacturer and other third parties who may be involved.

According to civil law, there are several principles of responsibility relating to automatic control system car accidents [11]. The first is the principle of responsibility based on fault which emphasizes that legal responsibility only applies if there is an element of fault. Second, the principle of presumption of responsibility, namely the principle that explains that the party who has control over the vehicle, namely the driver or owner, is responsible for the losses caused. Third, the principle of absolute responsibility applies without requiring proof of error.

Based on the principles of civil legal responsibility described above, it can be seen which parties have the potential to be responsible if an accident occurs involving an electric car with an automatic control system. Responsibility can be imposed on the driver if the driver is negligent by not paying attention to the road or failing to monitor the automatic system properly. Even though electric cars are equipped with an automatic control system, drivers are still required to monitor and ensure the vehicle operates safely. However, if the accident is caused by a technological failure such as a malfunctioning

automatic control system, failure to detect obstacles, or a manufacturing defect, then responsibility can be transferred to the vehicle manufacturer.

Currently, there is no legality governing electric cars with automatic control systems in Indonesia, so the legality of electric cars with automatic control systems is still guided by the laws and regulations governing transportation [12]. In this case, it means that there are no norms that prohibit and are contradictory regarding electric cars with automatic control systems because in essence currently electric cars with automatic control systems are included in the general type of car as written in Law no. 22 of 2009 concerning Road Traffic and Transportation in Indonesia, it's just that electric cars with automatic control systems have a robot control system or with the help of artificial intelligence (Artificial Intelligence). In this case, there is also article 1365 of the Civil Code which regulates the occurrence of unlawful acts and article 1367 of the Civil Code which regulates liability.

Several developed countries have established clear regulations regarding legal responsibility in electric car accidents based on automatic control systems. In the United States, legal responsibility for vehicles with a high level of automation (Levels 4 and 5) tends to be transferred to the manufacturer or software developer, as regulated in the state of California [13]. The European Union through the General Safety Regulation integrates legal responsibility with safety standards and vehicle data monitoring [14]. Meanwhile, the UK, through the Automated and Electric Vehicles Act 2018, stipulates that insurance companies are the first parties to compensate for losses, with the right to claim back to the manufacturer if the accident is caused by technical failure [15]. On the other hand, in Indonesia, there are no specific regulations regarding automated vehicles, so responsibility still centers on the human driver. Learning from other countries' regulations can be an important reference for formulating relevant policies in Indonesia, providing legal protection that is more adaptive to technological developments.

Regulations regarding electric cars in Indonesia have a strong foothold through Presidential Regulation Number 55 of 2019 concerning the acceleration of the battery-based electric motor vehicle program [16]. This regulation covers various important aspects, starting from fiscal incentives, developing the electric vehicle industry ecosystem, to building supporting infrastructure such as public electric vehicle charging stations. This step shows the government's commitment to transitioning towards environmentally friendly transportation and reducing dependence on fossil fuels. However, although the regulations relating to electric vehicles are quite comprehensive, there are significant gaps in accommodating developments in vehicle technology with automatic (self-driving) systems. Currently, the traffic regulations regulated in Law Number 22 of 2009 concerning Road Traffic and Transportation are still based on the concept of vehicles that are fully controlled by humans. This creates a legal vacuum when electric car technology equipped with automatic systems begins to be tested or operated in Indonesia [2].

Electric vehicle technology based on automatic control systems (self-driving cars) presents new legal challenges, especially regarding insurance and consumer protection. In conventional systems, responsibility for accidents usually lies with the driver. However, with the advent of automated vehicles controlled by software and sensors, liability patterns are shifting, affecting insurance arrangements and legal liability mechanisms.

Several developed countries have adopted special regulations for automated vehicles. In the UK, for example, through the Automated and Electric Vehicles Act 2018, insurance companies are the first parties responsible for compensating for losses in the case of an accident. If an accident is caused by a technological failure, such as a software or sensor failure, the insurance company can submit a counterclaim to the vehicle manufacturer or technology developer. This model protects consumers from complicated legal processes while ensuring accountability to manufacturers and technology developers.

In addition, regulations in these countries emphasize consumer protection by providing the right to clear information regarding the capabilities and limits of automated systems. Manufacturers are required to store vehicle technical data through a black box system to facilitate investigations if an accident occurs. This protection includes consumer rights to a safe vehicle, transparency in claims settlement, and guaranteed technology security.

In Indonesia, the legal vacuum is still a big obstacle. The existing insurance system does not cover accidents due to technological failures in automated vehicles. This can be detrimental to consumers, both in terms of insurance claims and legal processes. Therefore, regulatory revisions that integrate the responsibilities of producers, technology developers and insurance companies are urgently needed. This step not only ensures consumer protection but also supports public trust and creates a safer and fairer automated vehicle ecosystem.

Conclusion

Automated electric cars use artificial intelligence and sensors to improve efficiency and safety, but also raise questions about legal liability in the event of an accident. Currently, Indonesia does not have specific regulations governing electric cars with automatic control systems, making it difficult to determine the party responsible for an accident. Responsibility often still centers on the driver, although automation technology can influence vehicle control. Countries such as the United States and the United Kingdom have developed clearer regulations regarding legal liability for automated vehicles, with insurance companies often being the first parties responsible for compensating for losses. Legal reform is needed in Indonesia to integrate the responsibilities of producers, technology developers and insurance companies to protect consumers and create a safer automated vehicle ecosystem.

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