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Ignition Switch Based Automatic Parking Brake System for Vehicle

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Abstract: *In this world of mechatronics and automation, various systems have been developed just to reduce the time and human error. The automated braking system is a part of mechatronics. Presently the vehicle has alarm system for maintaining the safe distance between moving vehicle. When the vehicle gets too close to the object, the alarm is triggered this warns the driver about an object. But this feature has many problems and is prone to human error. We have brought the facility by using the same sensor system but with the automated breaking system which restricts the backward motion of the vehicle. Our aim is to design the system which can avoid the accident in reversing the heavy loaded vehicles like trucks, buses and all the vehicles consisting of pneumatic braking system. For this purpose we have developed a model which automatic braking for four wheeler when lock the ignition switch and releasing when on the ignition switch.*

Keywords: mechatronics

I. INTRODUCTION

The present invention relates to a parking brake system for motor vehicles having a control element and at least two electromechanical actuators for generating a parking brake force at in each case one wheel of the motor vehicle. An electric parking brake control unit of an electric parking brake apparatus has an input section for receiving signals for performing automatic activation and deactivation, but does not have a determination function and a circuit for inputting signals from various sensors, Which are necessary to deter mine Whether to start the automatic activation/deactivation control. Therefore, when used in a vehicle which does not require an automatic control function and requires only a manual control function, the electric parking brake control unit can be used solely, with no signal line connected to the input section. When used in a vehicle Which requires both the automatic control function and the manual control function, the input section is connected to a second control unit that can output signals for performing automatic activation and deactivation' whereby the electric parking brake Control unit operates in cooperation With the second control unit

II. METHODS

1) Ignition-State Detection
Use sensors or connections to the ignition circuit to detect voltage changes.
Microcontroller reads the ignition status in real-time.
2) Brake Actuation Mechanism
Electromechanical actuator or servo motor linked to the parking brake.
Controlled by microcontroller based on ignition input.
3) Control Logic Programming
If ignition OFF, engage parking brake.
If ignition ON and vehicle in drive/neutral, disengage brake.
Include fail-safes and manual override options.
4) Safety Interlocks
Use vehicle speed sensor to check if vehicle is stationary.

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III. CONCLUSION

The development of an Ignition Switch Based Automatic Parking Brake System presents a significant advancement in vehicle safety and convenience. By automating the engagement and disengagement of the parking brake based on the ignition status, this system reduces the chances of human error, such as forgetting to apply or release the brake. The integration of this system not only enhances user comfort but also ensures greater vehicle security, especially on inclined surfaces.

The project successfully demonstrates the feasibility of using simple electronic components to create a cost-effective and reliable automatic brake system.

Future improvements could include integration with smart vehicle systems and sensors for enhanced control. Overall, this innovation contributes to the broader movement toward intelligent and autonomous automotive systems.

REFERENCES

[1]. Automatically engages the parking brake when the vehicle is stopped or when the ignition is turned off. This system provides convenience and safety by eliminating the need for the driver to manually engage the parking brake.

[2]. EPB systems are controlled by an electronic control unit (ECU) and actuator mechanism.

[3]. The driver typically activates the EPB with a button, and the system then applies the brake pads to the rear wheels.

[4]. Some systems can be programmed to automatically engage the parking brake when the vehicle is stopped or when the ignition is turned off, eliminating the need for the driver to manually engage it.